

# Rehabilitation Management Plan

**Buller Plateaux**

**August 2026**

**BPCP-ENV-PLN-002**

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## Glossary

| Specific terms      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AEMP                | Aquatic Ecology Management Plan (BPCP-ENV-PLN-006)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| AMD                 | Acid Metalliferous Drainage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| AvMP                | Avifauna Management Plan (BPCP-ENV-PLN-003)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| BPCP                | Buller Plateaux Continuation Project ('The Project')                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| BDC                 | Buller District Council                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| BRL                 | Bathurst Resources Limited                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| BMP                 | Biosecurity Management Plan (BPCP-ENV-PLN-007)                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| BOMP                | Biodiversity Outcome Monitoring Plan (BPCP-ENV-PLN-009)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| CML                 | Coal Mining License                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Cypress Mining Area | Cypress Mine consented area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Disturbance Area    | The area where vegetation is to be stripped for mining as part of the BPCP. This includes new disturbance and existing/historic disturbance (such as underground workings and previously cleared areas)                                                                                                                                                                                                                                                                                                                      |
| DOC                 | Department of Conservation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ED                  | Ecological District                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Edge effects        | Edge effects are changes in ecological conditions at the boundary between two different habitats, which can influence resource availability and species composition.                                                                                                                                                                                                                                                                                                                                                         |
| EIANZ               | The Environment Institute of Australia and New Zealand                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ELF                 | Engineered landform                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ESC                 | Erosion and Sediment Control                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ESCP                | Erosion and Sediment Control Plan (BPCP-ENV-PLN-013)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ESE                 | Escarpment Extended project area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ES weeds            | Eradication and Surveillance weeds – weeds for which it is considered achievable to eradicate them from the Buller Plateaux (see the Weed Management Plan BPCP-ENV-PLN-008)                                                                                                                                                                                                                                                                                                                                                  |
| Fascining           | Fascining in rehabilitation refers to the use of bundles of sticks bearing almost mature seed being fixed to the ground (e.g., via brushwood pegs) to release their seed as it ripens directly to the substrate. The bundle of material provides shelter for young seedlings and a source of organic material as it breaks down. Seedling germination using this technique can be high, resulting in a dense sward of seedlings establishing which naturally thin as they age. Mānuka is particularly amenable to fascining. |
| Flat slopes         | Landforms with a slope of less than 5°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Gentle slopes       | Landforms with a slope of 5° - 12°                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Highwalls           | Engineered landforms cut into bedrock where slopes exceed 20°, featuring batter slopes and flat benches.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Hummockyness        | Describes an undulating or lumpy microtopography. A hummocky surface is one where the surface or terrain is uneven, bumpy, or includes common small, rounded mounds, humps or hillocks and corresponding hollows or depressions where water can collect following rainfall.                                                                                                                                                                                                                                                  |



|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydromulching                     | Application of a slurry composed of seeds, mulch, fertiliser and water onto exposed unvegetated surfaces (e.g., highwall slopes) for the purpose of erosion control.                                                                                                                                                                                                                                                          |
| Hydroseeding                      | Application of a slurry composed of includes seeds, fertiliser, water and sometimes fibre onto exposed unvegetated surfaces such as highwalls.                                                                                                                                                                                                                                                                                |
| Indirect effects contingency area | To account for edge effects an Indirect Effects Contingency Area was applied (ranging from 10m to 30m) to the Disturbance Areas dependent on the type of vegetation or landcover present within the adjacent Disturbance Area footprint.                                                                                                                                                                                      |
| Jumble dump(ing)                  | Placement of mixed soils, vegetation and slash on engineered landforms or elsewhere with minimal handling so as to retain patches of live vegetation and soil clods, and create rough surfaces. May also include boulders. Some vegetation typically re-sprouts/germinates from this approach, some invertebrates survive, and the boulders and larger material (branches/logs) provide micro-relief for establishing plants. |
| LAF                               | Low-acid forming                                                                                                                                                                                                                                                                                                                                                                                                              |
| Long term                         | More than 50 years                                                                                                                                                                                                                                                                                                                                                                                                            |
| LMP                               | Lizard Management Plan (BPCP-ENV-PLN-005)                                                                                                                                                                                                                                                                                                                                                                                     |
| Mapped Area                       | The area included within the vegetation map prepared by Ecological Solutions Limited (2026a). This covers 10,211ha and includes the Buller Plateaux and surrounds (see Figure 1).                                                                                                                                                                                                                                             |
| Medium term                       | 11 – 40 years                                                                                                                                                                                                                                                                                                                                                                                                                 |
| MFS                               | Mt Frederick South project area                                                                                                                                                                                                                                                                                                                                                                                               |
| Moderate slopes                   | Landform with a slope of 12° - 20°                                                                                                                                                                                                                                                                                                                                                                                            |
| NAF                               | Non-acid forming                                                                                                                                                                                                                                                                                                                                                                                                              |
| NES-FW                            | National Environmental Standards for Freshwater                                                                                                                                                                                                                                                                                                                                                                               |
| Overburden                        | The layer of material (e.g., soil, rock) on top of coal deposits that must be removed for mining.                                                                                                                                                                                                                                                                                                                             |
| PAF                               | Potentially acid forming                                                                                                                                                                                                                                                                                                                                                                                                      |
| PB                                | Plant bag                                                                                                                                                                                                                                                                                                                                                                                                                     |
| PR weeds                          | Progressive reduction weeds – weeds for which eradication is considered unachievable and the goal is a reduction in extent and biomass (see the Weed Management Plan BPCP-ENV-PLN-008).                                                                                                                                                                                                                                       |
| Releasing                         | Releasing is the post-planting maintenance process of clearing weeds and grasses from around the base of young seedlings. This prevents invasive vegetation from smothering the new plants and eliminates competition for vital light, moisture, and nutrients                                                                                                                                                                |
| RMP                               | This Rehabilitation Management Plan (BPCP-ENV-PLN-002)                                                                                                                                                                                                                                                                                                                                                                        |
| SQEP                              | Suitably Qualified and Experienced Person (e.g., Ecologist with particular expertise related to a specific task such as botanical monitoring)                                                                                                                                                                                                                                                                                 |
| Short term                        | Up to 10 years                                                                                                                                                                                                                                                                                                                                                                                                                |
| Slash                             | Remnant woody debris from forest clearance and felling                                                                                                                                                                                                                                                                                                                                                                        |
| Steep slopes                      | Landforms with slopes exceeding 20°                                                                                                                                                                                                                                                                                                                                                                                           |
| STO                               | Stockton project area                                                                                                                                                                                                                                                                                                                                                                                                         |
| Subsoil                           | The denser layer of soil lying directly below topsoil and above the bedrock that provides for water storage, drainage and structure for deep roots.                                                                                                                                                                                                                                                                           |



|                         |                                                                                                                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Natural subsoil acts as a deep-water reservoir during dry spells and is primarily composed of minerals (like clay and sand) and leached materials washed down from the surface.          |
| Topsoil                 | The top layer of the soil in which plants grow, which contains organic matter, nutrients and microorganisms. Topsoil is where plant roots grow and most biological soil activity occurs. |
| UWHR                    | Upper Waimangaroa Haul Road project area including the part of the UWHR within the Cypress Mining Area to the extent that the UWHR passes through it                                     |
| VDT                     | Vegetation Direct Transfer                                                                                                                                                               |
| WCRC                    | West Coast Regional Council                                                                                                                                                              |
| WMP                     | Weed Management Plan (BPCP-ENV-PLN-008)                                                                                                                                                  |
| <b>General terms</b>    |                                                                                                                                                                                          |
| Biodiversity            | The variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life                       |
| Ecology                 | The study of the relationships between living organisms and their physical environment                                                                                                   |
| <b>Site description</b> |                                                                                                                                                                                          |
| Project area            | The Project area includes everything within the BPCP consented boundary.                                                                                                                 |
| Project footprint       | The mine footprint areas and including the access road which is impacted by physical works and edge effects, but excluding buffer areas between the consented boundary and the effects   |
| Project sub-area        | Project sub-areas of the BPCP include Escarpment Extended, Mt Frederick South, Upper Waimangaroa Haul Road, Cypress Mining Area and Stockton.                                            |

## 1.0 Introduction

### 1.1 Project Description

Bathurst Resources Limited (BRL) is a publicly listed New Zealand coal mining company with a focus on people and long-term environmental sustainability. BRL is New Zealand's largest coal mining company, producing over 2 million tonnes of coal each year and employing over 550 people. Through its majority owned joint venture company BT Mining Limited (BT Mining), BRL operate the Stockton coal mine at the Upper Waimangaroa valley on the West Coast, and Rotowaro and Maramarua coal mines in the North Island.

### 1.2 Purpose

This Rehabilitation Management Plan (RMP; this Plan) sets out the objectives, risks, management controls, responsibilities, reporting and training requirements for the rehabilitation of disturbed areas as part of the Buller Plateaux Continuation Project (BPCP). Rehabilitation (Remediation) is an important component of applying the effects management hierarchy to address the adverse effects of mining activities. This Plan sets out how to effectively remediate impacts on terrestrial ecological values from the development, construction and operation of all operational and mining activities undertaken by BRL within the Buller Plateaux.

### 1.3 Management Approach

Rehabilitation of land disturbed by mining is one of the most consequential elements to managing effects of the Project. By recovering and conserving resources for rehabilitation and implementing proven methodologies to rehabilitate the site, medium and long-term effects on water quality, vegetation, habitat for fauna and landscape and amenity values can all be reduced. Rehabilitation aims to address potential negative effects of mining including Acid Metalliferous Drainage (AMD), sedimentation and erosion, effects on waterways, loss of habitats and loss of specific elements of the local biodiversity. This will be achieved by:

Providing appropriate training to our employees, so that they have a clear understanding of our environmental impacts and responsibilities.

Minimising land disturbance and ecosystem degradation as mining proceeds via mine planning and effective implementation of actions set out in the relevant management plans (e.g., Erosion and Sediment Control Plan (BPCP-ENV-PLN-013), Biosecurity Management Plan (BPCP-ENV-PLN-007), Avian Management Plan (BPCP-ENV-PLN-003) and Weed Management Plan (BPCP-ENV-PLN-008)).

Recovering and making use of local resources from mined areas in rehabilitation and edge management.

Creating final engineered landforms with low capacity for AMD generation and variable topography and drainage to underpin ecological variability.

Achieving at least 15% Vegetation Direct Transfer (VDT) across the BPCP as a whole.

Following natural patterns and processes to recreate a range of self-sustaining ecosystem types.

Re-establishing disturbed areas as sustainable ecosystems and community assets.

This Plan specifies the ecological management approach taken by BRL at the Buller and Denniston locations, consistent with the Conceptual Mine Closure Strategy for the Site (BPCP-ENV-PLN-050) and consistent with these commitments within the Environmental Policy:

<https://bathurst.co.nz/our-commitment/supporting-our-environment/>

## 1.4 Scope

This plan incorporates the terrestrial ecological rehabilitation of the Project sub-areas from all operational and mining activities undertaken by Bathurst within the Buller Plateaux, including all new disturbance as part of the BPCP and existing disturbance in parts of the Stockton Coal Mining License (CML) where rehabilitation has not been signed off by the relevant consent authority. These areas are shown in Figure 1 overlain on the area where vegetation mapping was undertaken to inform the ecological impact assessment ('the Mapped Area') and comprise:

- Escarpment Extended (ESE) Project sub-area (c. 503ha);
- Mt Frederick South (MFS) Project sub-area, including the associated access road (c. 175ha);
- Stockton Project sub-area (c. 31ha) and any existing CML areas where rehabilitation is required; and
- Upper Waimangaroa Haul Road (UWHR) which includes part of the Cypress Mining Area to the extent that the UWHR passes through it. At the completion of the Project, the carriage width of the UWHR will be reduced from a 16.7m wide haul road to a 6.5m wide road to convey light vehicles.

The operations at the Cypress Mining Area are undertaken in accordance with an existing suite of site-specific management plans, as required by the various resource consents authorising activities at that location. Cypress Mining Area is not considered further here. Where relevant, reference is made to the existing site-specific plans as required to avoid duplication



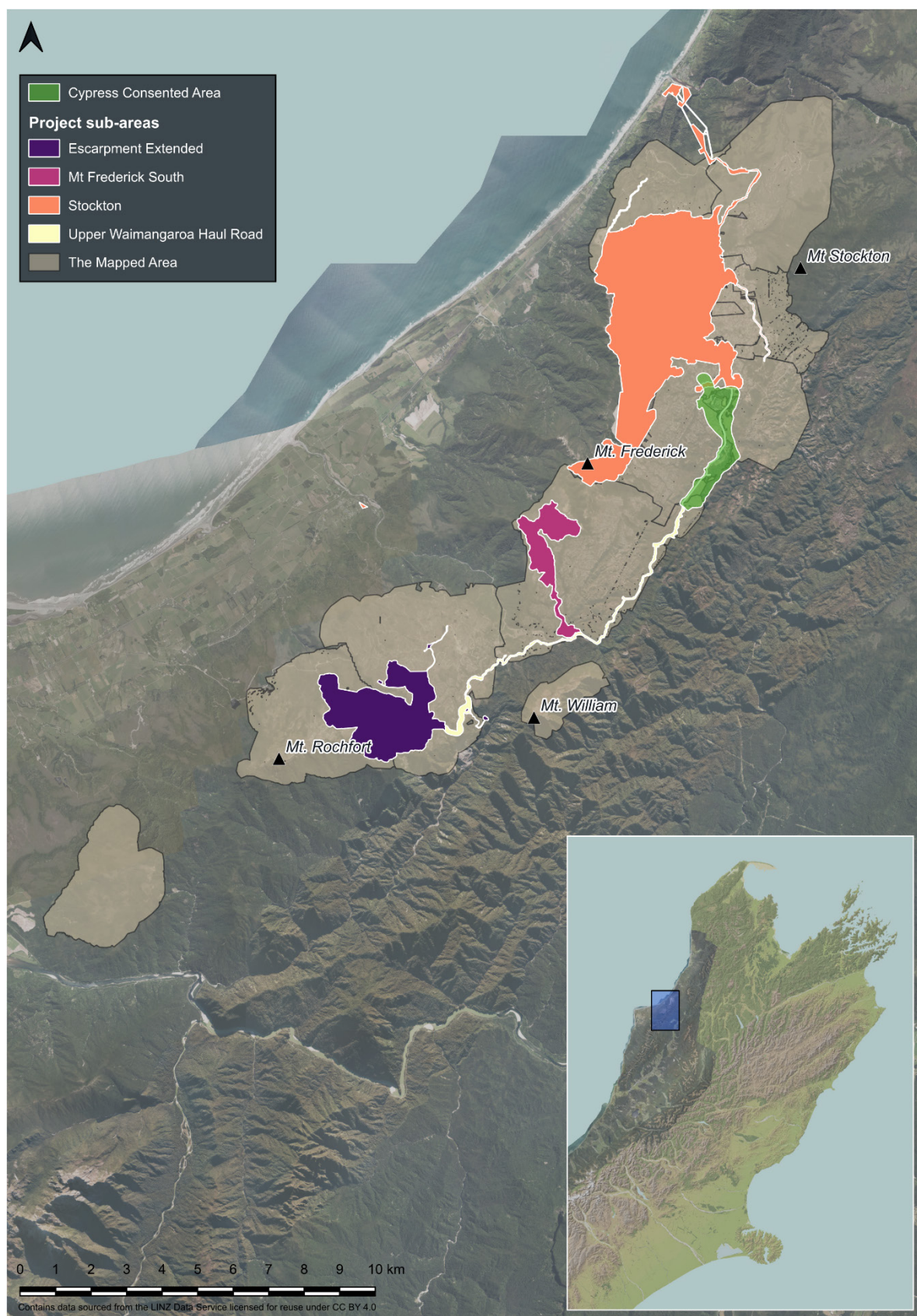


Figure 1: The Mapped Area and Project sub-areas (collectively 'the Project Area') of the Buller Plateaux Continuation Project.

In addition to this RMP, there are a suite of ecological management plans which address the following specific matters:

- Avifauna (BPCP-ENV-PLN-003).
- *Powelliphanta* snails (BPCP-ENV-PLN-004)
- Lizards (BPCP-ENV-PLN-005)
- Aquatic ecology (BPCP-ENV-PLN-006)
- Biosecurity (BPCP-ENV-PLN-007)
- Weeds (BPCP-ENV-PLN-008)
- Biodiversity Outcome Monitoring (BPCP-ENV-PLN-009)
- Pest control (BPCP-ENV-PLN-022)
- Conceptual Mine Closure Strategy (BPCP-ENV-PLN-050)

These plans are cross-referenced to each other and this RMP as necessary. In particular, management of previously rehabilitated areas at Stockton Mine where weeds are present and there is a need to prevent them adversely affecting rehabilitation outcomes at sites rehabilitated as part of the BPCP is provided for in the Weed Management Plan (BPCP-ENV-PLN-008) and Biosecurity Management Plan (BPCP-ENV-PLN-007). Aspects relating to rehabilitation of aquatic ecology are also considered within the Water Management Plans (AMD Water Management Plan (BPCP-ENV-PLN-010), Water Infrastructure Design Plan (BPCP-ENV-PLN-011), and Water Management Plan (STO-ENV-PLN-013)).

## 1.5 Goals and Objectives

The goal of rehabilitation is to leave the site in a safe stable state post-mining, incorporating landforms and vegetation communities that are sympathetic to surrounding landscapes and ecological habitats (Rough Milne 2026). The aim of rehabilitation is to establish self-sustaining ecosystems that are similar in plant and animal species diversity and functioning to undisturbed (pre-opencast mining) ecosystems and maintain local biodiversity. Self-sustaining ecosystems are defined as indigenous plant and animal communities that establish, grow, reproduce, and persist indefinitely in response to the ecological gradients present and underpinned by natural ecological succession without human intervention, management or protection. These ecosystems maintain their own biodiversity, nutrient cycles, and resilience against natural disturbances (including weeds).

The objectives of the RMP, as specified in the relevant resource consents, are to provide details as to how BRL will optimise rehabilitation outcomes, and to:

- Establish clear practices for the identification, prioritisation, salvage, handling, storage and reuse of rehabilitation materials, including soils, vegetation, rock and other salvageable resources;
- Establish hydrological, topographical and ecological conditions that support sustainable indigenous vegetation communities, including wetlands;

- In the short term (up to 10 years from commencement of rehabilitation in each area), establish stable landforms by developing predominantly indigenous vegetation cover and surfaces that support sustainable plant communities and control runoff and sediment;
- Use Vegetation Direct Transfer (VDT) to the extent practicable across the Project Area;
- Maximise, to the extent practicable, the physical and ecological connectivity between VDT areas, retained and perimeter vegetation, wetlands, riparian habitats, stream margins and rehabilitated areas;
- In the medium term (10–50 years for VDT areas), establish self-sustaining ecosystems with comparable species diversity and ecological function to surrounding indigenous ecosystems;
- In the long term (more than 50 years for planted areas), achieve self-sustaining ecosystems with comparable species diversity, ecological function and connectivity between populations of indigenous fauna, to surrounding indigenous ecosystems;
- Construct rehabilitated stream channels that reflect natural form and function, provide for aquatic fauna passage where appropriate, minimise sedimentation, and provide suitable habitat for koura and provide for koura passage;
- Use only non-acid forming or low-acid forming material in final rehabilitated surface material;
- Minimise the establishment and spread of problem weeds, including gorse (*Ulex europaeus*), broom (*Cytisus scoparius*), pampas (*Cortaderia* spp.) and *Juncus squarrosus*;
- Minimise the establishment of pest animals and organisms;
- Establish perimeter vegetation to reduce edge effects, maintain connectivity, integrate landforms with the surrounding landscape, and control erosion and sediment; and
- Ensure rehabilitation is monitored, maintained, reported and adaptively managed until completion criteria are achieved.
- Establish self-sustaining ecosystems, including the following distinct types:
  - Tall forest – vegetation which is on a trajectory to achieve forest similar to the pre-mining mixed beech-podocarp-broadleaved forest described in Ecological Solutions Limited (2026a);
  - Beech forest (a) – vegetation which is on a trajectory to achieve forest similar to pre-mining Southern rātā-mountain beech-podocarp forest described in Ecological Solutions Limited (2026a);
  - Beech forest (b) – vegetation which is on a trajectory to achieve forest similar to pre-mining silver beech-mountain beech forest described by Ecological Solutions Limited (2026a);
  - Mānuka dominated shrubland (a) – vegetation which is on a trajectory to achieve vegetation similar to pre-mining mānuka-mountain beech-podocarp shrubland described by Ecological Solutions Limited (2026a);

- Mānuka dominated shrubland (b) – vegetation which is on a trajectory to achieve vegetation similar to pre-mining mānuka/Gahnia-wire rush shrubland described by Ecological Solutions Limited (2026a);
  - Flax dominated shrubland (a) – vegetation which is on a trajectory to achieve vegetation similar to pre-mining mānuka-mountain flax/wire rush shrubland described by Ecological Solutions Limited (2026a);
  - Flax dominated shrubland (b) – vegetation which is on a trajectory to achieve vegetation similar to pre-mining tussock-mountain flax shrubland described by Ecological Solutions Limited (2026a);
  - Pākihi – vegetation which is on a trajectory to achieve vegetation similar to pre-mining low pākihi and mānuka-tussock-wire rush shrubland described by Ecological Solutions Limited (2026a);
  - Rockfield – boulderfield and forested blockfield – this includes coal floor and other created habitats with a high proportion of rock to provide habitat for species typical of sandstone erosion pavement.
  - Tarns – small areas of open shallow water that are commonly associated with pākihi wetland complexes. These will be created on engineered landforms with impeded drainage and flat to gentle slopes.
- Reinstatement streams so as to achieve a target of no net loss of extent and provision of diverse aquatic habitat of similar ecological value and functionality to the streams that were removed.
  - Provision for aquatic habitats for fauna in water infrastructure containing open water that will remain post-mining.

## 1.6 Closure Criteria

The closure criteria for the BPCP are set out in Table 1 below.



Table 1: Proposed Closure criteria for the BPCP

| Rehabilitated ecosystem type                                                                   | Plant cover <sup>*1</sup>                                                                | Key plant species*                                                                                                                                                                                                                           | No. of Native Plant species (richness) <sup>*2</sup>                                                                                          | Rock cover<br>Coarse wood cover | Fauna Habitat to be included | Monitoring Plot size | Rationale                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Forest<br>All forests (Tall forest, beech forest (a) and Beech forest (b) >5m height potential | An average of at least 75% > 0.5 m height<br>No less than 60% > 0.5 m height in any plot | Dependent on forest type. See Section 5.2 for details.<br><i>Lophozonia menziesii</i><br><i>Fuscospora cliffortioides</i><br><i>Metrosideros umbellata</i><br><i>Lepidothamnus intermedius</i><br><i>Halocarpus biformis</i>                 | >1000 beech and >500 podocarp trees >1m tall/ha.<br>Adventive native seedlings<br>>30% of monitoring plots contain <i>Halocarpus biformis</i> | < 25% rock<br><25% wood         | Rorua<br>Lizards             | 100 m <sup>2</sup>   | Forests are expected to be >5m tall in the medium to long term so are less vulnerable to most weeds at a lower 'closure' plant cover. A minimum density of 'keystone' species is required in sites where these species would be expected, to short-cut succession. No diversity criteria due to early canopy closure suppressing recruitment. Coarse wood and stumps are ecologically valuable and highly desirable. |
| Shrubland<br>(ecosystem types under 3m height)                                                 | >75% including rock                                                                      | Dependent on shrubland type. See Section 5.3 for details.<br><i>Leptospermum scoparium</i><br><i>Phormium cookianum</i><br><i>Empodisma minus</i><br><i>Gahnia procera</i><br><i>Lepidothamnus intermedius</i><br><i>Halocarpus biformis</i> | VDT: >70% of baseline<br><br>Planted:<br>>30% of baseline<br>>70% of monitoring plots contain wire rush                                       | <33% rock<br><10% wood          | Rorua<br>Lizards<br>Snails   | 25m <sup>2</sup>     | Large boulders create valuable shelter and hydrological variation. Species diversity for VDT areas is much higher than for planted areas because many more plant species are introduced in VDT and survive. Minimum cover includes all groundcover plants, so no minimum height is specified. Cover also includes rock as these are permanent and important to create variation in ecosystem and habitat             |



|                                       |                                                           |                                                                                                                                                                      |                                                                                                         |                                                                               |         |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                           |                                                                                                                                                                      | >25% of plots contain <i>Halocarpus biformis</i>                                                        |                                                                               |         |                  | for some bryophytes, lichens and lizards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Pākihi                                | An average of at least 75% <0.5m height                   | See Section 5.4 for more details.<br><i>Gahnia procera</i><br><i>Empodisma minus</i><br><i>Leptospermum scoparium</i><br><i>Halocarpus bidwillii</i>                 | VDT: >70% of baseline<br><br>Planted:<br>>30% of baseline<br>>70% of monitoring plots contain wire rush | <20% rock<br><10% wood                                                        | Lizards | 4m <sup>2</sup>  | Low vegetation is a feature of the Buller Plateaux.<br><br>Minimum cover includes all groundcover plants, so no minimum height is specified.<br><br>Large boulders create valuable shelter and hydrological variation.<br><br>Species diversity for VDT areas is much higher than for planted areas because many more plant species are introduced in VDT and survive.<br><br>Cover also includes rock as these are permanent and important to create variation in ecosystem and habitat for some bryophytes, lichens and lizards. |
| Rockfield <sup>vi</sup><br><1m height | A maximum of 30%<br><10% sediment or fines <10mm diameter | See Section 5.5 for more details.<br><i>Leptospermum scoparium</i><br><i>Phormium cookianum</i><br><i>Dracophyllum densus</i><br><i>Dracophyllum rosmarinifolium</i> | n/a                                                                                                     | >50% rock <sup>vii</sup><br>50-70% rock<br>>200m <sup>2</sup> contiguous area | Lizards | 25m <sup>2</sup> | Rockfields are used for habitat in pākihi (lizards, bryophytes, lichens) and forest (bryophytes, lichens) and landscape outcomes (highlighting ridgelines and creating heterogeneity); some plants are therefore important as part of habitat creation but there is no minimum cover is proposed. Fines                                                                                                                                                                                                                            |

|                     |                                                      |                                                                                                                         |                                                        |                        |       |                                                                          |                                                                                                                                                                                                                                                                         |
|---------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------|-------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                      | <i>Celmisia dubia</i><br><i>Celmisia dallii</i><br><i>Lepidothamnus laxifolius</i><br><i>Brachyglottis bellidioides</i> |                                                        |                        |       |                                                                          | are undesirable as they allow weed establishment, diameter of 'fines' is set at 10mm. Taller 'forest' heights (beech forest a and b) are acceptable.                                                                                                                    |
| Wetlands            | An average of at least 75%                           | <i>Leptospermum scoparium</i><br><i>Empodisma minus</i>                                                                 | VDT: >70% of baseline<br><br>Planted: >30% of baseline | <10% rock<br><20% wood | Rorua | 4m <sup>2</sup> (for low vegetation) or 25m <sup>2</sup> (for shrubland) | Wetlands meet the vegetation, hydrology and soils tests set out in the National Policy Statement for Freshwater wetland delineation protocols.                                                                                                                          |
| Small ponds (Tarns) | N/A                                                  | See Section 5.7 for more details.                                                                                       | N/A shrubland                                          | N/A                    |       | 10m <sup>2</sup>                                                         | Minimum 500m <sup>2</sup> total area of permanent pond habitat and 600m <sup>2</sup> of ephemeral pond habitat at each Project sub-area as habitat for indigenous fauna.                                                                                                |
| Weeds               | < 5% average presence in plots<br><br>No plots > 10% | Zero presence of eradication and surveillance (ES) weeds                                                                | N/A                                                    | N/A                    |       | As above                                                                 | The Weed Management Plan (BPCP-ENV-PLN-008) sets out which plants are considered weeds and provides for weeds to be eradicated (ES weeds) and weeds to be reduced in extent (PR weeds). The target in column 1 is for PR weeds. The target for ES weeds is 0% presence. |

\*1 Plant cover only includes indigenous vascular plants (not non-vascular bryophytes or lichens). All values given are means over all plots measured, and a minima or maxima for any individual plots is also provided

\*2 This is a measure of the native plant species diversity compared with pre-mining diversity. It excludes non-native species. The native species diversity will be measured in direct transfer vegetation immediately prior to transfer.

Note i: The above criteria will be measured in randomly located plots stratified (quadrats) by landform, vegetation type and rehabilitation method and may be stratified by age. A minimum number of permanent sample plots shall be installed within 12 months of the date that each area of rehabilitation is initially established (by VDT or planting). Plots shall be established in the rehabilitated vegetation types rehabilitated. There shall be at least one, 100m<sup>2</sup> plot per 0.5ha of forest and of shrubland in the first five years and in any year that less than 5ha is rehabilitated, and one, 100m<sup>2</sup> plot per 2ha of shrubland and forest if more than 6ha is rehabilitated in any one year. The density of plots in rehabilitated rockfield and wetland types shall be confirmed by initial monitoring results. Monitoring shall be done during the growing season, i.e. between November and March. Plots shall exclude habitat log/wood piles, cut rock faces and any agreed long-term infrastructure (roads or water infrastructure). Areas of water in small ponds/tarns shall be considered to contribute to vegetation calculations. Areas of forest will contain wood piles as habitat features. Constructed wood piles may be up to 25m<sup>2</sup> in extent, meaning that the presence of wood piles could reduce vegetation cover below the specified threshold. Wood piles are a deliberate strategy to provide habitat for fauna, therefore, if any one permanent plot has more than one constructed woodpile, the plot may be considered compliant, even with low plant cover.

Note ii: % cover is defined as the percentage of the ground within a quadrat which is occupied by the above-ground parts of plants when viewed from above.

Note iii: Coarse wood is defined as wood with a diameter >100mm; boulders/stones are defined as having a diameter >100mm; native plants are defined as those found in the Ngakawau Ecological District within a similar altitudinal range or those found naturally at the Buller Plateaux pre-mining.

Note iv: Height is measured as standing height excluding the flowering stems.

Note v: Weeds are non-native woody, herbaceous and bryophyte species identified as weeds in the current version of the Weed Management Plan (BPCP-ENV-PLN-008).

Note vi: Rockfield does not include highwalls. Although rehabilitation of highwall benches is proposed, no closure criteria are proposed because of the practical difficulty of safely monitoring them. Highwalls may be treated with hydroseeding with native species, including mosses.

Note vii: rock for rehabilitation purposes must be Non-Acid Forming (NAF), low-acid forming (LAF) or weathered (i.e. rocks with attached plants, bryophytes and lichens) to avoid adverse impacts of AMD on terrestrial ecosystems.

The rehabilitation and enhancement assessment for Completion of Closure of the BPCP sub-areas shall be undertaken and/or audited by a suitably experienced and qualified ecologist(s).

## 1.7 Proposed Consent Conditions

Proposed Consent requirements that are relevant to this RMP are provided in Attachment 1. A summary of these consent conditions and where they are addressed in this RMP is set out in Table 2.

*Conditions to be inserted upon issue of the final decision.*

*Table 2: Development consent requirements relevant to this RMP.*

| Condition | Summary of condition | Reference in plan |
|-----------|----------------------|-------------------|
|           |                      |                   |

## 2.0 Rehabilitation Outcomes

### 2.1 Overview

This RMP sets out rehabilitation methods and techniques which build upon methods and techniques that have been successfully tested and deployed at Stockton Mine and is informed by the findings of the Rehabilitation Outcomes report (Ecological Solutions Limited 2026c). This section sets out the target outcomes prescribed for each BPCP Project sub-area, followed by specific methods and approaches intended to achieve the stated targets. Constraints to rehabilitation are set out in Attachment 2, with opportunities set out in Attachment 3. Attachment 4 sets out how the rehabilitation of the Project Area differs from historic rehabilitation at Stockton Mine, and identifies specific methods intended to improve rehabilitation outcomes.

Engineered landform (ELF) construction typically results in the creation of large areas of moderate slopes (c. 18°) forming hillslopes with regular benches and flat peaks. Final landform creation will take into account the need to provide for a natural and varied topography that integrates with the surrounding landforms to avoid an overly-engineered appearance, accepting that highwalls and regular benches are engineered and can be difficult to integrate. The objective of creating variation in landform is to mimic natural patterns of drainage, aspect and exposure.

To the extent practicable, the methods described in Sections 5 and 6 will be applied to mimic natural distribution of vegetation at a landscape scale, taking into account the slope, elevation, drainage and aspect of the landform created. This section sets out the specific location of each of the rehabilitation covers and vegetation types at each of the Project sub-areas below.

### 2.2 Final Landform Cover

The final closure outcome proposed for the BPCP will involve the development of constructed landforms which integrate with the surrounding natural landscape on the Buller Plateaux and establishing functioning ecosystems on those landforms. This will be achieved through sympathetic and variable landform design and construction followed by revegetation using native species and the inclusion of rockfield and other features as appropriate.

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The proposed final landform for the Project Area<sup>1</sup> will include 1,909ha of total rehabilitation, 566ha of undisturbed land within the consent footprint and 171ha of infrastructure as set out in

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<sup>1</sup> Based on GIS files of final landform released 5 December 2025, noting these do not include the extent of 'undisturbed' landform for the Upper Waimangaroa Haul Road.

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Table 3. In accordance with Condition RHM26, each final landform to be rehabilitated must achieve at least 90% erosion-resistant surface cover which can include vegetation, slash, rock or other organic material.



Table 3: Final Landform rehabilitation cover type within the Project Area.

| Type                                           | Extent (ha) |           |            |              | Total        |
|------------------------------------------------|-------------|-----------|------------|--------------|--------------|
|                                                | MFS         | UWHR      | ESE        | STO          |              |
| <b>Native Ecosystem</b>                        | 99          | 8         | 303        | 1,168        | <b>1,578</b> |
| <b>Wetlands/ Tarns</b>                         | 18          |           | 64         | 6            | <b>88</b>    |
| <b>Rehabilitated Highwall</b>                  | 22          |           | 42         | 40           | <b>104</b>   |
| <b>Rockfield</b>                               | 11          |           | 69         | 59           | <b>140</b>   |
| <b>Undisturbed</b>                             | 44          |           | 80         | 442          | <b>566</b>   |
| <b>Infrastructure</b>                          | 3           | 8         | 13         | 70           | <b>93</b>    |
| <b>Water Infrastructure/Closure Water Body</b> | 22          | 2         | 16         | 37           | <b>78</b>    |
|                                                | <b>219</b>  | <b>18</b> | <b>588</b> | <b>1,822</b> | <b>2,647</b> |

### 2.3 Location of Post-Mining Vegetation Types

One of the goals of rehabilitation is to establish vegetation across the created landforms which mimics the natural patterns to the extent possible, responds to the dominant ecological drivers and enables development of self-sustaining ecosystems over time. To achieve this, planted and VDT vegetation should be placed where it is best suited to the local conditions so as to increase initial survival and promote persistence.

Particularly with respect to forest, the vegetation structure and composition will change over time with pioneer species decreasing in importance and eventually being replaced by later seral species. Ultimately, the vegetation which develops will be strongly influenced by the local conditions including soil characteristics, slope, exposure and aspect according to the growth requirements of the particular species present as part of rehabilitation and any species which colonise the areas naturally.

Some soil properties can be manipulated in order to accommodate the preferences of the desired vegetation type. For example, slope will be the most important driver of post-mining vegetation type because of its influence on drainage. Since slope is pre-determined by the topography of the ELF, this is the key driver to inform plant and VDT placement. The slope requirements and landscape level patterns are discussed further below. The provision of poorly drained areas of flat topography mirrors the natural state on the Buller Plateaux, where flat terrain is typically more poorly drained than in the dissected valleys and gullies, due to the presence of underlying (impermeable) bedrock near the surface. Gullies and valleys provide better drained, sheltered, more humid sites which allow taller vegetation to grow. Gullies also typically provide edge vegetation and ecological connection across the plateaux.

Rehabilitated vegetation types and the slope angles where they will be placed are shown in

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Table 4. Pākihi vegetation will be primarily placed on flat locations where poor drainage is expected to be maintained, shrubland on gentle to moderate slopes and forest placed on moderate to steeper slopes.

Table 4: Post-mining vegetation types and the corresponding slope angles for rehabilitated sites at the BPCP.

| Vegetation Types                    | Rehabilitated Slope Angle |                                            |                             |                             |           |
|-------------------------------------|---------------------------|--------------------------------------------|-----------------------------|-----------------------------|-----------|
|                                     | 0-5°                      | 5-15°                                      | 15-25°                      | 25-35°                      | >35°      |
| <b>Shrubland and low vegetation</b> | Pākihi                    | Mānuka shrubland<br>Flax shrubland         |                             |                             | Hydroseed |
| <b>Forest</b>                       |                           |                                            | Beech forest<br>Tall forest | Beech forest<br>Tall forest |           |
| <b>Rockfield</b>                    | Pākihi boulderfield       | Mānuka shrubland<br>Tall forest blockfield |                             |                             |           |

Once these slope requirements are applied, other drivers of vegetation patterns were considered in locating the post-mining vegetation types on the ELFs including;

- **Elevation** – Tall forest grades into beech forest and then shrubland and shorter vegetation with increasing altitude.
- **Topography** – Forest types are more common in sheltered gullies, with shrubland and low vegetation present upslope on spurs and ridgelines of the forested areas as exposure and elevation increases.
- **Ecotones** – Vegetation types generally grade from tall forest to shrubland to pākihi. Flax dominated shrubland typically occurs as an ecotone between pākihi and mānuka shrubland and at disturbed sites.

The requirements discussed above will inform the placement of each rehabilitation type so as to form a mosaic which mimics natural patterns corresponding to the constructed landform. In order to ensure heterogeneity in habitat types are created as part of rehabilitation, the minimum extent of each rehabilitation cover type to be created in each project area is set out in Table 5.

Table 5: Minimum extent of each rehabilitation vegetation type by Project Area.

| Post-mining Vegetation Type | Extent (ha) |      |     |
|-----------------------------|-------------|------|-----|
|                             | MFS         | ESE  | STO |
| <b>Forest</b>               | 27.9        | 85.4 | 8.7 |
| Tall forest                 | 0.8         | 2.5  | 0.3 |
| Beech forest (a)            | 26.3        | 80.5 | 8.2 |
| Beech forest (b)            | 0.8         | 2.5  | 0.3 |
| <b>Shrubland</b>            | 6.8         | 20.9 | 2.3 |
| Mānuka shrubland (a)        | 5.9         | 18.1 | 1.9 |
| Mānuka shrubland (b)        | 0.6         | 2.0  | 0.2 |
| Flax shrubland (a)          | 0.3         | 0.8  | 0.1 |

|                       |      |       |      |
|-----------------------|------|-------|------|
| <b>Low Vegetation</b> | 21.9 | 67.0  | 6.8  |
| Pākihi                | 21.8 | 66.7  | 6.8  |
| Flax shrubland (b)    | 0.1  | 0.3   | 0.0  |
| <b>Total</b>          | 56.6 | 173.3 | 17.8 |

## 2.4 Escarpment Extended Project sub-area

The indicative final landform features and final surface contours for the ESE Project sub-area are shown in Figure 2 and feature a large amount of moderate overall slopes (with benching) around a central conical hillslope with a flat peak. There are areas of flat terrain to the north and east and a series of undulating gentle and moderate slopes descending northwards in the west.

This landform is well suited to the creation of variable habitats, particularly on the undulating slope to the west as shown in Figure 2.

The main hillslope lends itself to continuous forest, particularly in sheltered gullies, with shrubland and low vegetation extending along more exposed ridgelines. Larger blocks of pākihi, interspersed with open water and shrubland are proposed for the areas to the north and east with an indicative plan shown in Figure 3.

Rockfield will be dispersed amongst predominantly pākihi and shrubland within the areas shown in Figure 3. Rockfield within areas of forest rehabilitation is intended to provide suitable habitats for bryophytes.



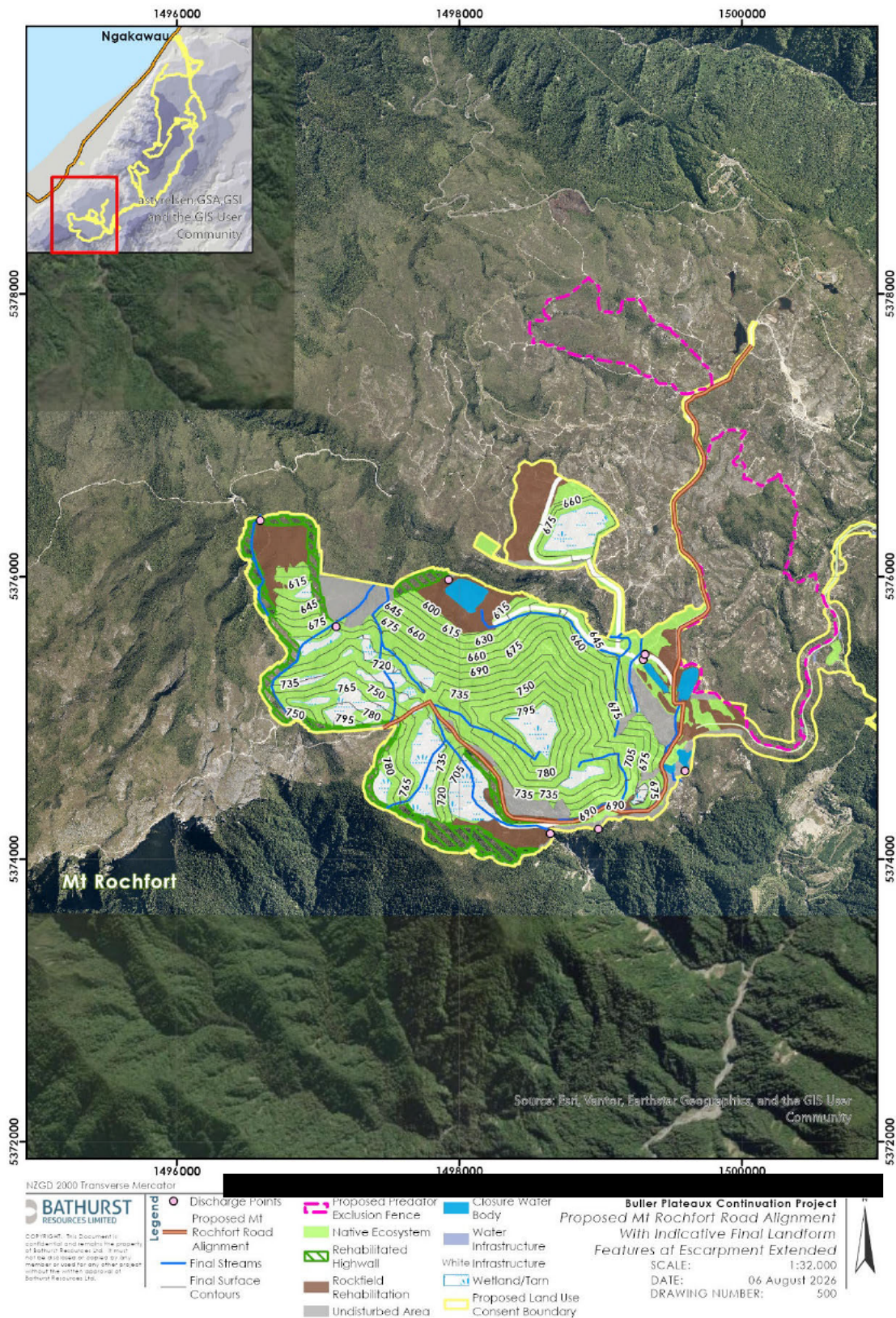


Figure 2: Indicative landform features and surface contours at Extended Escarpment Project Sub-area. Bathurst Drawing Number 500).



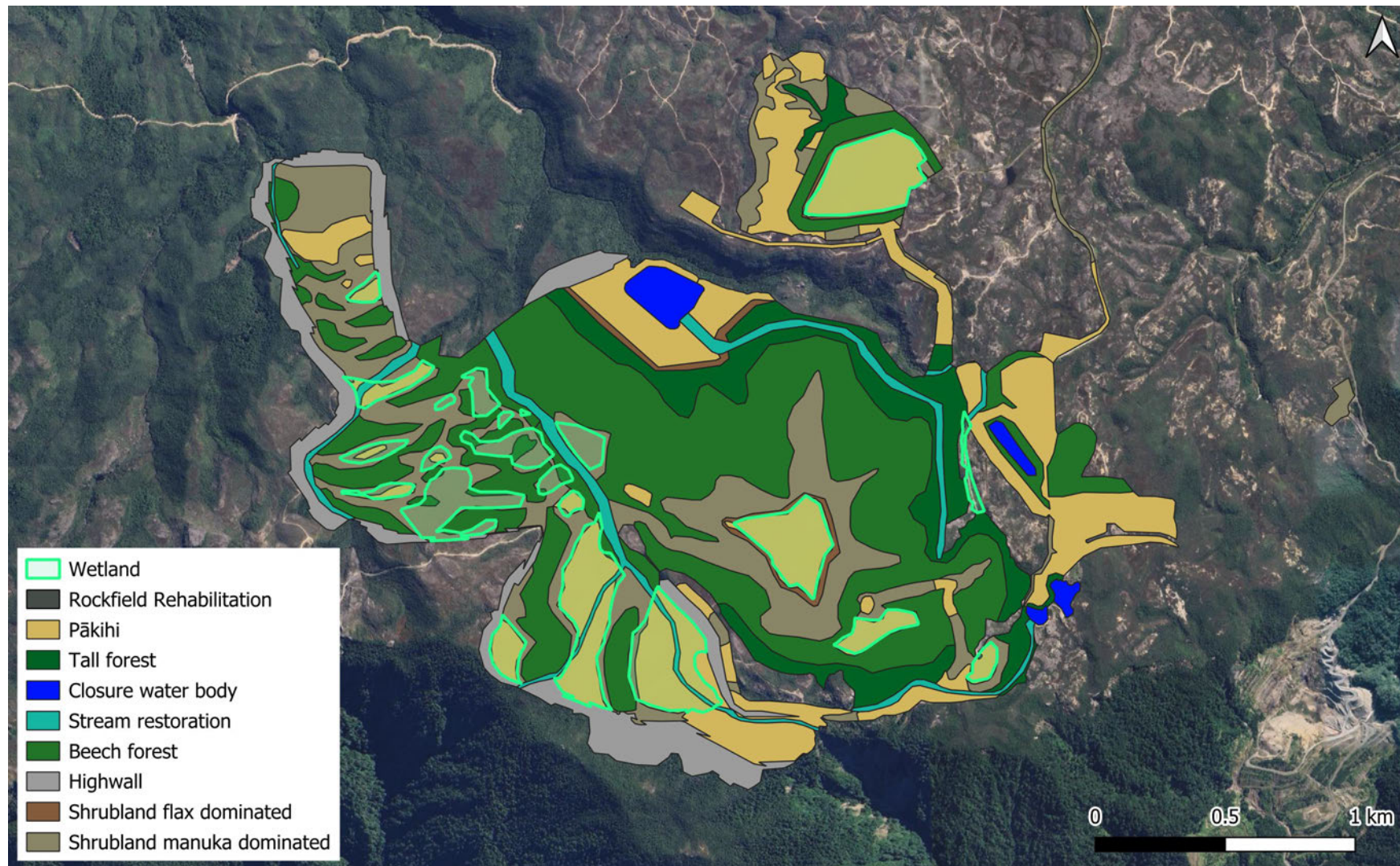


Figure 3: Conceptual rehabilitation cover types at the ESE Project sub-area.



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## 2.5 Mount Frederick South Project sub-area

The indicative final landform at the MFS Project sub-area gradually increases in elevation to the north from the Waimangaroa River via a series of moderately steep hillslopes and terraced platforms. The final landform also includes a large area of rehabilitated rockfield to the east as shown in Figure 4. The proposed outcome for the terraces is pākihi above forested lower slopes as shown in Figure 5.

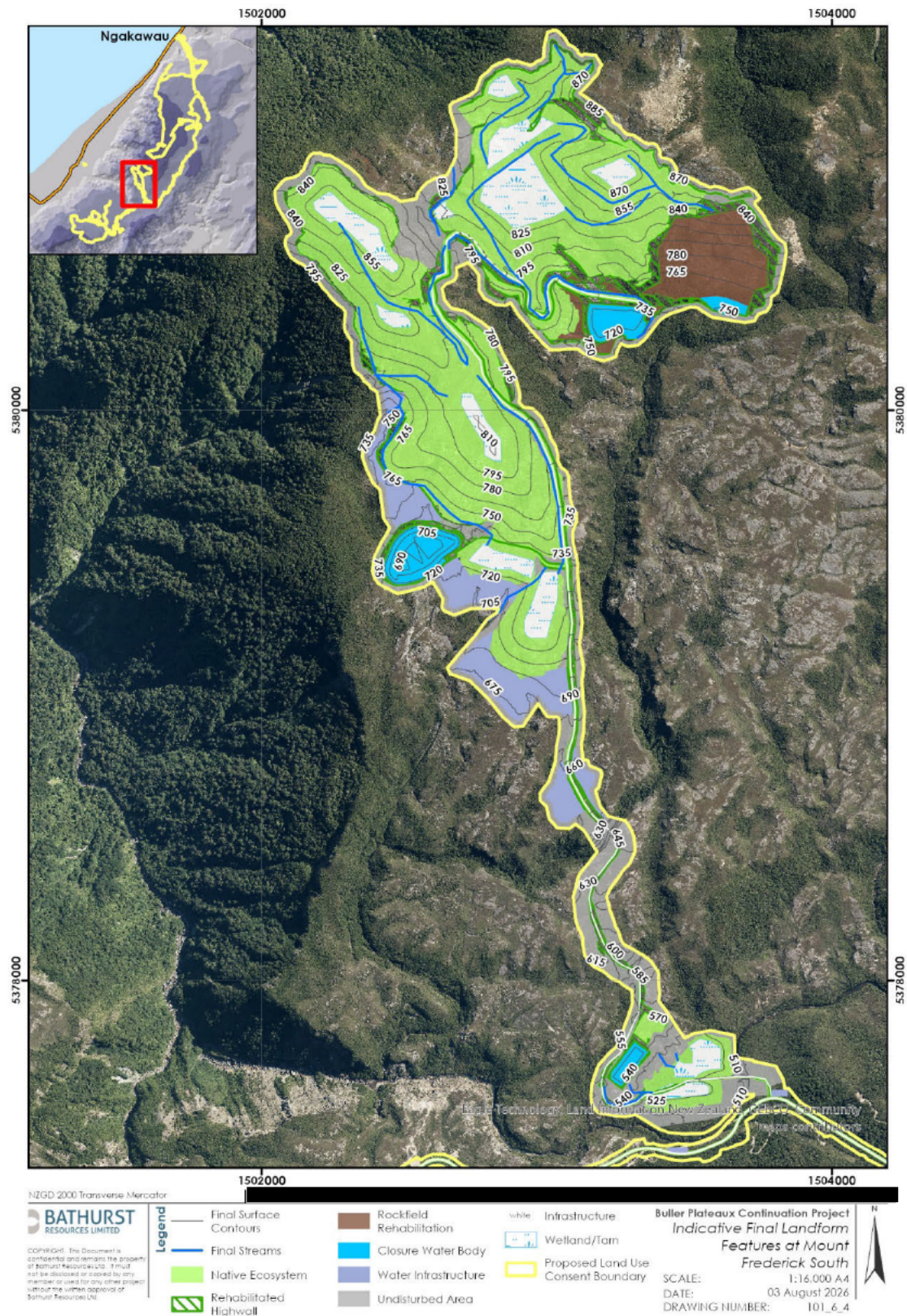


Figure 4: Indicative landform features and surface contours at Mt Frederick South Project Sub-area (Bathurst Drawing Number 101\_6\_4).



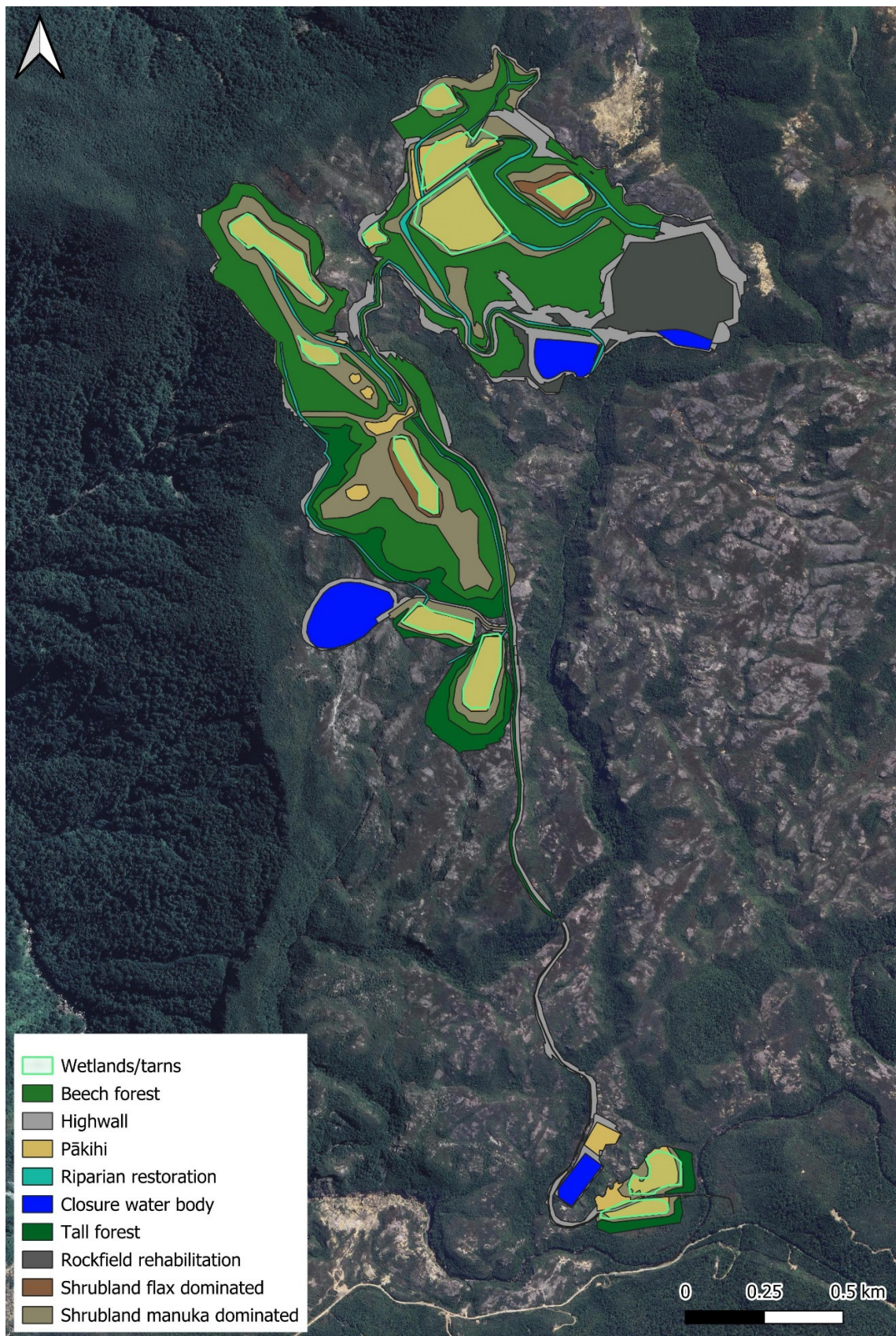


Figure 5: Conceptual rehabilitation cover types at Mount Frederick South Project sub-area.

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## 2.6 Stockton Project sub-area

The indicative final landform at the Stockton Project sub-area includes a combination of highwalls and flat terraces with increasing altitude to the south to merge with the adjoining ELF and fragments of natural terrain. The proposed outcome is mostly pākihi and shrubland with forested gullies as shown in Figure 6.



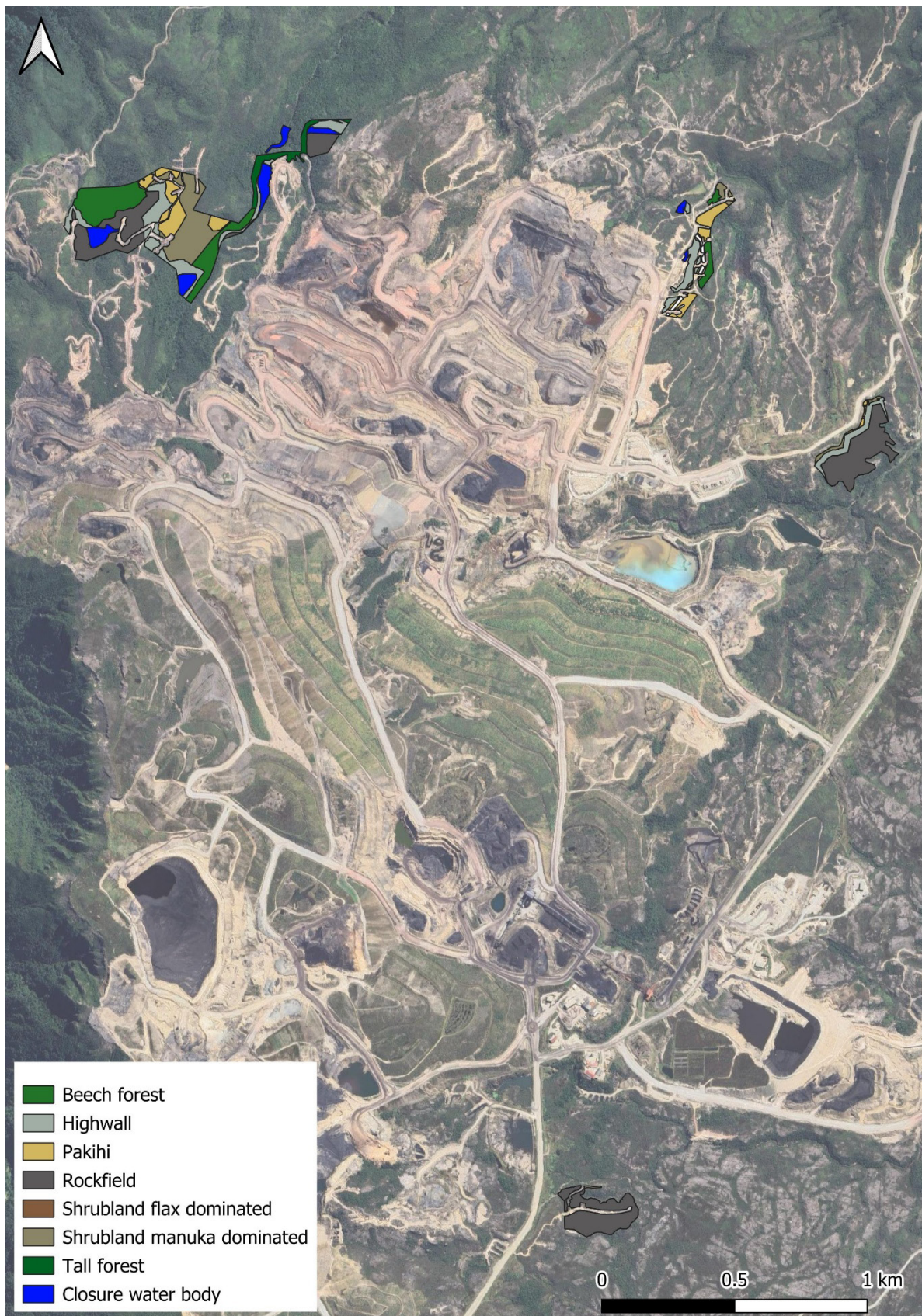


Figure 6: Conceptual rehabilitation cover types at the Stockton Project sub-area.

## 3.7 Upper Waimangaroa Haul Road Project sub-area

Following the completion of mining, the Upper Waimangaroa Haul Road will be narrowed from a 16.7m carriage width to 6.5m in order to provide light vehicle access. The remainder of the carriageway will be ripped and top-soiled as required to provide for rehabilitation. This will be achieved using shrubland plantings similar to adjoining vegetation in the south nearest the Denniston Plateau and forest species similar to the adjoining vegetation for the section within the Upper Waimangaroa Valley.

## 3.0 Ecological Context

### 3.1 Existing Environment

The Buller Plateaux lies within the Ngakawau Ecological District (ED) and North Westland Ecological Region. The boundaries of the Ngakawau ED are defined by a line connecting Te Kuha to Mount Rochfort, Mount William and a peak west of Mt Lyall in the south, the Glasgow Range in the east and the Mōkihinui River in the north, the coastal escarpment marks the boundary of the district to the west.

Ngakawau is the only ED in New Zealand defined by the presence of extensive, elevated coal measures geology. The Brunner coal measures encompass approximately 10,300ha, approximately 4,661ha (45%) of which is on the Buller Plateaux, including the Stockton plateau (3,013ha) and Denniston plateau (1,648ha). Soils on the sandstones of the Brunner coal measures are infertile and acidic (pH 4-4.9) with poor drainage. These conditions impede decomposition; hence many soils have deep leaf litter layers and topsoils with high organic matter content. At higher elevations and on 'pavements' the soil becomes skeletal (shallow and with a simple topsoil on rock), and exposed rock/sandstone erosion pavement is common. This geology, combined with extreme wind-shear and high precipitation supports a mosaic of vegetation communities unlike the surrounding taller forests overlying deeper soils on granite, gneiss, and greywacke geology. Coal measures vegetation is characterised by a mosaic of tussockland, mānuka shrubland, and distinctive low forest, the latter often growing between boulders and/or where deep cracks and fissures have accumulated better-drained soils. The most extensive vegetation communities on the exposed gently sloping rock pavements are dominated by prostrate shrub and tussock communities. Notably, these communities include alpine and subalpine species typically restricted to higher elevations.

### 3.2 Vegetation and Habitat Types

#### 3.2.1 Forest

Forest covers approximately 25% of the BPCP Project Area prior to mining as shown in Table 6. There are three forest types present, listed in descending order of extent in Table 6.



Table 6: Extent of pre-mining forest types within the BPCP and the post-mining forest type proposed.

| Forest Type                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Extent ESE (%) | Extent MFS (%) | Extent Stockton (%) | Extent UWHR (%) | Replaced By                                                             |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|---------------------|-----------------|-------------------------------------------------------------------------|
| <b>Southern rātā – mountain beech – podocarp forest</b> | Medium height forest commonly associated with gullies dissecting the plateaux. This forest type is diverse, with a sparse emergent layer commonly dominated by Southern rātā and sometimes pāhautea ( <i>Libocedrus bidwillii</i> ), and a dense canopy layer dominated by mountain beech ( <i>Fuscospora cliffortioides</i> ), the podocarps yellow-silver pine ( <i>Lepidothamnus intermedius</i> ) and pink pine ( <i>Halocarpus bidwillii</i> ) with occasional silver beech.                    | 25.6           | 14.5           | 32.8                | 28.1            | Tall forest – podocarp/kāmahi/Southern rātā dominated (See Section 6.2) |
| <b>Mixed beech – podocarp – broadleaf forest</b>        | Tall, dense, old growth forest, dominated by large forest trees such as red beech ( <i>Fuscospora fusca</i> ), silver beech ( <i>Lophozonia menziesii</i> ), Hall's totara ( <i>Podocarpus laetus</i> ) and southern rātā ( <i>Metrosideros umbellata</i> ), with emergent rimu ( <i>Dacrydium cupressinum</i> ) and red beech. This forest type occurs in sheltered gullies on the lower elevation flanks of the plateaux, or on fertile colluvial material such as the lower slopes of Mt William. | 0.08           | 0              | 0                   | 11.4            | Beech forest (a) (see Section 6.2))                                     |
| <b>Silver beech – mountain beech forest</b>             | Short stature, found on high elevation sites such as the upper slopes of Mt Frederick and Mt William. Stunted silver and mountain beech and <i>Dracophyllum elegantissimum</i> are dominant in the canopy, with occasional southern rātā. Stunted shrubs including <i>Archeria traversii</i> , mountain toatoa and <i>Pseudopanax linearis</i> dominate the subcanopy.                                                                                                                               | 0              | 3.1            | 0                   | 0               | Beech forest (b) (See Section 6.2)                                      |

### 3.2.2 Shrubland

Ecological Solutions Limited (2026a) identified six distinct shrubland types across the Buller Plateaux, the most common being mānuka-tussock-wire rush shrubland which covers 17.6% of the ESE Project sub-area, 1.8% of the MFS Project sub-area, 19.1% of the Stockton Project sub-area and 14.9% of the UWHR Project sub-area.

Mānuka-mountain beech-podocarp shrubland comprises 7.9% of the ESE Project sub-area, 19.4% of the MFS Project sub-area, 24.9% of the Stockton Project sub-area and 7.6% of the UWHR Project sub-area. This is a medium stature (mean height 3.9m) shrubland with the canopy tier dominated by mānuka and mountain beech, with yellow-silver pine, pink pine and Southern rātā also present in varying proportions. The understorey layer comprises saplings of canopy species, and shrubs such as *Coprosma* species, prickly mingimingi and weeping mapou. Gahnia is abundant in the ground layer.

Weedy shrubland occurs over 2.1% of ESE, 34% of Stockton, 2.2% of UWHR disturbance areas but does not occur in Mount Frederick South. Weedy shrubland includes native trees and shrubs such as kāmahī, Southern rātā, broadleaf, mānuka and *Coprosma* species. Exotic species found within this vegetation include gorse, exotic *Juncus* species (e.g., *Juncus squarrosus*) and exotic grasses. Soils and vegetation from these areas will need to be managed separately to avoid spreading weeds around the site, this is discussed further in the Weed Management Plan (BPCP-ENV-PLN-008) and Biosecurity Management Plan (BPCP-ENV-PLN-007).

Mānuka/Gahnia-wire rush shrubland covers 1.7% of ESE and 1.6% of Stockton disturbance areas.

### 3.2.3 Low Pākihi

Pākihi vegetation is widespread across the Buller Plateaux, making up approximately 20.6% of the Mapped Area (Ecological Solutions Limited 2026a). It includes five distinct vegetation types described in Ecological Solutions Limited (2026a): mānuka/Gahnia-wire rush shrubland, mānuka-tussock-wire rush shrubland, mānuka-flax/wire rush shrubland, low pākihi and low pākihi with exotic component. Pākihi will be rehabilitated through the use of planting and VDT. Planting specifications for pākihi rehabilitation are discussed in Section 5.4.

### 3.2.4 Wetlands

Seven of the thirteen vegetation types identified in the Project area by Ecological Solutions Limited (2026a) meet the vegetation tests to be considered natural inland wetlands. These include:

- Low pākihi;
- Mānuka-tussock-wire rush shrubland;
- Mānuka-mountain beech-podocarp shrubland;
- Mānuka/Gahnia-wire rush shrubland;
- Mānuka-mountain flax/wire rush shrubland;
- Tussock-flax shrubland; and



- Weedy low pākihi.

Wetlands comprise c. 55.3% (417.3ha) of the Project Disturbance Area. Wetland rehabilitation will make use of VDT and planting at locations where suitable hydrology on slopes less than 12° can be created to maintain the wetland vegetation in the long term.

### **3.2.5 Tarns**

Tarns are small ponds, often containing open water and emergent plants. Tarns are a feature of the Buller Plateaux associated with gently sloping sandstone pavement and low vegetation communities. Tarns occur in particular on the Stockton Plateau between Stockton and Cypress mining areas. Wildland Consultants Limited (2010) estimated the extent of wetland-shallow tarn complexes as approximately 2ha, but this is an underestimate. Wetland and tarn complexes are common and widespread in areas of low vegetation (pākihi, mānuka shrubland) on low gradient sites. Tarn rehabilitation is discussed in more detail in Section 5.7.

### **3.2.6 Sandstone Erosion Pavement**

Sandstone erosion pavements are a key feature of the Buller Plateaux. They are characterised by areas of flat to gently sloping quartzose sandstone with limited topsoil, resulting from chemical weathering and erosion of top soils. Ecological Solutions Limited (2026a) estimated there was approximately 885ha of 'bare rock' within the Mapped Area which comprises mostly sandstone erosion pavement, and approximately 63.6ha across the Project Disturbance Areas.

Habitat to mimic sandstone erosion pavement will be created in rehabilitated areas by a staged process that begins with exposed coal floor. Over time, provided it is not acid generating, the coal floor will erode and expose underlying rock, which is expected to provide cracks and open habitat for sediments to accumulate and biota to establish. Creation of coal floor is discussed further in Section 5.5.

Rockfield rehabilitation will also recreate habitats similar to sandstone erosion pavement in the high proportion of bare rock. Rehabilitated rockfield will be different to sandstone erosion pavement in many ways, particularly as it will be free draining between large boulders.

### **3.2.7 Boulderfields**

Boulderfields are accumulations of large fragments of quartzose sandstone, often with shrubland vegetation growing amongst the boulders. Wildland Consultants Limited (2010) estimated the extent of boulderfields of acidic rock across the Buller Coal Plateaux at just over 20ha. This ecosystem occurred on the upper slopes of Mt Rochfort and in the upper catchment of Deep Stream, both of which are outside the Project Area, but there are likely to be additional areas across the plateaux which have not been mapped. No boulderfields are known to be present within Project Disturbance Area, however Ecological Solutions Limited (2026a) mapped approximately 63.6ha of 'bare rock' predominantly comprising sandstone erosion pavement, but which may include small localised boulderfields. An example of a boulderfield is shown in Figure 7.



Figure 7: Boulderfields comprise large boulders and rocky outcrops with stunted vegetation. (Photograph at Te Kuha courtesy of Peter Rough).

In terms of vegetation, low subalpine scrub and shrubland with pockets of mānuka, yellow-silver pine, *Gahnia procera*, mountain flax and tussocks (*Chionochloa flavescens*, *C. juncea*) were interspersed among the boulders. Within rehabilitated sites 'Rockfield' ecosystems includes creation of 'boulderfield' which is described further in Section 5.5.

### 3.3 Species of Significance

#### 3.3.1 Vascular Flora

At least 542 vascular plant species have been recorded from the Buller Plateaux since 1990 (Ecological Solutions Limited 2026b). Approximately 87% of those species were indigenous, with the remaining 13% being exotic species. Approximately thirty-one species (6%) had a conservation threat status of 'At Risk' or 'Threatened' (de Lange et al. 2024).

The Buller Plateaux is a stronghold for the 'At Risk – Declining' species coal measures tussock (*Chionochloa juncea*), which occurs nowhere else in the country and may hybridise with *C. rubra* locally. Several of the 'At Risk' species that occur on the Buller Plateaux are unique to the North-West Nelson Ecological Region, including *Dracophyllum densus*, *Euphrasia wettsteiniana* (both 'At Risk – Declining') and *Pseudowintera traversii* ('At Risk – Naturally Uncommon'). Species with disjunct distributions across New Zealand, including the 'At Risk – Naturally Uncommon' umbrella ferns (*Sticherus tener*, *S. urceolatus*) and Parkinson's rātā (*Metrosideros parkinsonii*) also occur on the Buller Plateaux. These species are expected to occur in the Project Areas and will be subject to management as set out in Section 0.

#### 3.3.2 Fauna

A wide range of fauna species also occur on the Buller Plateaux, probably due, at least in part, to the high habitat diversity. Vegetation of the Buller Plateaux forms an intricate mosaic with a high degree of natural edge, creating ecotones between different vegetation associations. This results in a high plant species richness and a correspondingly high diversity of habitats for fauna. In addition, the Buller

Plateaux is well connected to surrounding habitats which are more fertile and productive (e.g., Orikaka forests to the west), which enables the species present in surrounding areas to visit the plateaux and contribute to the observed diversity of fauna species there. Notable indigenous terrestrial fauna of the plateaux includes giant land snails (*Powelliphanta patrickensis*, *P. augusta*), roroa/great spotted kiwi (*Apteryx maxima*), weka (*Gallirallus australis*), mātātā/South Island fernbird (*Poodytes punctatus*), two species of gecko (West Coast green gecko - *Naultinus tuberculatus*, and forest gecko - *Hoplodactylus granulosus*) and Westland speckled skink (*Oligosoma* aff. *newmani* “Westland”).

*Powelliphanta patrickensis* are mainly found in pākihi habitat, particularly 1-2 m high shrubland with a high component of mānuka and mountain flax (Lloyd 2012). Snails tend to favour habitats with low stature (<2 m) vegetation, deep soils and low rock cover (Lloyd 2012). Some of this habitat will be rehabilitated via VDT, and VDT has been found to support similar snail densities to undisturbed habitats (Lloyd 2024). This is attributable to the high proportion of low vegetation cover and relatively undisturbed soils supporting earthworms which are a key food for snails. In addition, VDT can directly translocate both snails and earthworms which assists in establishing snail populations in rehabilitated areas due to their poor natural dispersal. Rehabilitation of these habitats via VDT is described in Section 4.3.5.

The highest concentrations of birds are typically found in forest habitat, while coal-measures shrubland, sandstone pavement areas and pākihi generally support comparatively few species. Low-growing vegetation and prostrate shrubland vegetation is home to only a few species including weka, mātātā, and pīhoihoi/pipit. Creation of habitat for birds will be achieved via the revegetation methods, with VDT being the most effective in the short to medium term. A wide range of post-rehabilitation vegetation types from pākihi to forest is required to provide habitat for the full range of species which naturally occur pre-mining.

Roroa (great spotted kiwi) are sparsely distributed across the plateaux and inhabit a range of habitats, including forest, shrubland, pākihi and red tussockland. Deep and fertile soils which support a high abundance of soil dwelling invertebrates are important feeding grounds for roroa. Translocation of these soils and associated fauna is the best method for creating these habitats for roroa, which will otherwise be slow to develop and recolonise. Use of organic matter such as slash and jumble dump will also improve food provision for roroa.

Forest geckos are nocturnal and typically occupy sandstone pavement (where they are common underneath rock slabs), bluffs and tors, shrublands, prostrate vegetation and forest. West Coast green gecko use shrublands, fernlands on tussock wetland areas, sandstone pavement and forest. Creation of suitable lizard habitat will involve rock placement to create cracks and crevices used by skinks, with surrounding vegetation appropriate to provide suitable food sources.

## 4.0 Rehabilitation Procedure

### 4.1 Rehabilitation Planning

#### 4.1.1 Background

Conceptually, the process of revegetating the newly constructed ELF's consists of five steps:

1. Identifying and prioritising existing material for use in rehabilitation prior to stripping.
2. Stripping and salvage of material prior to mining.
3. Stockpiling of material awaiting formation of the engineered landform suitable for its return.
4. Return of material, initial erosion control, supplementation with nursery seedlings and other vegetation and construction of habitat features as required.
5. Maintenance including weed and pest animal control, interventions to address erosion control, possibly fertiliser application and any native fauna management required.

#### 4.1.2 Identifying Material for use in Rehabilitation

Before any drilling, haul road development or overburden stripping begins, the following steps will be taken to identify and prioritise soil, vegetation, rock, and rubble resources:

- To demarcate the mine footprint, the boundary of the block or area to be disturbed, covered or stripped will be defined by marking it physically on the ground and loading disturbance plans onto machines fitted with GPS so operators can track their progress against design.
- If the area is adjacent to any undisturbed land (outside the planned mine footprint), any particularly sensitive or significant species along the boundary will be identified and the potential for avoidance or mitigation of impact assessed, including the potential for felled or eroded materials to affect adjacent areas as set out in the Erosion and Sediment Control Plan (BPCP-ENV-PLN-013).
- The potential for a given area to act as a source of weeds will be assessed as set out in the Weed Management Plan (BPCP-ENV-PLN-008). If there is evidence of presence of priority weed species, the vegetation and soils will be marked for quarantine and separately stripped if necessary.
- Identify salvageable rehabilitation resources and probable volumes in the area to be disturbed. Potential resources include plants, topsoil, subsoil, favourable (i.e., NAF) quaternary materials, logs and stumps, weathered boulders with bryophytes and other lithophytes, streambed material and any bryophyte-covered boulders from streams.
- Identify potential destinations for stripped material with the Environmental Manager. Confirm destinations have adequate surface area, slope, access, water control and surfacing and favourable substrate depth. Identify contingency areas in the case of unfavourable weather.



- Identify and prioritise the methods of pre-treatment and salvage, and the time required to salvage each area and/or rehabilitation resource in consultation with the Environmental Supervisor.
- Machinery operators must develop protocols to ensure the direct transfer and jumble dump specifications in this plan can be met.

The Environmental Supervisor is required to sign off construction plans, stripping block plans, overburden placement areas and stockpiling areas before access roads are constructed. Any access road required as part of the drilling programme or water management programme will also require signoff by the Environmental Supervisor before construction. This is to ensure rehabilitation resources are salvaged where these are available and appropriate.

#### **4.1.3 Addressing Edge Effects**

Edge effects are changes in ecological conditions at the boundary between two different habitats, which can influence resource availability and species composition. Edge effects can reduce survival and growth of some species, particularly during establishment, and stressors such as increased wind shear, increased drainage (particularly if near the edge of mine pit), high light, increased weed pressure and other disturbance all contribute to indirect effects beyond vegetation clearance itself. Edge effects can be particularly severe when vegetation clearance creates a new cut edge and species and communities which were formerly buffered from wind and sunlight are newly exposed. Edge effects are most severe where the vegetation is tall (i.e., forest). Edge effects can also be positive – healthy, dense edges help shelter adjacent rehabilitated areas and contribute a stream of beneficial plant and animal propagules into regenerating areas.

Edge effects will be addressed via a combination of immediate construction of retaining structures using logs and boulders to reduce ingress into newly created edges, direct transfer and jumble dumping to establish dense edge vegetation so as to develop a natural buffer for newly cut edges over the medium term. Edge treatments may include (depending on available resources and other constraints):

- Direct transfer or jumble dumping to establish dense edge vegetation
- Newly exposed edges of tall vegetation (the three forest types described in Ecological Solutions Limited 2026a) will be protected by bunds. These bunds will be prioritised for VDT.
- Shrubland vegetation will be buffered by planting.
- Rock placement will be used along edges with low vegetation (as identified in Ecological Solutions Limited 2026a) to reduce effects of sedimentation and erosion.
- Weed control along newly created edges.
- Releasing of existing or establishment of new plants above highwalls where safe access is achievable.

Edge treatments must be applied to all locations where new landforms adjoin retained indigenous vegetation, new mine edges are created, highwalls intersect vegetated areas, and where rehabilitation areas are exposed to edge effects.

Weed control along newly created edges will be important. Edges above highwalls will be enhanced by releasing or establishing plant species that can naturally seed onto the faces where safe access for planting is not achievable.

#### 4.1.4 Prioritising Vegetation for VDT

Figure 8 and Figure 9 show priority locations for collecting vegetation for direct transfer at the ESE Project sub-area and MFS Project sub-area respectively. These areas were selected because of the high number of records of lizards and snails at those locations and on the basis that VDT would salvage some of those individuals and provide inoculates for rehabilitated areas. Where practicable (dependent on mine planning constraints, where vegetation is suitable, health and safety and other practical constraints), when areas are scheduled for stripping and salvage these areas should be prioritised for transfer.

#### 4.1.5 Prioritising VDT laydown locations

The locations prioritised to receive VDT at the ESE Project sub-area and MFS Project sub-area are shown in Figure 10 and Figure 11 respectively. These areas were prioritised to receive VDT so as to buffer edges, vegetate riparian areas, locate VDT next to high numbers of lizards and snails outside the footprint and assist in improving connectivity across the Project sub-areas. Priority areas may be updated over time in response to fauna monitoring results or opportunistic fauna observations. The RMP will be updated to reflect any updates to priority areas as these results arise. To the extent practicable, these areas should be prioritised to receive VDT. In the event this is not achievable, these areas should be subject to increased planting density and use of jumble dump in conjunction with other methods (dependent on research outcomes, but could include targeted fertiliser application and use of fascining) to improve habitats for lizards and snails and allow expansion of their range into rehabilitated areas. At the ESE Project sub-area 9.5ha is prioritised to receive VDT, and at MFS there is 0.5ha.

Table 7 sets out the extent of the priority VDT areas for ESE and MFS. These priority areas will contribute to the goal of achieving 15% of the total proposed rehabilitated ecosystem across the Project Area being VDT. Other than priority VDT uses identified in Table 7, VDT will be implemented as the vegetation and ELFs become available throughout each Project sub-area.

*Table 7: Extent of priority VDT proposed for the ESE and MFS project areas.*

|                                                                          | ESE (ha) | MFS (ha) |
|--------------------------------------------------------------------------|----------|----------|
| Riparian rehabilitation (10m width on one side of any reinstated stream) | 2.5      | 1.4      |
| Priority areas for VDT                                                   | 9.5      | 0.5      |
| Inoculation areas within planted sites                                   | 10       | 5        |
| VDT to assist in promoting connectivity                                  | 10       | 8        |

For riparian rehabilitation, VDT placement will be prioritised along at least half of the stream length and located on the upslope side in order to prevent washout of VDT sods during high rainfall events and

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ensure the best chance of VDT establishment. The use of VDT along streams contribute to creating connectivity of fauna habitat and provide sources of seed for adjacent rehabilitated areas.

At the ESE Project sub-area, 10ha of inoculation areas (i.e., 20 sites, each 0.5ha) is proposed, and for MFS 5ha (10 sites) is proposed. These VDT 'islands' on ELF's destined for planting are intended to more quickly establish habitat for fauna, particularly snails and lizards, and assist in providing seed sources for adjoining planted areas.

Additional priority areas for VDT will be selected so as to provide connectivity across each Project sub-area as rehabilitation proceeds. Connectivity to both other VDT areas and natural undisturbed areas is desirable. Approximately 10ha of VDT has been allocated specifically for this purpose at the ESE Project sub-area and 8ha at the MFS Project sub-area. In the event that there is a shortfall of suitable VDT to provide connectivity between areas of fauna habitat, then buffer zones of denser planting should be established around constructed fauna habitat (i.e., the habitats proposed in Section 6.0). Similarly, if insufficient suitable VDT material is available to be placed at the priority locations identified in Figures 10-11, then these priority areas should be rehabilitated by higher density planting (less than 0.5m spacing) with species chosen to reflect habitat requirements of lizards and snails.



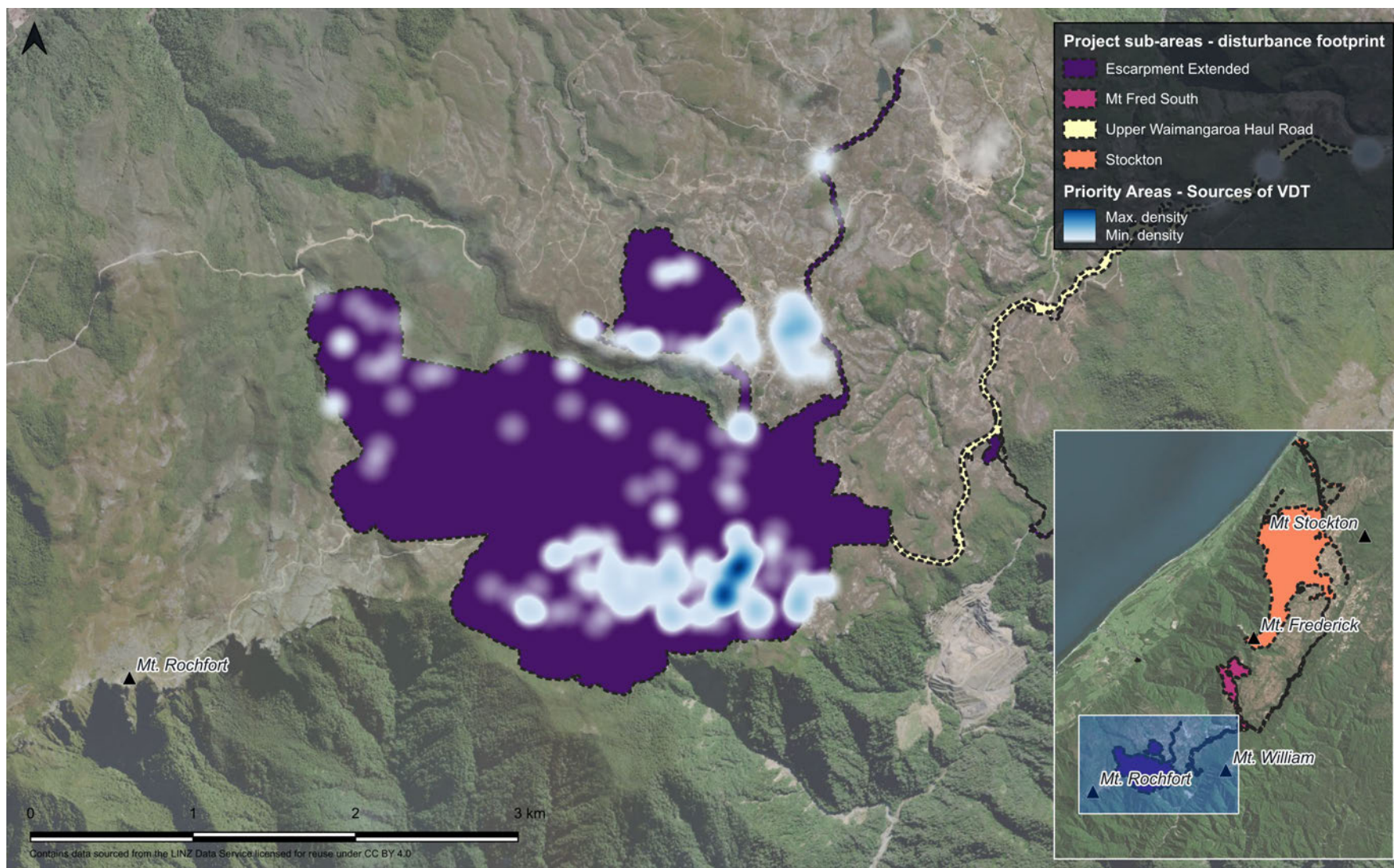


Figure 8: Priority locations for vegetation removal for VDT at the ESE Project sub-area.



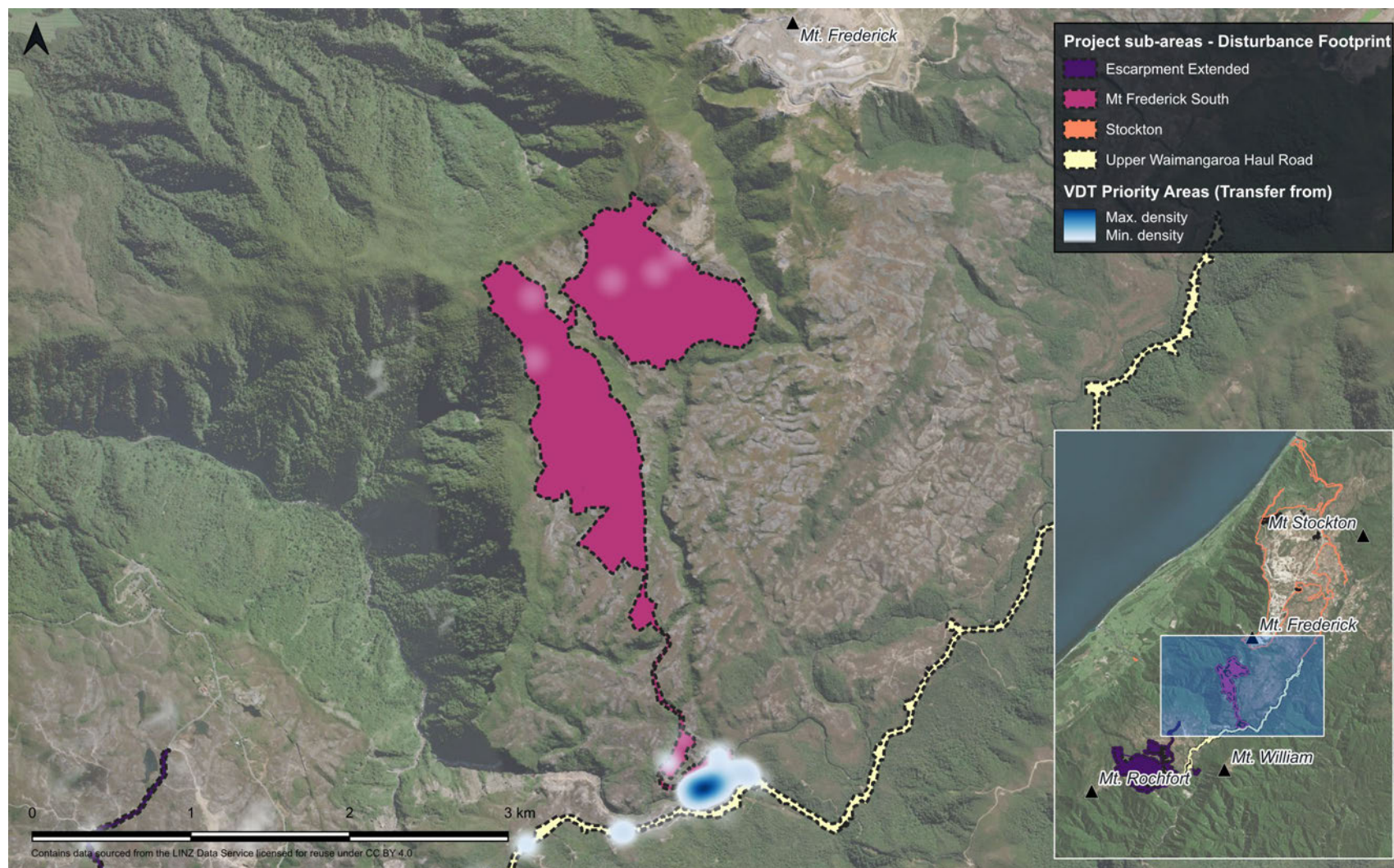


Figure 9: Priority locations for vegetation removal for VDT at the MFS Project sub-area.



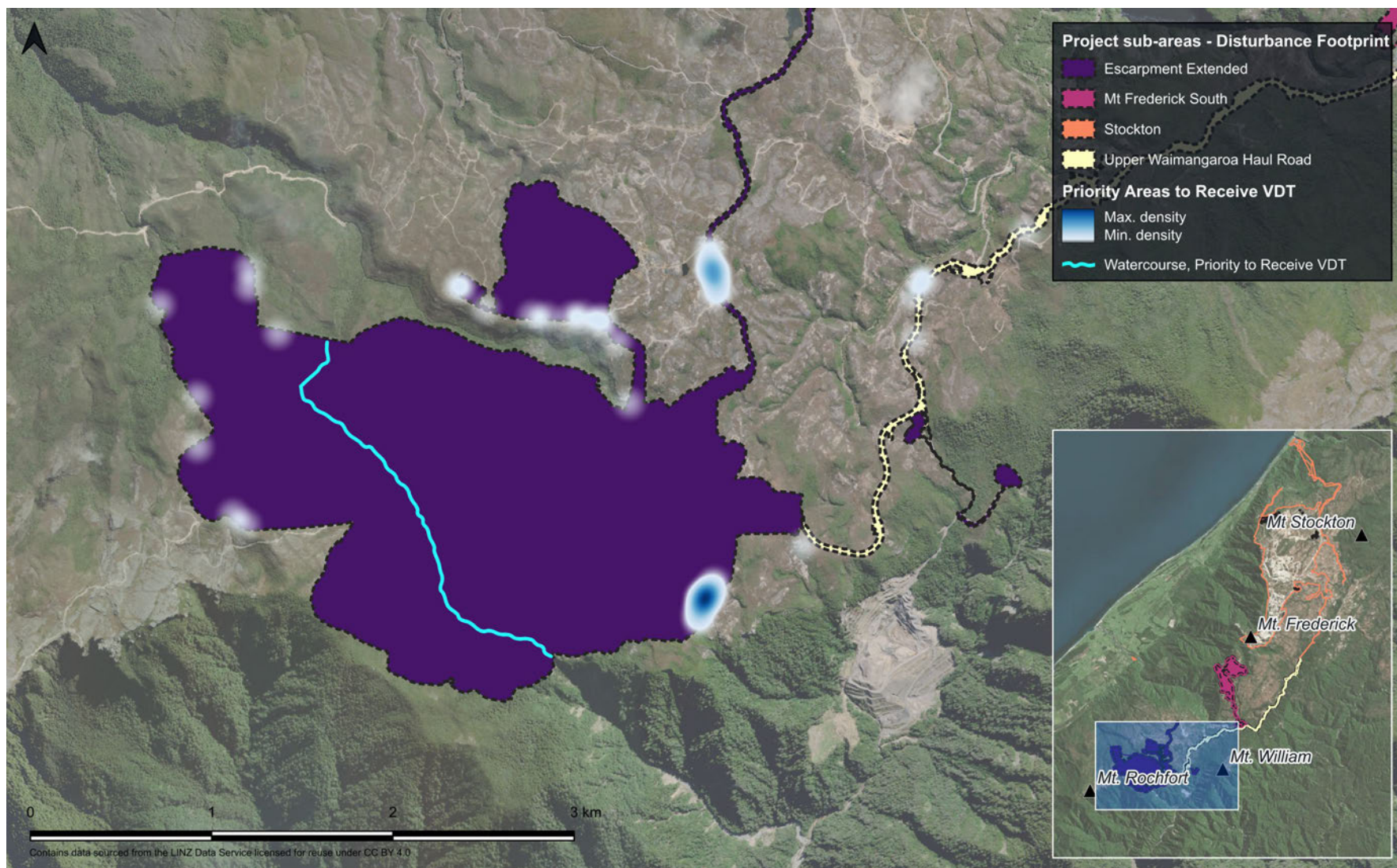


Figure 10: Locations at the ESE Project sub-area prioritised to receive VDT as part of rehabilitation.



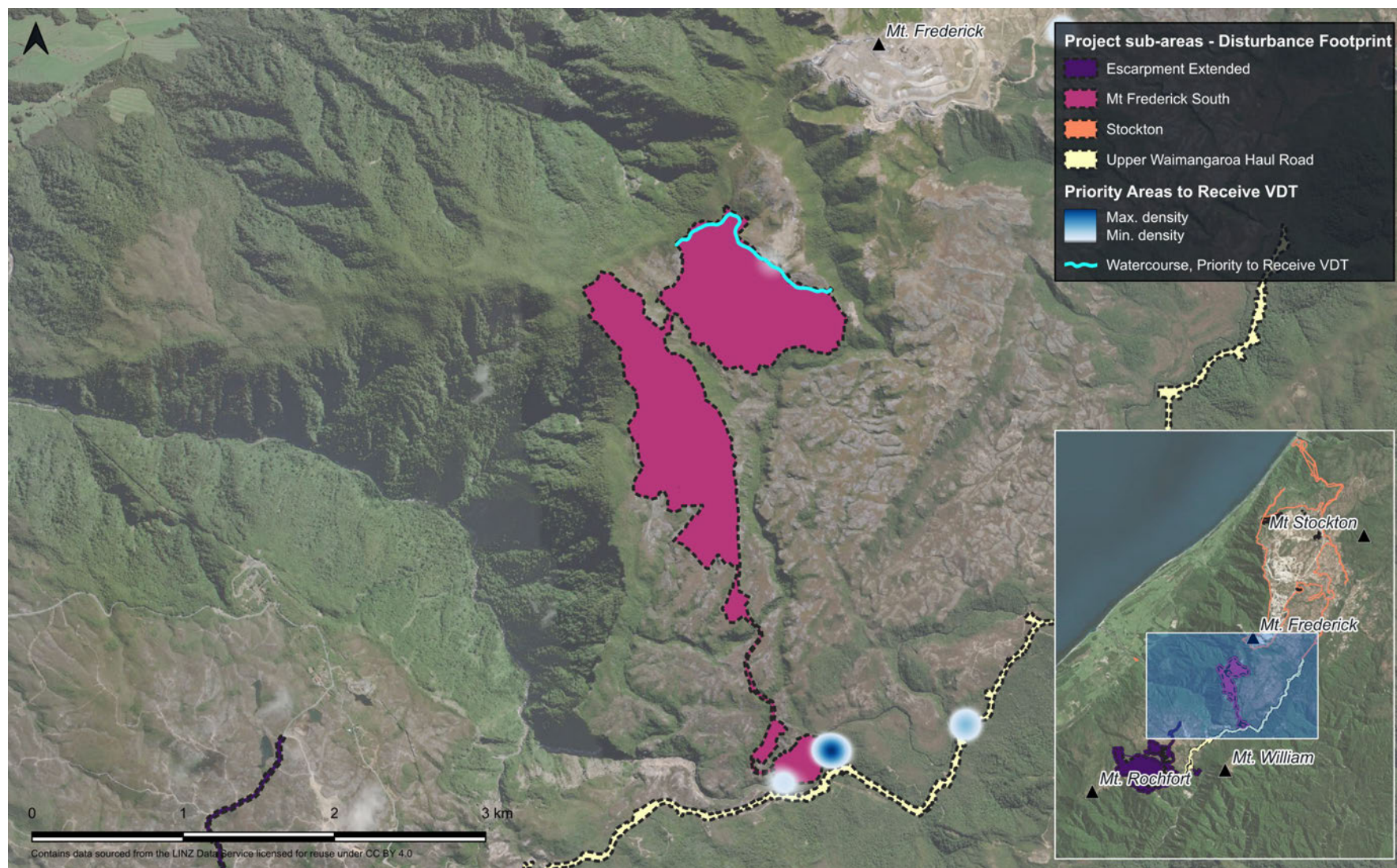


Figure 11: Locations at the MFS Project sub-area prioritised to receive VDT as part of rehabilitation.

## 4.2 Engineered Landform Rehabilitation

### 4.2.1 Landform Construction

Following completion of mining, the first stage of rehabilitation is the creation of an Engineered Landform (ELF). The ELF will be created from overburden with the aim of creating a stable landform which blends with the surrounding landscape and reduces AMD. Ingress of air and water will be reduced which minimises generation of AMD. The AMD: ELF Management Plan (BPCP-ENV-PLN-011) sets out implementation methods for creation of the ELF.

### 4.2.2 Landform Capping

ELFs will be composed of Potentially Acid Forming (PAF) overburden capped by a layer of NAF overburden and topsoil. This capping reduces infiltration of air and water into the PAF overburden below and will become the substrate for subsequent revegetation.

Variation in the thickness and compaction of the capping layer will provide variation in drainage and rooting depth. The target depths for alternate landform capping cover systems are shown in Figure 12, with further variation created by greater compaction of the 0.25m thick growth medium layer (GML) in areas intended to be rehabilitated as shrubland, wetlands and low vegetation compared to forests. This variation in compaction and depth (and therefore drainage) will underpin variation in the suitability of rehabilitation for different plant species and lead to variation in the final vegetation type across the BPCP. This variability in drainage and soil depth, combined with variation in landform topography and planting mixes, will create heterogeneity in vegetation and habitats across the rehabilitated site.

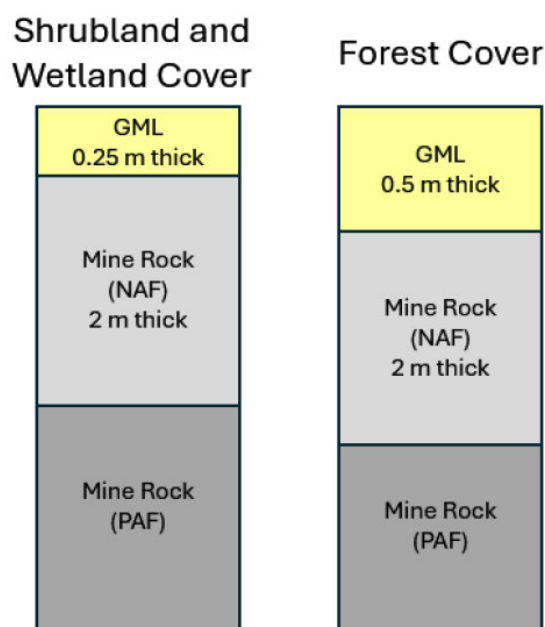


Figure 12: Profile of landform capping substrate and soil cover systems.

Tarns and wetlands, both requiring impeded drainage, will be constructed within the shrubland and wetland cover systems as the opportunity allows. The placement of these cover systems will be such that the vegetation types which they are intended to support will mimic a natural pattern and ecological



gradients based on drainage, slope, elevation, and aspect. Shrubland cover will be used as the cover system in areas intended to be rehabilitated as pākihi and both manuka dominated and flax dominated shrubland types. Forest cover will be used to rehabilitate all forest types. Management of soil to be used for rehabilitation of low vegetation types (e.g., shrublands, pākihi) is set out in the Weed Management Plan (BPCP-ENV-PLN-008) and Biosecurity Management Plan (BPCP-ENV-PLN-007).

#### **4.2.3 Soil Stockpile Management**

Management of weeds in soil stockpiles is set out in the Weed Management Plan (BPCP-ENV-PLN-008). Regular weed surveillance and control will be undertaken at soil stockpiles in order to prevent any seeds present in the soil from spreading across the site and accumulating propagules in soils destined for rehabilitated sites. In order to achieve this, weeds will be controlled prior to flowering or seed set. Soil from sites known to contain weeds will be kept separate from soil from weedy areas and should be prioritised for use in areas destined to be tall forest.

### **4.3 Revegetation**

#### **4.3.1 Introduction**

Once a stable landform is created and capping is in place, revegetation will occur as soon as practicably possible in order to stabilise the landform and retain soils. Revegetation will be achieved through a range of rehabilitation procedures depending on the proposed rehabilitated ecosystem type including (in order of priority):

- VDT of intact vegetation soil sods, including transfer with intermediate storage;
- Jumble dump and slash;
- Hydroseeding/hydromulching as soon as practicable (except where VDT will be undertaken);
- Transfer of other material such as salvaged plants (particularly Plants of Conservation Interest (PCI) as set out in Section 8), and biomass. This could include fascining where appropriate/required; and
- Planting of nursery raised seedlings, followed by enrichment planting as required. This could also include fascining where appropriate/required.

Coarse wood, logs and boulders will be used to increase the diversity of sheltered micro sites in shrubland and forest areas. The logs can provide inoculates of invertebrates and fungi and establish invertebrate habitat and diverse seedling establishment sites. During construction, rock slabs and boulders that can be salvaged should be placed directly into available rehabilitation areas where practicable. Each of these methods is considered in more detail below.

#### **4.3.2 Hydroseeding**

Hydroseeding (sometimes called hydromulching) is the application of a water-based slurry of seeds, adhesive, wood fibre, wool or straw mulch (or newspaper) and fertilisers using machine-operated high-pressure hoses (Solid Energy Limited 2010). Hydroseeding with non-native (usually sterile pasture) species provides short-term erosion control and adds organic matter to the soil.

Hydromulching and seeding (broadcast of seeds by hand or machine) will be used on highwalls and steep and poorly accessible areas and bunds, where vegetation is required with limited accessibility for planting or VDT.

To further assist in erosion control and create an environment into which vascular plants can establish, it is recommended to use bryophytes (particularly mosses) in hydroseeding mixes on coal measures material, along with fragments of herbs such as *Nertera depressa*, *Epilobium* species, and *Anaphalioides bellidioides* as well as seeds of mānuka and mountain flax.

### 4.3.3 Planting

Seed and plant resources used for rehabilitation must be genetically sourced from the Buller Plateaux or the Ngakawau Ecological District at a similar altitude, unless it is deemed by a SQEP that an alternative source is necessary and appropriate due to plant supply constraints, biosecurity requirements or ecological suitability.

Planting will be the method used to rehabilitate the majority of the BPCP. At Stockton Mine planted areas are able to establish vegetation cover and create microhabitat conditions which favour the colonisation of other native plant species typical of the area (Ecological Solutions Limited 2026c). Whilst effective, planting is slower to establish a high proportion of vegetation cover due poor soil quality (which can be ameliorated to some extent by careful stripping without mixing with topsoil with subsoils), exposed conditions and the typically slow growth rates experienced on the Buller Plateaux. There may be a high proportion of surface rock and bare ground remaining in planted areas in the years following planting. The presence of bare rock is an acceptable outcome as it forms an ‘armouring’ layer protecting the soils from erosion, but it is important that bare soil does not lead to sediment mobilisation and weeds are not allowed to proliferate until vegetation cover is established at planted sites.

Sites to be planted should be prepared using appropriate soil, ideally topsoil of sufficient depth for root establishment of the target vegetation associations. Depending on final vegetation type, underlying layers may be compacted to impede drainage and support wetland development if required or left relatively loose to allow support for taller vegetation. The addition of microhabitat features such as logs and boulders will assist in providing microhabitats for plants and, if properly designed and implemented, habitat for fauna as well. Creation of fauna habitat is discussed in more detail in Section 6.

VDT islands at least 0.5ha (5,000m<sup>2</sup>) will be established using direct transfer from newly stripped areas to parts of the newly constructed ELF where this is achievable and appropriate. These ‘inoculation areas’ aim to quickly establish more valuable habitat for fauna including snails and lizards within planted areas. Higher plant diversity, including the presence of higher proportions of astelia, gahnia, flax and forest tree seedlings are expected in these areas, with ferns and herbs likely to naturally colonise more sheltered areas.

Seedling podocarps collected from areas scheduled for vegetation clearance, or seeds collected for propagation can be repatriated to rehabilitation sites after other plants are established.

Targeted use of appropriate fertiliser will be used to improve initial growth rates of plant species (flax, tussock, Astelia, Gahnia) at locations intended to provide snail habitat and assist in generating leaf litter, providing habitat and promoting nutrient recycling. Development of a research programme to confirm the type, application rate and method of fertiliser application will form part of the rehabilitation research programme.

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#### 4.3.4 Slash and Jumble Dump

Jumble dump is the placement of salvaged or mixed soils, vegetation, organic matter and slash from stripped and cleared disturbance areas on surfaces of rehabilitation areas. Handling and mixing should be minimized so as to retain viable biota where possible and to create rough surfaces, ideally with retention of patches of live vegetation and soil clods. Jumble dump may also include boulders. Some vegetation typically re-sprouts or germinates from propagules from this approach, some invertebrates (including soil invertebrates) survive, and the boulders and larger material (branches/logs) provide micro-relief for establishing plants.

In order to maximise value of jumble dump, mixing should be reduced by use of excavators rather than bulldozers. Jumble dump should particularly be used for stripping in forests, where VDT is less achievable and soils are deeper, more fertile and productive. Jumble dump will be used for enhancing the quality of habitat for fauna which require deep leaf litter and soils, such as *Powelliphanta* snails and roroa.

#### 4.3.5 VDT

##### 4.3.5.1 Background

VDT involves the removal and relocation of intact mats or sods of vegetation and attached soil (Rodgers et al., 2011). This can provide an immediate ground cover of naturally-occurring vegetation and leaf litter layers, along with their associated soil microbial and invertebrate communities. This method is therefore preferable to planting or seeding, which may take 20–50 years on mixed soils/overburden to reach a dense vegetation cover, while also being vulnerable to erosion and weed invasion (Ross 2008). The target for the BPCP is to achieve 15% VDT across the whole project.

While native plant survival associated with high quality VDT of suitable vegetation types and soils is generally high, invasion of weeds will require careful management to meet closure conditions. An example of established VDT is shown in Figure 13.





*Figure 13: VDT at Stockton Mine.*

VDT is an effective way to conserve plants which are difficult to propagate, including bryophytes and lichens, to maintain large/old individual plants, and to translocate some poorly mobile species of fauna such as snails, lizards, poorly mobile beetles and wētā. Red tussock/wire rush-mānuka vegetation responds particularly well to direct transfer because of its short stature and dense root systems confined to the topsoil (Simcock et al. 2011) meaning the whole root zones can be transferred with minimal disturbance.

Although significant dieback and deaths of shrubs and trees (particularly podocarps and taller mānuka) typically occurs when transferring shrubland and forest vegetation, regenerative capacity can still be retained in root plates, understorey vegetation, seedlings and the seed bank retained in the soil (Ross, 2008). In addition, some tree species are resilient to shifting and can regrow from their base or trunk (notably Southern rātā and beech).

#### *4.3.5.2 Placement Criteria for VDT*

VDT will be prioritised for rehabilitation so as to achieve the target of at least 15% over the entire BPCP. Where achievable, VDT will be placed at locations which are well suited to the maintenance of the source vegetation type e.g., for low pākihi, placement at poorly drained and exposed sites likely to sustain low stature wetland vegetation. Even where matching the vegetation type is not achievable, VDT should still be prioritised, despite vegetation changing (e.g. succeeding to forest) as part of natural ecological processes.

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## 5.0 Rehabilitation of Specific Vegetation Types

### 5.1 Overview

The original vegetation within the disturbance footprints of the BPCP included three forest types, six shrubland types and four low vegetation types, as well as bare rock, cleared vegetation and water as shown in Table 8.

Table 8: Extent of each pre-mining and post-mining vegetation type within the BPCP Disturbance area.

| Pre-mining Vegetation Type                   | Amount removed (ha) | Post-mining Vegetation Type | Extent (includes VDT and planting (ha) <sup>2</sup> |
|----------------------------------------------|---------------------|-----------------------------|-----------------------------------------------------|
| <b>Forest</b>                                | <b>188.1</b>        |                             | <b>248.6</b>                                        |
| Mixed beech-podocarp-broadleaved forest      | 5.5                 | Tall forest                 | 7.2                                                 |
| Southern rātā-mountain beech-podocarp forest | 177.1               | Beech forest (a)            | 234.2                                               |
| Silver beech-mountain beech forest           | 5.5                 | Beech forest (b)            | 7.3                                                 |
| <b>Shrubland</b>                             | <b>214.2</b>        |                             | <b>125.7</b>                                        |
| Mānuka-mountain beech-podocarp shrubland     | 84.7                | Mānuka shrubland (a)        | 52.8                                                |
| Mānuka/Gahnia-wire rush shrubland            | 9.2                 | Mānuka shrubland (b)        | 5.7                                                 |
| Shrubland with exotic component              | 12.5                |                             |                                                     |
| Mānuka-tussock-wire rush shrubland           | 104.2               | Pākihi                      | 64.9                                                |
| Mānuka-mountain flax/wire rush shrubland     | 3.7                 | Flax shrubland (a)          | 2.3                                                 |
| <b>Low vegetation</b>                        | <b>216.4</b>        |                             | <b>130.1</b>                                        |
| Low pākihi                                   | 213.9               | Pākihi                      | 129.1                                               |
| Tussock-mountain flax shrubland              | 1.7                 | Flax shrubland (b)          | 1.0                                                 |
| Exotic grassland                             | 0.8                 |                             |                                                     |
| <b>Non-vegetated land cover</b>              | <b>135.5</b>        |                             |                                                     |
| Bare rock                                    | 63.6                |                             |                                                     |
| Vegetation cleared                           | 69.8                |                             |                                                     |
| Water                                        | 2.1                 |                             |                                                     |
| <b>Rehabilitated highwall</b>                |                     |                             | <b>68.8</b>                                         |
| <b>Rockfield</b>                             |                     |                             | <b>91.1</b>                                         |
| <b>Total</b>                                 | <b>754.24</b>       |                             | <b>664.5</b>                                        |

<sup>2</sup> The extent of each vegetation type proposed for rehabilitation is based on the final landforms ('Native ecosystem', 'wetland/ tarns', 'rehabilitated highwall' and 'Rockfield' extent) (Shapefiles released 5 December 2025) within the Disturbance Area (Shapefiles released 15 October 2025) of Stockton, Mount Frederick South, Upper Waimangaroa Haul Road and Extended Escarpment. It takes into account the slope of the final landform to dictate if the landform will support wetlands (<5°), Shrublands (5-15°) or forest (>15°). The rehabilitated area does not include retained infrastructure such as roads and water closure bodies.



Replicating this heterogeneity of vegetation and habitat types will not be achievable, but a degree of heterogeneity will be achieved at rehabilitated sites using a combination of landform position and contour, soil depth, sub soil compaction, source VDT and planting species mix to establish a range of vegetation types containing similar species and providing suitable habitat for the fauna and plant communities which occurred prior to mining. An indicative layout of the rehabilitation types is shown in Figures 2, 4 and 6 in Section 2.0.

Following rehabilitation of the Disturbance Area, there will be eleven different final landform rehabilitation cover types distributed across the affected area, including three forest types, five shrubland types, rockfield, and wetlands/tarns. Some infrastructure elements, including roads and water treatment infrastructure, will also be retained.

Rehabilitation using planting will aim to reproduce the following post-mining vegetation types on each of the landform capping cover systems described in Section 4.2.2:

- Forest landform capping cover system to be rehabilitated to;
  - Tall Forest – podocarp/kāmahi/Southern rātā dominated
  - Beech Forest (type a and b)
- Shrubland and wetland landform capping cover system to be rehabilitated to
  - Mānuka dominated shrubland (type a and b)
  - Flax dominated shrubland (type a and b)
  - Pākihi
- Rockfield landform capping cover system to be rehabilitated into;
  - Boulderfields of acidic rock or weathered boulders with low acidity
  - Forested blockfield

VDT rehabilitation will retain shrubland and low vegetation pre-mining vegetation types as set out in Table 7. VDT will also be applied to the rockfield ecosystem type to emulate natural boulderfields. This is explained further in Section 5.5.

Creation of these distinct communities will be achieved via methods described further below, to suit the final landform rehabilitation cover type, final landform and the soil and subsoil used in the cover system. As propagation and establishment of some species is slow and/or difficult, achieving a composition similar to the original type in planted areas will be impractical. Species which are more readily propagated and fast to establish will therefore be overrepresented in planting mixes, at least initially. In order to increase the diversity and ensure planted habitats are on a trajectory towards a similar composition, less easily propagated species will be included as enrichment plantings, though in smaller proportions and more evenly spread.

Locally sourced mānuka, including prostrate forms, will be used extensively on all areas intended to develop as shrubland or forest, because it is hardy and can colonise a wide range of substrates and micro sites, seeds precociously and develops litter relatively quickly, although larger leaved species builds litter

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faster. Mānuka will be established via VDT, laying slash (fascining), hydromulching and by planting of nursery grown seedlings, which can be propagated efficiently and reliably at scale.

Gahnia (*G. procera*, *G. rigida*) is a key component in shrubland habitats on the plateau and if growing in the right location can provide habitat for snails and food for forest ringlet butterfly (*Dodonidia helmsii*) caterpillars. Gahnia has been propagated in the past, but has tended to suffer from transplant shock. Gahnia included in VDT often dies back initially and then regrows. Gahnia plants produce abundant seed, so trials on direct seeding and transplanting trials will be carried out to increase abundance of these species in rehabilitation. Seral shrubland plants will be established initially with some beech and podocarp species added as diversity plantings later. Mānuka, flax, Gahnia, Dracophyllum, broadleaf and Southern rātā are likely to dominate in the medium term, especially at planted areas.

The original vegetation and the corresponding post-mining vegetation types are shown in

Table 9.

## 5.2 Forest

Forests naturally occur on the Plateaux at better drained, more fertile and less exposed sites with deeper soils – typically those locations are within gullies. On rehabilitated slopes, drainage and soil depth will be the most important determinants of the potential to support forest. The affected forest types are suited to restoration by planting by including a mix of forest canopy species, mānuka and a mix of understorey and ground layer shrubs and native grasses and sedges such as Gahnia. The mānuka will shelter and encourage height growth of the forest canopy species, while shrub and ground layer species will contribute to sediment retention in the short term and increase the overall species diversity of the seral shrubland and forest once established. One of the objectives of this plan is to create site-appropriate forest of varied composition. Three distinct post-mining forest types are proposed:

- Tall forest (Podocarp/kāmahi/Southern rātā dominated forest podocarp-broadleaved forest);
- Beech forest type a (Southern rātā, silver beech-mountain beech); and
- Beech forest type b (Silver beech-mountain beech).

While forest is less suited to VDT than lower vegetation types, VDT should also be applied where achievable. Trees to 5m or more height have been successfully transferred at Stockton if the root ball is relatively intact and conditions at the rehabilitation site have similar exposure conditions. Even though canopy exceeding 5m cannot be transferred, the understorey and stumps with root plates supports transfer of seedlings and relatively intact soils which contain seed, soil invertebrates and microbes. To achieve this, trees taller than 3 - 5m should be felled at waist to shoulder height. In addition, soils and organic matter 'jumble dump' should be salvaged where achievable and used in rehabilitation.

Two variants of beech forest are to be planted on higher elevation and more exposed positions on the ELFs – referred to here as beech forest type a and beech forest type b. A third 'tall forest' mix is also proposed. The planting mix for these three forest types is set out in



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Table 9. All three types include a high proportion of mānuka, which will be used as a pioneer species due to its ease of propagation, fast growth, tolerance to exposure and suitability for planting on engineered landforms.

Table 9: Species mix and densities for the three proposed forest rehabilitation types.

|                                    | Tall forest                                     | Beech forest type a                             | Beech forest type b                             |
|------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Pioneer species (40%)              | Mānuka                                          | Mānuka                                          | Mānuka                                          |
| Dominant species (20%)             | Southern rātā                                   | Southern rātā                                   | Mountain beech                                  |
|                                    | Kāmahi                                          | Mountain beech                                  | Silver beech                                    |
|                                    | Hall's tōtara                                   | Silver beech                                    |                                                 |
|                                    | Broadleaf                                       |                                                 |                                                 |
| Other tree and shrub species (10%) | Red beech                                       | Yellow-silver pine                              | Southern rātā                                   |
|                                    | Rimu                                            | Pink pine                                       | Yellow-silver pine                              |
|                                    | Pāhautea                                        | Pāhautea                                        | Pink pine                                       |
|                                    |                                                 |                                                 | Pāhautea                                        |
| Other species (30%)                | <i>Gahnia procera</i>                           | <i>Gahnia procera</i>                           | <i>Gahnia procera</i>                           |
|                                    | Mountain flax                                   | Mountain flax                                   | Mountain flax                                   |
|                                    | <i>Pseudopanax linearis</i>                     | <i>Pseudopanax linearis</i>                     | <i>Pseudopanax linearis</i>                     |
|                                    | <i>Coprosma foetidissima</i>                    | <i>Coprosma foetidissima</i>                    | <i>Coprosma foetidissima</i>                    |
|                                    | <i>Coprosma dumosa</i>                          | <i>Coprosma dumosa</i>                          | <i>Coprosma dumosa</i>                          |
|                                    | <i>Myrsine divaricata</i>                       | <i>Coprosma colensoi</i>                        | <i>Coprosma colensoi</i>                        |
|                                    | <i>Quintinia serrata</i>                        | <i>Dracophyllum longifolium</i>                 | <i>Dracophyllum</i> spp.*                       |
|                                    | <i>Pseudopanax colensoi</i> var. <i>ternata</i> | <i>Myrsine divaricata</i>                       | <i>Myrsine divaricata</i>                       |
|                                    |                                                 | <i>Quintinia serrata</i>                        | <i>Quintinia serrata</i>                        |
|                                    |                                                 | <i>Pseudopanax colensoi</i> var. <i>ternata</i> | <i>Pseudopanax colensoi</i> var. <i>ternata</i> |

\*Any of the larger forest species typical of the area including *Dracophyllum traversii*, *Dracophyllum elegantissimum*, *Dracophyllum townsonii*.

## 5.3 Shrubland

### 5.3.1 Introduction

Shrublands occur as ecotones between forest and low vegetation, and where historical disturbance has taken place. Natural (non-weedy) shrubland types on the plateaux are dominated by mānuka, with varying amounts of mountain flax, *Gahnia procera*, *Dracophyllum* species, podocarps and other stunted native shrubs. Ground cover is dominated by wire rush and tanglefern.

### 5.3.2 Mānuka Shrubland – Type a

Mānuka shrubland - type a is suited to slightly less exposed sites with moderately deep soils and better drainage. The planting mix includes a range of native shrub and low-growing tree species including:

- Mānuka - 60%

- Other tree and shrub species – yellow-silver pine, pink pine, mountain beech, silver beech, kāmahī, Southern rātā, *Pseudopanax linearis*, *Pseudopanax colensoi* var. *ternata*, broadleaf, *Coprosma colensoi*, *Coprosma dumosa*, *Veronica odora*, *Pimelea gnidia*, *Ozothamnus vauvilliersii* – 10%
- Ground species – *Gahnia procera*, mountain flax, wire rush, tanglefern – 30% with no more than 10% mountain flax.

### 5.3.3 Mānuka Shrubland - Type b

Mānuka-dominated shrubland type b is suited to wetter, more exposed sites. The planting mix includes:

- Mānuka - 45%.
- Other tree and shrub species – yellow-silver pine, pink pine, mountain beech, silver beech, dracophyllum, prickly mingimingi, mountain toatoa – 5%.
- Ground species – *Gahnia procera*, mountain flax, wire rush, tanglefern – 50% with no more than 10% mountain flax.

### 5.3.4 Flax Shrubland – Type a

Flax shrubland – type a is suited to drier and steeper sites and is dominated by mountain flax with common mānuka and wire rush shrubland as follows:

- Mountain flax – 50%.
- Other tree and shrub species – mānuka, bog pine, yellow-silver pine, *Dracophyllum rosmarinifolium*, *Dracophyllum longifolium*, *Coprosma dumosa*, *Veronica odora*, *Pimelea gnidia*, *Ozothamnus vauvilliersii* – 20%.
- Ground species – red tussock, coal measures tussock, wire rush, tanglefern, *Coprosma cheesemanii* – 30%.

### 5.3.5 Flax Shrubland – Type b

Flax shrubland – type b is suited to damper sites and includes the following species mix:

- Dominant species – flax, red tussock – 50%.
- Other tree and shrub species – *Dracophyllum rosmarinifolium*, *Dracophyllum longifolium*, *Coprosma dumosa*, *Veronica odora*, *Pimelea gnidia*, *Ozothamnus vauvilliersii*, bog pine, yellow-silver pine – 20%.
- Ground species – coal measures tussock, wire rush, tanglefern, *Coprosma cheesemanii* – 30%.

## 5.4 Low Vegetation

### 5.4.1 Pākihi

Pākihi vegetation is suited to poorly drained and exposed areas. The vegetation is similar to shrubland types described above, but with mānuka, tussock, and rushes as the dominant species. Flax will not be a component in Pākihi planting mixes. The planting mix for pākihi vegetation includes:

- Mānuka (50%).
- Other tree and shrub species – Gahnia procera, bog pine, Dracophyllum longifolium, Dracophyllum rosmarinifolium (10%).
- Ground species – wire rush, tanglefern, pākihi rush, coal measures tussock, red tussock (40%).

## 5.5 Rockfield

### 5.5.1 Introduction

Rockfield rehabilitation is intended to emulate, to the extent achievable, sandstone erosion pavement, boulderfields of acidic rock and forested blockfield ecosystem types and provide habitat for species which use those habitats through the inclusion of large boulders and the use of a high proportion of bare rock. Vascular vegetation is expected to grow in small patches of shallow topsoil with overall vegetation cover likely to be dominated by lichens and common bryophytes in the medium term.

Rockfield will be rehabilitated using a combination of exposed coal floor and boulderfield rehabilitation methods. Coal floor rehabilitation is a staged process that begins with exposed coal floor which over time will erode and expose underlying rock, which is expected to provide cracks and open habitat for sediments to accumulate and biota to establish.

Coal floor is not expected to generate AMD in the medium – long term (Pope et al. 2018). Initial treatment is provided for in the AMD: ELF Management Plan (BPCP-ENV-PLN-011). Local mobilisation and deposition of sediment initially will provide substrate for plants to establish naturally in the medium – long term.

Based on the shapefiles released by BRL on 5 December 2025, rockfield rehabilitation is expected to cover approximately 91.1ha within the Project Disturbance area (noting none is expected in the final landform for the Upper Waimangaroa Haul Road).

### 5.5.2 Boulderfield

Boulderfield vegetation consists of scattered trees, shrubs, ferns and other low-growing vegetation that favours sheltered microhabitats that boulderfields provide. The key element to restore boulderfield will be placement of large boulders. Boulders up to about 5m diameter have been salvaged and placed on rehabilitated areas at Stockton with suitable machinery, although movement of boulders 2-3m in diameter is more practicable.

Salvaged rock will be used where practicable to provide ecological elements such as lichens and bryophytes, supplemented by quarried or operational rock to achieve the required landform and coverage at scale. Boulderfields will cover up to 400m<sup>2</sup> and be constructed with weathered boulders of



various sizes so that the overall rock cover is at least 70%. Soils between boulders will be up to 500mm deep and adjoin boulders. Species for boulderfield vegetation include:

- Tree and shrub species – mountain beech, silver beech, *Dracophyllum longifolium*, *Pseudopanax linearis*, kāmahī, Quintinia, mānuka, *Pseudopanax colensoi* var. *ternata*, broadleaf, *Veronica odora*, *Pimelea gnidia*, *Ozothamnus vauvilliersii*, leatherwood (high altitude sites only)
- Ground species – red tussock, mountain flax, *Gahnia procera*, kiokio, *Astelia nervosa*.

Forested blockfield is a later-successional variant of boulderfield shrubland, where a closed-canopy forest has developed over sandstone blocks and boulders, which are closely aligned with each other and soil has accumulated on top, allowing plants to establish. Forested blockfield is present at Te Kuha, as well as high altitude sites along the ridgeline to Mt Rochfort, at Mt William and on the Stockton Plateau. The humid environment in the understory of such vegetation and within the interstices between the boulders allows bryophytes to establish and come to dominate the ground cover and develop “stalactites” of vegetative material. Forested blockfield provides good habitat for ‘Threatened’ and ‘At Risk’ bryophytes, including some which are present within the Project Area. For that reason, creation of habitat that can develop into forested blockfield, and where bryophytes can be located, is proposed. The size of boulders which can practicably be moved for forested blockfield is limited and will likely be smaller than natural forested blockfield. Recommended species for boulderfields intended to become forested blockfield include:

- Tree and shrub species – silver beech, mountain beech, *Archeria traversii*, Southern rātā
- Ground species – mountain flax, *Astelia nervosa*, *Coprosma colensoi*, *Coprosma dumosa*.

Boulderfields should also include VDT where practicable. Ideally the VDT would include large-diameter (>20 cm DBH) salvaged Southern rātā and beech to place between taller boulders or on top of adjacent lower boulders. Salvage and transfer of beech trees has been successfully demonstrated near the top of Mt Frederick, so this approach should be utilised where possible. The addition of jumble dump to boulderfields would also help quickly establish vegetation.

Patches of boulderfield at least 100m<sup>2</sup> will be distributed throughout rehabilitated areas. At least four of these patches will be established at each project area. Sites will adopt a range of soil depths, rock/boulder coverage and boulder layouts to provide a range of microhabitats. Design of individual boulderfield patches may be based on a detailed characterisation of existing boulderfield microclimate and conditions. This could help to inform specific boulder heights, orientation and clustering to provide microhabitats sheltered from prevailing winds. Providing such sheltered microhabitats would increase the likelihood of some areas of boulderfield developing into forested blockfield in the long term.

Examples of different rockfield restoration approaches at Stockton Mine are shown in Figure 14 and Figure 15. Rockfield will be created at several locations, particularly within the MFS Project sub-area as described in Section 2.5.





*Figure 14: Rockfield with direct transfer of weathered boulders, incorporating areas of VDT (Constructed 2012, photograph taken March 2025).*



*Figure 15: Exposed coal floor with no soil or planting as part of rehabilitation at Stockton Mine.*



## 5.6 Wetlands

The parts of the ELF's where slopes are gentle to flat ( $< 5^\circ$ ) will be targeted for creation of tarns and wetlands. In addition to low gradient, drainage will be reduced further by compaction of subsoils or NAF overburden to achieve  $10^{-7}$  m/s permeability and/or installation of low bunds under shallow, variably deep topsoil (50mm – 200mm, but no deeper than 300mm). Together with the high rainfall at the Buller Plateaux, this will result in frequently saturated conditions at or near ground level, creating and maintaining wetland hydrology. Within areas destined to be wetlands, depressions which are more than 100mm deep (and up to 600mm deep) will be purposely engineered where small areas of permanent open water (tarns) will develop into habitat for aquatic species as discussed in Section 5.7. The target depth for ponding is 200mm (no deeper than 600mm) with irregular shape.

Subject to the constraints described in Attachment 2, wherever practicable, VDT will be used to salvage low pākihi and other natural inland wetland vegetation types for use at the locations shown in Figure 2, Figure 4 and Figure 6 as wetland/ tarn complexes.

Where suitable hydrology can be created, but VDT is not available, these areas will be planted with the pākihi planting mix set out in Section 5.4.1, except near edges where mānuka shrubland (b), Flax dominated shrubland (a) and Flax dominated shrubland (b) described in Section 5.3 will be used.

This approach is expected to result in the creation of wetland/tarn complexes including pākihi and shrubland vegetation. Examples of successful rehabilitation of this type of outcome are shown in Figures 13 – 15, which show the small ephemeral pools within low pākihi wetland vegetation on very flat terrain and permanent open water tarns within surface depressions. Wetland/tarn complexes should include both types. Where achievable, constructed tarns will have a base of 20 – 50 mm sediment over rock/gravel floor so as to more closely resemble natural tarns and provide better habitat for aquatic invertebrates.

Hydrological conditions conducive to the survival and growth of wetland vegetation will be created on most of the flat and gently sloping area of the engineered landforms at the locations shown in Figure 22 for the MFS Project sub-area and Figure 23 for the ESE Project sub-area. Wetlands will be also be rehabilitated on gently sloping ( $<5^\circ$ ) areas with suitable hydrologic regimes and substrates (soft, moist) to support diverse wetland vegetation.

Based on the timing of stripping and rehabilitation scheduling<sup>3</sup>, it is expected that VDT of 39.5ha of vegetation in the MFS Project sub-area and 85.1ha within the ESE Project sub-area can occur. Based on the slopes of both existing vegetation and destination landform suitable for VDT, much of this is expected to comprise low pākihi and shrubland vegetation types.

There will be 130ha of wetlands restored in predominantly in pākihi vegetation type, however wetland conditions will also likely develop in some proportion of all shrubland types, particularly on flatter slopes and on convex and gully type landform positions.

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<sup>3</sup> 'Buller Plateau Combined Rehab Schedule 20251120.xls' 2 December 2025 version

## 5.7 Tarns

On gentle slopes, complexes of wetlands and tarns will be created with tarns occurring in small depressions created as part of capping to the specifications set out in Section 5.6. Constructed tarns are common at Stockton Mine, where they are used as habitat by aquatic species. An example of constructed tarns at Stockton Mine are shown in Figures 16 – 18.

Impeded drainage on the engineered landform will be achieved by compaction of suitable substrate close to the surface to achieve  $10^{-7}$  m/s permeability. A combination of poorly draining subsoil, low gradient and high rainfall will lead to soils frequently saturated at the surface and ponding in small depressions 100mm – 600mm deep as described above. The addition of bunds to retain water will assist in broadening the locations of where tarns can be established.

Both planting and VDT will be used to establish vegetation on the edges of tarns, with slash and jumble dump also used to reduce sediment mobilisation. On flat terrain, vegetation will be predominantly pākihi, with shrubland to be placed on gentle to moderate slopes, where soils may also be saturated.

Where achievable, the benthic substrate within tarns will be a sediment base over rock/gravel floor so as to more closely resemble natural tarns and provide better habitat for aquatic invertebrates. Any permanent or ephemeral ponds created on exposed coal floor will not count towards achievement of closure criteria.

Tarns can be prone to weed establishment, so creating larger areas of ephemeral tarns across rehabilitated sites and using the monitoring data to identify which tarns can be converted to drier (i.e., weed resistant) cover before closure will help to reduce the requirement of ongoing weed management. Placement of rocks and boulders to create access paths arounds tarns is recommended to reduce the risk of damage to plants during monitoring, as organic-rich and saturated soils around tarn edges are particularly vulnerable to damage and weed invasion.





*Figure 16: Constructed tarn/wetland complex at Stockton Mine.*



*Figure 17: Constructed tarn at Stockton Mine.*

## 5.8 Rehabilitated Highwalls

Highwall faces comprise batters formed by blasting or cutting to enable safe and stable access to coal. Highwalls are typically constructed at the edge of mining voids and are terraced, with near vertical batter faces separated by flat benches (up to 15m wide). As mining proceeds and voids are backfilled, these steep faces are converted into geotechnically stable slopes, which in some cases can be vegetated. At some locations (particularly the southern and western side of the former ESE pit and the north eastern side of the former MFS pit), the upper part of the highwall will remain above the ELF post-mining.

Benches forming part of highwalls can only be safely rehabilitated using machinery where conditions allow, such as when bench widths are sufficient to enable safe access and operation. Rehabilitation of these areas is therefore undertaken progressively during highwall construction and as surrounding topography is lowered.

Previous approaches to rehabilitation of benches have included:

- Using an excavator to place freshly removed slash from adjacent areas directly on the benches as cutting highwall faces down progresses (e.g., SN13, SN14).
- Planting and seeding by hand (e.g. parts of SN13, SN14). This method is reliant on the area being safe for human access and transporting plants.
- Seeding by drones (e.g., mānuka applied recently at Cypress mining area)
- Hydromossing (e.g., A10)

For rehabilitation of highwalls in the Project Area, at least 80% of the cumulative length of the highwall benches that are able to be rehabilitated safely will be rehabilitated so as to establish a trajectory towards native ecosystems. Methods used may include:

- Placement of slash, mulch, soil or other suitable rehabilitation materials;
- Planting;
- Seeding (by hand or drone);
- Hydroseeding and/or hydromulching;
- Hydromossing.

Where highwall benches are suitable for excavator access, these should be rehabilitated using placement of slash, mulch, soil or other suitable rehabilitation materials. Where this is not practicable or safe, the alternative methods listed above may be used.

An example of a high wall bench that has had slash deposited and been planted is shown in Figure 18. Rehabilitation of benches will be subject to a geotechnical and safety assessment to inform whether they can be safely rehabilitated or not (either as they are constructed or post construction). Where benches can be rehabilitated safely using an excavator, that will be the preferred approach, followed by planting and seeding by hand (if safe) followed by seeding using drones or hydroseeding or hydromossing, depending on the site.



Highwall faces or batters are too steep to rehabilitate using planting or VDT and can only be rehabilitated by human intervention using hydroseeding, hydromossing or drone seeding techniques involving glue or tackifiers to stick the product to the substrate. Figure 19 shows an example of bryophytes establishing on cut faces. The outcome of these approaches varies according to slope, aspect, technique and moisture availability. Bryophytes naturally colonise cut faces where moisture is retained or present (e.g. Mt Fred Quarry Highwall, SN13/14 highwalls). South facing slopes retain water more effectively than north facing slopes, and therefore mosses are more likely to establish and persist on south facing slopes.

Hydroseeding and/or hydromulching or drone seeding will be used to establish vegetation on highwalls where required.

Prior to the implementation of highwall rehabilitation, the Approval Holder must undertake a geotechnical and safety assessment, to identify:

- The sections of the highwall bench that can be safely accessed and rehabilitated;
- The appropriate rehabilitation method to be used;
- Any sections where rehabilitation cannot be safely undertaken.



*Figure 18: Example of a rehabilitated highwall using placement of slash and planting at SN14, Stockton Mine No.2 South Mining Block (Stockton Mine)*



*Figure 19: Bryophytes establishing naturally on batter faces at No. 2 South highwalls*

## **5.9 Roads and cut off drains**

### **5.9.1 Road Rehabilitation**

Detailed design for the UWHR has not yet been completed, but the route includes existing tracks throughout part of its length, which minimises vegetation clearance, noting that existing weeds require management. Following construction and during operations, the UWHR carriageway would be 16.7m wide, reduced to 6.5m at the cessation of mining with the balance (10.2m throughout its length) being rehabilitated. Post-mining rehabilitation will also include updating of the drains to accommodate run off from the reduced road footprint as required.

As part of detailed design, the locations and extent of any cut and fill, stockpiles (e.g., of soil, rock or wood), passing bays, safety bunds/windrows, water tables and sediment retention ponds will be identified. Small localised areas, such as stockpiles, can be rehabilitated once the road is constructed, but for the most part, the entire length of the road will be required for the duration of the Project.

This plan will be updated when the detailed design for the UWHR is completed so as to include final land use and completion criteria associated with the UWHR. In addition, an independent review of the UWHR construction and rehabilitation design will be undertaken with respect to optimising use of VDT as construction proceeds (e.g., on batter slopes), maximising use of salvaged boulders, stockpiling the use of soils containing weeds and the identification and management of any PAF rocks already present within historic roads. Once the rehabilitation of the parts of the UWHR not required for operation has been completed, monitoring of the rehabilitation will occur within three months, and then annually thereafter. Results of this monitoring will be presented in the Annual Rehabilitation Report. A monitoring plan will be decided once the rehabilitation design has been completed, and will likely



involve monitoring of permanently established vegetation plots similar to methods outlined in Section 9.3. General methods that may also apply to rehabilitation of roads and cut-off drains, depending on the specifics of their location, are set out in Section 4.1.2 (Identifying material for use in rehabilitation) and 4.1.3 (Addressing edge effects).

### **5.9.2 Road Construction**

Where road construction exposes PAF material, any AMD generated will be managed locally as set out in the Construction Phase Report (Mine Waste Management 2026). Management of road construction materials to avoid AMD generation is also set out in that report. Because road construction occurs early in mine life there is potential to use a very high proportion of the vegetation removed from the road footprint as VDT to the road margins, including on short, steep slopes in excess of 20 degrees (such as road cuts and fill batters), to assist in remediating road edges. The treatment of the outer face of safety bunds/windrows with direct transfer boulders and/or vegetation (or slash) will minimise the risk of sediment generation in the short term, and also creates a valuable resource in the long term, when it can be pulled onto the road when the running surface is rehabilitated to provide topsoil and vegetation. This approach also minimises the volume of material to be moved during construction (potentially reducing disturbance areas along the roads) and at the end of mine life. Rehabilitation of roads should aim to match the surrounding environment with regards to vegetation and landform.

### **5.9.3 Road Decommissioning and Rehabilitation**

Decommissioning former roads, including 10.2m of the UWHR, will involve the following general steps:

- 1) Recontouring to remove the road structure and pull fill material from the road edge back to match the surrounding terrain.
- 2) Decompaction – ripping to a depth of at least 50cm to break up compacted soils and allow water infiltration and root penetration, except at locations where the adjoining vegetation comprises sandstone pavement.
- 3) Restoration of more natural drainage/flow paths via removing and/or relocating and amending drains, roadside water tables and sediment retention ponds and possibly removing culverts to assist in managing water from the reduced road footprint. All sediment fences must be removed as part of long-term road rehabilitation.
- 4) Redistribution of topsoil and organic matter (jumble dump, slash, woody debris) over the site to create favourable microsites to support plant growth. Use of local soil or leaf litter to inoculate the soil with microbes, plant propagules and fungi. The depth of topsoil will vary according to the vegetation type proposed, with deepest soils where forest is proposed.
- 5) Revegetation using a combination of VDT and planting dependent on what resources are available at the time the road is decommissioned (to be informed by the detailed design process). Revegetation is likely to involve mostly planting. The target vegetation type will vary throughout the length, dependent on the immediately adjoining vegetation.

Examples of rehabilitated former mine roads are shown below, with a recently planted road surface shown in Figure 20 and a good example of rehabilitated road surface shown in Figure 21.



*Figure 20: Rehabilitated former road surface soon after planting near R6, Stockton Mine.*



*Figure 21: Rehabilitated former road surface at R6 at Stockton Mine.*

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## **5.10 Stream Reinstatement**

### **5.10.1 Description**

The BPCP will result in the loss of 17.1km of streams (Earth Sciences New Zealand 2026). Rehabilitation will reinstate 20.8km of streams. The indicative locations of the reinstated streams are shown in Figure 22 (at the ESE Project sub-area) and Figure 23 (at the MFS Project sub-area). Stream reinstatement aims to replicate, to the extent practicable, the pre-mining channel form, gradient, sinuosity and hydrological characteristics; and provide equivalent habitat complexity and ecological function relative to pre-mining conditions.



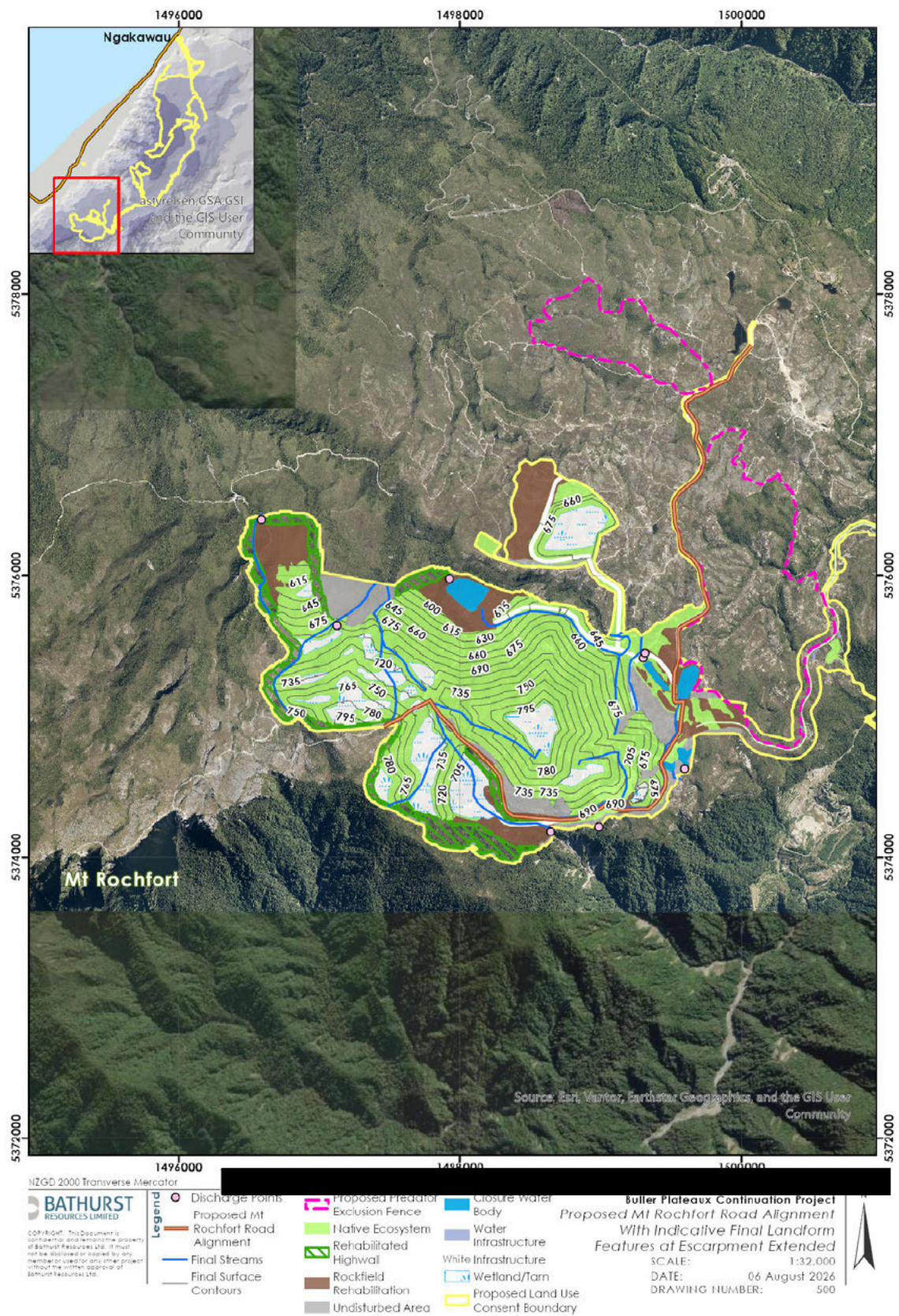


Figure 22: Indicative Reinstated Stream locations at the ESE Project sub-area.



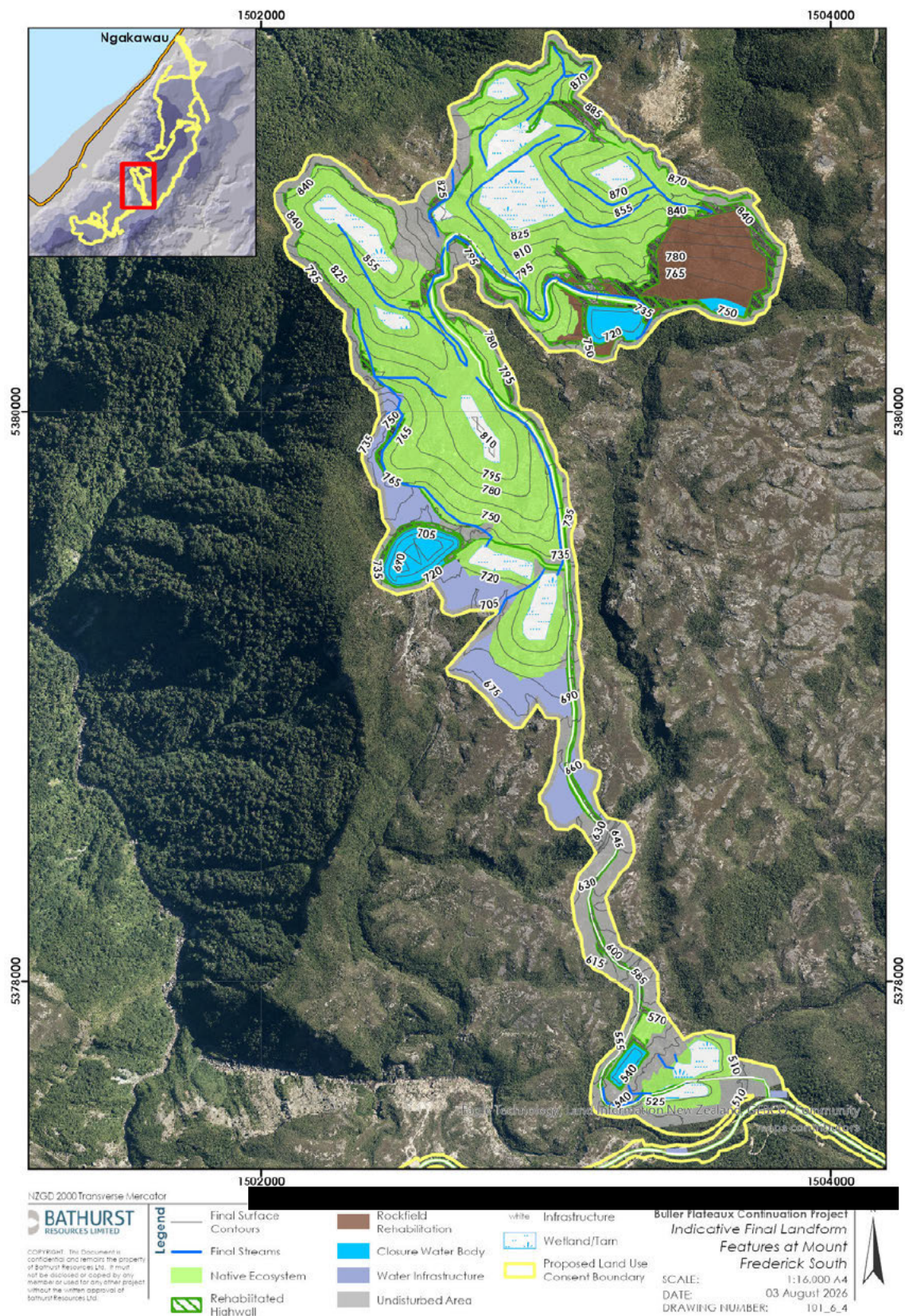


Figure 23. Indicative Reinstated Stream Locations at the MFS Project sub-area.

Due to the topography of the Plateaux and the location of mine footprints, many of the streams affected originate within the footprint and a large proportion of the post-mining stream catchment will be located entirely within engineered landforms (shown in Figures 2, 4 and 6). For example, at ESE, the catchments of Trent Stream, V40 Stream Conglomerate Stream and S Creek will be mostly or completely removed and reinstated, along with portions of other streams and a number of smaller permanent and intermittent streams.

Reinstated stream channels will feed into existing headwater tributaries and closure water bodies. Riparian vegetation will be established via VDT and/or planting (in that order of preference) of at least one of the stream banks (ideally on the upslope side) to assist in establishing the connectivity, shade and bank stability necessary to protect water quality. Reinstated Streams will remain within the original larger catchments without mixing or diversion into other catchments except for the reinstated creek that enters V37 Creek in the Cascade Stream catchment. This stream would have originally entered the Whareatea catchment. Post mining catchments will be of a similar size to the original, pre-mining condition.

The hydrology of streams post-mining will be largely determined by the rehabilitation works, particularly the topography and substrate used over the ELFs, along with the gradient, width and depth of the constructed channel itself. Increased runoff via a reduction in infiltration will minimise AMD, and flows in reinstated streams will be ‘flashy’ i.e., sharp spikes in flow immediately following rainfall events. This is not dissimilar to natural streams on the Plateaux, due to the large amount of low permeability base rock. Constructed channels will need to be capable of carrying high peak flows relative to baseflow, without excessive erosion of the channel. Stream substrates will therefore need to include a high proportion of rock in order to resist mobilisation and create pools of low velocity, capable of trapping finer sediment such as gravels and sand.

### 5.10.2 Channel Design

The base of reinstated stream channels will be backfilled with a minimum depth of 1.5m of NAF rock comprising at least 20 to 30% large rocks or boulders and 30 to 50% large cobbles and gravel to reduce substrate movement in the flashy environment and reduce sediment generation during high flows. Smaller amounts of gravel will be used. This will ensure a base-flow of water over either bedrock or a suitable impermeable liner in a channel lined with NAF material. Surface flows will be achieved by ensuring channel bed is filled with appropriately sized materials including large boulders, rock and well anchored woody debris, to interrupt flow and finer sediment such as sand and gravels to fill large interstitial spaces. Once the channel is constructed and water quality standards are achieved, water will be diverted from the mine water management system into the reinstated channel.

Constructed channels will include refugia for aquatic invertebrates in the form of pools able to be flooded by rainfall several times each year to a depth of 300 to 600mm and maintain water, even during dry summers. Large woody debris will be placed in these pools following construction to create habitat.

The created streams will be constructed to have the following characteristics:

- The base flow channel to have flow constrictions of a range of sizes so as to slow water and create pools during base flows.
- Preferentially maintaining permanent or largely permanent surface-connected flows,



recognising that some reaches may be ephemeral where consistent with natural catchment conditions.

- Base flow channel to have variable widths, depending on the size of the catchment and the flow which the channel is designed to hold.
- Channels to incorporate sinuosity and a meandering form consistent with natural stream systems.
- Construct riffle, run, waterfall, undercut banks and pool habitat sequences within the base flow channel, by using large boulders which pools will form behind.
- Pool habitat to comprise at least 50% of channel length where practicable, with at least 50% of pools having an average depth greater than 300 millimetres.
- Streambeds to comprise stable, coarse, non-acid-generating substrates, including approximately 20–30% large rocks or boulders and 30–50% cobbles and gravel.
- Create floodplains with variable widths alongside the base flow channel to attenuate higher flows and minimise bank erosion and channel scour.
- The base flow channel will have a natural streambed substrate with similar characteristics to natural streams. Bedrock generally cannot be recreated, however large boulders embedded in fine substrate such as sand can create a similar effect and appropriate liners can be deployed where required to maintain impermeable substrate. These boulders may be used to create chute-pool habitats (as shown in Figure 26) where appropriate.
- Large woody debris and large boulders installed at a frequency of at least one piece every 50m to increase the amount of stable habitat and cover for invertebrates and fish.
- Outer riparian margins along the diversion channel will be restored using VDT where available. Where VDT is not available, stream edges will be planted with appropriate species. Riparian vegetation will comprise wet-adapted plants on low gradient floodplains and trees/shrubs on bank slopes and provide bank stability, shade and organic matter inputs (e.g., wood debris, leaf litter).
- Stream crossings, culverts and other structures within rehabilitated or reinstated stream channels must not create perched outlets or other physical barriers to upstream movement of indigenous aquatic fauna, unless otherwise authorised.
- Measures must be implemented to prevent the establishment and spread of introduced aquatic predators and exotic aquatic species. This is addressed in the Biosecurity Management Plan (BPCP-ENV-PLN-007) and Weed Management Plan (BPCP-ENV-PLN-008) for the Project.

Where monitoring identifies that a rehabilitated stream channel is not achieving the outcomes described above, the Approval Holder must obtain advice from a freshwater SQEP and implement corrective actions.

Conceptually, examples of acceptable outcomes for reinstated stream habitats are shown in Figures 25 – 30. The inclusion of rocks and boulders in reinstated streams to provide habitat and a source of aquatic bryophyte colonists is set out in Section 8.2.7.

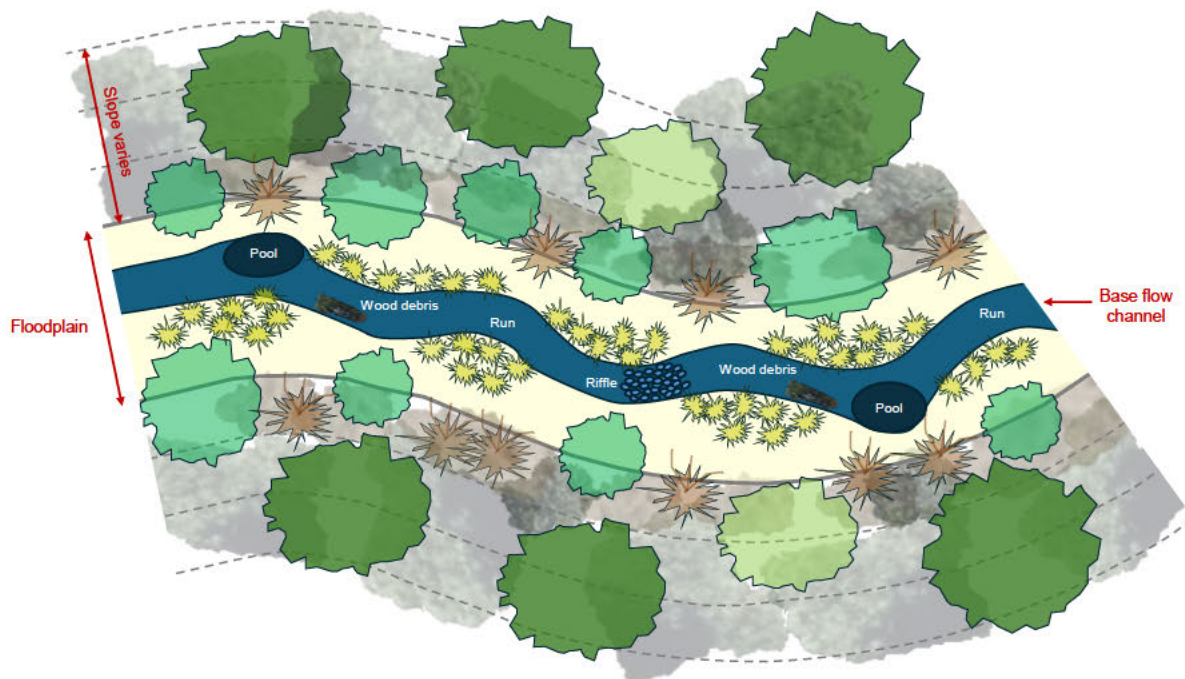


Figure 24: Plan view of indicative design for reinstated stream sections.



*Figure 25: Example of natural chute and pool habitat over bedrock.*





*Figure 26: Example of natural chute-pool formed using boulders.*



*Figure 27: Example of shallow riffle habitat.*





*Figure 28: Example of pool and riffle habitat.*



*Figure 29: Example of deep pool habitat with woody debris.*

### 5.10.3 Kōura passage

The BPCP will require installation of new, and replacement of some existing, culverts with up to 60 being required in total, not all of which would be located in streams (Bixley 2026). Where required, the new and replacement culverts will be installed and maintained in such a way that they do not impede the movement of fish or kōura as set out in the Aquatic Ecological Impact Assessment for the Project (Earth Sciences New Zealand 2026). Minimum design standards for permitted activity status for new culverts are set out in section 70 of the National Environmental Standards for Freshwater 2020 (NES-F). Monitoring of kōura passage is set out in the AEMP (BPCP-ENV-PLN-006).

The fish fauna of the Buller Plateaux is generally depauperate, but kōura (freshwater crayfish, *Paranephrops planifrons*) are a dominant component of the freshwater fauna. Bathurst commissioned a review from Earth Sciences New Zealand of the ecology, movements and passage requirements of kōura (Franklin and Crawford 2025). Based on the limited research that is available, kōura generally make only small movements or are resident to a stream reach, though much longer movements, of several hundred metres have been observed. This is consistent with three freshwater crayfish movement patterns identified internationally, viz.:

- Stationary phase:
- Short Movements; and
- Nomadic Burst.

Although kōura are expected to usually be resident within a small reach of stream, maintaining passage is required in order to allow for occasional larger movements.

The following features could act as barriers to kōura movement:

- high water velocities ( $>30 \text{ cm s}^{-1}$ );
- slopes greater than  $25^\circ$ ;
- vertical drops or overhangs; and
- smooth substrates.

To maintain passage for kōura, culvert designs will include the following:

- Roughened substrates to provide grip for walking;
- Water velocities remain below  $30 \text{ cm s}^{-1}$ ;
- Slopes that are less than  $25^\circ$ ; and
- Avoidance of vertical drops or overhangs at outlets (perching).

Although the step-pool or chute-pool habitats may have vertical drops or overhangs in places, stream reinstatement will also generally incorporate similar design considerations so as to avoid creating barriers to kōura movement. Specific placement of boulders adjoining culverts and fords will assist in



maintaining long-term stability of the culvert or ford and contribute to providing resistance to weed establishment, therefore minimising the need for application of herbicides near water.

#### 5.10.4 Riparian Planting

Riparian vegetation on the Buller Plateaux is typically similar in composition and structure to the surrounding vegetation, often featuring sharp transitions from shrubland and pākihi to streambeds cut into bedrock. Riparian restoration can have a disproportionately positive effect on overall restoration, by facilitating movement of animals and plant propagules along stream corridors and across the landscape.

Restoring indigenous vegetation along riparian margins will prevent erosion, provide shading of the stream, contribute organic matter to the stream, create habitat for aquatic fauna and encourage dispersal of indigenous flora and fauna along the stream.

This will be achieved by:

- Revegetation of the riparian margin of at least 10m on both sides of the channel using species and/or VDT that can tolerate inundation and provide overhanging cover along the banks of the constructed stream;
- Use of VDT immediately adjacent to at least the upslope side of reinstated streams where achievable. Placement on the upslope side will assist in preventing washout of VDT sods and ensure the best chance of VDT establishment;
- Where VDT is not achievable, planting with eco-sourced pioneer plants in order to establish a nurse crop in riparian areas into which light and moisture sensitive species will spread and establish via natural means of dispersal; and
- Removal of unwanted weeds and pest animals within reinstated riparian areas as set out in the Weed Management Plan (BPCP-ENV-PLN-008) and Pest Control Plan (BPCP-ENV-PLN-022).

Species to be planted in the riparian margins will be consistent with the surrounding rehabilitated native vegetation type, but will take into account the riparian location and risk of occasional inundation.

## 6.0 Habitat for Fauna

### 6.1 Snail Habitat

The most effective method of providing habitat for *Powelliphanta* snails at rehabilitated sites, at least in the short-term, is the use of VDT. Densities of *P. patrickensis* were found to be similar in VDT on Stockton Plateau to surrounding undisturbed habitat (Lloyd 2024) with the number of snails at one location found to be maintained or improving after 13 years (Grunner 2021).

Rehabilitated *P. patrickensis* habitat should be vegetated with medium height (1 – 2m) shrubland including mountain flax and tussock, have no bare rock and include patches up to 0.5ha (5,000m<sup>2</sup>) of deeper soils (up to 50cm). For planted areas which are within the known natural range of *P. patrickensis* and are adjoining areas of VDT, or undisturbed areas which are likely to include snails, at least 5,000m<sup>2</sup>

for each area of planting will be densely spaced (12,500 – 15,000 stems per hectare, 0.5m spacings) and comprise species favoured by snails, including mānuka, mountain flax, coal measures tussock, red tussock, *Gahnia* spp. and tanglefern. Both the flax dominated shrubland and pākihi shrubland planting lists include these species in high proportions, in part to develop deep litter of the type used by snails as habitat. Strategic use of fertiliser at these locations, underpinned by the research programme required by Condition RHM77, will help identify methods to speed up plant growth, establishment of earthworm communities and promote creation and establishment of this habitat. This approach will also encourage the development of earthworm communities, which is important because earthworms are a key component in the diet of snails. By creating such habitat near transferred and natural snail populations, any surplus snails produced in adjoining habitats can move into rehabilitated areas rather than continuing to be isolated by fragmentation or lack of habitat.

Jumble dumping is another rehabilitation method that has allowed snails to establish and/or persist at rehabilitated sites (Lloyd 2024). The use of jumble dumping surrounding areas of VDT and natural habitats which are likely to contain snails would also assist in providing snail habitat more quickly than at sites which are planted alone. To enhance planted areas as snail habitat, and provide sources for earthworm colonisation, including numerous small areas of VDT within planted areas is proposed.

Ultimately the use of fresh soils (and accompanying worm fauna and any vegetation which can develop litter and provide cover quickly) is likely to assist snails. Use of artificial cover such as (weed free) mulch or woodchip and addition of locally sourced worms may also assist in planted areas on fresh soils which are near a source of snails available to move into the area.

Strategic placement of rocks and natural woody debris including logs, mulch and leaf litter will assist in creating ideal microclimates for snails. Variation in slope angle and aspect should be included when creating snail habitats.

Monitoring of snails, including distribution and abundance outside the proposed predator exclusion fenced areas, is provided for in the Powelliphanta Management Plan (BPCP-ENV-PLN-004). Methods to enhance the earthworm communities and monitor earthworms in rehabilitated areas is also set out in the Powelliphanta Management Plan (BCP-ENV-PLN-004).

## 6.2 Lizard Habitat

Outcome monitoring has also confirmed that the most effective rehabilitation method for lizards in the short term is VDT (Alliance Ecology Limited 2020). It remains unclear whether lizards were present in VDT areas because they had survived transfer or because they had colonised from surrounding areas or both. It remains unknown if VDT provides suitable habitat for West Coast Green gecko.

In order to optimise long-term suitability of VDT as habitat for lizards, the following will be applied:

- Ensuring that VDT sites are ecologically connected to natural habitats and in proximity to gully habitat complexes.
- Using larger sized buckets to minimise loss of individuals during the VDT process.
- Enhancement of VDT, where achievable without damaging vegetation, and of adjoining planted areas, by placement of rock slabs and piles of rocks, small logs and branches to provide refugia

and basking opportunities for Westland skinks and forest geckos. Prior to placement, areas below the future habitat should be excavated to a shallow depth so as to provide refugia that are buffered from extreme weather during winter months. It will be important to ensure these excavated areas are free draining and do not accumulate water, which would make it unusable by lizards. At least two piles of boulders and/or logs per hectare at least 5m<sup>2</sup>, but up to 20m<sup>2</sup> in size will be provided as lizard habitat in planted areas adjoining VDT and natural areas known or suspected to provide lizard habitat. If VDT is not available to adjoin to natural areas, it is recommended to plant these areas at a high density (e.g., <1 m spacings). Planted areas that include the piles of boulders and/or logs should cover at least 5000m<sup>2</sup>. The locations of these planted areas should be:

- Adjacent to VDT areas;
- Adjacent to retained indigenous habitat;
- Within or near gully systems; and
- In locations that enhance habitat connectivity.

Where rock slabs, boulders, rock piles or other materials are used to create or enhance lizard habitat, these materials will be either weathered rock, non-acid-forming rock or other rock that has been assessed and confirmed by a SEQP as being geochemically benign and suitable for use in habitat construction.

The development and implementation of a monitoring programme for lizards within rehabilitated areas is set out in the Lizard Management Plan (BPCP-ENV-PLN-005) and Biodiversity Outcome Monitoring Plan (BPCP-ENV-PLN-009).

### 6.3 Rorua Habitat

Rorua (great spotted kiwi) using rehabilitated sites are likely to be limited (at least initially) by food and/or day time roosts and nesting sites. Rorua eat small invertebrates, especially earthworms and larvae of beetles and cicadas which live below ground, as well as various surface-dwelling invertebrates such as centipedes, spiders, beetles, wētā, snails and freshwater crayfish. They also eat fallen fruit and leaves. Rorua nest in natural hollows or burrows amongst roots, in hollow logs or dense vegetation. Rorua nesting and sheltering habitat will be constructed in rehabilitated forest and shrubland ecosystems. Rorua habitat features will also be added to planted or VDT areas that are located adjacent to, or form habitat connections with, existing or restored suitable rorua habitat. Constructed rorua burrows will comprise narrow entrances (at least 250mm wide, but no more than 350mm) that lead into longer (500 – 750mm), deeper (up to 1m below ground) chambers. Burrows will be oriented so as to remain dry during wetter periods and the entrance surroundings will be densely planted (less than 0.5 m spacings) with gahnia, flax, tussock or other densely growing species to provide camouflage. These plantings should cover at least 5,000m<sup>2</sup>.

Use of fresh soils and rapid development of a litter layer (via plant growth and senescence or use of weed free mulch and/or wood chip) and accompanying invertebrate communities is likely to benefit rorua in a similar way to snails as described above. Rorua are more mobile than snails, but are still likely to prefer areas with good levels of cover provided by boulders or log piles surrounded by dense



plantings. The placement of VDT near natural habitats, and buffering with densely planted areas (c. 0.5m spacings) including habitat suitable for snails is also likely to benefit rorua. Rorua burrows will be created at a rate of one per five hectares in planted areas.

Areas created by the use of logs and boulders in rehabilitation, particularly where they are combined with topographical variation and surface cavities or excavations that remain dry and include >1 entrance, are potentially able to be used by rorua. These habitats may also be useful to lizards, but rorua burrows require larger spaces between materials and >1 entrance. Large boulder piles and rock stacks can be used to provide habitat for both lizards and rorua, but generally lizards would be favoured by the construction of lots of small habitats, while rorua need fewer, larger areas. Inclusion of rorua habitats across the rehabilitated areas will allow other habitat like cavities in logs to develop over time as the vegetation grows and begins to provide food for rorua moving out of natural areas to forage.

Where rock slabs, boulders, rock piles or other materials are used to create or enhance rorua habitat, these materials will be either weathered rock, non-acid-forming rock or other rock that has been assessed and confirmed by a SEQP as being geochemically benign and suitable for use in habitat construction.

## 6.4 Habitat for Other Birds

Pīhoihoi/pipits are quick to occupy open habitats and are expected to colonise most of the rehabilitated areas relatively quickly without assistance. Weka, being omnivores, are also expected to colonise rehabilitated areas relatively quickly. Weka are ground nesters and would also make use of the types of habitats provided for rorua. Other species are expected to begin to use habitats as the food sources (invertebrates, fruit, nectar) become available. By using locally appropriate species, including bird dispersed species, natural successional processes will be promoted. Specific habitat creation methods for snails, lizards and rorua, including dense plantings and establishment of low stature vegetation, will also benefit other indigenous bird species by providing refuge, nesting and foraging habitat. The establishment of forests, wetlands and riparian habitat across the Project Area will contribute to the diversity of habitats available for avifauna in the rehabilitated landscape. Prioritisation of VDT locations as set out in Section 4.1.5 will help to achieve connectivity between undisturbed and rehabilitated habitats for avifauna.

## 7.0 Rehabilitation Scheduling

Mining and subsequent rehabilitation is proposed to take place in stages whereby active disturbance is minimized and rehabilitation is undertaken as soon as possible.

Progressive rehabilitation will require rehabilitation activities to be integrated into routine (daily, weekly, monthly and annual) mining operations via the Annual Mine Plan. This will require the preparation of an annual rehabilitation works programme to be implemented as mining proceeds.

In order for VDT to occur, clearance and rehabilitation schedules must be aligned, i.e. suitable areas for rehabilitation must be available and ready to receive sods at the time they are stripped from elsewhere, ideally not too far away to minimise transportation and handling.

Ideally, the location to receive VDT should be suited to the source vegetation type (i.e., 'true to type'). If the conditions at the rehabilitation location and the source vegetation type do not match, VDT should still be used since the benefits in this scenario still outweigh the disadvantages. For example, for an ELF constructed with moderate slope, good drainage and deep soils will most likely eventually support forest vegetation, however VDT of another type, such as low pākihi, to that location, still has value because it will achieve early vegetative cover to stabilise soils, maintain vegetation and soil biota and reduce the risk of the area becoming weedy. Over the medium- to long- term, vegetation at such a location would likely develop successional towards forest.

Rehabilitation is likely to occur most years with respect to native ecosystems and highwalls, with water infrastructure and rockfield rehabilitation occurring towards the end of mine life, immediately prior to closure.

Rehabilitation of a disturbed area must commence no later than:

- three months after the area becomes available for rehabilitation during the primary growing season; or
- six months after the area becomes available for rehabilitation outside the primary growing season.

Any deferral of rehabilitation beyond these timeframes must be justified in writing by a SQEP, limited to the minimum area and duration necessary, accompanied by interim stabilisation, erosion-control, sediment-control and weed-control measures, and recorded in the relevant Annual Work Plan and Annual Monitoring Report.

The Maximum Disturbance Footprint is the maximum area of land that may be disturbed within a Project sub-area at any one time before rehabilitation must commence on an equivalent or greater area within that Project sub-area. The Maximum Disturbance Footprint for each Project sub area shall be reported on in the Annual Work Plan. If the Maximum Disturbance Footprint is exceeded, the Approval Holder must comply with the actions outlined in Condition RHM14, as well as recording relevant information in the Annual Work Plan (see Attachment 1).

## 8.0 'Threatened' and 'At Risk' Plant Management

### 8.1 Vascular Plants

#### 8.1.1 Background

There are no plants considered to be 'Threatened' known to be present within the Project Area, however 'At Risk' and regionally important plants are widespread. Some of these plants (e.g. coal measures tussock (*Chionochloa juncea*)), whilst considered 'At Risk' nationally, are locally common and widespread. Some, such as coal measures tussock, would primarily be maintained through VDT, which will be supplemented with planting (including of salvaged plants), whilst others, such as *Celmisia* spp., *Brachyglottis bellidioides* and orchids are wind dispersed and are likely to colonise rehabilitated areas on their own.

To remedy the loss of habitat for 'At Risk' vascular plants this plan provides for:

- Prioritisation of VDT including any 'Threatened' and 'At Risk' plants where practicable;
- Collection of seed and other materials (cuttings, divisions) for propagation;
- Inclusion of 'Threatened' and 'At Risk' species in planting mixes for rehabilitated areas; and
- Salvage and hand-transfer of individual plants to suitable natural, rehabilitated or VDT habitat where appropriate.

#### 8.1.2 Relevant Approvals

The relevant conditions are set out in Attachment 1. Consent conditions beginning RHM are those relating to this Rehabilitation Management Plan. In particular RHM47 – RHM60 relate to 'Threatened' and 'At Risk' plants, including both vascular plants and bryophytes and lichens.

#### 8.1.3 Goal and Objectives

The goal is to retain 'Threatened' and 'At Risk' vascular plants which are typical of the Buller Coal Plateaux at rehabilitated sites and promote their colonisation of suitable habitats as ecological succession proceeds.

The objectives with respect to 'Threatened' and 'At Risk' vascular plants at rehabilitated sites are to maintain:

- Vascular plants and vascular plant communities which are typical of the Buller Plateaux.
- 'Threatened' and 'At Risk' species in post-mining vegetation communities in approximately similar abundances to their pre-mining abundance based on vegetation plots and known records.

#### 8.1.4 Target Species

Table 10 lists 20 vascular plants of conservation concern with at least one record from the Buller Plateaux. Specific management is not proposed for seven of these (orchids, filmy ferns and similar) on the basis that they have light, wind dispersed seeds or spores and can be expected to persist in VDT of



suitable habitat and/or colonise suitable rehabilitated sites unassisted. The remaining 13 species are proposed for specific management in order to remedy and/or mitigate adverse effects of the BPCP as set out in Table 10. Table 10 also sets out the specific management actions proposed.

Table 10: Plant species of conservation concern and their recommended management method(s).

|                                  | Pre-mining Distribution                    | Habitat                                                                          | Target                                                                                                                   | Seed collection | Cuttings / Divisions | VDT |
|----------------------------------|--------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|-----|
| <i>Dracophyllum densum</i>       | Common and widespread                      | Associated with sandstone pavement and low, open vegetation including low pākihi | At least five plants in each area of rockfield rehabilitation. At least 50 plants/ha averaged across all rockfield areas | ✓               |                      | ✓   |
| <i>Peraxilla tetrapetala</i>     | Three records                              | Beech dominated forest                                                           | At least six plants established in three locations of forest rehabilitation                                              | ✓               |                      |     |
| <i>Pimelea longifolia</i>        | TBC                                        | Open sites in forest, forest margins and shrubland                               | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                            | ✓               |                      | ✓   |
| <i>Pseudowintera traversii</i>   | Widespread, uncommonly encountered         | Montane to subalpine forest margins                                              | Present in suitable vegetation types in the same proportion of plots as pre-mining.                                      |                 | ✓                    | ✓   |
| <i>Hymenophyllum australe</i>    | TBC                                        | Found along waterways in shaded, persistently wet habitat                        | Nothing proposed because suitable forest habitat will likely take decades to develop                                     |                 |                      | ✓   |
| <i>Hymenophyllum pluvilatile</i> | TBC                                        | Wet, shaded forest                                                               | Nothing proposed because suitable forest habitat will likely take decades to develop                                     |                 |                      | ✓   |
| <i>Sticherus urceolatus</i>      | Several records at Escarpment and Stockton | Rocky overhangs near waterways                                                   | Established at > 20 locations.                                                                                           | ✓               | ✓                    | ✓   |
| <i>Sticherus tener</i>           | Several records at Escarpment and Stockton | Rocky overhangs near waterways                                                   | Established at >20 locations.                                                                                            | ✓               | ✓                    | ✓   |

|                                |                                    |                                                                                                   |                                                                                                                  |   |  |   |
|--------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---|--|---|
| <i>Euphrasia disperma</i>      | Occasional                         | Wetland habitat including cushion bogs, herbfield and sedgeland                                   | Present in suitable vegetation types in the same proportion of plots as pre-mining.                              |   |  | ✓ |
| <i>Euphrasia wettsteiniana</i> | Common in suitable habitat         | Herbfield within wet tussockland, also associated with seepages, streams and tarns                | Present in suitable vegetation types in the same proportion of plots as pre-mining. Established at >20 locations |   |  | ✓ |
| <i>Schizacme helmsii</i>       | Rare and seldom detected           | Wet tussock grassland and cushion bogs                                                            | Any individual plants detected will be hand transferred.                                                         |   |  | ✓ |
| <i>Brachyglottis traversii</i> | Widespread, uncommonly encountered | Associated with low vegetation including tussockland, pākihi and sandstone pavement               | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                    | ✓ |  | ✓ |
| <i>Astelia subulata</i>        | Three records                      | Boggy areas within low vegetation, including herbfield, low pākihi and tussockland                | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                    | ✓ |  | ✓ |
| <i>Bulbinella modesta</i>      | Two records                        | Wetland habitat including pākihi, alluvial forest and back swamps. Also found in mānuka shrubland | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                    |   |  | ✓ |
| <i>Calochilus paludosus</i>    | Two records                        | Pākihi vegetation, including mānuka shrubland on previously burnt areas                           | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                    |   |  | ✓ |
| <i>Pterostylis humilis</i>     | One record                         | Montane to subalpine forest and shrubland                                                         | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                    |   |  | ✓ |

|                           |                                               |                                                                |                                                                                                                             |   |   |   |
|---------------------------|-----------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---|---|---|
| <i>Townsonia deflexa</i>  | Three records                                 | Beech forest                                                   | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                               |   |   | ✓ |
| <i>Carex carsei</i>       | Several records from Upper Waimangaroa Valley | Red tussock wetlands                                           | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                               | ✓ |   | ✓ |
| <i>Carex dallii</i>       | Two records                                   | Tussockland and dense mānuka shrubland                         | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining.                               | ✓ |   | ✓ |
| <i>Chionochloa juncea</i> | Common and widespread                         | Low pākihi, shrubland and associated with sandstone pavement   | Present in suitable vegetation types in the same or higher proportion of plots as pre-mining. Established at >20 locations. | ✓ | ✓ | ✓ |
| <i>Juncus pusillus</i>    | One record                                    | Open, swampy ground including seepages within mānuka shrubland | Present in suitable vegetation types in the same proportion of plots as pre-mining.                                         |   |   | ✓ |

Procedures to minimise adverse effects on ‘Threatened’ and ‘At Risk’ vascular plants include seed collection, propagation by division, repatriation and translocation via the VDT process. Repatriation can involve direct hand-transfer from disturbance to rehabilitation sites, or can be indirect and involve transfer to a nursery or propagation area where plants can be managed to increase their biomass and seed production in terms of volume and quality, followed by repatriation to rehabilitation areas at a later date. A list of known locations of these plants will be compiled based on existing records and this list will be added to as the Project proceeds.

Surveys to identify the location of plants for individual management will be undertaken in suitable habitats prior to vegetation stripping. These surveys will be undertaken by a suitably qualified and experienced ecologist with expertise in the local flora. Timing of the surveys will reflect when the plants are most detectable, with surveys for plants requiring seed collection and cuttings/divisions occurring during spring and/or summer when fruit, seed and new growth is present. For species requiring



repatriation, this should be undertaken during autumn and winter to minimise stress and transplant shock.

The key components of management of bryophytes as described in Section 8.2 will be applied to target vascular plants. The creation of specific bryophyte habitat as described in Section 8.2.4 will also benefit target vascular plants, including orchids, filmy ferns, small herbaceous plants and the two species of umbrella fern. When repatriation is used as a management method, the habitat which the plant will be repatriated to should be consistent with the preferred habitat as described in Table 10 above.

## 8.2 Bryophytes and Lichens

### 8.2.1 Background

The Buller Plateaux supports a high diversity of bryophytes and lichens, including many species regarded as 'Threatened', 'At Risk', or 'Data Deficient' (i.e., not enough is known to assign a threat ranking) (de Lange et al. 2018. 2020, Michel et al. 2026).

Bryophytes in particular often occupy localised, rare or sparse microhabitats. Examples of these natural features are shown in Attachment 5. Habitats that have been identified as important for bryophytes include:

- Southern rātā-mountain beech-podocarp forest;
- Mixed beech-podocarp-broadleaved forest;
- Silver beech-mountain beech forest (including cloud forest growing on ridgelines);
- Mānuka-tussock-wire rush shrubland;
- Low pākihi as shown in Attachment 5;
- Mānuka-mountain beech-podocarp shrubland on nutrient poor soils with impeded drainage;
- Tussock-flax shrubland (includes red tussock grassland as shown in Attachment 5);
- Mānuka/Gahnia-wire rush shrubland as shown in Attachment 5; and
- Forested blockfield (large boulders overlain by forest with bryophytes growing between and among the boulders, see Attachment 5) and riparian and vertical wet walls.

For aquatic bryophytes, important habitats are those:

- with high humidity levels;
- Small gorges;
- Stream bed boulders and stream bed itself;
- Deep instream caverns;
- Banks of flood deposited sand (e.g. *Isotachis westlandica* is a specialist coloniser of such flood deposits);

- Riparian bedrock (as shown in Attachment 5), gorge walls, rock-walls, ‘bolsters’ and overhangs (e.g. shallow caves and cave entrances that receive limited direct sunlight); and
- Hanging bryophyte ‘sheets’ (as shown in Attachment 5) and ‘stalactites’ of plant roots trapped with peat, maintained by water seepage from above plateau.

The ‘rare’ and ‘threatened’ lichens are predominantly found within open sandstone pavement, and low pākihi. Some species such as *Cladia inflata* (‘At Risk’) are colonisers of subalpine *Chionochloa*-grasslands. This species has also been recorded in various VDT habitats at Stockton Mine including mānuka shrubland, pākihi, and low forest.

VDT has been successful at maintaining some ‘Threatened’ and ‘At Risk’ species of liverwort including *Neogrollea notabilis*, *Acromastigum mooreanum* and *Saccogynidium decurvum*, and the moss *Pleurophascum ovalifolium* (Ecological Solutions Limited 2026c). Planted mānuka – tussock shrubland approximately 15 years old at Stockton Mine also supported a good diversity of bryophytes including the ‘At Risk’ liverwort *Cryptolophocolea tuberculata* (Ecological Solutions Limited 2026c). Hydroseeding with mosses has also been used to facilitate natural plant colonisation, both vascular and non-vascular, and aids slope stability, moisture retention, and offers a seed bed for germination (Ross and Simcock 2004). Ross and Simcock (2004) identified *Campylopus clavatus* and *Racomitrium pruinosum* as the most successful moss species during hydroseeding trials at Stockton. These trials developed methods for ex-situ propagation, harvesting and hydromossing, including amendments with soil, fertilisers and inclusion of herbaceous species. These will be adapted and scaled up. Common pioneer bryophyte species that could be used for hydroseeding include the mosses: *Breutelia pendula*, *Campylopus clavatus*, *C. introflexus*, *Dicranoloma billardiarei*, *Ditrichum*, *Polytrichadelphus magellanicus*, *Racomitrium pruinosum*, *Rhacocarpus purpurascens*, and *Sphagnum cristatum*, and one lichen, *Stereocaulon*.

Creation of specific habitat for bryophytes as part of rehabilitation has not been attempted on the Buller Plateaux before. To date, the most successful rehabilitation method for retaining bryophytes has been VDT of habitats including them.

To remedy the loss of bryophyte and lichen habitat this plan provides for:

- Prioritisation of VDT including boulders and wood supporting bryophytes where practicable;
- Creation of specialised habitat suitable for bryophytes and lichens to colonise; and
- Hand-transfer of bryophytes and lichens to suitable natural, rehabilitated or VDT habitat.

### 8.2.2 Objectives

The goal is to retain ‘Threatened’ and ‘At Risk’ bryophytes and lichens at rehabilitated sites and promote the establishment of diverse, self-sustaining bryophyte and lichen communities which are characteristic of the Buller Plateaux.

The objectives of this Plan with respect to bryophytes and lichens at rehabilitated sites are to:

- Maintain bryophytes and lichens which are typical of the Buller Plateaux;
- Provide opportunities for diverse ‘mature bryophyte communities’ to naturally establish, including the ‘Threatened’ and ‘At Risk’ and other species which contribute to the high natural diversity of bryophytes at the Buller Plateaux.

- A mature bryophyte community is considered to be established if 25% of indicator taxa for a vegetation type are present. Indicator taxa are set out in Attachment 6.

This Plan provides landscape and habitat design intended to provide suitable post-mining habitats for bryophyte and lichens typical of the area.

### 8.2.3 Relevant Approvals

As set out in conditions RHM47-RHM60, the section of the Plan dealing with bryophytes shall, as a minimum, address:

- a) Survey of bryophyte habitats in areas allocated for vegetation clearance to inform location of target species to be salvaged;
- b) Baseline monitoring of VDT and hand-transfer of 'Threatened' and 'At Risk' species prior to vegetation stripping, and monitoring once relocated to rehabilitated areas;
- c) Relocation of bryophyte and lichen communities through the use of VDT, including individual boulder salvage and placing of suitable VDT on top of weathered boulders to assist in development of forested blockfield;
- d) Creation of a variety of habitats suitable for bryophytes as part of rehabilitation in order to ensure the best opportunity for mature bryophyte communities to naturally recolonise rehabilitated sites in the medium-long-term (15-50+ years), with particular focus on creating conditions suitable for 'Threatened' and 'At Risk' species;
- e) Enable provision of a variety of rehabilitated habitats which include microhabitat features such as perpetual wet wall seepages, blockfield, overhangs and drip zones to encourage the formation of bryophyte 'sheets' and 'stalactites';
- f) Placement of weathered boulders, NAF and LAF unweathered boulders, and coarse quartzose sands (2 – 4mm diameter and up to 100mm deep over rock) within rehabilitated sites to encourage establishment of bryophyte and lichen species;
- g) Buffering of existing and potential bryophyte habitats to reduce edge effects and assist in maintaining microclimates at newly exposed edges;
- h) Monitoring in rehabilitated habitats to confirm rehabilitation outcomes for bryophytes and lichens.
- i) Creation of instream and riparian habitat suitable to support aquatic bryophytes in larger reinstated streams.

### 8.2.4 Habitat Design

This RMP has taken the following matters into account:

- 1) Bryophyte and lichen distribution records;
- 2) Associated geological substrates and hydrological features; and
- 3) Specific habitat/vegetation requirements and environmental conditions necessary for different target species.



Rehabilitated sites suitable for bryophytes will need to create humid microsites with a variety of hydrological conditions e.g. perpetually wet wall seepages and 'drip zones' to encourage 'sheets' of bryophytes and 'stalactites' to develop (see Attachment 5).

The use of salvaged weathered sandstone, low fertility soils and an organic soil layer will assist in developing habitats suitable for bryophytes, as well as:

- Salvaged shallow topsoil, e.g., nutrient poor soils with impeded drainage;
- Rock material placed across the landscape as described in Section 5.5. Rockfields, rock stacks, and 'blockfield' surrounded by VDT and/or planting are all potential bryophyte habitats, depending on the other prevailing environmental conditions locally.
- Vertical walls, bolsters / overhangs comprised of sandstone bedrock and granite.

### 8.2.5 Target Species

Table 11 lists 43 species of bryophyte and lichen considered to be 'Threatened' or 'At Risk' and affected by the Project. Twenty of those species will be managed via individual hand transfer of specimens to suitable natural or rehabilitated habitats prior to vegetation stripping. A further three species are proposed for ex situ propagation and subsequent repatriation to suitable habitats.

### 8.2.6 Hand Transfer

Where the pre-mining baseline survey identifies Target Species in areas which are not suitable or otherwise unavailable for VDT, hand transfer may be used.

In considering whether hand transfer will be achievable, a suitable location and habitat for placement will need to be selected. This could include:

- Areas of completed VDT;
- On-Site/ Off-Site Rehabilitated areas; or
- Natural areas of suitable habitat.

Where the first two habitats are not available, hand-transfer to suitable habitats within natural area(s) outside the Project Area will be considered. Hand transfer will only take place between late autumn and early spring, when moisture conditions are such that plant establishment would not be limited by moisture availability.

The process for hand transfer will be as follows:

- Using a hand-trowel, carefully excavate the surrounding area at a surface area ratio of 2:1 (i.e., including the Target Species and twice as much surrounding material, including the substrate a depth of 10-20 cm;
- Ensure that all associated vegetation and species are collected to minimise disturbance;
- Place into a suitable plastic container, spray with a water mist and seal with lid;
- Keep cool and do not allow to warm up or dry out (e.g. by leaving in a vehicle);

- Transport to relocation site, ensuring the container is kept upright;
- Confirm the suitability of the relocation site (e.g., species present, vegetation cover and type, ecological context);
- Prepare relocation site for the Target Species and carefully position into substrate;
- Permanently mark the site, photograph the location, measure the coverage of the Target Species and record a GPS waypoint to enable future monitoring.
- Undertake initial monitoring (survival, coverage) three months after transfer followed by annual monitoring to determine outcomes and inform the viability of hand transfer.

Where hand-transfer fails, this process may be amended as required for subsequent hand-transfers.

### 8.2.7 Aquatic Boulder Transfer

Where stream removal includes bryophyte-rich boulders, a selection of boulders with attached bryophytes will be relocated to suitable unaffected similar natural or reinstated streams nearby, within the same catchment where achievable. In the longer term these boulders may be moved to reinstated headwater streams within the same Project sub-area. The location of these boulders will be photographed and they will be permanently marked at placement. As for hand transfer, initial monitoring will include collection of a GPS waypoint and be undertaken three months after placement followed by annual monitoring to determine outcomes, and inform the viability of aquatic boulder transfer in maintaining bryophytes within streams at the site.

### 8.2.8 Specific Methods

Bryophytes vary in their ease of management, with aquatic bryophytes being the easiest to relocate. This can be achieved through salvaging instream boulders with bryophytes secured to the substrate and relocating them.

For terrestrial bryophytes which are considered 'Threatened' or 'At Risk' individual hand transfer and *ex situ* propagation and repatriation to rehabilitated habitats is proposed.

Table 11: Specific Management Actions to maintain 'Threatened' and 'At Risk' bryophytes and lichens at the BPCP.

| Taxa                                                                                                                                                                                                                                                | Management method |               |                  |                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------|------------------|---------------------|
|                                                                                                                                                                                                                                                     | VDT               | Hand transfer | Boulder transfer | ex situ propagation |
| Aquatic bryophytes e.g., <i>Acromastigum</i> , <i>Blindia</i> , <i>Chiloscyphus</i> , <i>Hepatostolonophora</i> , <i>Isotachis</i> , <i>Pachyglossa</i> , <i>Riccardia</i> , <i>Solenostoma</i> , <i>Syzygiella</i> , <i>Telaranea sensu lato</i> . |                   |               | ✓                |                     |
| <i>Allisoniella scottii</i>                                                                                                                                                                                                                         | ✓                 |               |                  |                     |
| <i>Acromastigum interstiale</i>                                                                                                                                                                                                                     | ✓                 |               |                  |                     |
| <i>Acromastigum mooreanum</i>                                                                                                                                                                                                                       | ✓                 |               |                  |                     |
| <i>Acromastigum verticale</i>                                                                                                                                                                                                                       | ✓                 | ✓             | ✓                |                     |
| <i>Andrewsianthus perigonalis</i>                                                                                                                                                                                                                   | ✓                 |               | ✓                |                     |

|                                                   |   |   |   |   |
|---------------------------------------------------|---|---|---|---|
| <i>Archeophylla schusteri</i>                     | ✓ |   |   |   |
| <i>Austropeltum glareosum</i>                     | ✓ | ✓ |   |   |
| <i>Bazzania exempta</i>                           | ✓ |   |   |   |
| <i>Calycidium cuneatum</i>                        | ✓ |   |   |   |
| <i>Ceramanus tuberifera</i>                       | ✓ |   |   |   |
| <i>Cheilolejeunea novaezelandiae</i>              | ✓ |   |   |   |
| <i>Cladia fuliginosa</i>                          | ✓ | ✓ |   |   |
| <i>Cladia inflata</i>                             | ✓ | ✓ |   |   |
| <i>Cryptolophocolea leucophylla</i>               | ✓ |   |   |   |
| <i>Cryptolophocolea tuberculata</i>               | ✓ |   |   |   |
| <i>Herzogianthus sanguineus</i>                   | ✓ | ✓ |   |   |
| <i>Herzogianthus vaginatus</i>                    | ✓ | ✓ |   |   |
| <i>Heteroscyphus billardiarei</i>                 | ✓ |   |   |   |
| <i>Isolembidium anomalum</i> var. <i>anomalum</i> | ✓ | ✓ |   |   |
| <i>Isotachis westlandica</i>                      | ✓ | ✓ | ✓ |   |
| <i>Knightiella splachnirima</i>                   | ✓ | ✓ |   |   |
| <i>Kurzia tenax</i>                               | ✓ | ✓ |   |   |
| <i>Leiorreuma exaltatum</i>                       | ✓ |   |   |   |
| <i>Lembidium longifolium</i>                      | ✓ |   |   |   |
| <i>Lepidolaena novae-zelandiae</i>                | ✓ |   |   |   |
| <i>Micarea isabellina</i>                         | ✓ | ✓ |   |   |
| <i>Neogrollea notabilis</i>                       | ✓ | ✓ |   | ✓ |
| <i>Ochrolechia frigida</i>                        | ✓ |   |   |   |
| <i>Pallavicinia rubristipa</i>                    | ✓ | ✓ | ✓ | ✓ |
| <i>Pleurophascum ovalifolium</i>                  | ✓ | ✓ |   | ✓ |
| <i>Pseudocyphellaria lindsayi</i>                 | ✓ |   |   |   |
| <i>Pseudolophocolea denticulata</i>               | ✓ | ✓ |   |   |
| <i>Pulchrinodus inflatus</i>                      | ✓ | ✓ |   |   |
| <i>Pycnothelia caliginosa</i>                     | ✓ | ✓ |   |   |
| <i>Riccardia exilis</i>                           | ✓ |   | ✓ |   |
| <i>Riccardia furtiva</i>                          | ✓ |   |   |   |
| <i>Riccardia multicorpora</i>                     | ✓ | ✓ |   |   |
| <i>Saccogynidium decurvum</i>                     | ✓ | ✓ |   |   |
| <i>Telaranea inaequalis</i>                       | ✓ |   |   |   |
| <i>Trichotemnoma corrugatum</i>                   | ✓ | ✓ |   |   |
| <i>Zoopsis bicruris</i>                           | ✓ |   |   |   |
| <i>Zoopsis ceratophylla</i>                       | ✓ |   |   |   |
| <i>Zoopsis matawaia</i>                           | ✓ |   |   |   |



### 8.2.9 Management Methods

Figure 30 sets out the methods for relocating and monitoring Target Species. The key components are:

- I. **Survey** prior to vegetation stripping;
- II. **Salvage** of Target Species where they occur;
- III. **Management** via one of the following approaches:
  - VDT;
  - On-site rehabilitation;
  - Off-site rehabilitation;
  - Relocation to natural area(s) outside the BPCP Project Area (when VDT/Rehab is not available).
- IV. **Monitoring** of Target Species:
  - Permanent plots will be established to monitor Target Species as follows:
    - VDT and hand-transfer (pre/post-transfer);
    - Rehabilitated areas (on-site/off-site);
    - Any natural area(s) outside the Project Area which have received Target Species (when VDT/Rehab is not available to receive them); and
    - Any aquatic bryophyte communities transferred.

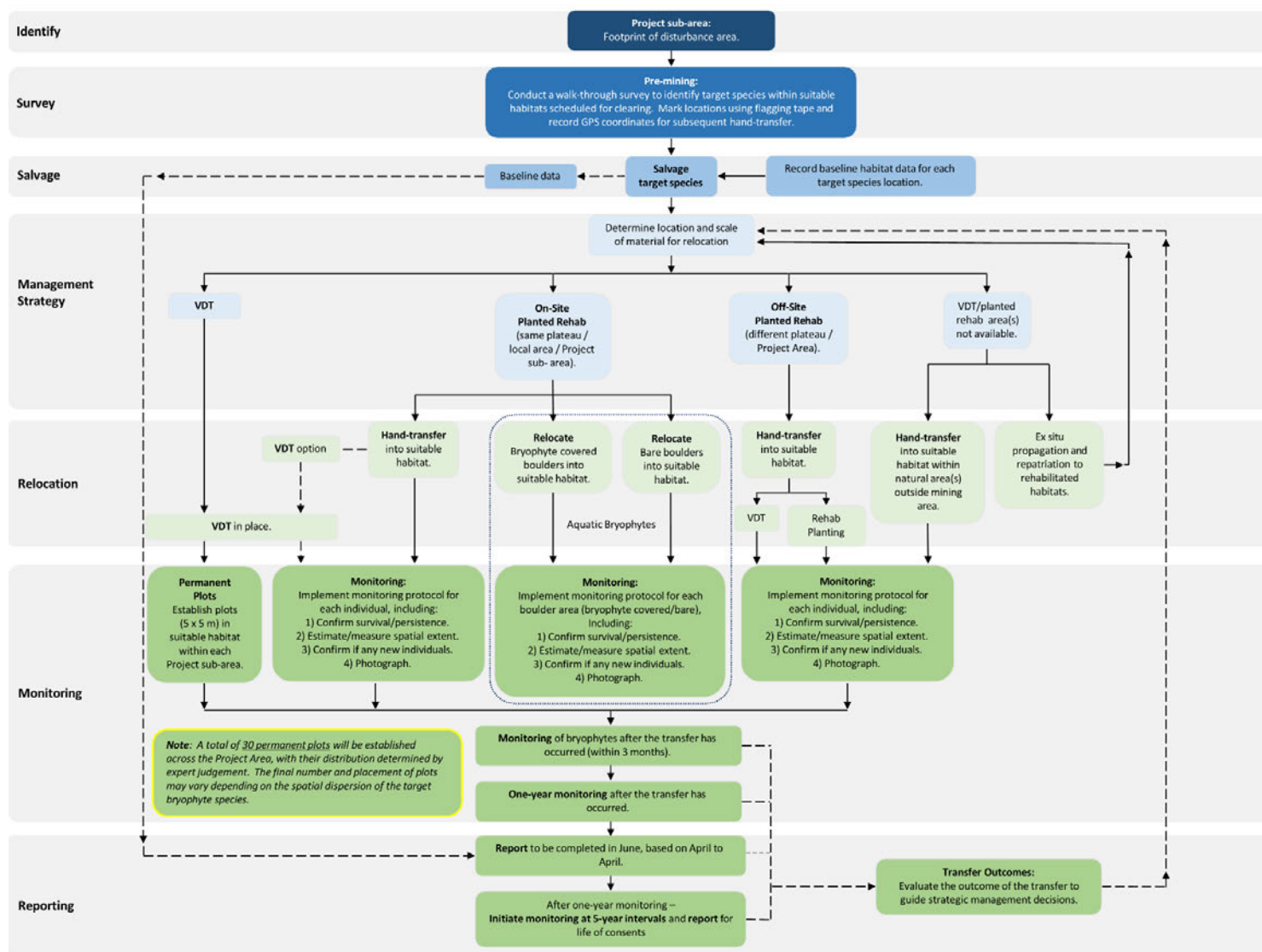


Figure 30: Methods for managing and relocating target bryophyte species.

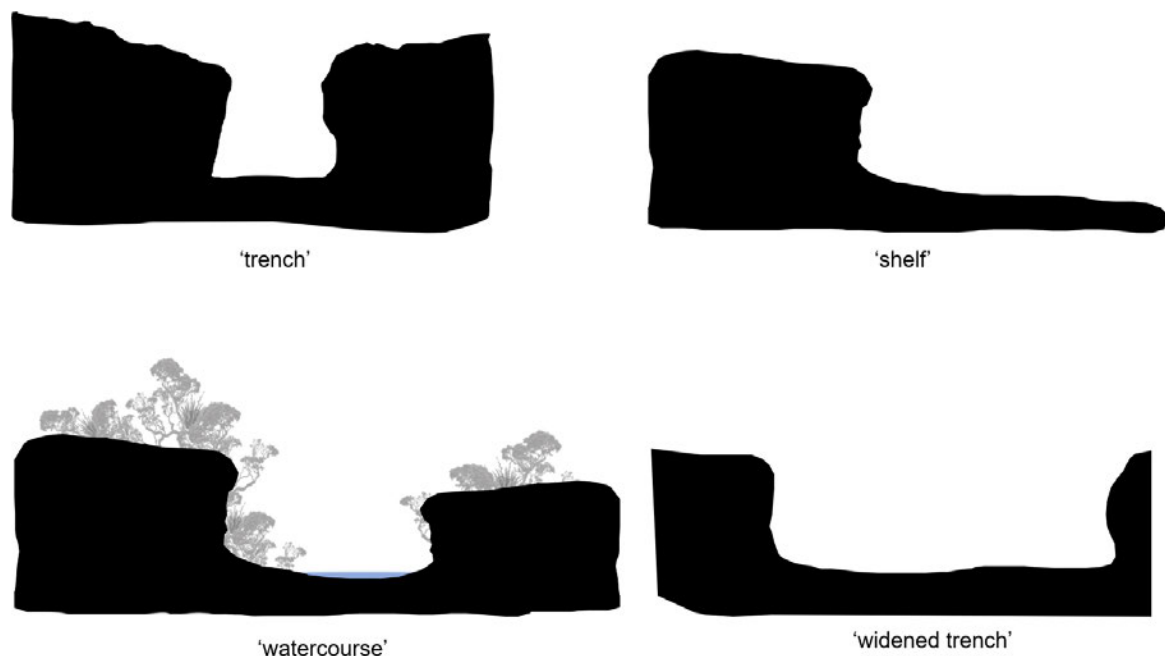
### 8.2.10 Habitat Construction

Bryophyte habitats are typically sheltered and humid. Construction of such habitats will rely on creating suitable topography including:

- Trenches
- Shelves
- 'Widened trenches' (or 'troughs'); and
- Rock features:
  - Rockfield/boulderfields,
  - Blockfield.

Each of these habitats relies on appropriate hydrological conditions (to maintain humidity and create perpetual seepages and drip zones) and incorporates vertical walls made from salvaged sandstone and/or bedrock and shallow local soils. Conceptual representations of these habitats are shown in Figure 31 to Figure 34.

Areas rehabilitated to forest blockfield (Figure 32) should be deliberately designed to favour establishment of bryophyte and lichen communities, including Target Species listed in Table 11, using an additional variation of trees and shrubs planted between tall boulders and emerging above them to create deeply shaded, super-humid conditions.



*Figure 31: Cross-section of habitats designed to suit bryophytes typical of the Buller Plateaux.*





'forested blockfield'

Figure 32: Indicative cross-section of blockfield design.

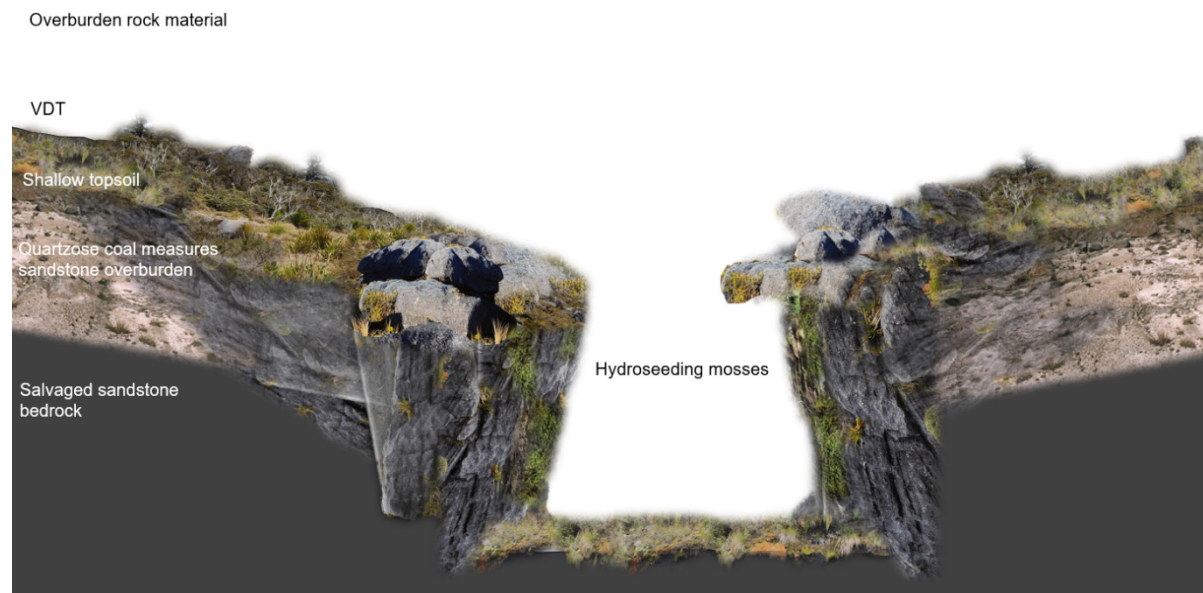


Figure 33: Conceptual 'trench' substrate design.

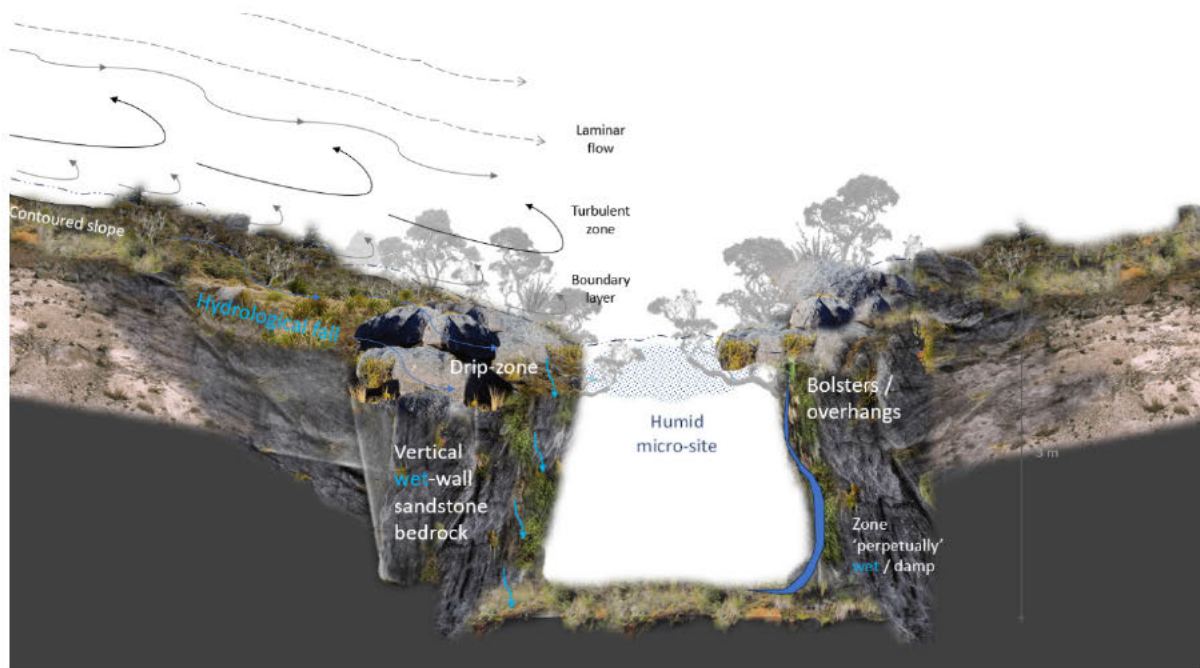


Figure 34: Conceptual 'trench' habitat design (with hydroseeding and VDT).

## 9.0 Biodiversity Outcome Monitoring

### 9.1 Compliance Monitoring

Biodiversity Outcome Monitoring is set out in the Biodiversity Outcome Monitoring Plan for the Project (BPCP-ENV-PLN-009). This section summarises the monitoring with respect to vegetation and is summarised in Table 12.

Table 12: Summary of rehabilitation compliance monitoring

| Monitoring Type            | Monitoring Frequency                                                                                                                                                                                             | Location                                                                                                                                                                        | Relevant condition |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Planted rehabilitation     | Rehabilitation monitoring must be undertaken within a Rehabilitation Unit at least annually for the first two years, then every two years during years 3 to 6 and at least every five years from year 6 onwards. | Permanent monitoring plots must be established within 12 months of rehabilitation establishment and must be stratified by rehabilitation method, vegetation type, and landform. | RHM69              |
| Vegetation Direct Transfer | As above.                                                                                                                                                                                                        | As above.                                                                                                                                                                       | RHM69              |

## 9.2 Rehabilitation Monitoring

Monitoring of rehabilitation must be undertaken in order to determine whether each rehabilitation unit is achieving, or is on an acceptable trajectory to achieve the outcomes, and completion criteria specified in this plan. Rehabilitation Monitoring will include;

- numbers of plants, survival and visual assessment of growth
- overall vegetation cover,
- indigenous vegetation cover,
- exotic vegetation cover,
- priority weed vegetation cover,
- quantity and quality of VDT,
- vegetation and hydrological indicators of wetlands.

Rehabilitation monitoring within each Rehabilitation Unit will be undertaken until the applicable completion criteria are achieved. This monitoring will be undertaken:

- Annually for the first two years;
- Every two years during years 3 to 6; and
- From year 6 onwards, at least once every five years.

A Rehabilitation Unit may be deemed complete once a Rehabilitation Completion Report is prepared by a SQEP demonstrating that the completion criteria have been achieved and maintained.

## 9.3 Vegetation

### 9.3.1 Planted sites

Rehabilitation via planting aims to create ecosystem types which generally include common elements typical of the Buller Plateaux which are similar to natural vegetation communities. Eight planting mixes that represent forest, shrubland and pākihi communities are set out in Section 3.2.

Vegetation at planted sites will be monitored using at least 30 10 x 10m RECCE plots (Hurst, Allen and Fergus 2022) across the Project Area. Key metrics will include:

- Vascular plant species richness (i.e., number of species per plot);
- Percentage vegetation cover by tier;
- Percentage rock and coarse wood cover;
- Percentage canopy cover;
- Weed presence and whether flowering or fruiting; and
- Presence of non-planted species.



The exact location of plots will depend on what rehabilitated areas are established and available as rehabilitation proceeds, but plots should aim to sample as many rehabilitated ecosystem types as possible and be stratified by rehabilitation approach, vegetation type and landform. A minimum of 30 plots will include at least three plots in each of the rehabilitation planting types as follows:

- Tall forest.
- Beech forest (a).
- Beech forest (b).
- Mānuka shrubland (a).
- Mānuka shrubland (b).
- Flax shrubland (a).
- Flax shrubland (b).
- Pākihi.
- Rockfield.

Vegetation on rehabilitated highwall benches will be monitored by visual assessment of indigenous shrubland cover by either walkthrough survey where possible or by aerial drone imagery.

Monitoring of these plots will occur every two years for the first six years, then every five years for the life of the consent. Upon meeting closure criteria, further monitoring will not be required, except all plots must be monitored within five years of the end of consent to confirm that the criteria are still met and allow time to address any non-conformance with the criteria.

### 9.3.2 VDT Sites

Areas rehabilitated by VDT will be monitored using transect-based methods. The method will be based on the Cypress tussock storage transect monitoring (Ecological Solutions Limited 2025). Three permanent transects per vegetation type will be established in each Project Area. Transects will be 30m long and will comprise four 1m x 1m plots

In addition to transect-based monitoring, walk-through assessments will be undertaken to assess the overall quality of VDT across the rehabilitated area. The walk-through survey will be combined with permanent photo points throughout the rehabilitated sites. Three photo points should be established in each vegetation type, ensuring a wide, clear view of the rehabilitated area.

Walkthrough visual surveys will assess the quality of VDT and record an average estimate of the following key indicators of the quality of VDT. These are;

- Hummockyness;
- Bare soil, rock and water coverage (as a percentage);
- Weeds (record any weed species present and estimated percentage cover) and if flowering and/or fruiting); and
- Dead vegetation (record species and estimated percentage cover).

This monitoring will be undertaken:

- Annually for the first two years;
- Every two years during years 3 to 6; and
- From year 6 onwards, at least once every five years.

All plots must be monitored within five years of the end of consents to confirm the criteria are still met and allow time to address any non-conformance with the criteria.

### 9.3.3 VDT

A baseline survey will be undertaken in vegetation to be transferred via VDT prior to vegetation stripping to confirm the presence and location of Target Species. The specific location of target species will be marked with flagging tape so that they can be followed through the transfer process.

The baseline survey will be focussed within areas of the important vegetation types for bryophytes listed in Section 8.2.1.

Within three months of VDT being relocated, as many marked specimens as possible will be re-located and their survival confirmed. Follow-up monitoring will be undertaken one year later, and then at five-yearly intervals for the life of the consents.

## 9.4 Bryophyte Monitoring

The characteristic features at each monitoring location will be recorded, including:

1. Date: Day, month, year.
2. Photograph.
3. Location: Record plot coordinates using GPS reference (e.g. easting and northing).
4. Aspect and slope: Record the orientation and slope of the location. If aquatic or instream, record direction of water flow, wetted bank width, water depth and estimate velocity.
5. Substrate: Describe the type of substrate present (e.g., granite bedrock), including soils if present.
6. Hydrology: Record any drainage indicators (e.g., imperfectly drained).
7. Cultural: Record any human interference (e.g., VDT, planted, aquatic transfer, burnt, tracked, cleared, browse, none).
8. Vegetation cover: Provide a brief description of vascular vegetation types (e.g., using the named vegetation types set out in Ecological Solutions Limited 2026a) and estimate percentage of canopy cover.
9. Non-vascular cover: Record the species of bryophytes and lichens (aquatic/terrestrial/epiphytic) and estimate percentage cover (e.g., bryophytes, 75%; lichens, 5%). Record general associations i.e., corticolous (bark), lignicolous (wood), saxicolous (rock), terricolous (earth/soil), plot.

10. Note any specific habitat features such as 'fissures in sandstone', 'damp shaded recess' and the like. Sample collection may be necessary to identify or confirm species through microscope examination.

Monitoring will be undertaken prior to vegetation stripping and within three months of any transfer or placement. Follow-up monitoring will be undertaken one year later, and then at five-yearly intervals for the life of the consents.

In addition to Target Species monitoring, 5 x 5m permanent monitoring plots will be established at least 10 sites rehabilitated using VDT and at least 10 sites rehabilitated using planting throughout the Project Area in order to monitor changes in the bryophyte community over time and confirm development and persistence of typical communities. Re-measuring of permanent monitoring plots will be undertaken three times in the first 10 years and then every five years for the life of the consents. This frequency of monitoring has been chosen to minimise the potential for damage at long term monitoring plots due to disturbance.

## 9.5 Monitoring Edge Effects

In order to confirm that edge effects are reducing over time, transects commencing as near the new edge as is practicable and safe, and which extend into the surrounding habitats will be established prior to creation of the new edge and monitored at least twice before any vegetation clearance. The length of transects will depend on the affected habitat, with transects in tall forest being 50m long and transects in shrubland and low vegetation being 20m long.

Microclimate data including temperature, humidity, light (canopy cover and photosynthetically active radiation (PAR) and wind will be collected at least seasonally. The edge treatment will also be recorded. During these surveys vegetation mortality (including individual species where identifiable), canopy height and the abundance of understorey plants and seedlings will be recorded.



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## 10.0 Reporting

### 10.1 Internal Reporting

Rehabilitation monitoring data will be compiled and reported to internal management on a 12-monthly basis within the Environmental Management System (EMS) Management Review Process. The Environmental Manager will be responsible for scheduling this review and presenting performance against objectives and Key Performance Indicators (KPIs).

All potential and actual non-compliance with this Rehabilitation Management Plan identified by site personnel during site inspections or monitoring activities are to be rectified in accordance with the Site Environmental Management Plan (SEMP). This system keeps track of non-compliances, corrective actions, responsibilities, planned and actual completion dates. Community complaints are recorded within the Community Complaints Register and addressed as per the Community Complaints Procedure.

Ngāti Waewae would like to work with the consent holder during development and trial of rehabilitation techniques (terrestrial and aquatic) so that mātauranga Māori is incorporated where practicable. Monitoring reports and long-term state of the environment reports will include measures to show improvement (or otherwise) in the mauri of the waterways. The consent holder and Ngāti Waewae will work together to develop a cultural health index for waterways and engage iwi to assist with interpretation and reporting. Ngāti Waewae will be provided with annual monitoring reports associated with this RMP.

#### 10.1.1 Record keeping Rehabilitation Materials Register

The consent holder will maintain a Rehabilitation Materials Register which records, for each type of material salvaged or reused:

- source location;
- material type;
- quantity, area or volume;
- date salvaged;
- storage location, where applicable;
- storage duration, where applicable;
- weed status;
- acid-generating risk, where relevant;
- destination rehabilitation area;
- date placed or reused.

### 10.1.2 VDT Register

The consent holder will also maintain a VDT Register that records:

- Source area;
- Destination area;
- Vegetation type;
- Area or volume transferred;
- Date of salvage;
- Date of placement;
- Condition of VDT material at placement, including the presence of any weeds;

### 10.1.3 Plant and Seed Provenance Register

The consent holder must maintain a Plant and Seed Provenance Register for seed-raised plants or plants supplied outside the BRL nursery for use in planted rehabilitation that records:

- Species
- Quantity
- Source location
- Altitude band
- Collection date
- Nursery supplier (where applicable)
- Destination rehabilitation area
- Planting or seeding date
- Any SEQP-approved departure from Condition RHM23 (see Attachment 1)

## 10.2 External Reporting

The Approval Holder must prepare an Annual Rehabilitation Report as set out in Section 10.3.2 below

## 10.3 Annual Reporting Requirements

### 10.3.1 Annual Work Plan

The Annual Work Plan will include a Rehabilitation Outcomes Schedule. The schedule must identify the rehabilitation outcomes and methods proposed for the relevant Project stage and must be consistent with the certified RMP. For each rehabilitation area, the Rehabilitation Outcomes Schedule must identify:

- the rehabilitation area name and location;

- the relevant Project stage;
- the target landform;
- the target soil, substrate and rock characteristics;
- the target vegetation community;
- the target fauna habitat function;
- the rehabilitation method or combination of methods to be used;
- the short-term, medium-term and/or long-term outcome to be achieved;
- the applicable performance thresholds;
- the monitoring method and monitoring frequency;
- the trigger levels requiring management response;
- the corrective actions required if a trigger is met; and
- the completion criteria.

### 10.3.2 Annual Rehabilitation Report

BRL will prepare and submit an Annual Rehabilitation Report.

As appropriate, rehabilitation management activities and monitoring results will be documented and reported in the Annual Rehabilitation Report, including:

- The type, extent and location of rehabilitation undertaken by Rehabilitation Unit;
- Areas disturbed and areas rehabilitated during the reporting year;
- Cumulative disturbed and rehabilitated areas;
- Rehabilitation methods used across the Project Area, including details of rehabilitation applied to highwall benches;
- VDT source and destination areas, particularly the total area of VDT applied to priority areas, riparian margins, number and size of inoculation areas and area of VDT used to provide connectivity;
- Rehabilitation materials salvaged, stored and reused;
- Plant and seed provenance records;
- Stream, wetland, riparian and fauna habitat works undertaken;
- Monitoring results;
- Trigger events and corrective actions;
- Progress against completion criteria, including specifically the progress toward the VDT coverage target of at least 15% for the Project Area



- 
- A summary of any work undertaken or findings from the rehabilitation research programme
  - Any recommended amendments to the RMP, such as any changes to the location of priority areas for VDT in response to fauna monitoring or details of 'next best' or compensatory rehabilitation methods should areas of VDT be less than commitment, for example jumble dump, wildling transplants and planting. The minimum density of these should be identified for such areas.

If a Target Species trigger event occurs (i.e., where monitoring shows that outcomes for bryophytes, lichens and vascular plants are not being met or are not on an acceptable trajectory to being met), BRL must obtain SQEP advice, implement corrective actions, undertake follow-up monitoring and report the trigger event, cause, response and outcome in the Annual Rehabilitation Report.

At the time of submitting the Annual Rehabilitation Report, BRL shall advise of any material changes that it intends to initiate and the timeframe for such material change.

## 11.0 Roles, Responsibilities, and Training

BRL is committed to continual training and awareness of all staff, employees, and contractors. Training and awareness procedures are an integral part of ensuring the full implementation of the [Ecology] Management Plan across all aspects of all projects. Effective and regular communication at all levels reinforces the message that ecology management issues are taken seriously and that the Plan has the active support of the principal contractor.

### 11.1 Roles and Responsibilities

Implicit in the effective management of rehabilitation of all areas where BRL operates is the allocation of responsibilities to key individuals. Details of roles and responsibilities associated with this Rehabilitation Management Plan are provided in Table 13 below.

*Table 13: Responsible personnel and tasks*

| Position                                              | Accountable Task                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Senior Executive (SSE)<br>/ General manager (GM) | <ul style="list-style-type: none"> <li>Overall accountability for implementation of this plan.</li> <li>Allocating adequate resources to support implementation of this plan</li> <li>Endorses significant management responses where required</li> <li>Clearly communicate rehabilitation management responsibilities where required</li> </ul>                                                                            |
| Environmental Manager                                 | <ul style="list-style-type: none"> <li>Primarily responsible for implementation and administration of this plan</li> <li>Coordinate internal and external reporting obligations under this plan</li> <li>Maintain liaison with relevant regulatory authorities as required</li> <li>Overseeing the periodic review of this plan</li> <li>Notify the SSE/GM of matters requiring review or amendment of this plan</li> </ul> |
| Suitably Qualified and Experienced Ecologist          | <ul style="list-style-type: none"> <li>Involved in undertaking surveys, monitoring and reporting required as part of the RMP.</li> <li>Undertake and/or audit the rehabilitation and enhancement assessment for Completion of Closure of the BPCP sub-areas.</li> </ul>                                                                                                                                                     |

### 11.2 Training and Inductions

Environmental issues are included within the Mine Induction Package and induction process and regular environmental awareness training through toolbox talks is planned.

Environmental issues will be a regular topic for toolbox talks, including [ecology] management as required. All monitoring results will be assessed, and significant results or events will be raised for discussion via toolbox talks to encourage and remind staff on appropriate activities.

## 12.0 Management Plan Approval and Revision

### 12.1 Change Register

This Rehabilitation Management Plan is issued, revised, and amended under authorisation of the CEO.

A copy will be stored electronically with access available to all workers. The signed hard copy will be maintained in the Wellington document library.

Reasons for making changes will be documented and recorded in the document management table, refer to Table 14. A copy of the original document and subsequent versions will be kept for records and marked as obsolete. Each new/updated version will be issued with a version number and date to eliminate obsolete documentation being used.

Table 14: Document management

|                                   |             |                   |                      |
|-----------------------------------|-------------|-------------------|----------------------|
| Document Management:              |             |                   |                      |
| Regulatory Approvals Authorities: |             |                   |                      |
| Document Owner:                   |             |                   |                      |
| Document Owner Name:              |             |                   |                      |
| GM HSEC Approval Signature:       |             |                   |                      |
| Date:                             |             |                   |                      |
| Document Approver:                |             |                   |                      |
| CEO Name:                         |             |                   |                      |
| CEO Signature:                    |             |                   |                      |
| Date Approved:                    |             |                   |                      |
| Revision History:                 |             |                   |                      |
| Date                              | Version No. | Lead Author       | Contributing Authors |
|                                   |             |                   |                      |
| Version No.:                      |             | Detail / Changes: |                      |
|                                   |             |                   |                      |
| Next Planned Review:              |             |                   |                      |
|                                   |             |                   |                      |

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## Attachment 1: Proposed Consent Conditions

*Conditions to be inserted upon issue of the final decision.*

## Attachment 2: Constraints on Rehabilitation

### Summary

The outcomes of rehabilitation are dependent on how mine planning, scheduling, resource availability and subsequent implementation manages environmental and other constraints at the affected sites. The existing and post-mining topography, availability and quality of rehabilitation resources, composition of overburden, drainage and other natural limitations on vegetation growth rates (such as root zone depth, pH and fertility) can be constraints on achieving the rehabilitation objectives. Trials and experience at Stockton Mine have shown that the key controllable factors affecting growth rates at rehabilitated sites are the degree of exposure and substrate type and depth. These are influenced by slope, microtopography, quality of soils and initial erosion control treatments. The fastest revegetation is achieved where exposure is low, erosion is controlled and substrates are topsoil-like. This section sets out the specific constraints for rehabilitation at the Buller Plateaux.

### Growth Rates

Plants on the Buller Plateaux are generally slow growing due to a combination of climatic challenges (e.g., low solar radiation, low temperature, high rainfall and high wind) and shallow, poorly drained, infertile and acidic soils. In addition to naturally low growth rates, plant growth in rehabilitated areas may be further constrained by the type of substrate used, particularly the level of organic matter.

Faster growth occurs on more fertile, well drained soils and locations which are less exposed to high winds (Ecological Solutions Limited 2026c). Surveys at Stockton Mine showed that plant growth rates in areas with mixed soil cover and hummocky landform have been between 3cm in height and/or width per year (hebe – *Veronica odora*) and 10cm in height/width per year (silver beech), with mānuka and mountain flax between 5 – 9cm in height/width per year (Theinhardt 2003). Growth in height typically slows once exposed to windshear.

The strategic use of fertiliser, such as Di-Ammonium Phosphate, can be beneficial on sites such as overburden dumps, where nitrogen and phosphorus are severely lacking (Solid Energy Limited 2004). Nitrogen and phosphorus fertiliser application has been shown to help boost initial plant growth for some species, particularly toetoe, red tussock and mountain flax. Red tussock and mountain flax can also contribute to litter formation and provide cover for snails. Targeted application of fertiliser to red tussock and mountain flax, or where there is insufficient topsoil is proposed. Addition of organic matter as woody debris and the practice of jumble dumping are also proposed to assist in promoting nutrient cycling and speeding up plant growth by creating rough micro-topography.

Indigenous vegetation can be slow to colonise rehabilitation sites, due to poor or irregular dispersal, or limited ability to establish on bare ground. Plants better able to colonise rehabilitation sites are those with wind-dispersed seed, those that produce abundant seed, or those that can successfully colonise bare ground and tolerate high light. This includes mānuka, Southern rātā (*Metrosideros umbellata*), native grasses (*Rytidosperma*, *Chionochloa*, *Austroderia* spp.), some sedges and rushes along with *Ozothamnus* and some *Veronica* spp. Mosses may be quick to colonise more moist and fertile areas. Wire rush (*Empodisma minus*) can effectively spread vegetatively and is well suited to growing through eroded sediment and sands.



The identified constraints in relation to plant growth have been taken into account in developing this RMP and are addressed where relevant via selection of appropriate species for planting and use of fertiliser where appropriate, i.e., where soil availability is limited and where accelerated growth is required to provide habitat for fauna.

## Climatic Constraints

The unique combination of gently undulating terrain, relatively high altitude, high annual rainfall, poorly drained and infertile soils, and high westerly wind exposure have combined to create a distinctive coal measures vegetation. At elevated areas and large flat areas particularly, the vegetation height is suppressed by high winds that 'shears' the vegetation, leading to prostrate growth forms dominating e.g., low pākihi vegetation dominated by prostrate mānuka with a mean height of 0.27m. The Plateaux experiences high rainfall – up to 6.4m per annum which results in nutrient leaching and, in combination with impervious rock pavement or iron pans, frequent soil saturation. High rainfall intensities (e.g., 300mm in 24 hours) quickly erode unstable or unprotected substrates. Heavy rainfall events are expected to increase in frequency and intensity in the future as a result of climate change.

The level of wind exposure at Stockton Mine is a key factor limiting plant growth. Natural wind breaks will be prioritised and can be created from coarse wood (logs), boulders or creation of uneven, hummocky topography.

## Soil and Overburden Characteristics

### Natural Characteristics

Plants growing at the Buller Plateaux extract nitrogen and phosphorus that is released from organic matter. Following stripping and placement of poorly drained soils there may be a weak flush of nutrients, particularly nitrogen, as a result of aeration. There are no naturally occurring nitrogen-fixing plant species present on the Buller Plateaux, so soil fertility and conditions are very slow to improve naturally. Nitrogen fixing lichens and bacteria are present. Prompt revegetation and return of suitable habitats for fauna therefore relies on conservation of topsoil stripped from areas before mining and buildup of organic matter.

The post-stripping flush of nutrients is short lived, so strategic use of fertilisers and salvaged organic material such as jumble dump, large woody debris and locally generated organic mulches is proposed to enhance plant establishment and initial growth.

Despite high rainfall, plants may be exposed to moisture deficits on some rehabilitation substrates and surfaces with rapid drainage and low moisture storage capacity such as gravelly mine overburden on sloping areas or where deliberate compaction has not been used to reduce underlying permeability to levels that impede drainage.

### Subsoil

Subsoils across the Project Area are typically infertile, strongly acidic, and some can be acid-generating (typically those immediately overlying coal), meaning that topsoil must be salvaged and replaced with minimal dilution from (i.e., mixing with) underlying subsoils. Some subsoils have high value for supporting deeper rooting species and are recommended for placement on free-draining slopes where forests are planned. NAF subsoils may also be used to create impeded drainage via compaction to

reduce the AMD capacity of underlying overburden and to assist in maintaining high groundwater/surface water levels to support wetland vegetation on flatter slopes. Impeded drainage and high saturation will be required to maintain pākihi vegetation types, whereas forests are expected to develop on better drained soils.

## Topsoil

Topsoil is the highest quality growth medium, and will be applied to all surfaces destined for planting to a minimum depth of 200mm, overlying an engineered capping layer of NAF overburden. An exception is rockfield where topsoil will be sparse and as shallow as 2 cm. Calculations based on stripping and rehabilitation schedules and storage capacity show that there is sufficient topsoil available for rehabilitation of the site. The schedule of topsoil requirements, sources and movements during mine life can be mapped out from the final mine plan and used to inform rehabilitation resource availability. The amount of topsoil used in each year and the amount available for use in each upcoming year must be reported annually in the annual rehabilitation monitoring report.

Topsoils will be transferred to the final landform both directly as part of VDT and via 'rehandling' (i.e., shifting fresh topsoil immediately following vegetation clearance) or following a period of stockpiling. The quality of soil diminishes during stockpiling, particularly due to compaction and lack of aeration which degrades both the structure and viability of biota, and where there is a lack of earthworms and biological root activity (Boyer et al. 2011). Mine and rehabilitation planning will ensure that the depth and duration of stockpiling soils will be minimized to the extent practicable. Ideally, stockpiles less than 2-3m deep with minimal handling and no compaction are required to preserve soil qualities. Fresh/recent soils will be prioritized for use following stripping of topsoil and vegetation using excavators (rather than bulldozers) to create loose, rough, uncompacted, minimally handled and untrafficked stockpiles which will promote regeneration of vegetation. Where long-term storage is required and natural regeneration is producing inadequate vegetation cover, seeding will be used to assist in maintaining soil quality and viability and soil biota.

To contain erosion from soil and overburden stockpiles, VDT of vegetation stripped from the base of the topsoil stockpile will be used to create and revegetate a bund with sods before the stockpile is constructed. This method will be used to construct all soil stockpiles

The topsoil requirements for planted areas vary depending on ecosystem type, with forest requiring deeper topsoil (up to 50cm) than shrublands (up to 25cm) and rockfield requiring minimal soil (2cm or less, often patchily distributed).

Approximately 1,023,600m<sup>3</sup> of topsoil will be required for rehabilitation and other activities associated with mining across the Extended Escarpment project sub-area. This topsoil will originate from mine pits (c. 650,229m<sup>3</sup>), infrastructure areas (c. 105,621m<sup>3</sup>) and from VDT (c. 267,750m<sup>3</sup>). Volumes of topsoil movement throughout the life of each Project sub-area will be monitored and reported annually as discussed above.

The establishment of vegetation on bare soils is necessary protect the overburden capping from exposure to rain droplet erosion, rill and gully erosion, and tunnelling caused by surface or overland flows and subsurface flows in the medium to long term. To minimise sediment mobilisation in the short term after topsoil application a range of methods are available including:

- i) Ensuring surfaces are rough

- ii) Placement of slash and jumble dump – both of which are the most effective sediment control treatments on most slopes, along with VDT.
- iii) Some slopes will be covered with rock or gravel mulch which act as armouring. This is an effective treatment in combination with lower gradient slopes and rough micro-topography.
- iv) Hydroseeding.

Soil that is bound with live or dead vegetation is less vulnerable to erosion, with VDT being highly resistant to erosion. However, topsoils placed on steeper or longer slopes, and those with smooth surfaces and/or a low vegetation or rock component will require, hydroseeding or other stabilisation methods to be undertaken as soon as possible. This could include application of organic matter, such as woody debris and chipped wood mulch (including leaves and small branches), to the surface to physically protect sediment from heavy rainfall and run off.

Hydroseeding methods which aim to minimise adverse effects from exotic grass and weed growth, while maximising erosion control, will be used. For that reason, Lotus (*Lotus pedunculatus*) will not be used, due to the species scrambling habit which can smother native plants, and because of its ability to fix nitrogen creating an unnaturally high soil fertility. Browntop (*Agrostis capillaris*) may be used. The use of native grasses such as *Carpha alpina*, *Poa imbecilla* or toetoe (*Cortaderia richardii*) in combination with long-lived species and/or thicker hydromulches enhanced with specific tackifiers and polyacrylamides should be investigated. Planting will be carried out as soon as possible after hydroseeding, particularly if exotic species are used, in order to prevent a smothering cover (developing into a thatch) of exotic species forming before native species can establish.

## Coal Floor

Exposed coal floor is one of the rockfield rehabilitation treatments which will form part of the final landform, particularly within the MFS Project sub-area. Initial acid generation will be managed via direction of water to the appropriate water treatment plant. The acid-generation decreases over time, and once the surface of the coal floor has been oxidised and the sulphur leached, no further acid generation occurs (Pope et al. 2018). As the coal floor ‘subsides,’ the rock will develop cracks which will accumulate sediment/soils and the rock will provide open habitat for species which occupy rocky habitats to establish. Development of a research programme to accelerate development and weathering of coal floor that is not acidic would assist in improving outcomes for this method.

## Slope and Aspect Constraints

Slope is a constraint for rehabilitation because:

- Increased slope improves drainage/runoff relative to flat areas and increases the potential for erosion, especially on the Buller Plateaux where annual rainfall is high and frequently intense. Engineered Landforms are engineered to withstand this constraint, although revegetation is required to physically protect (leaves) and bind soils (roots) and reduce erosion in the long term. Engineered landforms are created to minimise erosion and manage AMD generation. Surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) are constructed as required to ensure water quality and discharge requirements are met.

- Flat terrain and gentler slopes (<12 degrees) are suitable for revegetation by VDT or planting, while planting is suitable for slopes less than 20°. Slopes exceeding 20° (high walls and angle of repose slopes) are suitable for hydroseeding or hydromulching. The ELFs created will include slopes ranging from 0° to c. 20° and the rehabilitation treatment will vary accordingly. Within the Project Area, the only slopes exceeding 20° will be highwalls and trenches and troughs created to provide bryophyte habitat, which are either cut into the bedrock (in the case of highwalls and perhaps some trenches and troughs) or constructed using rock. Highwalls will be terraced, featuring batter slopes of 38° and flat benches 10-15m wide which can be planted where access allows.

## Weed Constraints

Until vegetation establishes, the relatively high proportion of bare ground at rehabilitated sites without VDT can make them susceptible to weed invasion. Gaps between sods in VDT areas are also susceptible to weed invasion. Weed species present within the Project Area are set out in the Weed Management Plan (BPCP-ENV-PLN-008) and include heath rush (*Juncus squarrosus*), broom (*Cytisus scoparium*), gorse (*Ulex europaeus*), Yorkshire fog (*Holcus lanatus*), *Juncus canadensis* and pampas (*Cortaderia selloana*). Exotic species used in hydroseeding (e.g., browntop, lotus) have also been identified within and near rehabilitated areas, including planted sites and constructed tarns (Ecological Solutions Limited 2026c).

Weed management across the Buller Plateaux within and surrounding the Project sub - areas is addressed in the Weed Management Plan (BPCP-ENV-PLN-008).

## Propagation and Planting Constraints

Previous plantings have been effective at re-establishing indigenous vegetation cover over time, although total vegetation cover, canopy cover and species richness is highest in VDT. Mānuka has been widely used in rehabilitation at Stockton Mine to date and should continue to be utilised as a key pioneer species for shrubland and pākihi vegetation in the BPCP. Propagation of a variety of species, from a variety of nurseries, is required to reduce risk of plant shortfall. To date plants prioritised for use in rehabilitation have been precocious (produce seed early), easy to propagate and relatively quick growing, although the Bathurst nursery in particular is developing experience with a wider range of species.

Community composition at some historic rehabilitated sites does not resemble a natural or typical assemblage of the Buller Plateaux (Ecological Solutions Limited 2026c). Some planted rehabilitated sites at Stockton are dominated by species which either:

- Do not occur naturally at the Buller Plateaux; or
- Are not naturally common there; or
- Are assemblages of species which do not normally occur together.

For example, species atypical of coal measures vegetation such as *Chionochoa conspicua*, mountain tauhinu (*Ozothamnus vauvilliersii*), hebes (*Veronica* spp.) dominate plantings at some locations.

Rehabilitation planting within the BPCP will use species mixes that are more similar to natural vegetation communities and this is expected to result in a better rehabilitation outcome by creating more natural



and less homogenous vegetation types and including local species which would be slow to colonise rehabilitated areas on their own.

Some otherwise desirable species for planting, such as wire rush and Gahnia, are likely to be more difficult to cost-effectively propagate at scale and others, such as podocarps, may be both slower to grow to a robust size in nurseries and establish more slowly than those used currently, particularly at scale. These species should be still included in rehabilitation where possible through propagation at smaller scale and inclusion in plantings as enrichment species, as well as through VDT and salvage of individual plants. Other species, like mountain flax and red tussock, produce seed irregularly however these can be propagated by division and used at a larger scale. These species are listed as 'enrichment planting species' in the planting lists provided in this RMP.

Beech species (*Fuscospora*, *Lophozonia*) are a key feature of forest and tall shrubland types across the Buller Plateaux. Beech is not able to disperse long distances and is unlikely to appear at rehabilitated areas that are not adjacent to beech forest. Therefore, beech species need to be widely distributed in plantings where beech forest, or forest with a beech component, is the desired outcome. Other tree species, including the podocarps (yellow-silver pine (*Lepidothamnus intermedius*), pink pine (*Halocarpus biformis*), pygmy pine (*Lepidothamnus laxifolius*), bog pine (*Halocarpus bidwillii*) and thin barked tōtara (*Podocarpus laetus*) are slow growing and need attention to ensure they establish. Podocarps have not been propagated and widely used in plantings at Stockton Mine, however survival after planting of hand collected seedlings has been good (Ecological Solutions Limited 2025c).

## VDT Constraints

Not all vegetation types are suitable for VDT, with taller vegetation (> 1.5 m in height) and rocky soils being less suitable than shorter vegetation on more consistent soils. Taller vegetation can be used for VDT, though felling of trees over 3 to 5 m in height may be required and very large rootballs may not be feasible to transport.

Shallow or rocky soils are less amenable to VDT and slopes exceeding c. 12° require more expensive access techniques to create tracks that are gentle enough to provide access for excavators and trucks carrying VDT.

The ability to undertake direct and immediate relocation of VDT sods to suitable rehabilitated landform is a significant mine planning constraint, i.e., achieving alignment of the timing of vegetation stripping in relation to when an ELF is available to receive VDT. For the Cypress mining area, 'storage pads' were created as an interim solution to store vegetative material which will be relocated to the final landform once it is built (a type of 'indirect transfer'). This required additional storage space, which can significantly add to the adverse effects of a project if undisturbed vegetation is removed to provide storage space. Indirect transfer is not proposed as part of the BPCP.

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## Attachment 3: Rehabilitation Opportunities

### Summary

The BPCP has a number of features that are opportunities for achieving and securing high quality rehabilitation outcomes including outcomes from research to drive practice and procedures, a team of experienced staff already in existence, a mine plan that includes staging and configuration and local conditions that support establishment of appropriate vegetation. These matters are set out in more detail below.

### Research based outcomes

Rehabilitation outcomes for the Project are supported by detailed design and based on data from more than 30 years of trials and continuous improvement of the rehabilitation approaches and methods in the natural environment at Stockton. The most recent summary of rehabilitation outcomes (Ecological Solutions Limited 2026c) has been used in preparing this plan.

In addition, the ecological context (Ngakawau Ecological District) and local environment (Buller Plateaux) have been comparatively well studied and are well understood, including the risk that specific weeds (particularly gorse and heath rush) pose to achieving good rehabilitation outcomes and site-specific management approaches to dealing with effects such as acid and metalliferous drainage (AMD) and management of fauna.

### Rehabilitation Research Programme

The Project includes a research programme in relation to rehabilitation outcomes for approaches that are either untested or have not yet been attempted at scale and the results of this programme will inform future rehabilitation actions. This rehabilitation research programme will commence no later than five years after the Project Commencement Notice is given. The rehabilitation research programme will address, as relevant,

- effectiveness of VDT,
- indigenous vegetation establishment,
- wetland and riparian rehabilitation,
- *P. patrickensis* habitat establishment,
- lizard habitat construction,
- stream rehabilitation and kōura habitat creation,
- use of slash, mulch, rock slabs and boulders,
- *ex situ* propagation and repatriation of bryophytes to rehabilitated habitats,
- soil and substrate performance,
- weed and pest effects on rehabilitation, and,

- methods for improving rehabilitation success on engineered rocky faces and angle-of-repose slopes.

The results of the rehabilitation research programme will be reviewed at least every five years and used to inform any necessary amendments to the RMP.

## **Experienced staff**

Although the mine operator at Stockton has changed several times, many of the same personnel continue to be involved in both rehabilitation planning and monitoring and practical rehabilitation operations. There is experience with local conditions and operations, including VDT and salvage and placement of boulders up to at least 3m in a range of configurations including embedded in the substrate and placed on the surface.

There is a general expectation amongst existing staff of high-quality direct transfer across a range of soils and slopes and in the past there has been a team dedicated to achieving these outcomes.

## **Mine Planning and Configuration**

The provisional mine schedule allows for refinement of rehabilitation methods as mining proceeds based on research outcomes early in mine life, e.g., small areas of highwall are scheduled for rehabilitation in years 2 (at Mt Frederick South) and 5 (at Extended Escarpment) which will allow methods to be tested and refined before larger scale high wall rehabilitation is required.

## **Local conditions**

The Buller Plateaux receives high and regular rainfall. This allows planting and VDT to occur throughout most of the year and results in an average rainfall surplus in most months and therefore low drought stress. There is also minimal frost heave.

The Project Area includes undisturbed areas within and adjoining the Project footprint that have the potential to improve rehabilitation outcomes by providing linkages and seed sources.

There are large areas with suitable soils, low slopes and vegetation that is amenable to VDT.

Many of the potential weed species which could establish are either not present or present at few locations and/or low densities, meaning that eradication of some species, that could adversely affect rehabilitation outcomes, and prevention of others establishing is achievable. The poorly fertile and acidic soils also naturally limit the number of weed species capable of colonising the Project Area.

## Attachment 4: Ways in which this plan differs from existing rehabilitation practice

### Background

This plan has been informed by Ecological Solutions Limited (2026c) assessment of previous rehabilitation outcomes on the Buller Plateaux, mostly at Stockton Mine where practices have changed since mining began and there are few longstanding (>20 years) examples of successful approaches, but multiple more recent examples of approaches, including VDT, that were designed to improve outcomes and implemented at varying scales.

The rehabilitation procedures set out in this plan builds upon successful outcomes of existing and previous practice in several ways including planning and logistical changes and practical/implementation changes. Each of these are described in more detail below.

### Rehabilitation Planning

Rehabilitation planning for the BPCP has benefited from years of experience, trial and error, research as well as recent detailed measurement of rehabilitation outcomes (Ecological Solutions Limited 2026c). Incorporating techniques that lead to rehabilitation success into mine planning considerations are expected to lead to better, and more consistent, rehabilitation outcomes for the BPCP including:

- i) The legacy issues are well understood. Both AMD and the presence and existing distribution of weeds could affect rehabilitation outcomes. These matters are addressed in management plans (the AMD: Water Management Plan (BPCP-ENV-PLN-010, AMD: ELF Management Plan (BPCP-ENV-PLN-011) and Weed Management Plan (BPCP-ENV-PLN-008) respectively). At the commencement of mining at MFS and ESE mine planning has included a detailed understanding of available rehabilitation resources. Materials classification and planning to maximise the use of those in rehabilitating the site.
- ii) Development of best practice with respect to salvaging and storing rehabilitation resources, particularly resources that cannot form part of VDT, i.e., soils, boulders, vegetation and logs and the use of jumble dump to maximise outcomes. The prioritisation of use of fresh materials and scheduling of staged rehabilitation will maximise the regenerative potential of rehabilitated sites.
- iii) Planning to create heterogeneity in the ELF (particularly with respect to topography and drainage) which will underpin long-term variation in the resulting vegetation and enable restoration of wetlands and other habitat types previously largely ignored. Making landforms more variable at the macro (landform) scale and micro-topography scale including variations in soil depth rather than adopting a relatively consistent 300 mm on slopes.
- iv) Identifying soil and sub-soil layers prior to stripping and completing vegetation stripping in ways that delivers higher quality media for plant establishment (i.e., higher organic content with less subsoil).



- v) Identifying locations for particular vegetation types based on slope, drainage and exposure e.g. wetland vegetation and tarns at locations with low slope angle, prioritisation of VDT to support local sediment control and site wide connectivity objectives, including dispersal of propagules.
- vi) Planning of planting informed by previous trials relating to density, fertiliser use (including biosolids) and species growth and establishment to maximise vegetation cover and outcomes for fauna.
- vii) Focus on development of appropriate plant communities suited to site conditions rather than generic planting of a wide range of eco-sourced, and generally easily propagated species, across the rehabilitated landscape as is current practice. This will increase the proportion of manuka so it is the dominant species planted and decrease the extent and proportion of species that dominate most historic plantings at Stockton including flax, toetoe, tauhinu, broad-leaved tussock (*Chionochloa flavescens*) and broadleaf.
- viii) Approximately quadrupling the number of different vegetation types from three (tussock, low altitude and high-altitude/exposure shrubland) to eight (two forest types, four shrubland types, one low vegetation and rockfields).

## Practical considerations and Goals

- i) VDT operational matters including optimising and making safe tall forest vegetation for recovery, reducing costs via operational efficiencies, minimising gaps at laydown, optimising sod thickness, matching bucket sizes to soil and other site characteristics (e.g., consistent soil depths at Cypress supported larger bucket size, variable soil depths (as expected at MFS and ESE require smaller bucket sizes to achieve similar proportion of vegetation recovery)).
- ii) Selectively locating VDT across site rather than at large, concentrated areas. Distributing VDT more evenly across rehabilitated areas in blocks >0.5 ha size will provide dispersal nodes and to improve connectivity across the site.
- iii) Including deliberate recovery of resources such as boulders and logs for construction of habitat for lizards/ororoa including burrows/nesting opportunities.
- iv) Providing a moderate density of new, specifically-designed habitat features for kiwi and lizards made from recovered rock and/or wood
- v) Technological advancement such as GPS has allowed provision of more 'real time' information to operators via in cab GPS/screens to ensure maximum clarity with respect to requirements relating to 'on the ground' work and delivering more reliable build to design/destination and optimisation of the ELF construction and rehabilitation process.
- vi) Inclusion of podocarps, beech and other species to assist in restoring ecological function (such as seed dispersal and pollination) more quickly than otherwise expected.
- vii) Extensive establishment of wire rush via planting within rehabilitated shrubland and wetland vegetation types. To date wire rush has only been established either at small scale or via VDT.
- viii) Increased biosecurity and weed surveillance/monitoring and control with a greater range of non-native species being targeted for elimination.

## Attachment 5: Examples of important bryophyte and lichen habitats



*Rockfield with sandstone pavement and boulders, incorporating areas of VDT.*



*Forested 'Blockfield', Mount Frederick South.*





*'Blockfield' landscape, Mount Frederick South.*



*'Cloud forest', Mount Frederick South.*

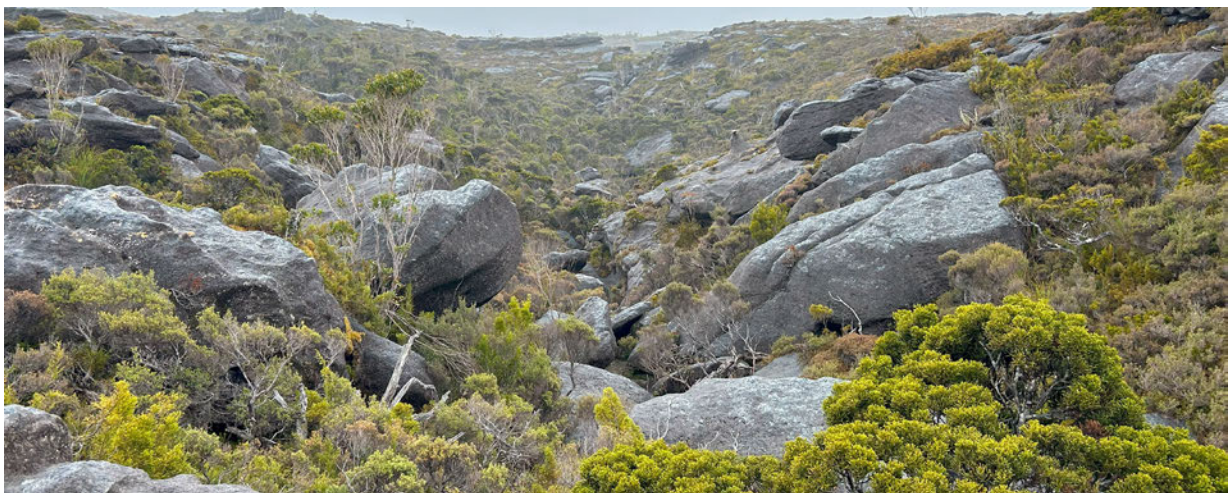


*Bryophyte 'Stalactites', Escarpment Extension.*





*'Sheets' of bryophytes, Upper Waimangaroa Haul Road.*



*Riparian bedrock, Denniston Plateau.*





*Pākihi with a small tarn, Mount Frederick South.*



*Red tussock grassland, Mount Frederick South (outside the Project footprint).*



*Low-stature mānuka shrubland with sandstone pavement, Escarpment Extension.*





*Area of open sandstone pavement with quartzite sands, Stockton Plateau.*



*Low pakihi, Mount Frederick South.*

## Attachment 6: Indicator Bryophyte taxa

| Habitat type                                                           | Indicator taxa of successional advanced communities |
|------------------------------------------------------------------------|-----------------------------------------------------|
| Forest,<br>Shrubland,<br>Pākihi / Tarns,<br>open sandstone<br>pavement | <i>Acromastigum</i>                                 |
|                                                                        | <i>Bazzania</i>                                     |
|                                                                        | <i>Ceramanus</i>                                    |
|                                                                        | <i>Gottschea</i>                                    |
|                                                                        | <i>Kurzia</i>                                       |
|                                                                        | <i>Lepidozia</i>                                    |
|                                                                        | <i>Neolepidozia</i>                                 |
|                                                                        | <i>Pallavicinia</i>                                 |
|                                                                        | <i>Pleurophascum ovalifolium</i>                    |
|                                                                        | <i>Psiloclada clandestina</i>                       |
|                                                                        | <i>Pulchrinodus inflatus</i>                        |
|                                                                        | <i>Rhacocarpus purpurascens</i>                     |
|                                                                        | <i>Riccardia</i>                                    |
|                                                                        | <i>Schistochila</i>                                 |
|                                                                        | <i>Syzygiella colorata</i>                          |
|                                                                        | <i>Telaranea</i>                                    |
|                                                                        | <i>Tricholepidozia</i>                              |
|                                                                        | <i>Zoopsis</i>                                      |

### Notes:

Some species formerly placed in *Telaranea* (Lepidoziaceae) are now placed in *Ceramanus*, *Kurzia*, *Neolepidozia* and *Tricholepidozia*.