Ecology and Landscape Management Plan

Wharekirauponga Underground Mine

2025

OCEANAGOLD WAIHI

ECOLOGY AND LANDSCAPE MANAGEMENT PLAN - WAIHI NORTH PROJECT (WAREKIRAUPONGA UNDERGROUND MINE)

3 March 2025

Certified on [date] as part of the Fast Track Approvals Act substantive application for the Waihi North Project.

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PART A: INTRODUCTION AND OVERVIEW

1. INTRODUCTION

1.1 OVERVIEW

OceanaGold New Zealand Limited's ("**OGNZL**") mining operation at Waihi has had a prolonged presence in Waihi, and during that time has played a significant role in influencing the ecology and landscape values of the area.

To sustain its ongoing operation, OGNZL is proposing the Waihi North Project ("**WNP**") to extend the life of its Waihi operation. WNP comprises several components, being:

- The mining of a new pit near the existing Processing Plant;
- A new tailings storage facility to the east of existing tailings storage facilities;
- A new rock stockpile area north of and adjacent to the existing tailings storage facilities;
- Changes to the layout of the existing Processing Plant;
- Upgrades to the existing Water Treatment Plant and reconsenting of the existing discharge of treated water to the Ohinemuri River;
- A new Wharekirauponga Underground Mine ("**WUG**"), under the Coromandel Forest Park ("**CFP**") north of Waihi; and
- Site infrastructure supporting the mine, located on farmland located at the end of Willows Road.

These components are shown in the following figure:

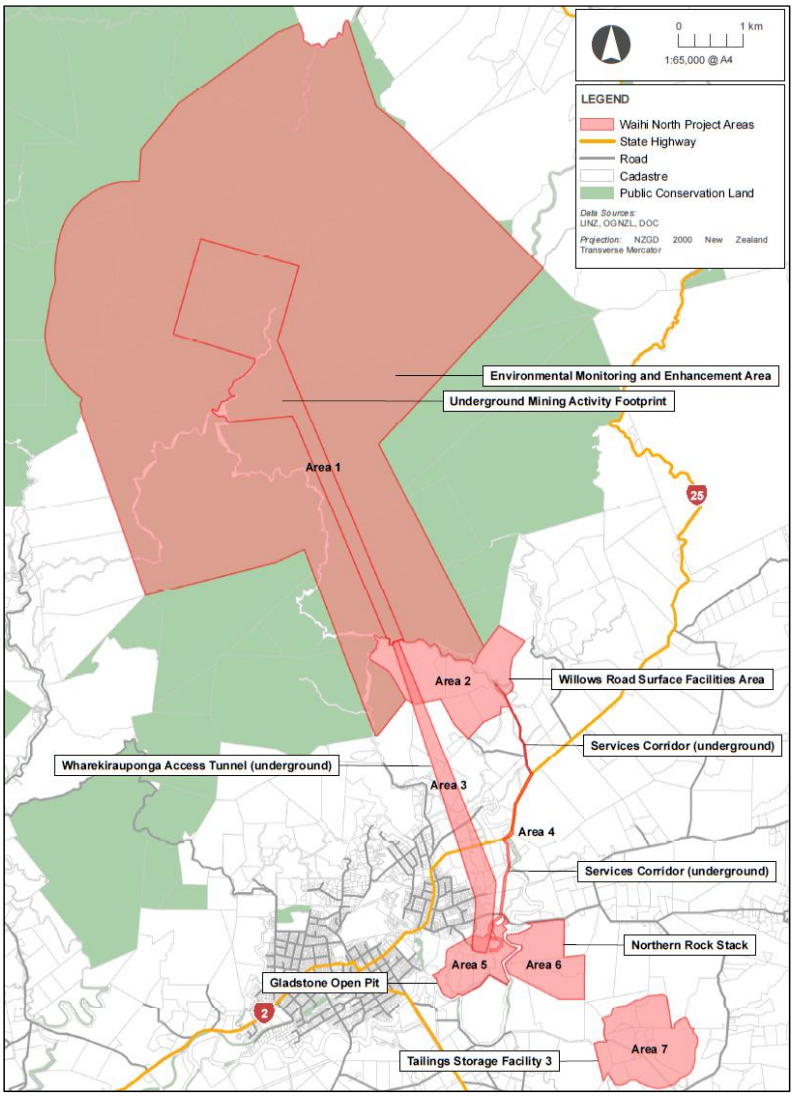

Figure 14: Waihi North Project Areas 1-7

This management plan addresses the components of the WNP associated with the WUG – being the underground mine and activities on farmland at the end of Willows Road (Areas 1 and 2 on the above figure). This plan does not address the ecological management of activities within the wider Waihi Area these are addressed in a separate management plan (ELMP – Waihi Area).

Several reports been compiled to assess the ecology and landscape effects of the WNP and recommend actions to avoid, mitigate, remedy, compensate or offset (as appropriate) potential impacts to a level such that a Net Ecological Gain is the anticipated outcome. This Ecology and Landscape Management Plan ("**Plan**") does not seek to replicate the assessments contained within that report: rather this Plan seeks to collate the management actions required to manage the actual and potential ecology and landscape effects of the WNP.

1.2 INTEGRATED LANDSCAPE AND ECOLOGICAL RESPONSE

The proposed mitigation for the Project has been developed as an integrated package of complementary measures that encompasses all landscape and ecological management initiatives and enhancements, with the intention that this coordinated effort achieves more than simply the 'sum of its respective components'. This Plan therefore largely addresses the ecological matters, as landscape management is included within the ecological management approach.

1.3 PLAN OBJECTIVE

The objective of this Plan is to identify how the potential adverse effects of the WNP (WUG) on the ecological, landscape and biodiversity values within the WNP (WUG Area) and its surrounds will be avoided, remedied, mitigated and offset for

(a) Vegetation;

(b) Habitats;

(c) Herpetofauna (lizards and frogs);

(d) Bats; and

(e) Avifauna.

This Plan details the methods OGNZL will use to comply with the relevant conditions of the authorisations for the WNP.

1.4 PLAN STRUCTURE

This Plan is split into several sections to address the various requirements of the proposed consent conditions, as follows:

Part A: Is this Introduction, which includes a high-level description of the WNP.

Part B: Contains the overarching Integrated Landscape and Ecological Response Plan.

Part C: Contains the Terrestrial Ecological Management Plan.

Part D: Contains the Vegetation Remediation Plan.

Part E: Contains the Plant Pathogens Management Plan.

Part FE: Contains the Aquatic Fauna Salvage and Relocation Plan.

Part GF: Contains the Kauri Dieback Management Plan.

Part H: Contains the Landscape and Visual Mitigation Plan.

Commented [MD1]: Updated to include additional plans that have been linked in.

2. EXISTING SYSTEMS

OGNZL already has significant systems in place to manage the ecology and landscape impacts of its activities. Through the existing operational consents and OGNZL's environmental philosophy, key controls have been established.

2.1 SITE RESPONSIBILITIES

Table 1 summarises the primary OGNZL responsibilities for landscape and ecological management.

Table 1: Responsibilities

Role	Responsibilities
General Manager	Approval of resources for ecology and landscape management.
Manager - Sustainability	Review and approval of all Ecology and Landscape Management Plans and reports. Management of resources to respond to biodiversity initiatives.
Senior Environmental Advisor / Planner	Author and reviewer of Ecology and Landscape Management Plans and reports, including the closely aligned Rehabilitation and Closure Plan. Coordination of initiatives and monitoring. Coordination of investigations into landscape and ecological impacts, both for existing projects and for new projects to enhance the sustainability of the operation.
Environmental Advisor / Officers	Monitoring of ecology and landscape management values as required. Supervision of contractors / consultants.
All employees	Avoidance of unnecessary detrimental impact on ecology and landscape values. Reporting of potential ecology and landscape impacts. Implementation, where appropriate, of relevant components of management plans.

PART B: INTEGRATED LANDSCAPE AND ECOLOGICAL RESPONSE PLAN

3. INTEGRATED LANDSCAPE AND ECOLOGICAL RESPONSE PLAN

The following table provides an overview of the planting required to manage the ecological and landscape effects of the WNP (WUG). Figure 2 provides the locations of these areas.

Table 2: Planting Referred to in Condition ~~165~~195 of the Hauraki District Council Conditions

Commented [MD2]: Amended to reflect condition number change.

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
Offset Planting				
Vent Shaft Offset	> Clearance of vegetation for first vent shaft / pump test site	> To offset for the loss of vegetation and habitat associated with the vent raises in Area 1. > To recreate complex broadleaf native forest habitat with species and vegetation tiers consistent with the Coromandel Forest Park (**CFP**). > To provide an extension of habitat for native fauna in the CFP. > To promote natural reseeding from the CFP. > General ecological and landscape enhancement.	> Stock and pig exclusion. > Low density native planting with suitable broadleaf species, for example kanuka (Kunzea robusta), pigeonwood (Hedycarya arborea), mahoe (Melicytus ramiflorus). Once established (3-5 years), enrichment planting with specimen tawa (Beilschmiedia tawa), miro (Prumnopitys ferruginea), pukatea (Laurelia novae-zelandiae) and rimu (Dacrydium cupressinum) > Planting should be staged to support natural forest regeneration processes particularly where natural seedling establishment is observed. > Weed control. > Mammalian pest control.	> Pioneer planting completed by the end of the first planting season following vegetation clearance for vent shafts within Area 1. > Enrichment planting of future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
Screen planting	> Commencement of Willows SFA construction	> To visually contain and assimilate landform modification and screen associated surface infrastructure area from Willows Road (including the unformed paper road) and adjoining rural dwellings.	> Stock exclusion; > Site preparation; > Standard mass planting of riparian and adjoining terrestrial areas using representative native pioneer species and non-invasive exotic shelter belt in specified area; > Enrichment with future representative canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species; > Establishment of a shelterbelt in the location shown in Figure A; > Weed control; and > Mammalian pest control.	> Planting complete within the first planting season following the completion of bulk earthworks in Area 2 associated with the establishment of the Willows Road Surface Facilities Area.
Other Terrestrial Planting within OGNZL owned land	As above	> To recreate complex broadleaf native forest habitat with species and vegetation tiers consistent with the CFP. > To provide an extension of habitat for native fauna in the CFP. > To promote natural reseeding from the CFP. > General ecological and landscape enhancement	> Stock and pig exclusion. > Low density native planting with suitable broadleaf species, for example kanuka (Kunzea robusta), pigeonwood (Hedycarya arborea), mahoe (Melicytus ramiflorus). Once established (3-5 years), enrichment planting with specimen tawa (Beilschmiedia tawa), miro (Prumnopitys ferruginea), pukatea	> As soon as practicable but no more than 10 years following commencement of activities within Area 2.

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
			(Laurelia novae-zelandiae) and rimu (Dacrydium cupressinum). > Planting should be staged to support natural forest regeneration processes particularly where natural seedling establishment is observed. > Weed control. > Mammalian pest control.	
Buffer Planting of the Coromandel Forest Edge (subject to approval being provided by the Department of Conservation)	As above	> Minimise edge effects and provide a buffer between the CFP and the farmland. > To recreate complex broadleaf native forest habitat with species and vegetation tiers consistent with the CFP. > To provide an extension of habitat for native fauna in the CFP. > To promote natural reseeding from the CFP. > General ecological and landscape enhancement	> Stock exclusion. > Low density native planting with suitable broadleaf species, for example, kanuka (Kunzea robusta), pigeonwood (Hedycarya arborea), mahoe (Melicytus ramiflorus). Once established (3-5 years), enrichment planting with specimen tawa (Beilschmiedia tawa), miro (Prumnopitys ferruginea), pukatea (Laurelia novae-zelandiae) and rimu (Dacrydium cupressinum). > Planting should be staged to support natural forest regeneration processes, particularly where natural seedling establishment is observed.	> As soon as practicable but no more than 10 years following commencement of activities within Area 2.

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
			> Weed control. > Mammalian pest control.	

Table 3: Planting Referred to in Condition G24

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
set Planting				
Willows Rock Stack Offset	> Commencement of construction works in Tributary 2	> To offset for the reclamation of tributary 2. > To protect and enhance aquatic ecological values.	> Stock exclusion. > Low stature riparian planting to prevent bank erosion and provide bank stability > High stature riparian planting to provide approximately 70% shade to stream channel. > Weed and pest browse control until riparian area matures (up to five-years).	> Pioneer planting complete by the end of the first planting season following commencing construction works in Tributary 2. > Enrichment planting of future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).
Warm Spring Compensation	> As per Vent Shaft Offset in Table 2 (to integrate with Vent Shaft offset planting).	> To compensate for the loss of warm spring.	> As per Vent Shaft Offset in Table 2 (to integrate with Vent Shaft offset planting).	> As per Vent Shaft Offset in Table 2 (to integrate with Vent Shaft offset planting).
Mataura Wetland	> Commencement of construction works in Tributary 2	> The Mataura wetland will be enhanced to improve the ecological values it provides.	> Stock exclusion. > Weed and pest plant clearance and management.	> Stock exclusion as soon as practicable. > Weed and pest plant management as soon as practicable.

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
			> Staged planting of wetland plants within the wetland area with seed derived from local seedbank. > Assist the regrowth or replenishment of ecologically sourced swamp maire. > Ensure that the hydrological (surface and groundwater) connection and hydrological replenishment is maintained.	> Pioneer planting complete by the end of the first planting season following commencing construction works in Tributary 2. > Enrichment planting of future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).
Other Riparian Planting within OGNZL owned land	> Commencement of activities within Area 2	> To protect and enhance aquatic ecological values > To enhance stream conditions and connectivity throughout stream and river network of the Ohinemuri River catchment	> Stock exclusion. > Low stature riparian planting to prevent bank erosion and provide bank stability > High stature riparian planting to provide approximately 70% shade to stream channel. > Weed and pest browse control until riparian area matures (up to five-years).	> Pioneer planting complete as soon as practicable but no more than 10 years following commencement of activities within Area 2. > Enrichment planting of future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).
Other Riparian Planting on land owned by others	> Commencement of activities within Area 2	> To protect and enhance aquatic ecological values > To enhance stream conditions and connectivity throughout	> Stock exclusion. > Low stature riparian planting to prevent bank erosion and provide bank stability	> Pioneer planting complete as soon as practicable but no more than 10 years following commencement of activities within Area 2.

Area	Trigger Activity	Objective	Treatment	Timeframe / Performance Indicators
		stream and river network of the Ohinemuri River catchment	> High stature riparian planting to provide approximately 70% shade to stream channel. > Weed and pest browse control until riparian area matures (up to five-years).	> Enrichment planting of future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).

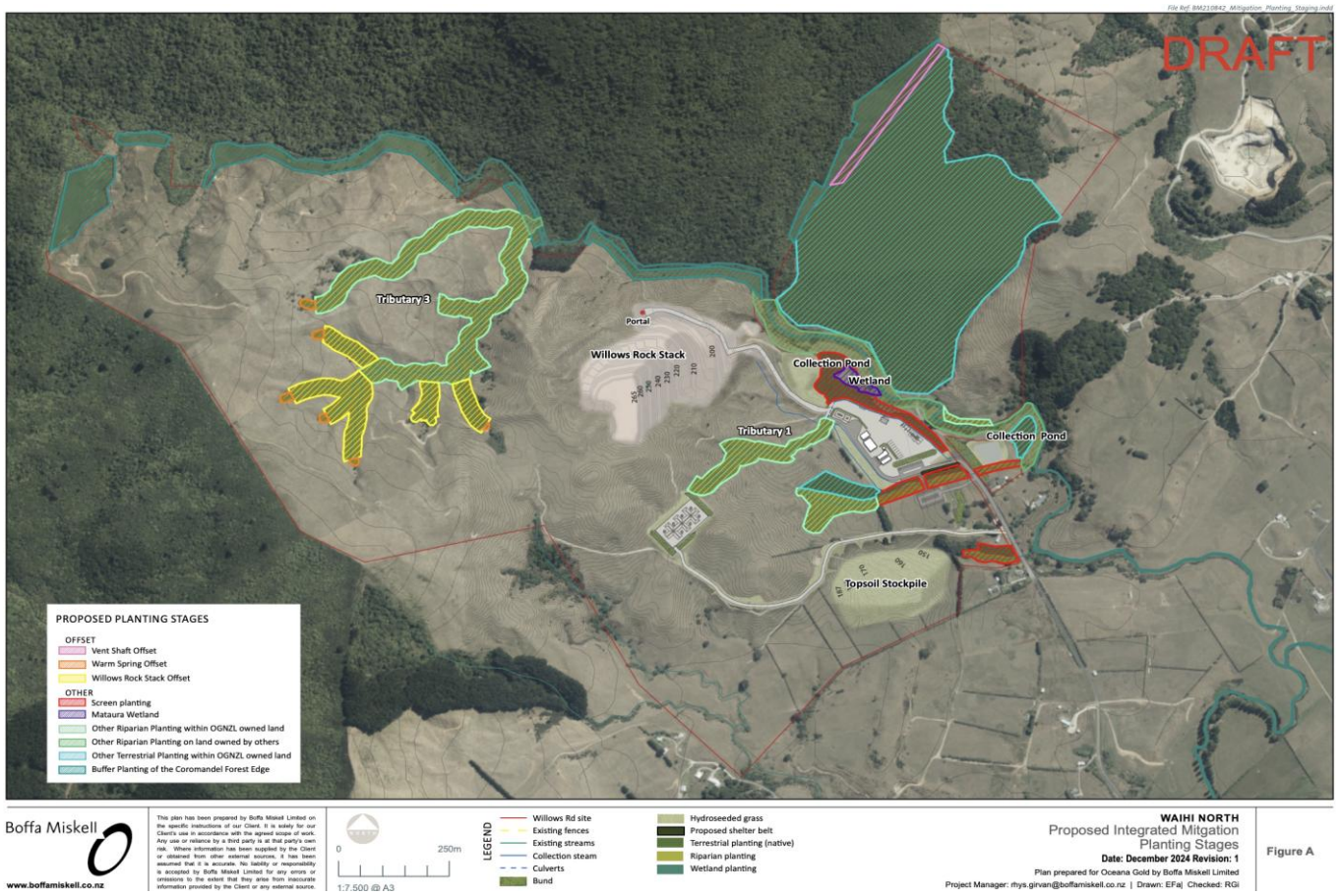

Figure 2~~2~~: Proposed Integrated Mitigation Planting Plan

PART C: TERRESTRIAL ECOLOGICAL MANAGEMENT PLAN

4. TERRESTRIAL ECOLOGICAL MANAGEMENT PLAN

4.1 INTRODUCTION

4.1.1 Overview

OGNZL is proposing to extend the life of its Waihi operation through the Waihi North Project ("**WNP**", "**the Project**"). The Project comprises several components to expand the Waihi operation including a new open pit (Gladstone Open Pit) and one new underground mine, Wharekirauponga Underground Mine ("**WUG**").

This report describes the ecological management actions to avoid, minimise and remedy the potential terrestrial ecological effects associated vegetation and habitat clearance for the WUG only.

The Project Site for the WUG includes two discrete areas, Area 2 where the portal and supporting surface infrastructure will be located, and Coromandel Forest Park where exploration drill sites, pump sites, and ventilation raises will be located (Area 1) (Figure 3). The actions described in this report are based on information and management requirements described in the Terrestrial Ecology Values and Effects of the WUG (Boffa Miskell, 2025a).

4.1.2 Purpose

The primary effect of the Project within Coromandel Forest Park is the temporary loss of high value vegetation / habitat at up to 24 sites (comprising up to 0.66 ha) at the proposed exploration drill, pump and vent raise sites and impacts on native fauna that occupy those areas. The primary effect of the Project at Willows Road Farm is the loss of 0.25 ha of low value potential fauna habitats.

This report describes methods to reduce the potential impacts of vegetation and habitat removal associated with the WUG. Management actions associated with Areas 1 and 2 are described separately because of their different ecological values and land ownership.

The matters addressed here are additional to those relating to noise, artificial light, discharges to air, episodic vibration and the spread of kauri dieback.

4.1.3 Objective

The overall objective for all fauna groups at all Project sites is to:

- Maintain / enhance species' population within works' areas by avoiding and minimising impacts on them.
- If fauna salvage is required, the release site must be of a suitable quality and extent to support the population of the species to be relocated.
- Demonstrate a protective benefit for fauna groups through additional actions.

These objectives will be achieved by implementing industry-accepted best practice methods and undertaken by suitably experienced specialists. These are referenced in the following sections where appropriate.

The ecological communities included in this plan are:

- Vegetation communities
- Native frogs
- Native lizards
- Native birds
- Native bats

Ecological management for Coromandel Forest Park is provided in Section 4.2 and Willows Road Farm in Section 4.3.

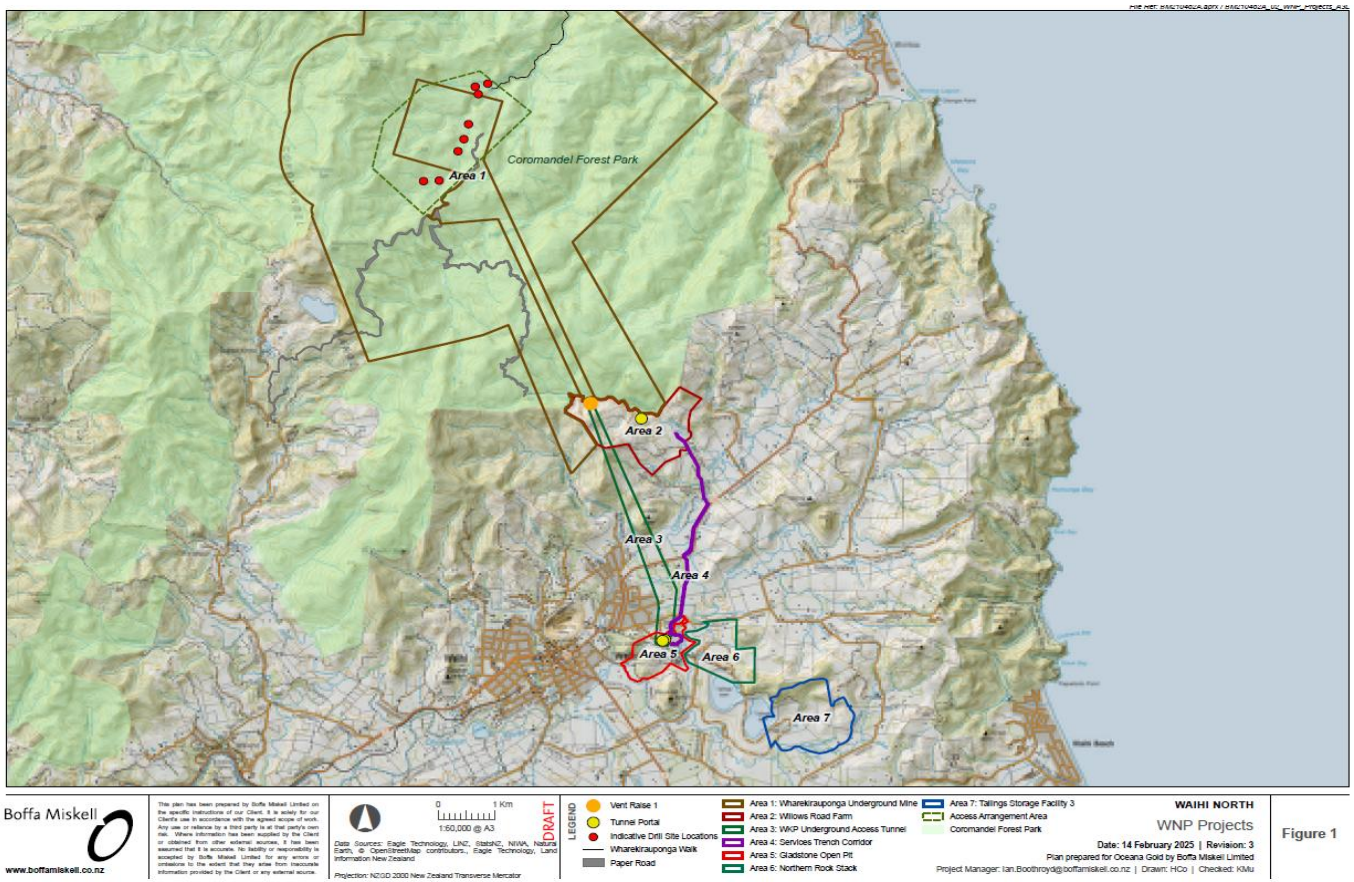

Figure 3~~3~~: Location and layout of the WNP

4.2 COROMANDEL FOREST PARK

4.2.1 Location

The WUG is located under the Coromandel Forest Park, within the Mataura, Ramarama, Waiharakeke and Wharekirauponga catchments. The WUG is located south of Otahu Ecological Area and is a typical example of Coromandel forest. The WNP project works are located within the Access Arrangement area indicated in (Figure ~~3~~4).

4.2.2 Summary of Ecological Values

Coromandel Forest Park has very high ecological values using any of the widely accepted methods for assessing ecological value. These include meeting several Waikato Regional Policy Statement (WRPS) criteria for indigenous biodiversity significance; as well as all of the Department of Conservation criteria for assessing ecological values (Davis 2016)4, and ecological "matters for evaluation described in Roper-Lindsay et al. Briefly, ecological features recorded in Wharekirauponga catchment include:

- Three broad vegetation types (kauri forest, mixed secondary broadleaved forest, kanuka scrub) consistent with early to mid-successional stages of the WF11 and WF13 ecosystem units typical of Coromandel Forest Park.
- 34 orchid species, Pittosporum virgatum, and king fern.
- Archey's and Hochstetter's frogs (both classified as 'At Risk – Declining').
- Forest and elegant gecko (both classified as 'At Risk – Declining'), although other lizard species may be present, but not detected.
- Long-tailed bats (*Chalinolobus tuberculatus*, classified as Threatened – Nationally Critical), were not recorded in Wharekirauponga in surveys between 2017 and 2021, or previously. However, recent surveys by Bioresearches (2025a) and Boffa Miskell (unpublished) recorded bats around Gladstone Pit (southeast of the site) and Maratoto (4.5 km southwest of the site) in 2024.
- Twenty-four bird species, 16 of which are native, were recorded in Wharekirauponga catchment. Of these, kākāriki/ yellow-crowned parakeet, and kākā are of conservation concern.
- No specific invertebrate surveys have been carried out in Wharekirauponga, but species associated interior forests (e.g. wētā, paua slugs and peripatus) were commonly observed during nocturnal frog and lizard surveys.

- Predators and animal pest species including rats, mice, possums, stoats, feral cats, pigs, and deer have been detected in pest monitoring surveys. With the exception of feral cats and deer, all species were recorded at moderate- high densities.

4.2.3 Activities

The primary project elements associated with the Coromandel Forest Park land will be located underground and comprise a dual decline tunnel and mine excavations.

Above ground elements located in conservation estate include exploration drill sites, and geotechnical drill sites to confirm tunnel alignment and/or location of vent raises. New and existing drill sites may be subsequently used for camps / messing facilities and helipads to service the drilling and mining operation. Exploration, geotechnical and vent raise sites may be located in the existing Access Arrangement area, or outside of it above the dual access decline.

Two types of ground clearance will be used:

- **Man-portable rig drill investigations** at up to 50 sites to determine suitable locations for vertical ventilation shafts. Man-portable rig investigations do not require tree clearance, but will require clearance of groundcovers, wood debris and forest duff which provide habitat for native species over an area of **32 m²** each. Man-portable rigs will be located in natural clearings and the drill rig will be placed on bedlogs to prevent soil damage. Ground materials will be stored next to the drill site and returned when drilling is complete.
- **Drill site / pump test / vent raise sites** clearance where the site must be cleared of woody trees and large ferns. A temporary, raised wooden platform will be constructed to create a flat surface for the drill rig and portacoms / sheds. The platform will remain in place until the site is rehabilitated (1 – 7 years occupancy with an average of 2 years) or used as a vent site. The cumulative clearance area for all sites is **up to 0.66 ha**.

Sites will be accessed using walking tracks, although machinery and materials will be flown in by helicopter.

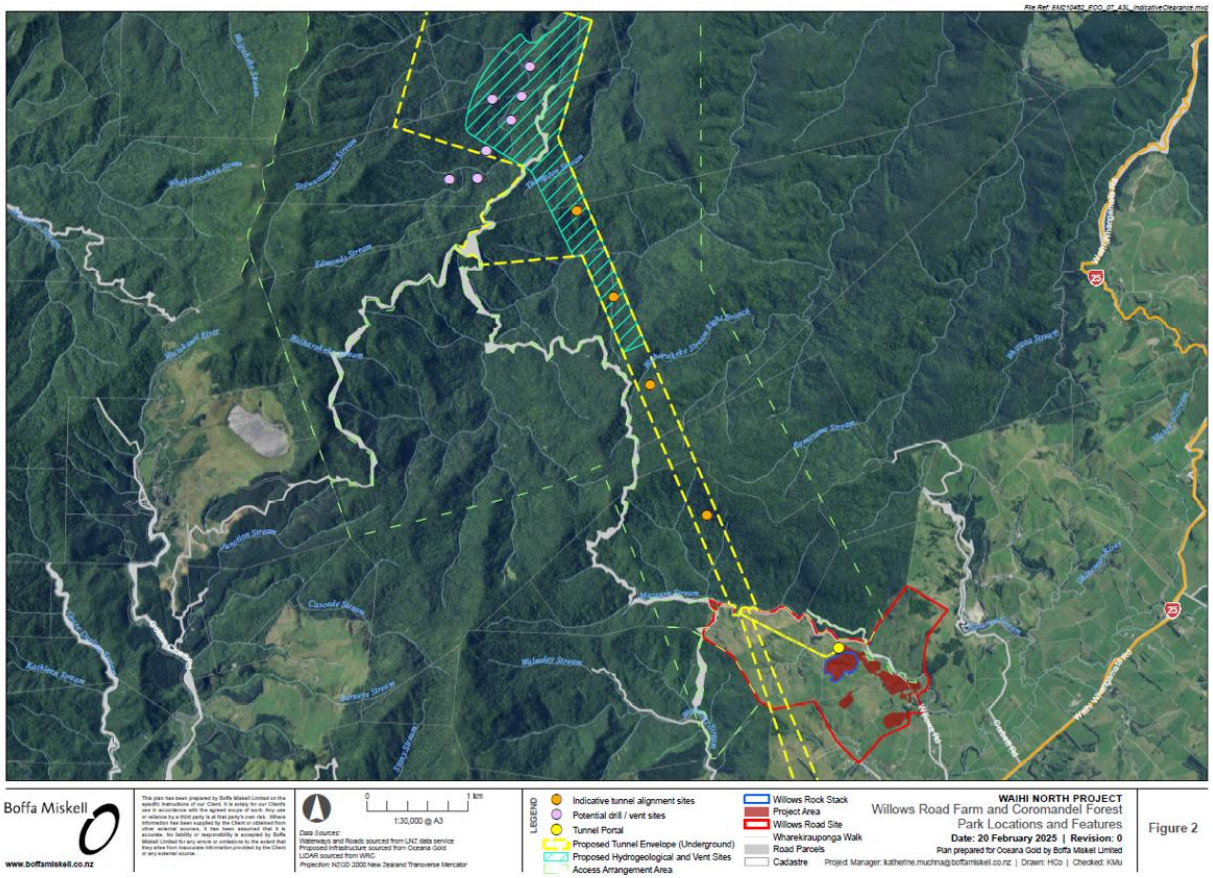

Figure 44: Indicative Clearance Areas

4.2.4 General Principles: Vegetation and Fauna Management

4.2.4.1 Rationale

Requirements for vegetation and fauna management under this Plan include the planned translocation of fauna (native frogs, lizards and notable invertebrates) out of vegetation clearance areas at man-portable drill and drill sites (if required), ~~pump test~~ and vent raise sites; avoiding active native bird nests and occupied bat roosts; and facilitating the natural regeneration of the site once drilling / use as a vent site is complete.

This Plan provides a ~~stronger~~ different approach to managing and monitoring fauna values relative to previous Access Arrangement (AA) and Wildlife Act Authority (WAA) conditions ('the conditions') for mining operations at Waihi associated with site clearance. Briefly, the previous conditions required pre-clearance surveys with the objective of avoiding sites where frogs and native lizards were present; and a 6 m buffer around each frog observation wherein no vegetation clearance was permitted. If 4 or fewer frogs or lizards were detected immediately prior to, or during site clearance, Condition 91 of the AA required that they be captured and relocated at least 100 m away (i.e. translocation was a possible outcome of the site clearance – and was undertaken 3 times). To date, no lizards have been detected within sites, or translocated.

This Plan improves on the "salvage translocation" requirement and will provide better protection for Archey's frogs. Specifically,

- Carefully planning and monitoring the outcome of the translocations allows OGNZL to improve techniques and adapt management over time in response to monitoring outcomes.
- ~~Repeated surveys of clearance sites can result in damage to the habitat (trampling) with the potential to injure frogs (although this has not been observed).~~
- ~~Repeated handling of frogs during successive surveys may be stressful for them, and result in reduced emergence. Often, fewer emerged frogs are found on the second and third night surveys.~~
- The pest control requirement in the current conditions does not address major predators such as pigs and is on a small scale where constant reinvasion is a certainty.

Leiopelma frog translocations undertaken to date have had low success, particularly salvage translocations which are often rushed and insufficiently funded in the long term. This document sets out ~~a number of~~several process improvements so that there is

sufficient time and resources made available to plan, prepare, carry out and monitor translocations, of frogs (and lizards if required).

4.2.4.2 Process

Commented [MD3]: Section updated to include greater detail of the differing approaches proposed at each type of site.

Man-portable drill sites

Up to 50 man-portable drill sites will be located in clearings and will avoid deep leaf litter, wood debris and other features likely to be occupied by native species. Man-portable drill site locations will be selected based on accessibility, geotechnical requirements and habitat conditions. No overhead vegetation clearance is proposed for these sites. There is no formal process for selecting man-portable locations because of the comparatively low impact and the short duration of works.

Once selected, the process for man-portable sites is:

1. Survey for 1 day and 1 night to detect lizards and frogs. If none are detected during surveys,
2. Fence site with polythene fence to prevent frog / lizard access
3. Remove leaf litter and woody debris, salvage translocate any previously undetected frogs / lizards
4. Install drill, commence drilling
5. Remove drill
6. Remove fencing
7. Return material to drill footprint

Drill sites

Up to 20 drill sites (including exploration sites (8), hydrogeological piezometer sites (4), geotechnical drill sites (8) are proposed. These sites will be surveyed in a manner similar to the Access Arrangement conditions described above. Surveys will be conducted over three nights for frogs; and three days and three nights for lizards in suitable conditions for each group. If a frog is detected, a 3 m buffer will be applied to that location wherein no habitat clearance can be undertaken. If more than 5 frogs or lizards are detected on the site, that site cannot be used.

Drill sites require 150m^2 cleared area.

Once selected, the process for drill sites is:

1. Fence site with polythene fence to prevent frog / lizard access

2. Remove leaf litter and woody debris over 1 week, fell trees (as required), salvage translocate any previously undetected frogs / lizards (refer to Section **Error! Reference source not found.** and **Error! Reference source not found.**)

3. Install drill, commence drilling

4. Remove drill

5. Remove fencing

6. Return material to drill footprint

Vent sites

Up to ~~2~~4 ~~drill and~~ vent sites will be selected based on the site selection criteria described in Appendix 4A. Each potential site will be assessed by walkover survey to identify ecological features, particularly:

> Vegetation and habitat cover as a proxy for likelihood of frog presence.

> Size and location of large tree specimens.

> Presence of bat roost features.

All sites will then be assessed through the MCA process (Appendix 4A and Section 4.2.4.3).

Clearance of the selected site~~s~~ will follow the 'fauna salvage and translocation' process below (Figure 5 and Figure 6)~~,~~ and described in the subsequent sections.

Trampling and disturbance of animals and their habitat will be minimised by using the same marked access routes for access to, within and between the sites throughout all activities in Coromandel Forest Park.

Once site clearance is complete (i.e. all fauna and vegetation debris will be~~is~~ translocated out of the fenced area), the ecologist will notify OGNZL that ecological works are complete and that construction can begin.

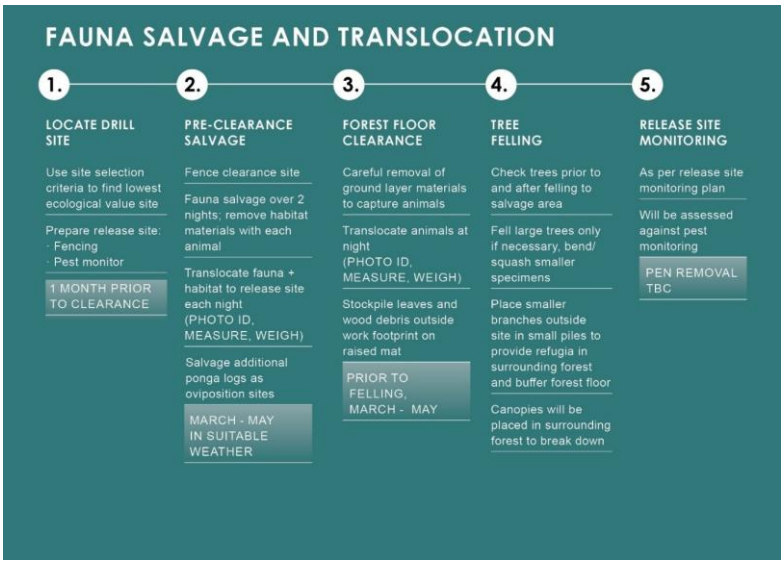

Figure 5~~6~~: Fauna salvage and translocation process for vent sites (30 m^2).

Stage 2: Site fencing

Stage 2: Fauna salvage (note that ziplock bags will not be used)

Stage 3: Forest floor clearance

Stage 4: Tree felling

Stage 4: Stacked wood piles

Built platform

Figure 6~~7~~: Site clearance process

4.2.4.3 ~~Drill and~~ Vent Site Selection Criteria

The protocol to select the ~~location of drill, pump test and~~ vent sites follows a cascading management approach whereby:

1. A short list of suitable investigative drill and pump test sites will be selected based on OGNZL's technical requirements; and
2. A short list of suitable vent shaft sites will be selected (assisted by the use of data captured during man-portable drilling at up to 50 sites).
3. Shortlisted sites will then be subject to a multicriteria assessment ("MCA") by appropriately qualified and experienced experts, who will evaluate each potential site against ecological, freshwater, landscape, heritage and recreational criteria. The final sites will be selected based on the outcomes of the MCA. This protocol will ensure that selected sites meet OGNZL's technical requirements, whilst minimising adverse effects on the environment. The MCA Assessment tool is provided in Appendix 4A.

Locations of investigative drill, pump test and vent raise sites will be chosen to be achieve the outcomes set out below.

Multicriteria Assessment Outcomes:

Terrestrial Fauna

- The loss of 'At Risk' or 'Threatened' herpetofauna is avoided;
- The loss of 'At Risk' or 'Threatened' terrestrial invertebrates is avoided;
- The removal of bat roosting trees is avoided; and
- The removal of trees in which birds are actively nesting is avoided.

Terrestrial Flora

- The loss of 'At Risk' or 'Threatened' flora is avoided;
- The loss of mature trees (i.e. at drill sites this is trees that are ≥50 cm dbh and at vent sites this is no more than 4 trees ≥100 cm dbh) is minimised where practicable; and
- Preference is given to sites where trees can be trimmed or tied back in such a way as to minimise felling.

4.2.4.4 Drill and vent site fencing

Once a drill or vent site is selected, and before site clearance, it will be fenced with a sheer polythene fence to prevent lizards or frogs from dispersing into the site. The sheer polythene fence will remain erected for the duration of site clearance and drilling until the drill site is rehabilitated and activities have ceased, or once the evase is constructed in the case of vent sites.

Specifications for the fence are:

- The fence will be staked at regular intervals (similar to a silt fence).
- The fence should be tightly pinned to the ground with the lip facing out of the works area.
- The fence will be a minimum of 800 mm high.

Fencing will be inspected on a regular basis (i.e., at least every three weeks), and after any storm event or drill rig relocations. If the integrity of the fence is not maintained, and rips, tears or holes are observed, the fence will be repaired immediately. Overhanging vegetation will be tied back or trimmed. Corrective actions, dates, and repairs will be recorded in the maintenance records.

Man-portable drill rigs sites will also be fenced to exclude fauna, although the fencing will only be in place for a short time (days) and does not require frequent checks / maintenance. Drilling contractors will inform OGNZL of any fence damage during drilling works.

4.2.4.5 Release site location~~s~~

~~Two~~ An indicative fauna release site location~~s have~~ has been identified to translocate animals from the northern drill and pump test sites; and from the southern vent, tunnel alignment and pump test sites. Criteria for the release site~~s are~~ is that:

- The locations must be more than 200 m from the edge of the Wharekirauponga Animal Pest Management Area (WAPMA) where any translocated and resident animals in the release site will be buffered from rodent reinvasion.
- The site must be outside of the 2 mm/ s vibration footprint (Figure 7).
- The release site must be walkable within 2 hr from the clearance site to minimize stress to fauna during transport.

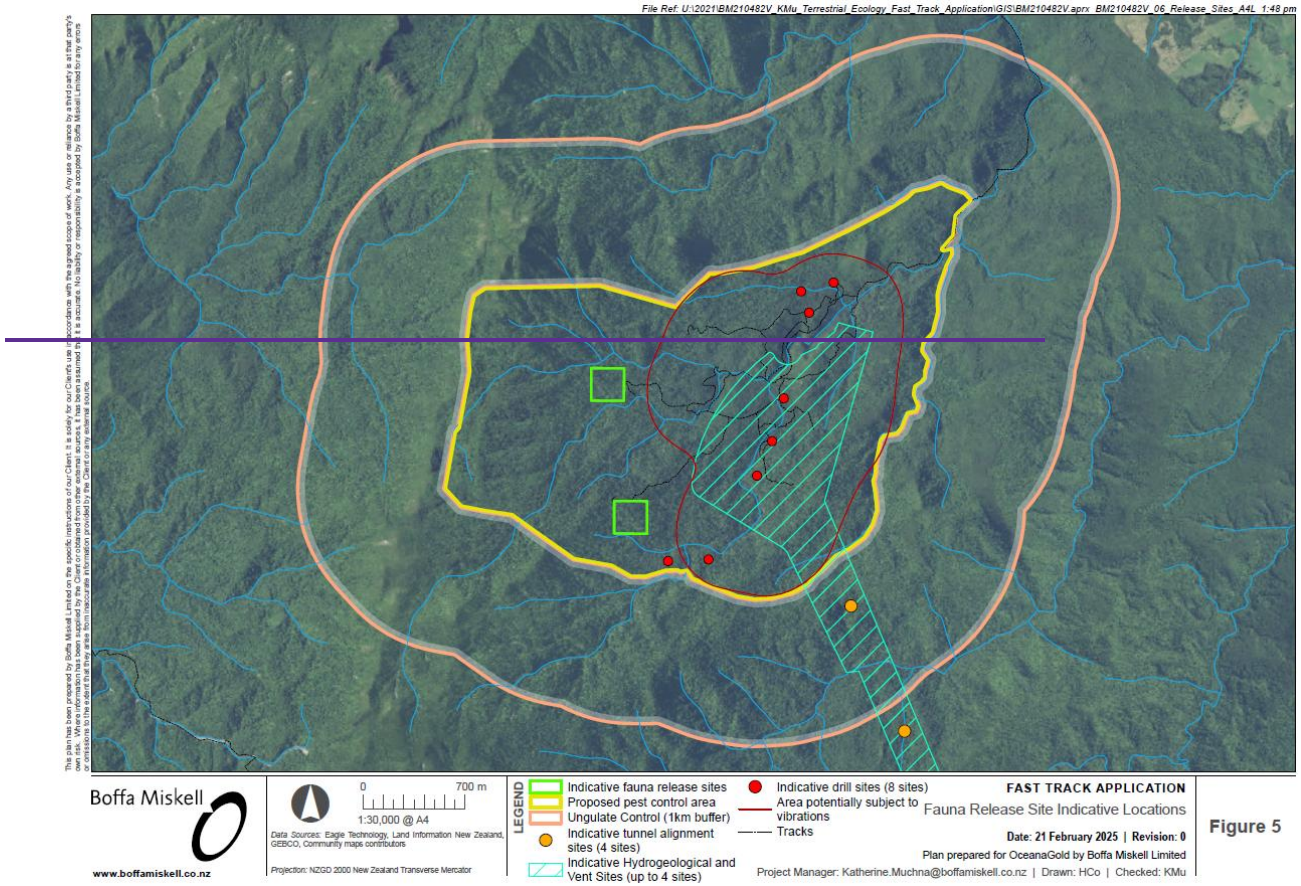
File Ref: U:\2021\BM210482V_KMu_Terrestrial_Ecology_Fast_Track_Application\GIS\BM210482V.aprx BM210482V_06_Release_Sites_A4L 1:48 pm
This plan has been prepared by Boffa Miskell Limited on the specific instructions of our Client. It is solely for our Client's use in accordance with the agreed scope of work. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate. No liability or responsibility is accepted by Boffa Miskell Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.
Boffa Miskell
www.boffamiskell.co.nz
0
700 m
1:30,000 @ A4
Data Sources: Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors
Projection: NZGD 2000 New Zealand Transverse Mercator
LEGEND
Indicative fauna release sites
Proposed pest control area
Ungulate Control (1km buffer)
Indicative tunnel alignment sites (4 sites)
Indicative Hydrogeological and Vent Sites (up to 4 sites)
Indicative drill sites (8 sites)
Area potentially subject to vibrations
Tracks
FAST TRACK APPLICATION
Fauna Release Site Indicative Locations
Date: 21 February 2025 | Revision: 0
Plan prepared for OceanaGold by Boffa Miskell Limited
Project Manager: Katherine.Muchna@boffamiskell.co.nz | Drawn: HCo | Checked: KMu

Figure 5

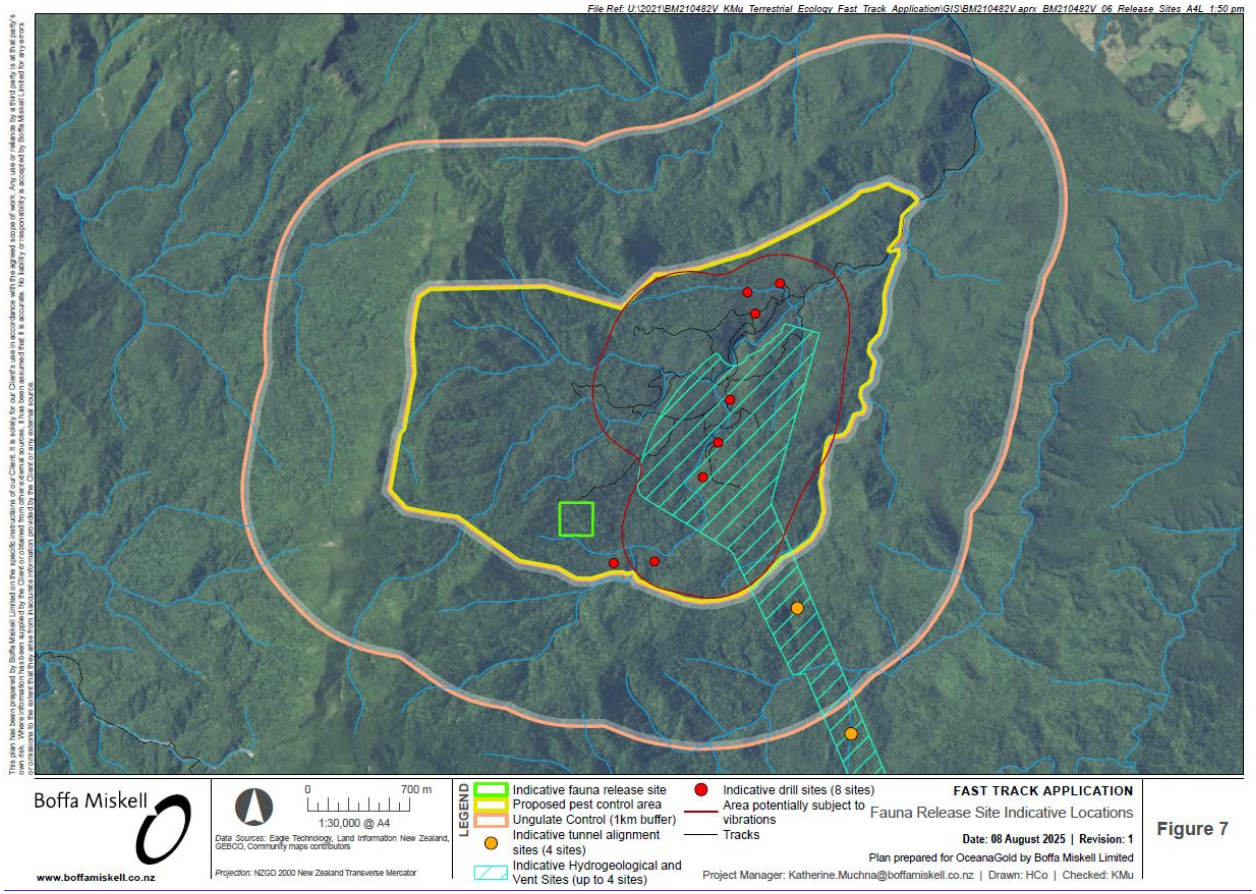

Figure 7~~8~~: Fauna release site indicative locations.

Commented [CM4]: Katherine Muchna: Figure 7 has been updated as we are now only proposing one release site because the number of frogs to be translocated is much lower than originally anticipated when we were using the MCA process to select all drill / vent sites. Because we are carrying out surveys before selecting drill sites, to exclude ones with frogs, we're unlikely to salvage as many.

4.2.4.6 Release area and design

All lizards, frogs and At Risk invertebrates captured during site clearance will be translocated to a prepared release ~~area~~site. The release ~~area~~ site should have the following characteristics:

- A minimum of 5 ha in size with no streams or rivers through the site.
- Has ≥ 50% cover of species favoured by frogs in Wharekirauponga, favouring kiekie, fern, gahnia and leaf litter (Figure 8).
- The surveyed resident frog population will have a surveyed density of between 5 and 10 frogs / 100 m2 (i.e. 20-40 frogs in 400m2 plot), based on surveys carried out over a minimum of 6 nights to maximise detection and recapture probability.
- The release site will have predator control in place prior to translocation and pest abundance must meet monitoring targets. Frogs must be released within one of six soft release pens, which will be 0.04ha in size and enhanced by including habitat features recovered from the capture site (Figure 9). The soft release pens should be enhanced with arboreal cover objects and ground-based cover objects (artificial cover objects, ACOs) to provide a release point for any lizards captured within the drill / vents during clearance.
- Soft release pens will be constructed with materials similar to an Animex Wildlife Fencing (AMX-T40 – Temporary Fencing), which has a 25 year expected lifespan.[1]
- Lizards and translocated invertebrates should be released into suitable habitat depending on the species. Acoustic recorders will be installed in and around the release area prior to fencing to ensure kiwi aren't present.

Commented [MD5]: Added for further detail.

[1] https://animexfencing.com/amx-t/40in

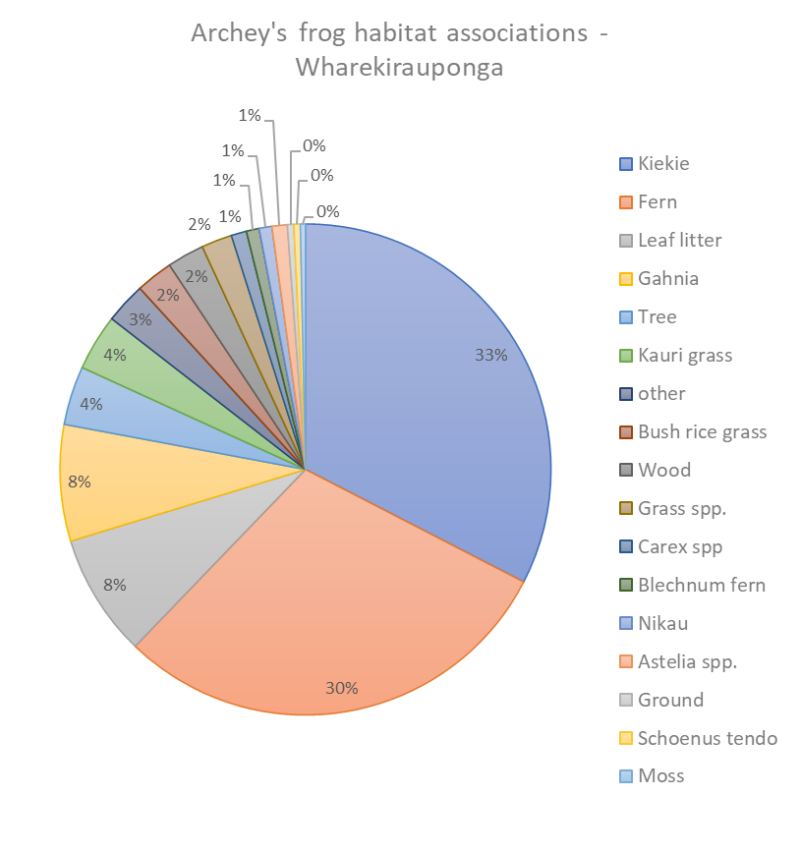

Figure 8~~89~~: Archey's frog habitat associations in Wharekirauponga

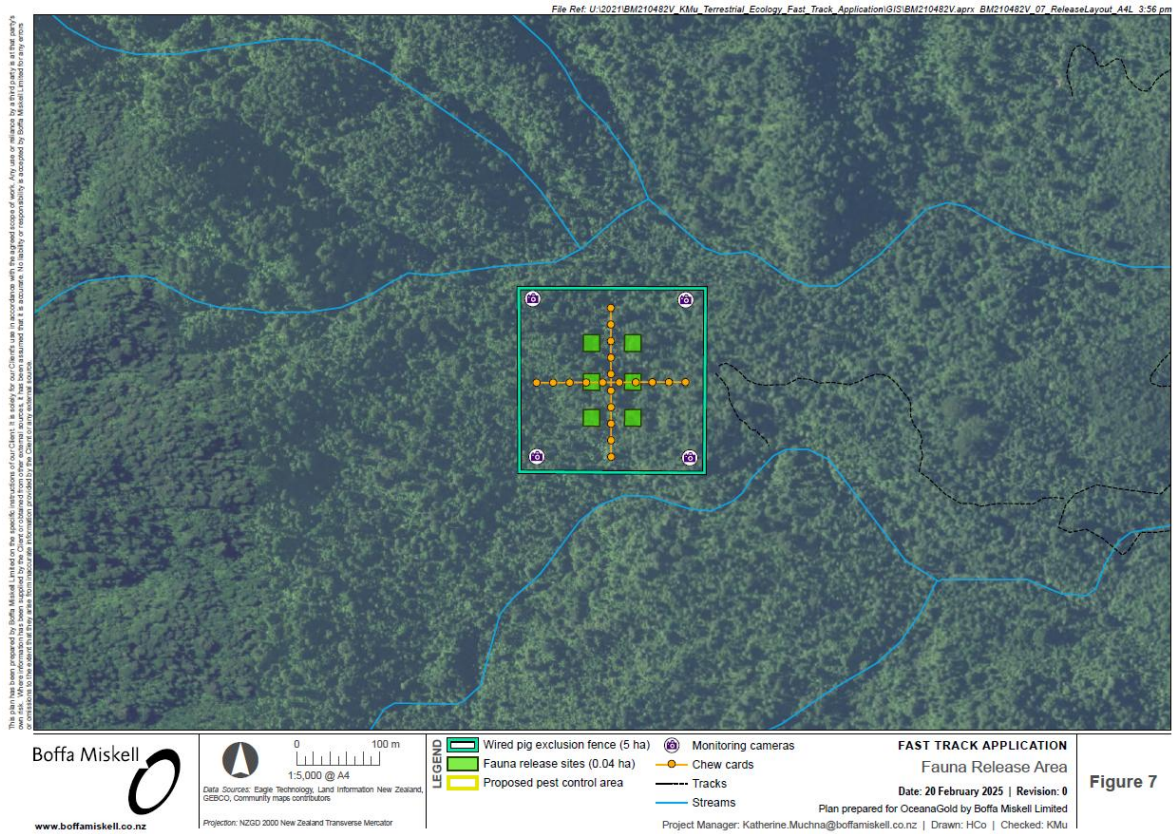

Figure 9~~10~~: Proposed fauna release site layout.

4.2.4.7 Predator control and monitoring

Commented [MD6]: Amendments made in this section to provide greater detail.

Predator control at the release site comprises bait stations, traps and an electrified ~~pig~~ wire on a low height fence. The site will be monitored using cameras and chew cards and there will be a higher density of control devices around the perimeter (Figure ~~9~~ 10~~and Figure 10~~).

- The release site will be situated within the wider WPAMA (Wharekirauponga Pest Animal Management Area, described in the Wharekirauponga Pest Animal Management Plan) and will benefit from intensive pest management once the pest control in this wider area has been initiated.
- If the release site is used before the wider WPAMA pest plan has commenced, it should be surrounded by a low-height pest fence, capable of preventing access from pigs and deterring other key predators (including ferrets, feral cats and stoats). This fence will use waratahs, fine mesh and electric wires to prevent ungulate entry.
- The low height fence will be up to 1100 cm high to deter goats and exclude pigs. The electrified wire will be offset from the fence, preventing frogs from being electrocuted.
- Fences can act as a significant movement barrier for all pests, as they tend to run along the outside of fences once encountered. Therefore, trap/s capable of catching the full range of pest species (mice through to feral cats, but excluding pigs), will be deployed at 25 m intervals alongside the outer perimeter of the fence boundary.
- Within the fenced area, bait stations and traps will be placed at 50 m intervals in a grid formation. Bait stations will target rodents, and traps will be capable of catching rodents, mustelids and feral cats.
- Predator monitoring will comprise seasonal (i.e. every 3 months) chew card and trail camera deployment. Chew cards will be in place for 3 days, and trail cameras will record for 3 weeks.
- The management targets for mice, rats, possums, mustelids, feral cats, and ungulates, and associated thresholds for additional control are set out in Table 4 below.

Table 4: Summary of Management Targets and Thresholds for Initiating Control and Monitoring Frequency

Pest Species	Management Targets	Threshold	Monitoring Frequency
Mice	<5% CCI (yea-round)	≥~~10~~5% CCI (year-round)	Before and after toxic control, four monitors

Pest Species	Management Targets	Threshold	Monitoring Frequency
Rates	<2.5% CCI (Nov-Feb); <5% (Mar-Oct)	≥ 5% CCI (Nov-Feb); ≥10% (Mar-Oct)	per year in February, May, August, and November. Ongoing monitoring using automated technology
Possums	<1% CCI and/or RTC (Nov-Feb); <5% (Mar-Oct).	≥ 5% CCI and/or RTC (Nov-Feb); ≥10% (Mar-Oct)	
Mustelids (stoats and ferrets)	A combination of camera trap indices (<3 detections per 2000 CH) and catch rates, based on DOC best-practice	≥3 detections per 2000 CH	
Feral cats	A combination of camera trap indices (<3 detections per 2000 CH) and catch rates, based on DOC best-practice	≥3 detections per 2000 CH	
Ungulates	Zero density	Any observation (incl. sign)	

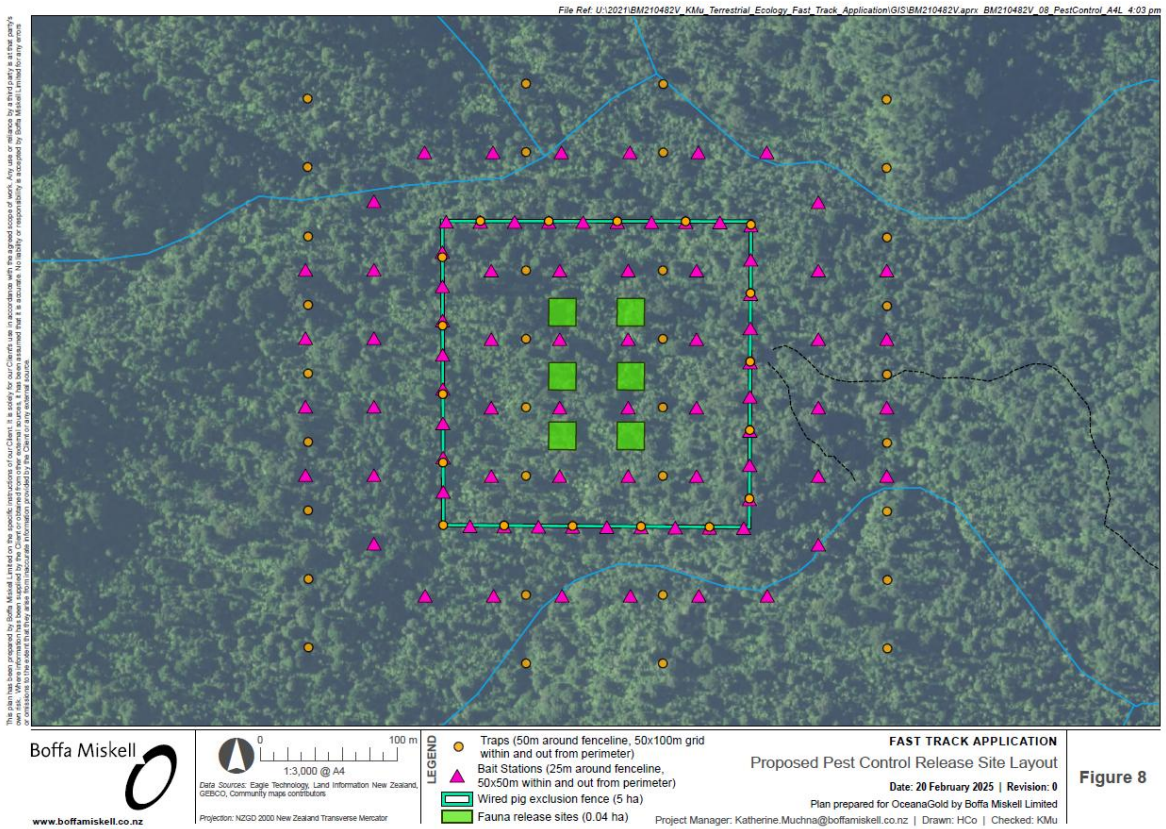

Figure 10~~11~~: Pest control trap and bait station layout within the fauna release area.

4.2.5 Indicative Timing

Seasonal activity is an important consideration for fauna management and habitat clearance. For any sites within Coromandel Forest Park where native fauna may be present, vegetation clearance must be carried out from March – May (inclusive, but in suitable, warm weather). This timing coincides with:

> Lizard activity periods (i.e., excludes winter when lizards are inactive).

> The period when Archey's frogs are not brooding, but are still active.

> Forest birds unlikely to have active nests (i.e., chicks have typically fledged)

> Bats are active and, if present, emergence can be monitored. If affected vegetation supports bat roost features as assessed by a certified bat ecologist (Competency 3.3), it must be surveyed before 30 April, following protocols described later in this report.

> An indicative schedule for the first year is provided below and incorporates the actions described in earlier in this report. Management can be amended in following years in response to experience.

<table>
<tr><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th></tr>
<tr><td colspan="2">Select release sites</td><td colspan="7">Install predator control infrastructure at release site</td><td>Identify first two drill sites using selection criteria</td><td colspan="3" rowspan="4">Clear first two sites using fauna salvage and translocation procedures</td></tr>
<tr><td colspan="2">Install 'leaky' boundary fence</td><td colspan="7">1st pulse predator control (Sept), 2nd pulse (Dec)</td><td>Practice run of frog salvage</td></tr>
<tr><td colspan="2" rowspan="3">Identify habitat enhancement requirements</td><td colspan="7">Pest monitor, adjust control devices if required</td><td rowspan="3">3rd pulse of predator control</td></tr>
<tr><td colspan="7">Install release pens and pig fence</td></tr>
<tr><td colspan="7">Photo ID resident frogs, set up photo ID database</td></tr>
</table>

4.2.6 Vegetation Management

4.2.6.1 Vegetation Impacts and Impact Management

The primary effect of the Project within Coromandel Forest Park in terms of vegetation is the temporary loss of vegetation / habitat (0.66 ha) at the proposed drill sites and vent ~~raise~~ sites following clearance. This may result in changes to the vegetation community at the margins of the cleared areas due to 'edge effects' and change in vegetation composition as drill sites and vent ~~raise~~ sites are progressively restored and regenerate.

The proposed management is briefly outlined below, summarised as a flowchart in Figure 11 and detailed in BML (2025d). Different approaches for drill sites / vent raises are identified, where necessary.

4.2.6.2 Actions: Man-Portable Drill Rig Sites

Man-portable drill rigs will be located in clearings and will avoid deep leaf litter, wood debris and other features likely to be occupied by native species.

Man-portable rig investigations do not require tree clearance, but will require removal of loose groundcovers, wood debris and forest duff which provide habitat for native species over an area of 32 m^2. Vegetation clearance on this scale is likely to most effectively regenerate via natural processes once forest duff is returned, and specific remediation measures are not required.

4.2.6.3 Actions: Drill and Vent Raise Sites

Commented [MD7]: Additional content provided to reflect differing approaches proposed at each type of site.

Key principles for vegetation remediation include (Boffa Miskell 2025 *in* OGNZL, 2025):

1. Minimising the impacted area.
2. Salvaging, conserving, and re-using topsoil, subsoil, vegetation, wood, and rocks.
3. Maintaining high standards of biosecurity by carefully cleaning and inspecting all construction equipment prior to transporting to / from site, remove all foreign soil and seeds, and clean footwear and clothing especially Velcro. Remove all waste.
4. Facilitating natural regeneration with minimum interference and without undertaking additional planting. Forest habitats in CFP have sufficient seed source and favourable climatic conditions (etc.) for natural regeneration (cf. Forbes et al., 2023). Avoiding additional planting of 'ex situ' stock (i.e., nursery raised material) avoids key biosecurity risks (introduction of pests / pathogens).
5. Minimise the establishment and spread of woody, non-native species.

~~4.2.6.3~~4.2.6.4 Monitoring and documentation

Drill sites will be decommissioned progressively as they are no longer required. This provides opportunities to adapt and refine the restoration approach based on success monitoring (i.e., which methods are appropriate for different species).

Monitoring will be carried out six monthly for the first two years (i.e., 0, 6, 12, 18 and 24 months) and then yearly up to five years (i.e. 26, 48, and 60 months).

Reporting and analysis will include general observations of successful regenerating species from previous transplanting (i.e. which species have the best survival / growth).

Short term success indicators to be assessed within the first 5 years include:

> Evidence of regeneration (e.g. crushed / bent trees resprout once platform is removed);

> Seedling recruitment; and

> Regeneration of a diverse vegetation community similar to the surrounding forest.

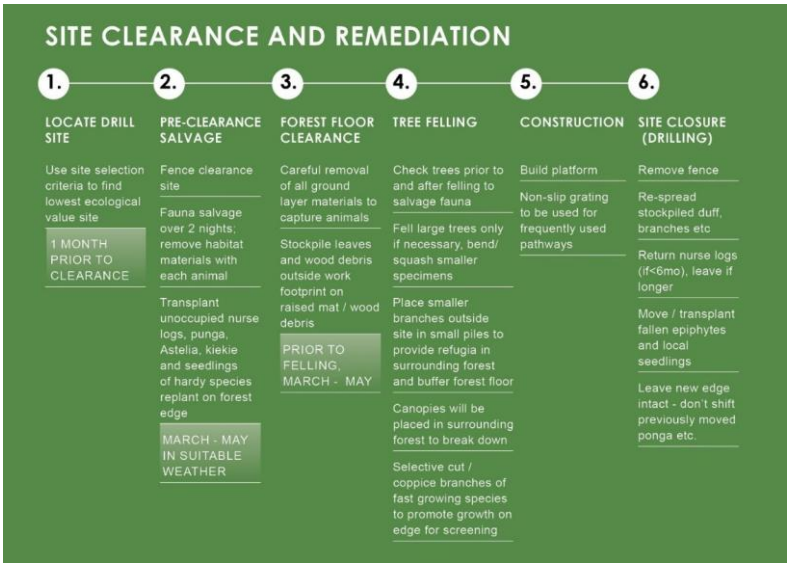

Figure 11~~11~~12: General process for vegetation remediation alongside drill site / vent raise site establishment and closure

4.2.7 Frog-specific Management

4.2.7.1 Frog values

Archey's frogs are widely, but not densely, distributed throughout the Wharekirauponga catchment, but are less prevalent in vegetation types associated with drier, more well drained soils (BML 2025a). It is likely that Archey's frogs are present in areas where drill, pump test and vent sites will be located, and translocation will be required.

Hochstetter's frogs have been observed in dedicated surveys on the margins of stream and rivers. Although they are known to occupy terrestrial habitats, the numerous small, stony-bottomed tributaries in the catchment provide higher quality habitat for Hochstetter's frogs throughout their life. Proposed drill and vent sites are unlikely to be

located in habitats associated with Hochstetter's frogs because of the practicality of managing water inflows and sediment.

4.2.7.2 Frog salvage and translocation

Commented [MD8]: Updates made in this section to reflect amendments made to the Wildlife Act Authority proposed conditions. Specifically Condition 15(e).

Frog salvage will be undertaken for undetected frogs in man-portable and drill sites, and frogs in all vent sites. Frog salvage will be carried out prior to (for vent sites) and during site clearance (for all sites). Site clearance will be carried out in a staged way and will comprise:

1. For vent sites only: Systematic, slow ~~nocturnal~~ moving nocturnal searches within the works footprint over two nights in suitable conditions (warm and moist – e.g. after rain when the vegetation and ground is still moist and temperatures are a minimum 12°C);
2. For all sites: Careful searching of the forest floor and all available habitats, removing forest duff sequentially; during nocturnal searches, any moved materials will be carefully replaced after ensuring frogs are not present;
3. Careful searching of felled trees for any frogs that may be present;
4. Any frogs that are captured will be translocated to the pre-prepared release site within 6 hours of capture. Frogs will be transported individually, in hard sided containers with breathing holes and leaf litter / moss. Frogs will also be transported with larger organic material from their point of capture. Ponga logs will also be taken to the release site to provide additional habitat elements. Transport will be on foot from the capture site to the release site;
5. ~~3.~~ To release a frog, each individual will be carefully scooped up from its transport container with gloved hands and placed next to the leaf litter and refugia salvaged from its point of capture. Care will be taken to ensure that the refugia is orientated in such a way that the frog can find immediate cover. Frogs will be released a minimum of 3 m apart.

4.2.7.3 Frog handling protocols

Frogs will be handled by experienced personnel only. Frogs will be scooped up in cupped, gloved hands, or gently held in the middle of the body between thumb and forefingers. Each frog will be photographed, measured, weighed and carefully placed in a hard-sided plastic container for transport. Each frog will be assigned a unique identification number that will be referenced in compliance and monitoring reporting. Powder-free nitrile gloves will be replaced between each frog.

~~Any frogs that are captured will be translocated to the prepared release site within 6 hours of capture. Frogs will be transported individually, with organic material from their point of capture. Ponga logs will also be taken to the release site to provide additional habitat elements.~~

Frog salvage will be carried out by suitably qualified and experienced ecologist(s)[2] under the supervision or permission of the WAA permit holder.

Figure 12~~12~~13: Frog translocation, including moving each frog in a secure container with materials from its point of capture. Note that frogs will not be housed in plastic bags, but in individual hard sided plastic containers.

4.2.7.4 Frog release site

The native frog release site will be located outside of the 2mm/s vibration footprint and within the Wharekirauponga Animal Pest Management Area (WAPMA). An indicative location is provided in Figure ~~7~~13. The location of the release site will be confirmed following a habitat assessment, and baseline resident frog survey (Section 4.2.7.5)). The

Commented [MD9]: Updates made in this section to reflect amendments made to the Wildlife Act Authority proposed conditions. Specifically Condition 15(b) and (d).

[2] Frog survey and capture experience follows DOC guidance whereby: Before searching for frogs independently new observers must receive training by an experienced frog observer. Training, at a minimum, must include observations of live frogs of a variety of sizes, demonstration of the variety of places and microhabitats frogs can be found; how to safely lift and replace objects; direct (in person) observation by the trainer of the ability of the trainee to follow these guidelines to safely search for frog.

release site location, and baseline surveys to estimate resident population size and habitat conditions will be confirmed in the Annual Native Frog Salvage Release Report.

The release site will encompass a 5ha area surrounded by an electrified wire offset from a low height fence (1100 cm high) to deter goats and exclude pigs. The placement of the electrified wire will prevent frogs being electrocuted. Pest control and pest monitoring within the release site are described in Section **Error! Reference source not found.**.

Within the 5ha release site, six soft release pens, constructed with materials similar to Animex Wildlife Fencing (AMX-T40 – Temporary Fencing), will be established (). These pens will be 0.04 ha in size. The release site will be set up in advance of any site clearance.

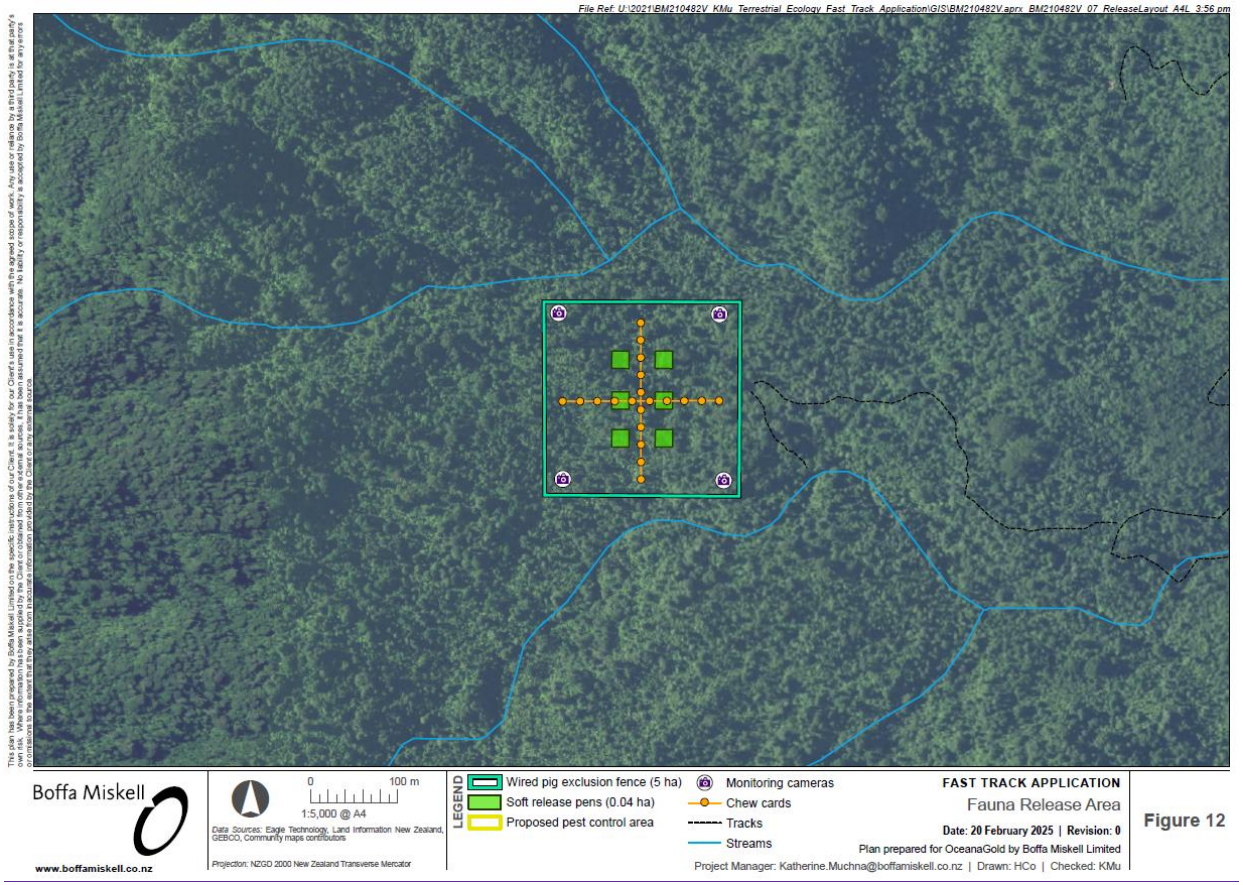

Figure 13~~13~~: Release site layout showing soft release pen arrangement, fencing and predator monitoring tools.

~~Figure 12: Release site layout showing soft release pen arrangement, fencing and predator monitoring tools.~~

Frogs salvaged from man-portable rig sites will be released into a single soft release pen (up to 30 frogs, after which additional frogs will be released into a secondary soft release pen (Pens 1 & 2)) (Table 5). Frogs salvaged from drill rig sites will be released into a single soft release pen (up to 30 frogs, after which additional frogs will be released into a secondary soft release pen (Pens 3 & 4)).

Frog translocations from man-portable drill and drill sites are expected to be rare because of pre-clearance survey protocols whereby a site is precluded from use if frogs are detected and cannot be avoided. Frog translocations are more likely to occur prior to and during site clearance of vent sites, although the number of frogs translocated is still likely to be small.

Soft release pens will be removed when the population size has reached 80 frogs per 400m^2 plot, (i.e., 20 frogs/100m^2), or after 5 years – whichever is first.

Table 5:- Indicative soft-release pens frogs will be translocated to, based on capture location. This allocation is proposed to maintain sufficient numbers of frogs in the release site (avoiding overcrowding) and keeping frogs from the same source site together where possible.

Soft-release pen number	Source
1	Man portable drill sites
2	Man portable drill sites (backup)
3	Drill sites
4	Drill sites (backup)
5	Vent raise sites 1& 2
6	Vent raise sites 3 & 4

4.2.7.5 Resident frogs at release site

Commented [MD10]: Updates made in this section to reflect amendments made to the Wildlife Act Authority proposed conditions. Specifically Condition 15(c)and comments from DOC regarding monitoring plans.

The resident frog population at the release site has not been surveyed because the site has not yet been confirmed. However, will have a surveyed density of between 5 and 10 frogs / 100 m2 (i.e. 20-40 frogs in 400m2 plot), based on surveys carried out over a minimum of 5 nights to maximise detection and recaptures. Frog population surveys will be carried out at the proposed release site between September – November 2025 (weather conditions permitting), and reported in the Annual Native Frog Salvage Release Report (Section **Error! Reference source not found.**).

Baseline (pre-release) surveys of the release site will aim to document the resident frog population, confirm that the proposed release site design/layout is suitable (i.e. habitat is suitable for Archey's frogs throughout the entire 5ha site, pen design, locations and materials are suitable etc).

4.2.7.6 Monitoring

Commented [MD11]: Updates made in this section to reflect amendments made to the Wildlife Act Authority proposed conditions. Specifically Condition 15(g).

Release site monitoring will include both frog monitoring and pest monitoring. Archey's frog monitoring will be carried out annually from March – May. Monitoring methods and analyses are described in the Frog Monitoring Plan (Lloyd, 2025) and will incorporate the success indicators from Cisternas et. al. (2022), including:

- Recapture of 20% released frogs
- Breeding / presence of juveniles (noting this could be resident animals breeding)
- Stable - increasing population density over multiple years
- Annual habitat survey to assess changes to habitat cover following pig exclusion

Monitoring will also include recording habitat use and movement patterns of resident and released frogs.

Release site monitoring will conclude when the pest control above WUG finishes~~XXX~~.

~~4.2.7.3~~4.2.7.7 Reporting and Documentation

Commented [MD12]: Updates made in this section to reflect amendments made to the Wildlife Act Authority proposed conditions. Specifically Condition 15(h), 16, and 17 (j-m).

A suitably qualified and experienced herpetologist will prepare an annual report, delivered by 30 June each year (Annual Native Frog Salvage Release Report) including the following items:

- A summary of man-portable, drill and vent sites that have been cleared and any associated frog salvages (including unique ID, capture details, morphometrics, identification photographs, location of capture and release pen number) in the previous 12 months;
- A description of any other actions described in the Native Frog Salvage Release Plan completed in the previous twelve months;
- Release site monitoring results for frog population monitoring and pest control monitoring., including any pest incursions and how these were managed;
- Where aspects of the Native Frog Salvage Release Plan have not been implemented, the reasons why, and the measures that have been taken to address this;

- An assessment of the effectiveness of the actions taken to implement the Native Frog Salvage Release Plan in achieving its objective. Where the report identifies that the objective has not been met, the Report must include:
    - The reasons why the objective has not been achieved;
    - Specific measures that have already been implemented, or are required to be implemented to meet the objective; and
- Details of any amendments needed to the Native Frog Salvage Release Plan or any other of the other management plans identified in Condition 2 to better ensure that the objective will be met.

4.2.7.8 Roles and Responsibilities

Commented [MD13]: Updates made in this section to reflect amendments made to the Wildlife Act Authority proposed conditions. Specifically Condition 15(i).

Key roles to implement the Native Frog Salvage Release Plan include:

OGL Environmental Advisor – WNP (OGL)

Role: Liaison between OGL exploration team and ecologists

Responsible for:

- Coordinating site clearance requirements (i.e. which sites are proposed for clearance in the coming 12 months, back up sites if proposed sites are unsuitable)
- Project and field logistics
- Communications with DOC
- Adaptive management, with Project Herpetologist
- Coordinating pest control at the release site
- Ensuring all frog fencing, including at release pens, is installed and maintained

Project herpetologist (independent)

Role: Technical expert

Responsible for:

- Preparation of Annual Native Frog Salvage Release Report, and any other reports required.
- Training field staff, and QA
- Ensure compliance with site survey, site clearance and translocation conditions
- Adaptive management, with OGL

- Creation of a data management system suitable for extracting data as required for analysis / query
- Data management and analysis, incorporating pest control and frog monitoring analyses.

Field staff (independent / OGL)

Role: Fieldwork

Responsible for:

- Undertaking frog surveys & translocations, completing site clearance activities following established best practise, and all Wildlife Approval and consent conditions
- Accurate and clear data recording
- Notifying OGL and the Project herpetologist of any changes or unforeseen circumstances.

Frog survey and capture experience follows DOC guidance whereby: Before searching for frogs independently new observers must receive training by an experienced frog observer. Training, at a minimum, must include observations of live frogs of a variety of sizes, demonstration of the variety of places and microhabitats frogs can be found; how to safely lift and replace objects; direct (in person) observation by the trainer of the ability of the trainee to follow these guidelines to safely search for frog. Any new field staff must carry out a minimum of three nocturnal frog surveys (where they detected frogs), and two site clearance – translocations before they are eligible to be assessed for independent competency and able to lead a field team.

~~Prior to the salvage and translocation of any native frogs, a Native Frog Salvage Release Plan is to be prepared which details the process and methods to be undertaken when salvaging and translocating native frogs. This plan will include:~~

- ~~Identification of where any frogs are to be released ("the release site");~~
- ~~Data which confirms the resident frog population at the release site;~~
- ~~Explanation of how the release site is to operate (i.e. multiple release pens and types of pens);~~
- ~~Frog salvage methods including transportation methods, transportation timings / durations, frog handling protocols, and release process;~~
- ~~Identification of what monitoring is to occur at the release site following the release of frogs at the site, and how this monitoring is to be implemented; and~~

~~Details of how / when the operation and monitoring of the release site is to conclude.~~

~~Release site monitoring will include both frog monitoring and pest monitoring and will be detailed in the Frog Monitoring Plan (Lloyd, 2025) but we anticipate it will incorporate the success indicators from Cisternas et. al. (2022), including:~~

- ~~Recapture of 20% released frogs~~
- ~~Breeding / presence of juveniles (noting could be resident animals breeding)~~
- ~~Stable - increasing population density over multiple years~~
- ~~Annual habitat survey to assess changes to habitat cover following pig exclusion.~~

~~The findings of each site clearance will be documented and reported. The following information will be included: the number and biometric data (snout vent length, SVL) of any Archey's or Hochstetter's frogs; the release pen (for Archey's frogs), or stream location (for Hochstetter's frogs) that they were released into; a clear dorsal photograph for photographic identification; and all survey details (climatic conditions, time and date, and search effort).~~

4.2.8 Lizard-specific Management

4.2.8.1 Lizard values and potential effects on lizards

A small number of lizards (elegant geckos and a forest gecko) have been detected during lizard surveys in Wharekirauponga catchment. No skinks have been detected, but it is possible that they are also present at low densities. No lizards have been detected during clearance of previous drill sites. If present within a proposed drill or vent site, the potential effects on lizards from unmanaged habitat clearance include:

4.2.8.2 Lizard salvage and translocation

Given the low density of lizards detected within the Wharekirauponga catchment, lizard salvage will be limited to capture during site clearance, comprising:

1. Careful searching of the forest floor and all available habitats, removing forest duff sequentially;
2. Careful searching of felled trees for any lizards that may be present.
3. Moving felled material (particularly tree canopies where lizards may not be detected during searches) outside of the fenced site so that lizards can disperse if they are not captured.

Any lizards that are captured will be translocated to the prepared release site within 6 hours of capture. Lizards will be transported individually in cotton bags in a hard sided container. Lizards will be released into ground, or arboreal ACOs. Because the prepared release site has robust predator control and monitoring, we consider that is the most secure location for any lizards captured within a clearance area.

Lizard salvage will be carried out by suitably qualified ecologist(s) under the supervision or permission of the WAA permit holder.

Trampling and disturbance of herpetofauna and their habitat will be minimised by using the same marked access routes for access to, within and between the sites.

4.2.8.3 Monitoring and Documentation

Because it is unlikely that any translocated lizards would be in high enough density to undertake monitoring, no monitoring is proposed.

The findings of each site clearance will be documented and reported. The following information will be included: the number and biometric data (snout vent length, SVL) of any lizard translocated; the release pen that they were released into; a clear dorsal photograph for photographic identification; and all survey details (climatic conditions, time and date, and search effort).

4.2.9 Native Bird Management

4.2.9.1 Native bird values

Sixteen native bird species were detected during baseline surveys in Wharekirauponga. Birds are highly mobile and will generally move away from noise and activity, although eggs and chicks are extremely vulnerable to disturbance during the breeding season. For this reason, site clearance will be undertaken outside of the peak forest bird nesting season (August-February inclusive).

4.2.9.2 Action: Nest checks

A native bird and nest survey will be undertaken by an appropriately qualified and experienced ecologist to detect any late nests / second clutches for native birds, or birds in crevices. The bird and nest survey protocols are:

- Any vegetation scheduled for removal will be surveyed for native bird nests within 24 hours before felling. This will include examining crevices and holes for ruru / morepork and kōtare / kingfisher nests.

- If an active native bird nest is identified during the visual inspection, all vegetation removal within 20m of the nest will cease until the ecologist has confirmed that the nest has failed, or the chicks have fledged. This area will be clearly demarcated to ensure the vegetation is not accidentally felled.
- Once an area of vegetation has been confirmed clear of active native bird nests (i.e. the chicks have fledged or the nests have failed), vegetation clearance should then commence as soon as possible.

4.2.9.3 Monitoring and Documentation

The findings of each site clearance will be documented and reported. The following information will be included: if any active bird nests, or occupied crevices were observed; if vegetation clearance was delayed because of an active nest was observed; the date of clearance; and if any bird nests were missed. Survey details (climatic conditions, time and date, and search effort) will also be recorded.

4.2.10 Bat Management

4.2.10.1 Bat values

Bat surveys have previously been carried out at specific sites as part of the Wharekirauponga exploration drill surveys and baseline ecological surveys (described in BML 2025a). A total of 15 sites throughout the Wharekirauponga area have been surveyed for 220 nights. No bats have been detected in the Wharekirauponga catchment during any of these surveys, although in 2024, long tailed bats were recorded around Gladstone Pit and Maratoto (Bioresearches 2025a and BML, unpublished).

4.2.10.2 Action: Bat roost surveys

Bat management procedures shall be in general accordance with the most recent DOC guidelines "Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols)" (v4: 2024).

Tree felling must be carried out between 1 October and 30 April when bats are most active so are easier to detect and less vulnerable to disturbance. A flow chart showing the process for tree removal is provided in Figure ~~13~~14.

- Acoustic bat monitors ("**ABMs**") should be used to detect bat activity in the first instance. These must be installed by someone accredited with Competency 3.1[16] to determine bat presence around trees due to be felled.

- Surveys should be undertaken over a minimum of two consecutive valid survey nights[17] with no bat activity to have confidence that bats are not roosting in the clearance area.
- If there is uncertainty, and indications of a bat roost (e.g., crevice with staining), a trained arborist may climb the trees to check for bats under the direction of an approved bat specialist. The bat specialist must be accredited with Competency 3.3.
- If a bat is detected, surveys must continue until the bat(s) has moved to a new roost.
- If bats continue to use the roost, there is uncertainty about whether bats have left the roost, or there is high bat activity in the area, an ecologist accredited with all level 3 competencies will advise on how to proceed, consistent with the Bat Roost Protocols. The Operations Manager at DOC Hauraki will be advised.
- Trees can be felled if no bats are present. Trees must be on the day of inspection / on the day following survey completion.
- Felled trees must be checked for bats. Accidental discovery and mortality protocols are provided in Section 4.4.

4.2.10.3 Monitoring and Documentation

No further action / monitoring is required after trees are felled and checked for bats. Reporting will include a record of any trees that contain bat roosts and details the size, location and type of tree. Where no bats are detected within potential bat roost trees within the vegetation clearance areas then survey data will be provided separately.

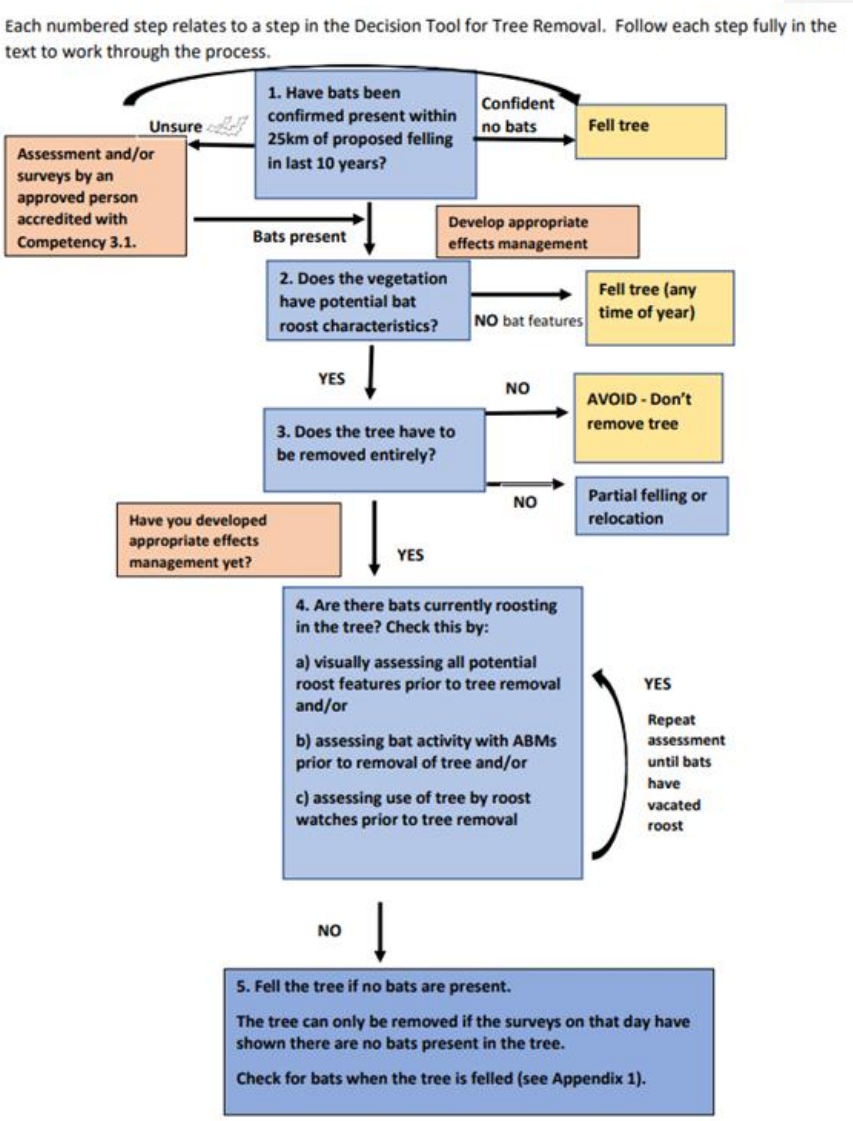

Figure 14~~14~~: Tree removal in bat areas flow chart. From the Bat Roost Protocols (2023).

4.2.11 Invertebrates

4.2.11.1 Native invertebrate values

Native invertebrate values from Wharekirauponga are known from incidental observations during nocturnal surveys. Key species include paua slugs *(Schizoglossa spp)*, peripatus / ngaokeoke (Not Threatened), cave and tree wētā (both Not Threatened). These species are often detected during site clearance and where possible, they will be relocated outside of the clearance area.

4.2.11.2 Action: Invertebrate salvage and translocation

Notable invertebrate fauna, including, but not limited to wētā, paua slugs and peripatus will be salvaged prior to or during any vegetation clearance if detected. They will be released into similar habitat assessed by a suitably qualified ecologist at a distance of no less than 50 m beyond the site.

4.2.11.3 Monitoring and Documentation

No further action / monitoring is required after invertebrates are salvaged from sites during clearance. The number and species of any translocated invertebrates will be recorded in site clearance reporting.

4.2.12 Biosecurity Management

4.2.12.1 Kauri dieback

A Kauri Dieback Management Plan (KDMP, which is documented later in this ELMP) has been prepared to provide practical guidance on reducing the risk of *Phytophthora agathidicida* (PA) spread as a result of exploration works associated with the WNP.

Movement of machinery, equipment and people between sites is identified as a key pathway for the spread of kauri dieback and the methods proposed are specific to this project and its constraints. This plan includes a description of recommended hygiene procedures and how these could be applied to the WNP, as well as monitoring and site management recommendations.

Phytophthora agathidicida produces both motile waterborne spores (zoospores) and resting soil-borne spores (oospores). The primary purpose of the KDMP is to prevent the introduction of PA to the Wharekirauponga area or contain the spread of PA within the Wharekirauponga area (if present) through the movement of spores through soil and water. Fundamental to the success of this management plan is ensuring the proposed

approach is practicable during all activities associated with the WNP. This will be achieved by employing the general principles identified below:

- Implement decontamination procedures whereby all soil is removed from footwear, equipment, tools and machinery that may have come into contact with soil, prior to entering the site.
- Avoid areas with kauri present where possible, and plan routes to avoid kauri, using established tracks where possible.
- Survey drill sites and walking tracks for trees with symptoms of Kauri Dieback Disease prior to project commencement.
- Avoid infected sites and report any potentially infected trees immediately.
- Avoid activities upslope of kauri and avoid muddy areas.
- Keep soil disturbance to a minimum and prevent the deposition of soil into watercourses.
- When vegetation felling is required, all vegetation should be retained on site in the immediate locality of the works.
- Implement ongoing surveillance throughout the life of the project.

Activity-specific actions are provided in the KDMP (within the ELMP (OGNZL 2025)).

4.2.12.2 Frog pathogens

Controlling the spread of frog pathogens (principally the fungal disease *Chytridiomycosis*, which affects Hochstetter's and Archey's frogs) follows the same generally hygiene procedures as controlling the spread of PA. OGNZL will ensure that all equipment and clothing is cleaned to remove soil and disinfected with Trigene to minimise the risk of pathogen spread. All staff and contractors handling native frogs will follow the supplied 'Native frog hygiene and handling protocols' (Appendix 4B). In particular, any items that come into contact with native frogs will be single use (i.e. gloves and plastic bags) or cleaned after touching any animal.

4.3 WILLOWS SITE

4.3.1 Location

The Willows Portal entrance and Willows Surface Facilities Area (Willows SFA) are located at Willows Road Farm, a property encompassing 197 ha of rolling to steep

pastoral land approximately 5 kilometres north of the Waihi township. The Willows SFA is accessed along Willows Road from SH25 at the foothills of the Coromandel Ranges. The Project area encompassing Willows SFA is located in Area 2 of the Project (Figure 315).

The proposed construction footprint for the Willows SFA is a combined area of 17.45 ha within the 197 ha farm property. Throughout the project development phase, the design and layout of the surface infrastructure was developed to avoid native vegetation areas where possible. Approximately 0.25 ha of mixed native / exotic vegetation will be removed in the footprint of the rock stack and portal entrance. Most of the footprint is within existing pasture or modified riparian margin.

4.3.2 Ecological Values

Willows SFA has Low ecological values using any of the widely accepted methods for assessing ecological value. Vegetation and fauna communities within the Willows SFA do not meet any of the Waikato RPS criteria for indigenous biodiversity significance; or the Department of Conservation criteria for assessing ecological values (Davis 2016), or ecological "matters" for evaluation described in Roper-Lindsay et al., (2018). Briefly, ecological features recorded in Willows SFA include:

- Narrow riparian forest/scrub remnants confined to steep tributary sides, and some isolated trees in pasture. Riparian areas are all currently unfenced and are heavily grazed.
- Unsuitable habitat for Archey's or Hochstetter's frogs, although one juvenile Hochstetter's frog was detected in a stand of vegetation in the northeast of Willows Road Farm. This area is not connected to any of the development areas on the property.
- No lizard surveys were carried out, but vegetation within Willows Road Farm was assessed as low-quality habitat for native lizards due to the relatively poor condition of vegetation remnants, limited refuge availability and prevalence of vertebrate predators.
- The majority of habitat within the farm property is pasture or scrub and is not suitable for bat roosting. Where mature tree species are present, such as the stand of mature pine trees on the northern property boundary, these are outside of the development areas.
- Bird species recorded included common native species of forest, scrubland and human-modified landscapes i.e. tūī, pīwakawaka / fantail, tauhou / silvereye, riroriro / grey warbler, kotare / kingfisher, pīpīwharauroa / shining cuckoo, welcome swallow and several exotic species that inhabit the fringes of native forest.

- Habitat within the Willows Road Farm property was assessed as relatively poor for native terrestrial forest invertebrates due to fragmentation and stock damage.

4.3.3 Activities

The above ground infrastructure at Willows Road Farm is referred to as the Willows Surface Facilities Area (Willows SFA) and the footprint comprises approximately 17.45 ha of farmland. Once mining is complete, all surface infrastructure will be removed, and footprint areas will be rehabilitated with stored topsoil. The land will be returned to arable farming land.

The surface infrastructure footprint comprises approximately 20.83 ha of farmland. Once mining is complete, all surface infrastructure will be removed, and footprint areas will be rehabilitated with stored topsoil. The land will be returned to arable farming land.

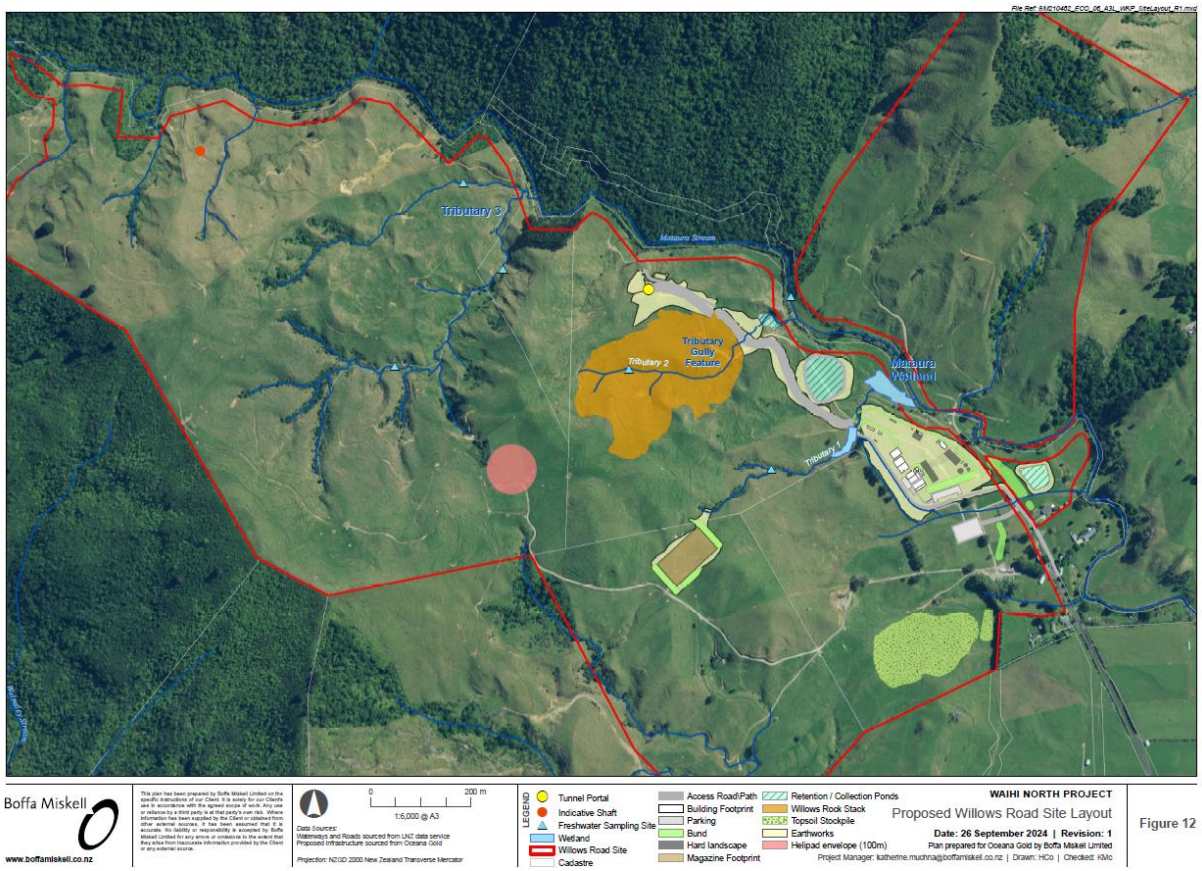

Figure 15~~15~~: Proposed Willows Road Site layout.

4.3.4 General Principles: Vegetation and Fauna Management

Vegetation and habitat clearance within the Willows SFA will be managed to allow sufficient time to survey and capture (where applicable) fauna prior to site works. Timing must take into account the seasonal constraints to fauna activity to avoid periods when lizards and bats are inactive (May-October, inclusive), and as far as possible, when native birds are nesting.

Effects management for vegetation loss / potential habitat clearance associated with construction comprises:

- Vegetation clearance protocols which will include surveys to identify and avoid active bird nests and occupied bat roosts
- Lizard surveys which will be undertaken in any potential habitats and where detected, lizards will be captured and translocated to a prepared release site.
- Revegetation and remediation of the rock stack area once the rock has been reused / removed at or before mine closure (LEMP, OGNZL 2025).

Willows SFA footprint has very low ecological values, and this is reflected in the limited ecological management proposed for the site (BML 2025a).

Once site clearance is complete (i.e. all fauna checks / salvage are complete), the ecologist will notify OGNZL that ecological works are complete and that construction can begin.

4.3.5 Vegetation Management

4.3.5.1 Vegetation values and impacts

The primary effect of the WNP at Willows Road Farm is the removal of approximately 17.45 ha of farmland, most of which is pasture (Figure ~~14~~15). Native forest and scrub vegetation present within the Willows SFA comprises narrow riparian remnants confined to steep tributary sides, and some isolated trees in pasture.

The footprint within which the rock stack is proposed overlies Tributary 2, and is typical of the surrounding Willows Road Farm site, comprising sparse woody vegetation, with only occasional native species (e.g. māhoe, mānuka, wheki and ponga) (Figure ~~15~~17). The Tributary 2 stream channel is steep with evidence of erosion, and pasture grasses are present within the channel itself. Native scrub becomes denser further upstream as the stream and tributaries become more incised. Māhoe and makomako are common

shrubs, with ferns in the understory. Vegetation quality was assessed as poor with many dead trees observed.

4.3.5.2 Actions: Fauna salvage and revegetation

At least 1 month prior to vegetation clearance within any potential habitat areas at Willows SFA, the works area will be surveyed for native lizards and potential bat roosts. Where these are identified, the actions described ~~in~~ later in this report, will be undertaken. The project ecologist will confirm that these surveys have been undertaken and confirm what further action (if any) is required as a result of the findings.

The timing of vegetation clearance will take into account fauna activity periods to avoid sensitive periods when animals are nesting or dormant.

4.3.6 Native Lizard Protocols

4.3.6.1 Overview

Lizard management must follow the principles provided in "Key principles for lizard salvage and transfer in New Zealand" (hereafter "Lizard Salvage Guidelines", DOC 2019).

A pre-works survey will be used to assess whether lizards are present onsite and their indicative abundance. If lizards are detected, a salvage and release programme will be undertaken as the primary mitigation strategy. If no lizards are detected, no further management is required. A flow chart showing the process for lizard surveys is provided in Figure 16.

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The salvage will target areas of lizard habitat where lizards are detected and be scaled to suit the expected number of lizards (based on survey findings) and extent of that habitat to be removed.

Figure 16~~16~~: ~~———~~Lizard Survey Flow Chart

4.3.6.2 Prospective lizard habitats within the site

Willows Road Farm is heavily impacted from stock access and grazing with few habitats and refuges for native lizards. It is possible that some lizard species suited to grassland habitats (e.g. copper skink, ornate skink) may be present within the farm property in ungrazed areas, although these were assessed as small and isolated at the time of survey and we consider it unlikely lizards are present. It is very unlikely that geckos are present within Willows SFA because arboreal habitats are very small and fragmented, and unlikely to provide secure habitat. Nevertheless, these habitats may have further developed since the site was previously assessed and a lizard survey will be undertaken prior to vegetation clearance commencing.

Figure 17~~Figure 1717~~: **Riparian vegetation along Tributary 2 within the footprint of the proposed Willows Rock Stack at Willows Road Farm, Waihi. Downstream view (left), upstream view (right).**

4.3.6.3 Lizard values and potential effects

It is possible that copper skink (*Oligosoma aeneum*) or ornate skink (*O. ornatum*) may be present in~~s~~ grassy, shaded habitats within Willows SFA. It is very unlikely that geckos are present within Willows SFA because arboreal habitats are very small and fragmented, and unlikely to provide secure habitat.

Potential effects on lizards from unmanaged habitat clearance include:

- Injury / death during construction
- Habitat loss and displacement
- Habitat degradation

4.3.6.4 Lizard survey, salvage, transfer and release

Timing and authorisations

Lizards will only be surveyed and, if present, salvaged during the period between October and early May, when the temperature is 12 °C or above. Activities described in this plan will be implemented prior to and if required, during works (e.g. supervised clearance of vegetation using heavy machinery).

All lizard survey and salvage work will be conducted by suitably qualified persons with an existing Wildlife Act Authority (WAA), or under their supervision.

Pre-works survey

A range of tools will be utilised to detect lizards within the site. The density and type of tools deployed, and time spent at each site will depend on the size and habitat complexity. Tools may be installed in clusters, grids, transects or targeted to specific micro-habitats as deemed suitable by the project herpetologist. The survey will be conducted across five days and will include the following:

- Hand searching: All searchable potential lizard refuges (e.g., rocks, rotting logs, woody debris, clumps of leaf litter etc) will be inspected for any sign of lizard presence (i.e. scat, slough). Pest plant species that provide good quality refuge to lizards such as pampas may be targeted for destructive hand-searching techniques in areas where it is present and scheduled for removal.
- Pitfall and funnel (gee minnow) traps: Traps will be stuffed with leaf litter, baited with mashed banana or chopped pear and have a damp sponge or wet moss inserted for moisture. Traps will be covered to provide shade, and for pitfall traps to exclude predators from entering. Traps will be inspected daily, in the morning for four consecutive trapping days. Pitfall traps will be deployed within the forest vegetation habitat in three transects at 5 m spacings, consisting of 10 traps. Traps will be checked for four trapping days. Trap density may be increased to 2m spacings if habitat is sufficiently complex, or large in extent (noting habitat at Willows Road is often linear).

Lizard salvage methods

ACOs and trapping:

If skinks are detected during surveys, ACOs, pitfall traps and funnel traps will be used for capturing and relocating skinks. Traps and ACOs will be placed in an appropriate density and alignment to the available habitat. Skink salvage will continue daily for a minimum of five consecutive days. If lizards continue to be caught on days four and five, then trapping will continue until three consecutive inspections fail to capture any further individuals. Traps will be inspected daily in the morning.

Hand-searching:

Where it is possible to deconstruct potential lizard refuges, the herpetologist will do so. These may include man-made debris, rock piles or rotting logs if present.

Machine assisted clearance:

If five or more skinks are detected in weedy scrub/grassland areas, the herpetologist will be present for grass scrape-back to attempt to salvage additional skinks that were unable to be caught during the baseline salvage effort. Supervision of scrape-back involves working alongside a digger (operator) that uses a root raker or toothed-bucket attachment. The herpetologist and the digger operator will systematically scrape back sections of grassland and weeds at a pace that allows the herpetologist to quickly access the area if a skink is detected.

Transportation and release:

Lizards will be held individually in cloth bags in a secure, vented container out of the sun. Lizards will be transported to the release site and will not be held for more than 8 hours.

Risk management:

Risks associated with lizard capture and salvage will be managed by undertaking salvage at least 2 weeks in advance of works and using a range of tools suitable to the species in question. Communication with contractors undertaking site clearance is key to ensuring that works are undertaken in a way that minimises risks to lizards (i.e., gradual habitat clearance, using appropriate machinery). Potential risks will be minimised using an experienced herpetologist or suitably trained handler and selecting release sites that are suitable with adequate pest control.

Specific risk management measures will be implemented in accordance with best practise methods and include the following:

- Overheating: lizards will be placed in individual containers and kept in a cool place until released. Handling will be minimised to ensure they do not become stressed. All traps will be checked daily in the morning.
- Overcrowding/ competition: it is not likely that overcrowding or competition will be a risk as current populations of lizards at the release site are likely suppressed due to predation pressure.
- Displacement: A lizard proof fence will prevent rehoming into the works area.

- Injury/death: lizards will be captured by a suitably trained herpetologist or individual. This will follow best practice and hygiene protocols to minimise the risk of injury, mortality or disease transmission.

4.3.7 Release Location Assessment

If lizards are detected within the Willows SFA, the proposed release area for captured lizards is shown on Figure ~~16~~18. The release area is 1.15 ha in size and is near a stand of remnant forest. Most of the hillside is proposed for planting / regeneration with forest tree species, but the area above the existing vegetation will be fenced from stock and maintained as a grassland area (if required for lizard release).

Lizard habitat enhancements including planting (low-growing grass species and flax), provision of refugia and predator control are proposed for this site, and these will be suitable for any skinks recovered from Willows SFA.

Predator control will include traps and bait stations to target rodents, mustelids and hedgehogs. The control area will extend beyond the enhanced lizard release area to ensure adequate protection and buffering of the release site from reinvasion.

Bait stations:

- Bait stations will be established on a 25 m grid. Baiting should occur in seasonal pulses, with bait restocked in stations on the first and third weeks of January, February, April, August, and November, old bait should be removed in the fourth week of each of these months. During active pulse months, at every service older bait should be removed before replenishing new bait to keep it fresh and attractive to rodents.
- Bait stations should be ground-based, run-through bait stations containing a toxin such as DoubleTap (diphacinone and cholecalciferol) bait, which targets all rodents. The baits' effectiveness at controlling mouse populations will depend on the density of bait stations. Double Tap does not require a Controlled Substance License to use and it is low residue.

Traps:

D rat traps will be established on a 50 m grid, and DOC 250 traps will be established on a 100 m grid. Both traps types are NAWAC approved.

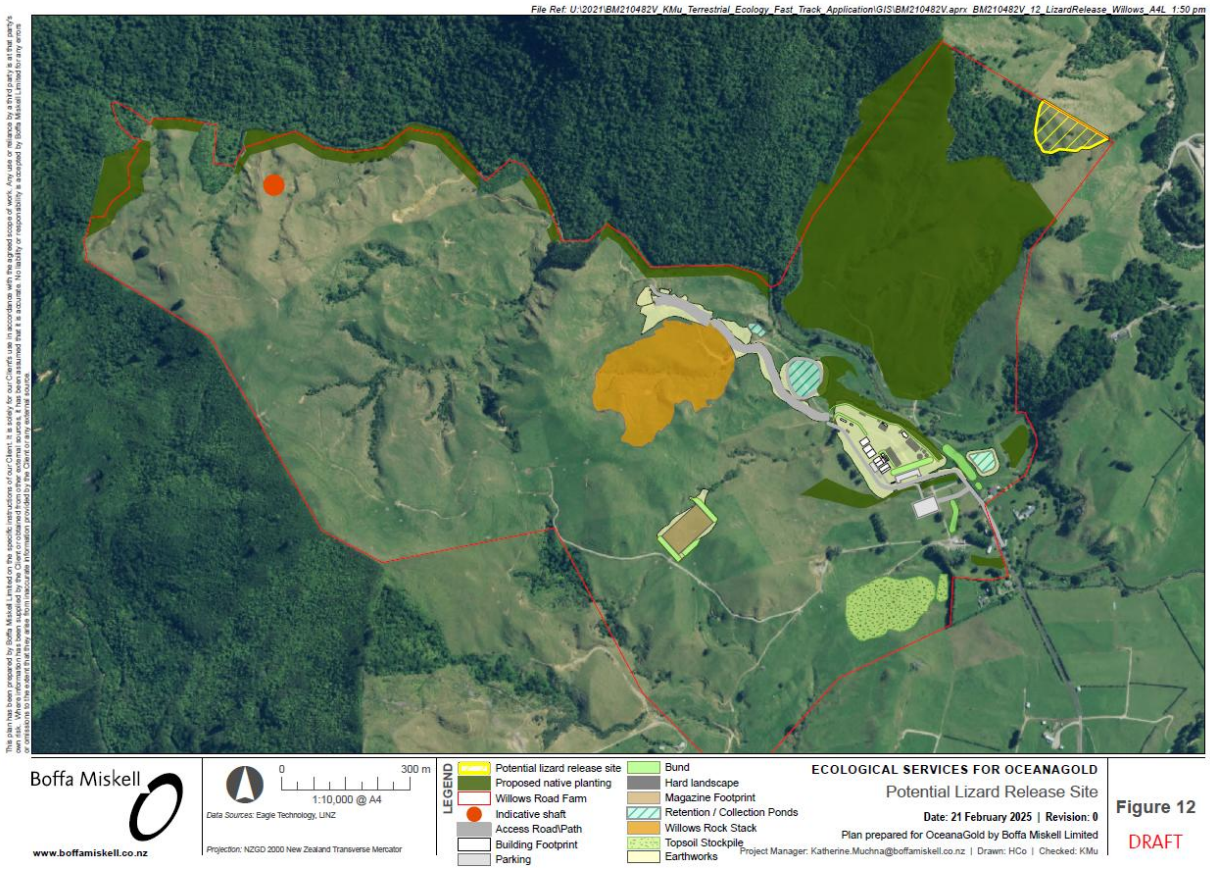

Figure 18~~Figure 1818~~: **Willows Road Farm potential lizard release site.**

4.3.7.1 Contingency Actions

Lizards can inhabit the most unlikely of locations and sometimes be found in surprising abundance. Table ~~5~~ 6 identifies potential issues that could arise and contingency actions to address them.

Table 6: Contingencies for potential unexpected discoveries

Potential issue	Contingency Action 1	Contingency Action 2
Geckos are detected during salvage or earthworks	If a gecko is detected during the salvage only, the salvage must be paused in that area, and survey and salvage methods updated to incorporate geckos. HDC will be notified of any changes in an updated LMP.	Selection and preparation of a release site for geckos
Higher density lizard population than anticipated during survey/ salvage	If the lizard survey detects a high density of lizards (i.e., 50+) the management of the release site will be reviewed. HDC will be notified of any changes in an updated LMP.	Placement of sufficient materials to create enough release refuges for the salvaged population. An expanded release site will be prepared with pest control and habitat enhancement if required.

Any minor adaptations made to the methods and strategy outlined in this plan will be made at the discretion of the project herpetologist in order to appropriately manage any lizard populations that are detected during the survey and / or salvage operation.

4.3.7.2 Post release monitoring and reporting

The following data will be collected from each of the lizards captured: species, sex, reproductive condition, morphometrics (snout-vent length (SVL), and tail regeneration), photos, GPS records, description of habitat where captured, date and time. Weather conditions will be recorded at the beginning of the salvage.

Information collected will be collated in a report to be prepared for DOC following the conclusion of the salvage. ARDS (Amphibian and Reptile Distribution Scheme) cards will be completed and submitted to DOC and HDC.

Post-release monitoring will be triggered if more than 20 lizards of an 'At Risk' species are salvaged and, population persistence and breeding (i.e. gravid females, or juveniles present in the population) will be determined for 3 years following release.

All lizard captures and transfers will be undertaken by a suitably qualified and experienced herpetologist.

A report will be prepared detailing the results of each lizard capture and relocation exercise and certification that works were carried out in accordance with this plan.

4.3.8 Native Bird Management

4.3.8.1 Native bird values and potential effects

Baseline surveys at Willows Road farm detected common native species of forest, scrubland and human-modified landscapes i.e. tūī, pīwakawaka / fantail, tauhou / silvereye, riroriro / grey warbler, kotare / kingfisher, pīpīwharauroa / shining cuckoo, warou / welcome swallow and several exotic species that inhabit the fringes of native forest (blackbird, chaffinch), along with species more typical of rural and suburban environments (e.g. greenfinch, yellowhammer, magpie, myna, etc). Pīwakawaka / fantail and other unidentified bird nests were observed within scrub on the margin of Coromandel Forest Park

Birds are highly mobile and will generally move away from noise and activity, although eggs and chicks are extremely vulnerable to disturbance during the breeding, and nesting season. For this reason, site clearance will be undertaken outside of the forest bird nesting season (August-February inclusive) as far as practicable.

4.3.8.2 Action: Nest checks

Vegetation clearance within the works footprints shall, as far as practicable, take place outside the native bird breeding season (August-February inclusive).

For work occurring in the months of March to July, no bird management is required.

If vegetation clearance is undertaken during the main breeding season, a bird and nest survey will be undertaken by an appropriately qualified and experienced ecologist. The bird and nest survey protocols are:

- Any vegetation scheduled for removal will be surveyed for native bird nests within 24 hours prior to clearance, this includes examining crevices and holes for ruru and kingfisher nests.
- If an active native bird nest is identified during the visual inspection, all vegetation removal within 20m of the nest will cease until the ecologist has confirmed that the nest has failed, or the chicks have fledged. This area will be clearly demarcated to ensure the vegetation is not accidentally felled.

- Once an area of vegetation has been confirmed clear of active native bird nests (i.e. the chicks have fledged or the nests have failed), vegetation clearance will commence as soon as possible to prevent birds laying a second clutch.

4.3.8.3 Monitoring and Documentation

The findings of each site clearance will be documented and reported. The following information will be included: if any active bird nests, or occupied crevices were observed; if vegetation clearance was delayed because of an active nest was observed; the date of clearance; and if any bird nests were missed. Survey details (climatic conditions, time and date, and search effort) will also be recorded.

4.3.9 Bat Management

4.3.9.1 Bat values and potential effects

The majority of habitat within the farm property is pasture or scrub and is not suitable for bats, which generally favour mature trees and linear features such as forest margins and vegetated riparian corridors.

The stand of mature pine trees on the northern property boundary offers potential bat roosting habitat. The Mataura River and forest margin also provide a flight corridor that bats may utilise. These potential habitats are all outside of the Project footprint. Long-tailed bats were also recently detected around Gladstone pit (October 2024) (Bioresearches 2025b) and it is possible they may use the wider site intermittently, although there are higher quality habitats in the surrounding area.

4.3.9.2 Action: Bat roost survey

Bat management procedures shall be in general accordance with the most recent DOC guidelines “Protocols for minimising the risk of felling occupied bat roosts (Bat Roost Protocols)” (v4: 2024).

Tree felling must be carried out between 1 October and 30 April when bats most active so are easier to detect and less vulnerable to disturbance. A flow chart showing the process for tree removal is provided earlier in this report.

- Acoustic bat monitors (ABMs) should be used to detect bat activity in the first instance. These must be installed by someone accredited with Competency 3. to determine bat presence around trees due to be felled.

- Surveys should be undertaken over a minimum of two consecutive valid survey nights with no bat activity to have confidence that bats are not roosting in the clearance area.
- If there is uncertainty, and indications of a bat roost (e.g., crevice with staining), a trained arborist may climb the trees to check for bats under the direction of an approved bat specialist. The bat specialist must be accredited with Competency 3.3.
- If a bat is detected, surveys must continue until the bat(s) has moved to a new roost.
- If bats continue to use the roost, there is uncertainty about whether bats have left the roost, or there is high bat activity in the area, an ecologist accredited with all level 3 competencies will advise on how to proceed, consistent with the Bat Roost Protocols. The Operations Manager at DOC Hauraki will be advised.
- Trees can be felled if no bats are present. Trees must be on the day of inspection / on the day following survey completion.
- Felled trees must be checked for bats. Accidental discovery and mortality protocols are provided in Section 4.4.

4.3.9.3 Monitoring and Documentation

No further action / monitoring is required after trees are felled and checked for bats. Reporting will include a record of any trees that contain bat roosts and details the size, location and type of tree. Where no bats are detected within potential bat roost trees within the vegetation clearance areas then survey data will be provided separately.

4.4 ACCIDENTAL DISCOVERY AND PROTOCOLS

Fauna may be accidentally discovered (injured or deceased) during Project works, and an ecologist may not be on site to assist.

In the event of fauna injury / mortality:

Bats

If a bat (intact, injured or dead) is discovered on the ground or in vegetation at any point during site clearance or geotechnical works, works will pause immediately and the DOC Hotline called (0800 DOC HOT, 0800 362 468). Works will not resume without approval from DOC. More detailed instructions for managing bat discovery during vegetation maintenance works can be found in the 2024 DOC Bat Roost Protocols (V4) and Bat care for first responders (Wildlands, 2019).

Lizards and frogs

If an injured native skink, gecko, Hochstetter's or Archey's frog is discovered, the animal should be placed in a box or container with holes in the lid and moist earth/leaf litter from the site and kept in a cool, shaded place. The Project ecologist should be contacted immediately, and they will notify DOC. If a dead animal is discovered, it should be placed in a ziplock bag in a secure container and the project ecologist contacted. The project ecologist will contact DOC and organise an examination if required.

4.5 REPORTING REQUIREMENTS

Methods and results of all ecological surveys related to site clearance for the WNP will be recorded and reported to Hauraki District Council.

Records should include:

- Extent of vegetation clearance
- Survey and salvage efforts in person hours
- Details of any fauna that has been captured and translocated
- Details of any fauna that has been seen but not captured
- Details of bird nests and bat roosts and actions taken to avoid damage to active nests / roosts
- Release site GPS locations of any translocated fauna.
- Details of any accidentally discovered fauna and steps taken following discovery.

4.6 KEY PERFORMANCE INDICATORS

Terrestrial ecological management within the Coromandel Forest Park will be implemented in accordance with best practice standards and requirements with indications of performance identifiable via the following measures:

- For predator and pest control – the extent to which the management targets in Table 4 are being met. If necessary, management methods may be amended to better meet targets;
- For vegetation management – via monitoring undertaken six monthly for the first two years, and then yearly up to five years. In the short term (within the first five years),

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success is to be assessed via matters such as evidence of regeneration, seedling recruitment, and regeneration of a diverse vegetation community similar to the surrounding forest;

- For frog-specific management – release site monitoring will consider success indicators including recapture of 20% of released frogs, breeding / presence of juveniles, stable – increasing population density, and annual habitat survey. Release site monitoring will conclude when pest control measures conclude. In instances where anticipated outcomes are not being met, management methods will be reviewed and amended in effort to generate greater success;
- For lizard management – it is unlikely that any translocated lizards would be in high enough density to undertake monitoring, as such monitoring is not proposed. However the findings of each site clearance will be documented and report;
- For native bird management - the findings of each site clearance will be documented and reported;
- For bat management – monitoring is not required after trees have been checked for bats and felled. However reporting will include a record of trees that contain bat roosts;
- For the management of invertebrates – monitoring is not required after invertebrates have been salvaged from site during clearance. The number and species of any translocated invertebrates will be recorded.
- For biosecurity management - Any sightings or confirmed infections of kauri dieback or frog pathogens will be reported and managed in accordance with best practice standards and requirements.

Further details of any of the measures and methods implemented in relation to the management of terrestrial ecology within the Coromandel Forest Park can be provided on request.

Terrestrial ecological management at the Willows Site will be implemented in accordance with best practice standards and requirements with indications of performance identifiable via the following measures:

- For lizard management – post-release monitoring will occur if more than 20 lizards of an 'At Risk' species are salvaged. Monitoring will consider population persistence and breeding for 3 years following release. Reporting will detail the results of each lizard capture and relocation;

- For native bird management - the findings of each site clearance will be documented and reported; and
- For bat management - monitoring is not required after trees have been checked for bats and felled. However reporting will include a record of trees that contain bat roosts.

Further details of any of the measures and methods implemented in relation to the management of terrestrial ecology at the Willows Site can be provided on request.

~~4.6~~4.7 REFERENCES

Borkin, K. M., Giejsztowt, J., McQueen-Watton, J., & Smith, D. H. (2023). Influence of weather on long-tailed bat detection in a North Island exotic forest. New Zealand Journal of Ecology, 47(1).

Wildlands (2019). Advice for first responders. Appendix 6 of Initial veterinary Care for New Zealand bats.

APPENDIX 4A: WAIHI PROJECT SITE SELECTION PROTOCOL

Site Selection Protocol For the Location of Investigative Drill Sites and Ventilation Shafts

Overview

This document outlines the protocol which will be used by OceanaGold New Zealand Limited ("**the Consent Holder**") to select the location of up to eight investigative drill sites and up to four ventilation shafts ("**vent shafts**") at the proposed Wharekirauponga Underground Mine ("**WUG**"), located within the Coromandel Forest Park ("**CFP**") as part of the Waihi North Project ("**WNP**").

This protocol follows a cascading management approach whereby:

A short list of suitable investigative drill sites will be selected based the Consent Holder's technical requirements; and

A short list of suitable vent shaft sites will be selected based the Consent Holder's technical requirements, which shall be assisted by the use of man-portable drilling at up to 50 sites.

Shortlisted sites will then be subject to a multicriteria assessment ("**MCA**"), which will evaluate each potential site against ecological, freshwater, landscape, heritage and recreational criteria. The final eight investigative drilling and four vent shaft sites will be selected based on the outcomes of the MCA. This protocol will ensure that selected sites meet the Consent Holder's technical requirements, whilst minimising adverse effects on the environment.

Investigative Drill Sites – Potential mineralisation?

The Consent Holder shall create a short list of drill site options where it considers the potential mineralization can be successfully reached and investigated, and which meet associated engineering and geotechnical requirements.

The Consent Holder shall assess each of the shortlisted sites against the MCA (set out below) to inform the final site selection.

Vent Shafts – Geotechnical Requirements

The Consent Holder shall undertake investigative drilling using man-portable drill rigs at a maximum of 50 sites across the area shown in **Attachment A**. This will be completed sequentially with one rig to minimise the surface expression of the operation.

Following the investigative drilling, the Consent Holder shall create a short list of vent shaft site options which meet the engineering and geotechnical requirements for vent shaft construction.

The Consent Holder shall assess each of the shortlisted sites against the MCA (set out below) to inform the final site selection.

MultiCriteria Assessment

The following assessment shall be used for both investigative drill sites and vent shafts.

Once the Consent Holder has established a shortlist of investigative drill sites or vent shaft sites, it shall convene a team of appropriately qualified and experienced experts to undertake the MCA evaluation for each site.

The MCA will guide the Consent Holder's selection of up to eight investigative drill sites and up to four vent raise sites at locations which best achieve the outcomes set out below.

Multicriteria Assessment Outcomes

Terrestrial Fauna

> The loss of 'At Risk' or 'Threatened' herpetofauna is avoided;

> The loss of 'At Risk' or 'Threatened' terrestrial invertebrates is avoided;

> The removal of bat roosting trees is avoided; and

> The removal of trees in which birds are actively nesting is avoided.

Terrestrial Flora

> The loss of 'At Risk' or 'Threatened' flora is avoided;

> The loss of mature trees (trees that are greater than 50 cm in diameter at breast height (1.4 m above ground level)) is minimised where practicable; and

> Preference is given to sites where trees can be trimmed or tied back in such a way as to minimise felling.

Freshwater Values

Sites selected are located as far from surface waterbodies (including natural inland wetlands) as is reasonably practicable; and

The loss of riparian vegetation is minimised where practicable.

Landscape and Visual Amenity Values

Sites selected can be visually contained and assimilated into the environment so that they are reasonably difficult to see from public viewpoints.

Once work has been completed, selected sites can be successfully rehabilitated to ensure that long term landscape and visual effects are avoided.

Heritage and Cultural Values

Disturbance to, or interference with listed or known heritage features and / or sites is avoided.

Archaeological features and features of particular significance to iwi are avoided.

The Consent Holder must engage a suitably qualified and experienced archaeologist to assess if there are any known archaeological or other historic heritage features, or a likelihood of unidentified archaeological or other historic heritage features within 500m of the shortlisted investigative drill sites and vent shaft sites.

Recreation Values

Sites selected are located as far away as is practicable from the nearest recreational features such as walking tracks.

Multicriteria Assessment Tool

A red / amber / green ("**RAG**") MCA tool will be utilised to guide decision-making. The assessment tool has three rankings, based on the level of adverse effect anticipated for each criterion:

Low level of effects	Moderate level of effects	High level of effects

The criteria for assessing each value set is set out in **Table 67**.

Table 7: MCA Assessment Tool.

Criteria	Low level of effects	Moderate level of effects	High level of effects
Terrestrial Fauna			
'At Risk' and / or 'Threatened' herpetofauna	No 'At Risk' and / or 'Threatened' herpetofauna is found on site.	'At Risk' and / or 'Threatened' herpetofauna is found on site, but can be salvaged and moved to suitable habitat at least 100m away from the drilling and / or vent raise site (as assessed by a suitably qualified herpetologist).	At Risk' and / or 'Threatened' herpetofauna is found on site, and cannot be salvaged and moved to suitable habitat at least 100m away from the drilling and / or vent raise site (as assessed by a suitably qualified herpetologist).
'At Risk' and / or 'Threatened' terrestrial invertebrates	No 'At Risk' and / or 'Threatened' terrestrial invertebrates are found on site.	'At Risk' and / or 'Threatened' terrestrial invertebrates are found on site, but can be salvaged and moved to suitable habitat at least 50m away from the drilling and / or vent raise site (as assessed by a suitably qualified entomologist).	At Risk' and / or 'Threatened' terrestrial invertebrates are found on site, and cannot be salvaged and moved to suitable habitat at least 50m away from the drilling and / or vent raise site (as assessed by a suitably qualified entomologist).
Bat roosts	No trees with bat roost characteristics identified on site (as assessed by suitably qualified zoologist).	Trees with bat roost characteristics identified on site, but no bats are found to be currently roosting in the tree (as assessed by a suitably qualified ecologist).	Trees with bat roost characteristics identified on site, with signs that bats are currently roosting in the tree (as assessed by a suitably qualified ecologist).
Nesting birds	No active bird nests detected on site (as assessed suitably qualified ecologist).	-	Active bird nests detected on site (as assessed by a suitably qualified ecologist).
Indigenous Terrestrial Flora			
'At Risk' and / or 'Threatened' flora	No 'At Risk' and / or 'Threatened' flora identified is on site (as assessed by suitably qualified botanist).	'At Risk' and / or 'Threatened' flora identified is on site, but can be readily translocated to a suitable alternative site containing similar light, soil and vegetation community characteristics (as determined by a suitably qualified botanist).	'At Risk' and/ or 'Threatened' flora identified on site, and cannot be readily translocated to a suitable alternative site containing similar light, soil and vegetation community characteristics (as determined by a suitably qualified botanist).
Removal of mature trees	No removal of trees greater than 50 cm in diameter at breast height is required.	Removal of <=5 trees greater than 50 cm in diameter at breast height is required.	Removal of >5 trees greater than 50 cm in diameter at breast height required.
Tree felling avoidance measures	At least 50% of trees onsite can be trimmed or tied back in such a way as to minimise felling.	Between 20 – 50% of trees onsite can be trimmed or tied back in such a way as to minimise felling.	Less than 20% of trees on site can be trimmed or tied back in such a way as to minimise felling.
Freshwater			
Proximity to water body	Site is more than 100m from nearest waterbody.	Site is between 50-100m from nearest waterbody.	Site is less than 50m from nearest waterbody.
Riparian vegetation	No riparian vegetation removal required.	Minimal riparian vegetation removal is required.	More than minimal riparian vegetation removal is required.
Landscape and Visual Amenity			
Visibility	Site cannot be seen from any public track or viewpoint.	Site can partially be seen from a public track or viewpoint.	Site can be clearly seen from a public track or viewpoint.
Heritage			
Heritage features/Cultural	No heritage or cultural features and / or sites are identified within 500m of the site.	Heritage/cultural features and / or sites are identified within 500m of site, but outside the proposed site footprint.	Heritage/cultural features and / or sites are identified with the proposed site footprint.
Recreation			
Proximity to recreational tracks	Site is at least 5km from nearest open tramping or public access track.	Site is between 1-5km from nearest tramping or public access track.	Site is within 1km from nearest tramping or public access track.

Multicriteria Assessment Process

The Consent Holder shall assess each site using the following process:

1. **Score Sites:** Each investigative drill site and vent shaft option shall be evaluated against each MCA criterion set out in **Table 67**. Each site shall be given an RAG rating for each criterion.

2. **Evaluate Red Ratings:** Where a site option is assessed as red (having a high level of effect) for any criterion, the Consent Holder shall engage a suitably qualified expert to determine if the effect is of such magnitude as to constitute a 'fatal flaw' (i.e., a critical issue that would make the site unsuitable for selection, based on an environmental value or values). If the suitably qualified expert considers the site option unsuitable, it shall be disqualified. If the suitably qualified expert does not deem the effect to be a fatal flaw, the site shall remain in contention.

3. **Compare Sites:** After assigning RAG ratings, the Consent Holder shall compare the sites. Generally, sites with more green ratings and fewer amber or red ratings are more favourable.

4. **Site Selection:** The Consent Holder shall select those sites with the best overall balance of green and amber ratings, ensuring no fatal flaws are present.

Reporting

The Consent Holder shall report the outcome of the MCA as follows:

For investigative drill sites, the results of the assessment shall be documented in an Investigative Drill Site Siting Report, which shall be submitted to the Hauraki District Council, Waikato Regional Council and Department of Conservation, at least 20 days prior to investigative drilling commencing at any of the selected sites; and

For vent shaft sites, the results of the assessment shall be documented in a Ventilation Shaft Siting Report, which shall be submitted to the Hauraki District Council, Waikato Regional Council and Department of Conservation, at least 20 days prior to the commencement of work required to construct the ventilation shafts.

Appendix 4B: Indigenous frog hygiene and handling protocols (from DOC 2013)

These guidelines outline the hygiene requirement needed for any person authorised (permitted) to handle native frogs under the Wildlife Act, 1953 (i.e. herpetologists and their supervised assistants). Following these protocols is essential for any person working in frog habitat as it minimises the risk of human-assisted disease transmission and these protocols are suitable for any activity requiring frog handling (including, but not limited to, activities associated with mitigation or vegetation clearance).

Background

Over the past 25 years, amphibian populations have declined throughout the world and disease, in particular the amphibian chytrid fungus, is considered to play a major role in this decline. Given the risk of the fungus and other diseases being transmitted to and between our native frog populations, strict hygiene and handling protocols are required to ensure their safety. This document provides information on how to:

- Minimise any possible spread of the amphibian chytrid fungus and other pathogens.
- Avoid artificially increasing contact between frogs.
- Achieve the highest level of hygiene protocol that is effective and practical in the field.
- Safely handle frogs for any purposes.
- Principles
- Transmission risk can be managed/reduced through good hygiene practices.
- New or disinfected equipment and footwear should be used at every new population.

What should I do before entering known frog habitat?

Before you enter known frog habitat, ensure all your footwear, gaiters and equipment are clean, e.g. free of dirt or mud and dry. Footwear, gaiters and equipment must also be disinfected. You can ensure that your clothing and equipment is safe to take into frog areas by following simple hygiene protocols.

- Any equipment in direct contact with frogs should be new or disinfected before being used on a different frog, where practicable.

Site hygiene

- Remove all dirt and mud from footwear, gaiters and field equipment. Pay particular attention to field gear likely to come in contact with amphibians, soil and ground, freshwater, and/or that is already dirty (e.g. boot soles).
- Disinfect all field gear. Mud and dirt etc. must be cleaned off **clothing and equipment first** before it is disinfected.
- Wash and **dry** everything. This is **particularly important**; chytrid fungus cannot survive drying out, so it is very important that cleaned items are dried.
- Store gear in a clean dry area away from soil to avoid recontamination.
- If you have been to an area infected with the amphibian chytrid fungus **you must clean and disinfect all your gear**. Note: the more common introduced Australian frog species found in New Zealand can also be infected with chytrid fungus, so any field site should be regarded as a potential source of infection, not just known habitats of native frogs. Gear must also be cleaned between each field trip into the **same** indigenous frog area.

Tips

- Clean everything well before planned actions to allow time for clothes and equipment to be cleaned and completely dried out. Consider having multiple sets of high-use items if little or no time is available to clean and dry them between field trips.
- Wear different footwear when driving between areas and change into clean footwear at the point of entry into frog habitat.
- These hygiene protocols are subject to change in the event of new amphibian diseases emerging in New Zealand. Always check with your local DOC office for the most up-to-date hygiene information.

What disinfectant should I use for cleaning and how much?

Disinfection strategies for frog field studies (minimum times and concentrations) are provided in table A6.1. Trigene, Sterigene and Virkon and can be purchased from your local vet clinic.

Table A6.1. Disinfection strategies for frog field studies (minimum times and concentrations).

PURPOSE	DISINFECTANT	CONCENTRATION	TIME	PATHOGEN KILLED	RINSE REQUIRED
Disinfecting cloth (e.g. clothing, cloth bags)	Trigene	50 mL per 4.5 kg laundry load (do not use detergent, do not overfill)	Normal wash time	Chytrid ranavirus	Yes
	Hot wash and complete drying	60°C or greater	15 minutes	chytrid	No
Disinfecting footwear	Sodium hypochlorite (bleach)	1%	1 minute	chytrid	Yes
		4%	15 minutes	ranavirus	Yes
	Trigene	1%	1 minute	chytrid ranavirus?	Yes
	F10	1%	1 minute	chytrid ranavirus?	Yes
	Virkon (corrosive)	1:100	10 minutes	chytrid	Yes
Disinfecting collection equipment, instruments and containers	Sodium hypochlorite (bleach)	1%	1 minute	chytrid	Yes
		4%	15 minutes	ranavirus	Yes
	Trigene	1%	1 minute	chytrid ranavirus?	Yes
	F10	1%	1 minute	chytrid ranavirus?	Yes
	Ethanol	70%	1 minute	chytrid and ranavirus	Air dry
	Complete drying		3+ hrs	chytrid only	No
	Heat	60°C or greater	5 minutes	chytrid	No
			15 minutes	ranavirus	No
	Heat	37°C	4 hours	chytrid	No
	Sterilising UV light		1 minute	ranavirus only	No

Frog handling hygiene

- A new plastic bag or new powder-free nitrile gloves must be used for each frog when they are caught or handled. Within a local area (deemed as a continuous population) the same gloves may be used when for searching for frogs, but they need to be changed if they come into contact with a frog. It is important to ensure that new gloves are used when moving between areas. Also, if a frog displays signs of ill health or looks compromised in some way, make sure a separate glove is used to handle these individuals.
- Each frog should be housed in a separate plastic bag.
- For researchers working in indigenous frog habitat – please ensure all frog handling/ measuring equipment that comes into direct contact with a frog is disinfected prior to its next use, both between frogs and between sites.
- Each frog must be weighed and measured in the plastic bag to reduce unnecessary contact.

- Ensure that frogs are kept cool at all times; in particular, avoid holding frogs in your hands to ensure their proper thermoregulation continues.
- Minimise handling times to reduce stress and to avoid the side effects of stress.
- Sick or dead frogs should be collected and held separately from all other frogs until delivered to the appropriate recipient. All equipment should be cleaned and disinfected after use.
- Although hind-leg handling is a common technique used while measuring and weighing other species of frogs, this technique must **never** be used with any indigenous frog (*Leiopelma*) species as it can cause injury.

If capture/recapture work involving photographing individual frogs is required:

- All stage platform covers must be sterilised with ≥70% ethanol, or surgical antiseptic wipes and air dried between frogs, between successive nights at the same site and between areas.
- The mirror stage must be disinfected with either 70% ethanol and then air dried, or disinfected with TriGene/Sterigene, rinsed thoroughly and then air dried, between sites.

If you find a sick or dead frog, please take it to or contact your local DOC office.

PART D: VEGETATION REMEDIATION PLAN

5. VEGETATION REMEDIATION PLAN

5.1 INTRODUCTION

5.1.1 Background and Scope

This Vegetation Remediation Plan (this document; the **Plan**) guides impact management for vegetation clearance above ground within CFP. Specifically, this Plan provides the vegetation remediation approach for proposed new drill sites and vent raise sites within the WUG site (c.24 sites in total, ranging from 150-900 m^2 each).

This Plan does not address prior drill sites that have already been lawfully established and approved under previous consent / permit processes. However, observations and learnings from those sites have informed this Plan.

5.1.2 Plan Objective

To support natural regeneration and succession to native forest at all new drill sites and vent raise sites within the WUG site, and to avoid introduction of pests and pathogens during drill site and vent raise site rehabilitation.

5.2 PROJECT SUMMARY AND ECOLOGICAL CONTEXT

5.2.1 Proposed Works in CFP

As noted above, the above-ground elements located in CFP include exploration drill sites, geotechnical drill sites to confirm tunnel alignment, and vent raises. Proposed works and vegetation clearance requirements are outlined below.

5.2.1.1 Drill Sites / Vent Raise Sites

Exploration Drill Sites

Up to eight additional drill sites would be sized the same as existing operations at a maximum disturbed area of 150 m^2 per site. Indicative locations for these drill sites are shown in Figure 19. The sites would use wooden platforms (see Figure 20 and Figure 21). The WNP proposes to reuse exploration drill sites as follows:

- Ability to use two drill sites as a helipad (four in total);
- Ability to have an additional four camps located on any drill site (six in total);

OGNZ proposes to have a maximum of 6 operational exploration drill rigs at any one time. Water will be supplied by two additional proposed pump sites at a maximum of 600 m^3 per day.

Maximum number of sites proposed: 8

Maximum site extent / clearance area: 150 m^2 per site

Maximum total clearance: 1,152 m^2 / 0.12 ha

Hydrogeological Drill Sites

Short term pumping tests are required to reduce uncertainty associated with hydrogeological modelling. To facilitate and conduct such a test requires the establishment of up to four large pumping test / vent sites.

These sites will be located at either existing cleared pads or new sites within the area shown in ~~Figure 17~~Figure 19. All efforts will be made to use existing sites if they are deemed to be appropriate (which ensure any clearance requirements are reduced as far as practicable).

Sites will not be wooden platforms but instead levelled concrete pads which enable a raised bore rig and the ability to drill a larger diameter hole (see Figure 22). Earthworks and retaining walls will be required to establish the flat pads. The total area for each pad would be 900 m^2 maximum (with the concrete pad size being 12x12 m, however the larger 900m^2 is required to accommodate potential steep gradients). All efforts will be made to reduce total clearance area as far as practicable. These large pumping test sites will ultimately become the vent raise sites. The site size will be reduced to 12x12 m once the vent raise is constructed, so the outer area can be rehabilitated.

Maximum number of sites proposed: 4

Maximum site extent / clearance area: 900 m^2 per site

Maximum total clearance: 3,600 m^2 / 0.36 ha

Hydrogeological Piezometer Sites

Four sites are proposed for the purpose of drilling additional piezometer holes to assist with pumping test investigation and/or other hydrogeological testing or baseline data collection. These sites will have a maximum disturbed area of 150 m2 per site.

Maximum number of sites proposed: 4

Maximum site extent / clearance area: 150 m2 per site

Maximum total clearance: 600 m2 / 0.06 ha

Geotechnical Drill Sites for Investigation

Up to four geotechnical drill sites are proposed for resource investigation purposes. These sites will have a maximum disturbed area of 150 m2 per site.

Maximum number of sites proposed: 4

Maximum site extent / clearance area: 150 m2 per site

Maximum total clearance: 600 m2 / 0.06 ha

Geotechnical Drill Sites for Tunnel Alignment

Four geotechnical drill sites are proposed within the tunnel corridor area. These are in addition to the ten exploration drill sites. Geotechnical drill sites will have a maximum disturbed area of 150 m^2 per site. A water supply pump site will be located at the closest stream site for each of the geotechnical drill sites.

OGNZL proposes to reuse one of the drill sites as a camp, and one drill site as a helipad.

Maximum number of sites proposed: 4

Maximum site extent / clearance area: 150 m^2

Maximum total clearance: 600 m^2 / 0.06 ha

Geotechnical Drill Sites for Vent Raises

In order to locate vent raise sites, OGNZ proposes geotechnical investigations comprising:

- Man-portable rig drill investigations at up to 50 sites to determine suitable locations for vertical ventilation shafts.
- Four additional geotechnical drill sites at the preferred vertical ventilation shaft sites. These sites are the same locations as the four large pumping test sites (hydrogeological drill sites, described above).

Geotechnical considerations may require additional reinforcement of the vent raise collar, but the surface footprint will be limited to 30 x 30 m. Vent raises will be constructed at different stages of the mine life in response to resource extensions and mining schedules, and vent raises may be converted between intake and return (or vice-versa). Once operating, steam plumes may be visible from return air raise (RAR) discharges under certain climatic conditions (typically during winter and in periods of

higher relative humidity). Once mining is complete surface infrastructure will be removed and vent raise areas will be rehabilitated.

Maximum number of vent raise sites proposed: 4

Maximum site extent / clearance area: no additional clearance

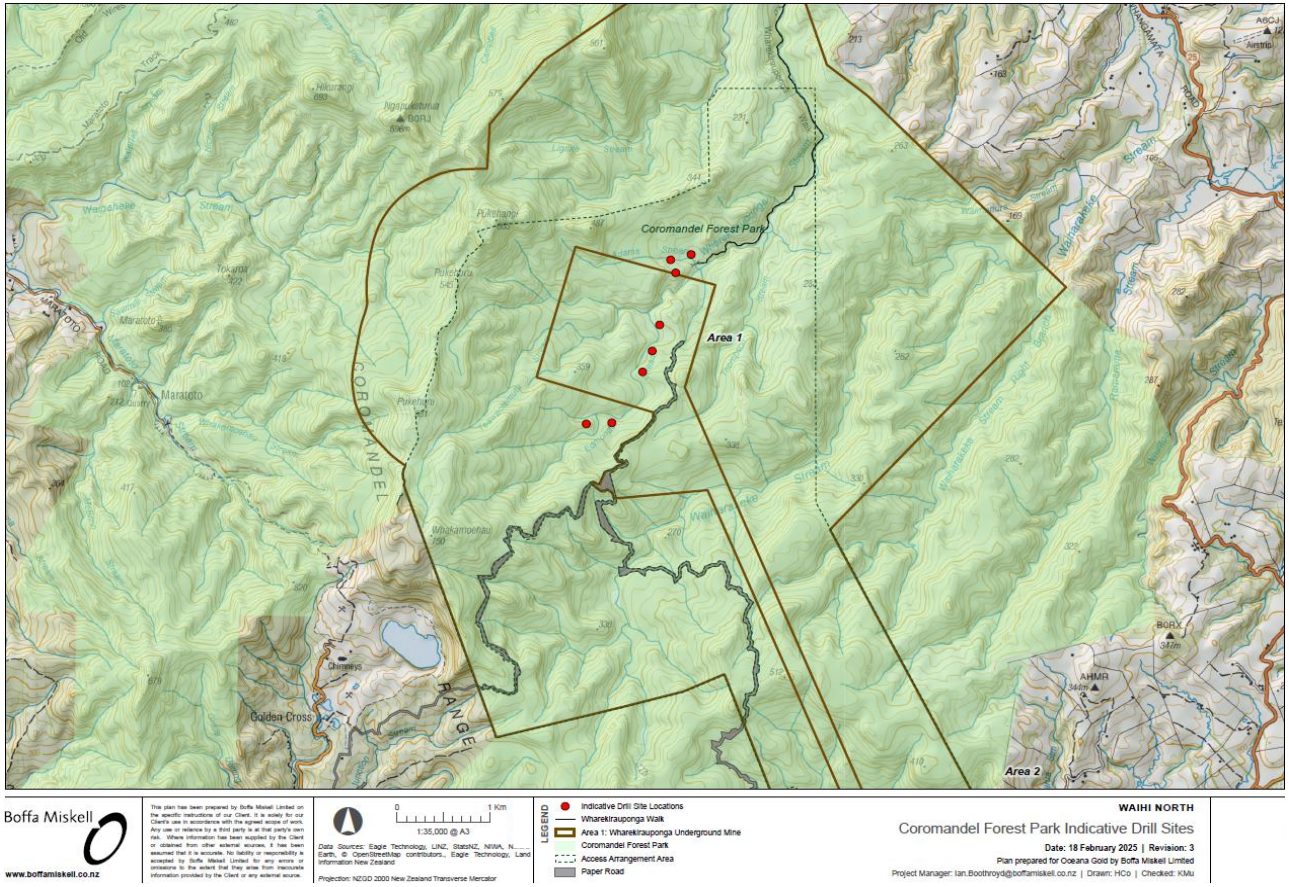

Figure 19~~Figure 1919~~: **Indicative drill sites**

Summary – Drill Sites / Vent Raise Sites

Because the pre-clearance and enabling works to establish Exploration Drill Sites and Geotechnical Drill Sites for Tunnel Alignment are similar, they are hereafter aggregated and described simply as '**drill sites**.' Because the Geotechnical Drill Sites for Vent Raises will re-use Hydrogeological Drill Sites, they are hereafter aggregated and described simply as '**vent raise sites**' or '**vent raises**.'

The total vegetation clearance required is in the vicinity of 6,600 m^2 / 0.66 ha.

Table 8: Summary of above-ground works requiring tree clearance within CFP.

Site Type	Purpose	No.	Max. Size	Description	Timeframe / Lifetime
Drill Sites	Exploration Drill Sites, Geotechnical Drill Sites for Tunnel Alignment	20	150 m^2	Clearance of c. 12 x 12 m site to accommodate drill rig. Sites may be reused as helipads or camps following drilling activities.	Drilling: from 1 – 7 years with an average of 2 years following site clearance. Camps / helipads: as required. Interim vegetation remediation to occur following cessation of drilling where possible.
Vent Raise Sites	Hydrogeological Drill Sites, Geotechnical Drill Sites for Vent Raises	4	900 m^2	Clearance of c.30 x 30 m site and construction of (as required) a 12 x 12 m concrete pad, retaining, and vent raise including collar.	Concrete pad and vent raises: c.15 years / lifetime of consented mining activities. Interim vegetation remediation to occur following cessation of drilling and establishment of vent raise collar. Final remediation to occur following deconstruction of evase.

Figure 20~~Figure 2020~~: Typical exploration drill site with raised wooden drill platform.

Figure 21~~Figure 2121~~: Typical exploration drill site seen from the air

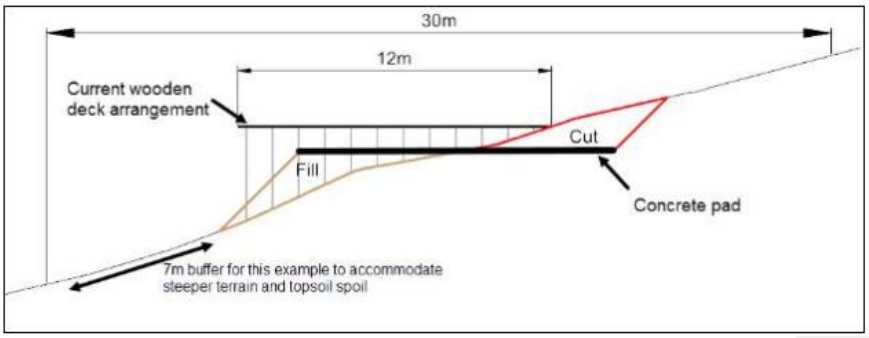

Figure 22~~Figure 2222~~: **Indicative hydrogeological drill site / vent raise site arrangement. The diagram depicts cut and fill to account for a worst-case scenario; but note that this would not be required if the site is located on level terrain.**

5.2.2 Summary of Existing Environment (Vegetation)

5.2.2.1 Broad Vegetation Types

The drill sites and vent raise sites in CFP are likely to be located in a range of vegetation types, being broadly as follows (~~Figure 21~~Figure 23):

Mixed Secondary Broadleaved Forest

Broadleaved secondary forest is the principal vegetation type in the Wharekirauponga catchment. The canopy structure is patchy, with numerous tall emergent trees interspersed throughout a relatively low stature (<5m tall) subcanopy.

Rewarewa, tanekaha and pukatea are the most abundant canopy species, while tawa is locally co-dominant in places. Ponga and nikau are ubiquitous in the subcanopy, and mahoe is also common. Miro, tanekaha, tōtara, hinau, rimu, tanekaha, toatoa, and kauri are occasionally present in low abundances. Ponga, māmāku, pigeonwood, wheki, hangehange, makamaka, lancewood, mapou and kanono are frequently present in subcanopy layer and/ or understorey tiers, along with epiphytic orchids, ferns and lianes such as supplejack and kiekie. Ferns are a dominant plant group throughout broadleaved forest, and are a common ground cover, along with kamu (*Carex uncinata*) and bush rice grass.

A local area of swamp forest was identified as a component of the secondary broadleaved forest type. These forested wetlands are situated on hillside terraces, with a

tall canopy of pukatea with spreading buttress roots, and in dense thickets of kiekie and supplejack in the understorey.

Kauri Forest

Kauri forest is found mainly on ridgelines and knolls on the sides of valleys. Kauri dominates the top canopy, often comprising groups of young kauri (rickers) growing closely together, with many of the trees over 25 m tall. Tanekaha (and to a lesser extent toatoa), are interspersed sporadically throughout canopy and subcanopy tiers. Rimu, miro, and rewarewa are also present in moderate densities along with towai and *Pseudopanax discolor*. Toro and tāwari are occasionally present. Kauri grass, *Gahnia xanthocarpa* and towai are the most abundant sub-canopy species. Seedlings and saplings of canopy species are represented in the sub-canopy along with abundant broadleaved species such as kanono, pigeonwood, rewarewa, mapou, *Pseudopanax discolor*, toro and mingimingi. Kiokio is typically the most abundant fern, and silver fern was also common. While distinct areas of kauri forest are generally small and confined to ridgelines, early successional components of this forest type were present throughout the broadleaved forest and scrubland vegetation types. Historically, kauri stands would have been a common vegetation type, but historic logging and land clearance has depleted and fragmented kauri forest within the Wharekirauponga catchment.

Kanuka Scrub

Kānuka scrub typically has a top canopy layer approximately 5 m tall, comprising kanuka and pole-sized rewarewa, tanekaha and towai, in varying proportions. Rimu and mahoe occur frequently in the scrub canopy but are not abundant. Mapou, kauri, ponga, rimu, pigeonwood, mingimingi, mahoe, *Pseudopanax discolor*, supplejack, towai and karamu, hangehange, kiokio are also common, while miro, nikau, kauri grass, toro, lancewood, kumeraho, morelotia, bushy clubmoss, makamaka, *Gahnia xanthocarpa*, kiekie, wheki, kāpuka, kānuka, kamu and toropapa are often present. Tree ferns are more common on the lower slopes and hillsides.

5.2.2.2 Tree Species

Based on wide-ranging prior survey reports and vegetation clearance reports, the main woody species likely to be encountered at drill sites and vent raise sites are listed below. Those marked with a '*' are considered to generally be rapidly growing / readily regenerating / tolerant species. Those marked with a '' are more typically slow growing / sensitive to disturbance.

1. Porokaiwhiri (pigeonwood, *Hedycarya arborea*)*

2. Māhoe (Melicytus ramiflorus)*
3. Nīkau (Rhopalostylis sapida)+
4. Pukatea (Laurelia novae-zelandiae)+
5. Horoeka (lancewood, Pseudopanax crassifolius)
6. Kānuka (Kunzea ericoides)*
7. Towai (Pterophylla silvicola, syn. Weinmannia silvicola)*
8. Ponga (silver fern, *Cyathea dealbata*)*
9. Rewarewa (Knightia excelsa)*
10. Large-leaved coprosma (*Coprosma grandifolia*)*
11. Kātote (Cyathea smithii)*
12. Hangehange (Geniostoma ligustrifolium var. ligustrifolium)+
13. Whekī (Dicksonia squarrosa)*

Additionally, lianes and epiphytes e.g., supplejack (*Ripogonum scandens*), kiekie (*Freycinetia banksii*), and bush flax (*Astelia* spp.) are common especially in broadleaved forest areas.

Surveys of previously cleared drill sites show that very few very large trees (>300 mm diameter at breast height, DBH) are typically present; this likely reflects site selection to avoid such trees. While reporting varies (some surveys report all trees with DBH >25 mm, others DBH >100 mm only), small to medium size trees (<200 mm DBH) appear to be those most commonly felled.

5.2.2.3 Pests

A range of pest species are known to occupy CFP, including species that are highly detrimental to forest establishment and recovery such as pigs, goats, and possums. Where forest gaps are created at drill sites / vent raise sites, and once these sites are longer in use, some of these pests may even preferentially feed there (recently disturbed soils may be easier to dig, flush of young palatable plant growth, etc.). Wider pest animal management in CFP is proposed separately and is detailed in the Wharekirauponga Pest Animal Management Plan (Pest Animal Management Plan; Boffa Miskell, 2025b). Except where additional temporary pest control steps are specifically recommended during active use of drill site / vent raise sites, this Plan does not provide pest animal

recommendations and instead it assumes general effectiveness of implementation the Pest Animal Management Plan. Very high numbers of mammalian pests would compromise the trajectory of vegetation recovery at these sites, regardless of the approach taken (i.e., whether natural regeneration processes and / or supplementary plantings are used).

Figure 23~~Figure 2323~~: Forest habitat and stream in Coromandel Forest Park.

5.2.3 Summary of Vegetation Impacts and Impact Management Requirements

Prior to drilling activities and construction of vent raises, forest canopy cover needs to be cleared to provide helicopter access (unless natural clearings are present), and subcanopy / understory vegetation needs to be trimmed or cleared to enable assembly of the raised drill rig platform (see ~~Figure 18~~ Figure 20 and ~~Figure 22~~Figure 24). Ground disturbance is required for the drillholes themselves, being typically c.150 mm in diameter each for exploration and hydrogeology investigations (many may be drilled at a single drill site)

The primary effect of the Project within CFP in terms of vegetation is the temporary loss of vegetation / habitat (0.66 ha) at the proposed drill sites and vent raise sites following clearance, change in vegetation community at the margins of the cleared areas due to 'edge effects', and change in vegetation composition as drill sites and vent raise sites are progressively restored and regenerate. Edge effects relate to changes in physical habitat conditions including increased light, wind damage, and direct rainfall, and decreased humidity at forest edges (including areas surrounding newly established drill sites). These changes in physical conditions can damage or kill sensitive forest interior plant species or promote the growth of indigenous or exotic species not normally found in the forest interior. Hence, the process outlined in this Plan includes specific steps to thicken the edge of the forest at the edge of the drill sites and vent raise sites, to minimise edge effects.

Figure 24~~Figure 2424~~: **Future drill site clearance (of previously consented sites), showing fence to exclude fauna and with evidence of removal of large trees, debris and duff. Clearance at this site is incomplete.**

5.3 VEGETATION REMEDIATION PLAN

The proposed approach is outlined below and summarised as a flowchart in ~~Figure 23~~Figure 25. Different approaches for drill sites / vent raises are identified, where necessary.

5.3.1 Key Principles for Vegetation Remediation

(Adapted from Simcock & Ross, 2014)

1. Minimise the impacted area and enhance the health of adjacent ecosystems. The smaller the area disturbed, the less area needs rehabilitation.
2. Identify, salvage, conserve, and re-use rehabilitation resources. The most valuable resources are topsoil, subsoil, vegetation, wood, and rocks.
3. Maintain high standards of biosecurity. Carefully clean and inspect all construction equipment (etc.) prior to transporting to / from site, remove all foreign soil and seeds, and clean footwear and clothing especially velcro. Remove all waste.

4. Facilitate natural regeneration with minimum interference and without undertaking additional planting. Forest habitats in CFP have sufficient seed source and a favourable climatic conditions (etc.) for natural regeneration (cf. Forbes et al., 2023). Avoiding additional planting of 'ex situ' stock (i.e., nursery raised material) avoids key biosecurity risks (introduction of pests / pathogens).
5. Minimise the establishment and spread of woody, non-native species. Dense lotus and large pasture grasses (e.g. Yorkshire fog, cocksfoot, ryegrass) can also smother native species, particularly in higher fertility sites. Although some weeds such as gorse are effective nursery species in the medium term (Wilson, 1994), rapid short-term regeneration is more likely if such species are controlled / excluded upfront.
6. Record details of rehabilitation: what, when and where. Records and monitoring help tailor rehabilitation methods to individual sites and may be part of consent or access conditions. Photographic records are a fast and cost-effective way of recording rehabilitation progress.

5.3.2 Process for Pre-construction Works / Active Use – Both Drill Sites and Vent Raises (Per Site)

Critical to vegetation remediation is the minimisation of impacts up front. The proposed approach below is intended to best enable the forest to regenerate itself, by using available resources (wood / rocks / seedlings) from within the drill site / vent raise site, and minimising loss.

Table 9: Pre-construction process for vegetation clearance, per site.

Timeframe	Task	Explanation / Notes	Responsibility
PRIOR TO SITE CLEARANCE	Identify site (desktop)		OGNZL with input from ecologist
	Confirm suitability (on site) based on technical requirements, accessibility, ecological factors (etc.) Initial mark out of site – e.g. with string line	Ecological factors: e.g., few large (>300 mm DBH) trees, no / minimal Threatened / At Risk plant species	OGNZL with input from ecologist
	Coppice small trees of fast-growing species located on the edge of the drill site (māhoe, pigeonwood, towai, *Coprosma* spp., *Pittosporum* spp., *Veronica* (*Hebe*) spp., *Pseudopanax* spp.). ***Note***: Ideally complete in winter >4 months prior to site clearance. Or, if site is very shaded, defer this step to clearance stage	Promotes dense growth of vegetation at the future drill site edge – will protect forest interior following site clearance	Arborist and / or Ecologist
	Fence site and carry out fauna salvage	See WUG Ecological Management Plan (within this ELMP)	
	Alongside fauna salvage - transplant nurse logs, punga, bush flax, kiekie and seedlings of hardy species – replant on edge Control woody weeds (e.g., gorse: cut and paste with glyphosate) Move any rocks or fallen epiphytes to edge – use to screen edge and protect any seedlings in situ	Focus on protecting seedlings and sensitive slow-growing species on the future site edge that will receive midday-afternoon sun (i.e. ~northwest aspects) Promotes growth of vegetation at drill site edge	Ecologist with assistance from OGNZL

Timeframe	Task	Explanation / Notes	Responsibility
STRIPPING / SITE CLEARANCE	Fell large trees only if necessary. Fell into site rather than into forest. Where available / for larger trees, use grapples. Cut large branches / logs into transportable lengths Where discretion is available, prefer removal of rapidly growing / tolerant tree species, rather than slow-growing sensitive tree species – see Section 5.2.2.2 Establish drill platform: bend / squash / crush smaller trees beneath platform without cutting. Place cut branches / logs within site beneath platform where possible	Many tree species more likely to resprout if crushed vs. cut Promotes rapid remediation following removal of platform Examples of tolerant / sensitive species listed in Section 5.2.2.2	Arborist and OGNZL with input from ecologist
	If large branches are placed on / outside site edge, place in gaps (areas with no seedlings). Lay small branches on large ones. Aim for fewer, taller piles Place scraped duff / soil (from fauna salvage) in piles. Either place in piles on top of branches (as above) with thick coir mat in between branches and duff, or place on thick coir mats on ground Mānuka, kānuka, hebes, and some *Coprosma* spp. branches with ripe seed can be placed on edges for immediate brush seeding (also known as fascining) Place other surplus small branches outside of site (many small piles)	Branches placed on ground protects soil, maintains soil aeration, etc. Coir matting beneath duff / soil stockpiles separates stockpile from existing natural soil beneath, maintains soil aeration, and enables rapid / easy transfer back into drill site / vent raise site during remediation	OGNZL with input from ecologist
ACTIVE DRILLING / VENT RAISE CONSTRUCTION	Carefully deliver / remove construction material to site by hand or lower into forest gap by helicopter	Minimise damage	OGNZL
	Minimise trampling of forest floor, confine activities to platform where possible. Place non-slip grating along frequently used routes (e.g. to water pump or outhouse) especially in wet / soft soil areas.		OGNZL

Timeframe	Task	Explanation / Notes	Responsibility
	Place rocks, logs (etc.) beneath rainfall drip lines from structures		
	Control possums and rodents around platform	Maximise seed output and germination rate of trees surrounding site	OGNZL

5.3.3 Interim Closure – Drill Sites (Per Site)

Table 10: Process for site closure following cessation of drilling, per site.

Timeframe	Task	Explanation / Notes	Responsibility
REMOVAL OF DRILL EQUIPMENT / CONSTRUCTION MATERIAL	Remove all construction equipment. Cap / stabilise drill holes raises. Remove platform, piles, and non-slip grating on tracks (etc.) unless re-using site as helipad / camp Remove fence	Note: refer to WUG Ecological Management Plan (earlier in this report) in relation to fence removal	OGNZL
	Control woody weeds (e.g., gorse: cut and paste with glyphosate)	Avoid use of soil active herbicides	OGNZL
	Carefully spread stockpiled felled logs, branches, rocks, and duff / soil across drill site Spread nurse logs / duff / soil only if it has been stockpiled for <6 months, otherwise remove coir mats (etc.) and leave in situ Ripping of the root zone (using hand tools / hand operated machinery) may be beneficial if surfaces are heavily compacted	Consider site specific factors (e.g. sunny / dry areas, dark / damp areas) and put effort where it is most likely to be successful. E.g., if minimal duff is available / stockpiled, place it in cool / damp / shady areas, rather than sunny dry areas.	OGNZL with input from ecologist
	If considered necessary by ecologist, obtain additional seedlings and seeds from immediately surrounding forest areas Plant surplus seedlings salvaged from adjacent areas. Consider habitat suitability / species tolerance Mānuka, kānuka, hebes, and some *Coprosma* spp. branches with ripe seed can be placed on edges for immediate brush seeding	Approach recommended only if large proportion of site lack small trees or seedlings Preferable to planting of ex-situ nursery raised stock – much lower effort, no biosecurity risk	Ecologist with assistance from OGNZL
	Maintain control of possums and rodents around platform	Maximise seed output and germination rate of trees surrounding site	OGNZL

Timeframe	Task	Explanation / Notes	Responsibility
	Record observations of most successful plant species from earlier coppicing, transplanting, crushing etc. (best survival / growth)	Obtain knowledge applicable to future sites	Ecologist

5.3.4 Final Closure and Aftercare – Drill Sites (Per Site)

The following steps apply to **final closure of drill sites** (i.e., following cessation of all drilling activities and final removal of camp / helipad etc.). This does not apply to vent raise sites, which will have vent infrastructure in-situ during the entire mine operational phase.

Table 11: Process for site closure following drill site closure, per site.

Timeframe	Task	Explanation / Notes	Responsibility
FOLLOWING SITE CLOSURE	Final closure: Remove all remaining foreign material (piles, platform etc.). Leave drillholes capped as required. Leave site to regenerate		OGNZL
	At 0, 6-, 12-, 18- and 24-months post-closure: control woody weeds, carefully hand-clear other weeds (e.g. grasses / herbs) if necessary	Avoid use of soil active herbicides	OGNZL
	At 36-, 48-, and 60-months post-closure: control weeds as above		
	At 0 months post-closure: establish basic process for monitoring survival of transplants and canopy closure (e.g., tag representative range of seedlings / transplanted trees and measure DBH, record canopy cover with densiometer, establish photopoints) Record general observations of most successful regenerating species from previous transplanting etc. (best survival / growth)	Obtain knowledge applicable to future sites	Ecologist
	At 24 months and 60 months post-closure: remeasure survival of transplanted trees and recovery of forest / canopy closure (as above)		
	At 24 months and 60 months post-closure, if considered necessary by ecologist, plant seedlings or relocate nurse logs (salvaged from adjacent areas), or undertake brush seeding	Approach recommended only if large proportion of site lacks small trees or seedlings	OGNZL

Timeframe	Task	Explanation / Notes	Responsibility
	Maintain general catchment scale predator control – for time duration as determined by Pest Management Plan (Boffa Miskell 2025) / approvals	Site-specific pest control no longer necessary, general control remains beneficial	OGNZL

5.3.5 Interim Closure (During Mine Operational Phase), and Final Closure and Aftercare – Vent Raises (Per Site)

The following steps apply following construction of vent raises, including interim closure during the operational phase of the mine (while vents are in use), and final closure following cessation of all mining activities. This assumes a c.20 year mine operational phase once the vents have been established and while they remain in use.

Table 12: Process for site closure at vent raise sites, including interim closure (following vent raise construction, during mine operational phase) and final closure (following cessation of all mining activities), per site.

Timeframe	Task	Explanation / Notes	Responsibility
INTERIM CLOSURE (MINE OPERATIONAL PHASE)	Remove all construction equipment and foreign material (piles, platform etc.) aside from vent raises. Remove fence Leave site to regenerate	Note: refer to WUG Ecological Management Plan (earlier in this ELMP) in relation to fence removal	OGNZL
	At 0, 6-, 12-, 18- and 24-months following construction of vent raises: control woody weeds, carefully hand-clear other weeds (e.g. grasses / herbs) if necessary	Avoid use of soil active herbicides	OGNZL
	At 36-, 48-, and 60-months: control weeds as above		
	At 10, 15, and 20 years: undertake weed control as above		
	At 0 months following vent raise construction: Establish process for monitoring survival of transplanted trees and recovery of forest / canopy closure (e.g., tag representative range of seedlings / transplanted trees and measure DBH, record canopy cover with densiometer, establish photopoints)	Obtain knowledge applicable to future sites	Ecologist

Timeframe	Task	Explanation / Notes	Responsibility
	Record general observations of most successful regenerating species from previous transplanting etc. (best survival / growth)		
	At 24 months and 60 months, if considered necessary by ecologist, plant seedlings or relocate nurse logs (salvaged from adjacent areas), or undertake brush seeding.	Approach recommended only if large proportion of site lacks small trees or seedlings	OGNZL
	Maintain general catchment scale predator control – for time duration as determined by Pest Management Plan (Boffa Miskell 2025) / approvals	Site-specific pest control no longer necessary, general control remains beneficial	OGNZL
FINAL CLOSURE (FOLLOWING MINE OPERATIONAL PHASE)	Determine preferred final closure approach: consider whether leaving vent raise collars (etc.) *in situ* is preferable for forest regeneration rather than new disturbance / excavation to enable their removal	Over the c.20-year operational lifetime of the vents, the forest and canopy is likely to have generally closed over the vent raise collars (etc.). New disturbance may do more harm than good	OGNZL with input from stakeholders and ecologist
	If leaving vent raise collars *in situ* or deconstructing them without canopy disturbance / soil disturbance: no specific actions required		
	If vent raises are physically removed / deconstructed requiring canopy disturbance / soil disturbance: assess canopy cover, then: If canopy is generally closed (>80% cover), carefully hand-transplant small number of nurse logs or hand spread duff from nearby areas over final capped surface / landform If canopy is still open (<80%), carefully hand-transplant small number of nurse logs or hand spread duff, spread soil and transplant seedlings of tolerant species from nearby areas. Protect seedlings with rocks, large branches, punga logs etc.	Additional monitoring required if sites disturbed again during vent raise removal. Required actions dependent on canopy closure progress during prior mine operational phase	OGNZL with input from stakeholders and ecologist

Timeframe	Task	Explanation / Notes	Responsibility
	And: Conduct additional weed control, monitoring and transplanting at 2, 5 and 10 years following removal / deconstruction of vent raises		

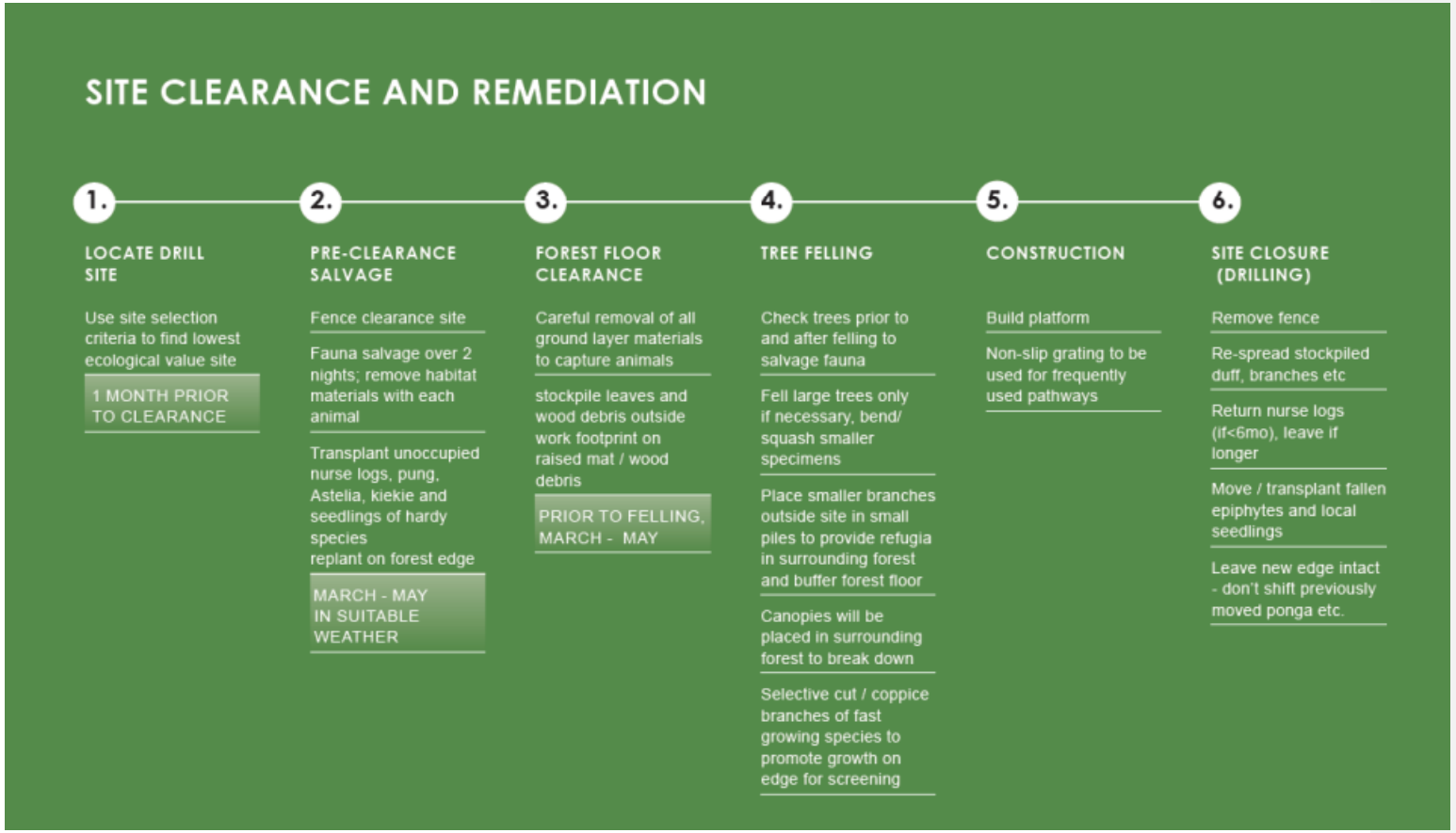

Figure 25~~Figure 2525~~: **General process for vegetation remediation alongside drill site / vent raise site establishment and closure.**

5.4 OUTCOMES

Successful implementation of the approach outlined earlier in this report will allow for natural regeneration of forest habitat within each drill site and vent raise site. Natural regeneration will be supported by:

- Minimising the loss of trees within each site; - Creating a 'thickened' edge of vegetation to reduce edge effects, maintain habitat conditions within the forest, and enable the eventual spread back into cleared site;
- Reinstating organic material rather than exposing bare soils; and
- Minimising impacts to seedbanks and microbiota in forest duff by careful handling and storage, allowing seedlings able to germinate.

In the long term (decades), sites should be indistinguishable from their surrounding forest habitat. These forest regeneration processes are intended to be as similar as possible to natural scenarios, such as gap regeneration following large treefall.

5.5 MONITORING AND ADAPTIVE MANAGEMENT

Drill sites will be decommissioned progressively as they are no longer required. This provides opportunities to adapt and refine the restoration approach based on success monitoring (i.e., which methods are appropriate for different species). Once a site is decommissioned and the platform is removed (i.e., 0 months post-closure), a representative range of seedlings and transplanted trees will be tagged and measured (DBH) to assess survivorship, and canopy cover will be recorded with a densiometer. Observations of disturbance or damage from pest e.g. browse / pig rooting will be recorded (exclusion fencing / localised control will be initiated if required). These will be the key monitoring parameters and measurement and recording protocols will be prepared to ensure they are consistently recorded. Monitoring will be carried out six monthly for the first two years (i.e., 0, 6, 12, 18 and 24 months) and then yearly up to five years (i.e. 26, 48, and 60 months). Reporting and analysis will include general observations of successful regenerating species from previous transplanting (i.e. which species have the best survival / growth). Short term success indicators to be assessed within the first 5 years include:

- Evidence of regeneration (e.g. crushed / bent trees resprout once platform is removed);
- Seedling recruitment; and
- Regeneration of a diverse vegetation community similar to the surrounding forest.

Coromandel Forest Park is highly favourable to regeneration and the time lag to a closed canopy is likely to be rapid for smaller sites (years for complete cover) to decades for larger sites (noting there may be local differences forest type / slope / aspect).

5.6 KEY PERFORMANCE INDICATORS

Commented [MD16]: Linked in to more clearly identify how it will be determined if management measures are functioning as they are intended to.

Success monitoring will be undertaken considering matters such as survivorship, canopy cover, disturbance or damage from pests. Monitoring will be carried out six monthly for the first two year and then up to five years. In the short term (within the first five years), success is to be assessed via matters such as evidence of regeneration, seedling recruitment, and regeneration of a diverse vegetation community similar to the surrounding forest.

~~5.6~~5.7 REFERENCES

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PART E: MANAGEMENT OF PLANT PATHOGENS AND INVASIVE SPECIES

6. MANAGEMENT OF PLANT PATHOGENS AND INVASIVE SPECIES

6.1 MURTLE RUST PROTOCOLS

Commented [MD17]: Added in at request of DOC.

6.1.1 Overview

Myrtle rust is a serious fungal disease of plants in the myrtle (Myrtaceae) family and is caused by the fungus Austropuccinia psidii. It affects several native plants including ramarama, pōhutukawa, rātā, kānuka and mānuka, as well as several exotic species. Myrtle rust is known to be present throughout most of the North Island (including Waihi), and across the top and on the west coast of the South Island (Beresford et al., 2019). In May 2018, the Ministry for Primary Industry's (MPI) response was closed, and the focus moved to science to find ways to manage the disease in the longer term.

Myrtle rust (shown in Figure 26 below) can be identified by the following symptoms (myrtlerust.org.nz):

- Bright yellow powdery eruptions appearing on the leaf;
- Brown/grey rust pustules on older lesions;
- Grey 'fuzzy spore growth on underside of leaf; and
- Some leaves may become buckled or twisted and will die off.

Figure 26~~Figure 26~~: Myrtle rust on ramarama (left), rata (right). Images courtesy of myrtlerust.org.nz

6.1.2 Purpose of Myrtle Protocols

Myrtle Rust is now widespread and is wind-borne. Therefore, its transmission into the WNP area cannot be prevented (if it is not already present). However, Project-mediated transmission can be minimised through recommendations provided in this Plan.

Currently, if Myrtle Rust is found, the MPI website recommends:

> Don't touch it;

> Take a clear in-focus photograph; and

> Submit the photograph to iNaturalist.

The following recommendations will ensure the appropriate management of myrtle rust risk within the WNP area.

6.1.3 Myrtle Rust Risk Management During Surface Activities

If personnel believe they have seen the symptoms of myrtle rust, refer MPI recommendations above and notify the relevant plant nursery (if the infected plants are less than 5 years old).

If personnel wish to remove infected myrtle plant material:

> Bury infected material onsite (at 50 cm depth); or

> Take the Myrtle rust infected material to a landfill or transfer station provided that is it securely enclosed in a sealed bag and disposed of as general waster (not green waste).

6.2 DIDYMO PROTOCOLS

Commented [MD18]: Added in at request of DOC

6.2.1 Overview

Didymo (Didymosphenia geminata), also known as "rock snot", is an invasive freshwater algae found in New Zealand, primarily in the South Island.

Didymosphenia has large sarcophagus-shaped cells that are mounted on long mucilaginous stalks. Masses of this alga (commonly referred to as "didymo") primarily consisting of the stalks, can smother streambeds, and pile up along stream and river margins. Dried-up wads of this alga look like paper pulp dumped on the stream/river banks as shown in Figure 27 and Figure 28.

Figure 27~~Figure 27~~: Didymo on stream rocks. Image courtesy of Landcare Research.

Figure 28~~Figure 28~~: Didymo on rocks in stream bed. Image courtesy of Landcare Research.

6.2.2 Purpose of Didymo Protocols

Didymo is not yet detected in the North Island of New Zealand, therefore following the "Check – Clean -Dry" method outlined by MPI is of high importance (further details on cleaning methods is available on the MPI website) in preventing the spread through north island water ways.

6.2.3 Didymo Risk Management During Surface Activities

All gear and equipment being used in or near waterways should be washed using the "Check - Clean - Dry" method outlined by MPI. If personnel believe they have seen didymo, refer to the MPI recommendations at the website link above. Sightings should be reported to MPI or the local regional council.

6.3 KEY PERFORMANCE INDICATORS

Any sightings or confirmed infections of plant pathogens or invasive species will be reported and managed in accordance with best practice standards and requirements. Further details of any measures and methods implemented in relation to the management of plant pathogens can be provided on request.

Commented [MD19]: Specific performance indicators are not identifiable in relation to infection matters. As such, sightings or confirmed infections will be managed in accordance with best practice standards and requirements.

PART F: AQUATIC FAUNA SALVAGE AND RELOCATION PLAN

~~6.~~7. AQUATIC FAUNA SALVAGE AND RELOCATION PLAN

~~6.1~~7.1 INTRODUCTION

~~6.1.1~~7.1.1 Background

This Plan details the processes for native aquatic fauna (fish, kōura and mussel) salvages that are required in several watercourses within the WNP operation site. Successful translocations reduce the potential impacts on native fauna and will allow streamworks to commence.

The freshwater fish onsite are protected by the Freshwater Fisheries Regulations 1983, which prohibits intentionally killing of destroying indigenous fish.

~~6.1.2~~7.1.2 Location

After conducting freshwater values assessments throughout the Project site, it is necessary to carry out fish and kōura salvage in Tributary 2 on Willows Site, as shown on the following figure.

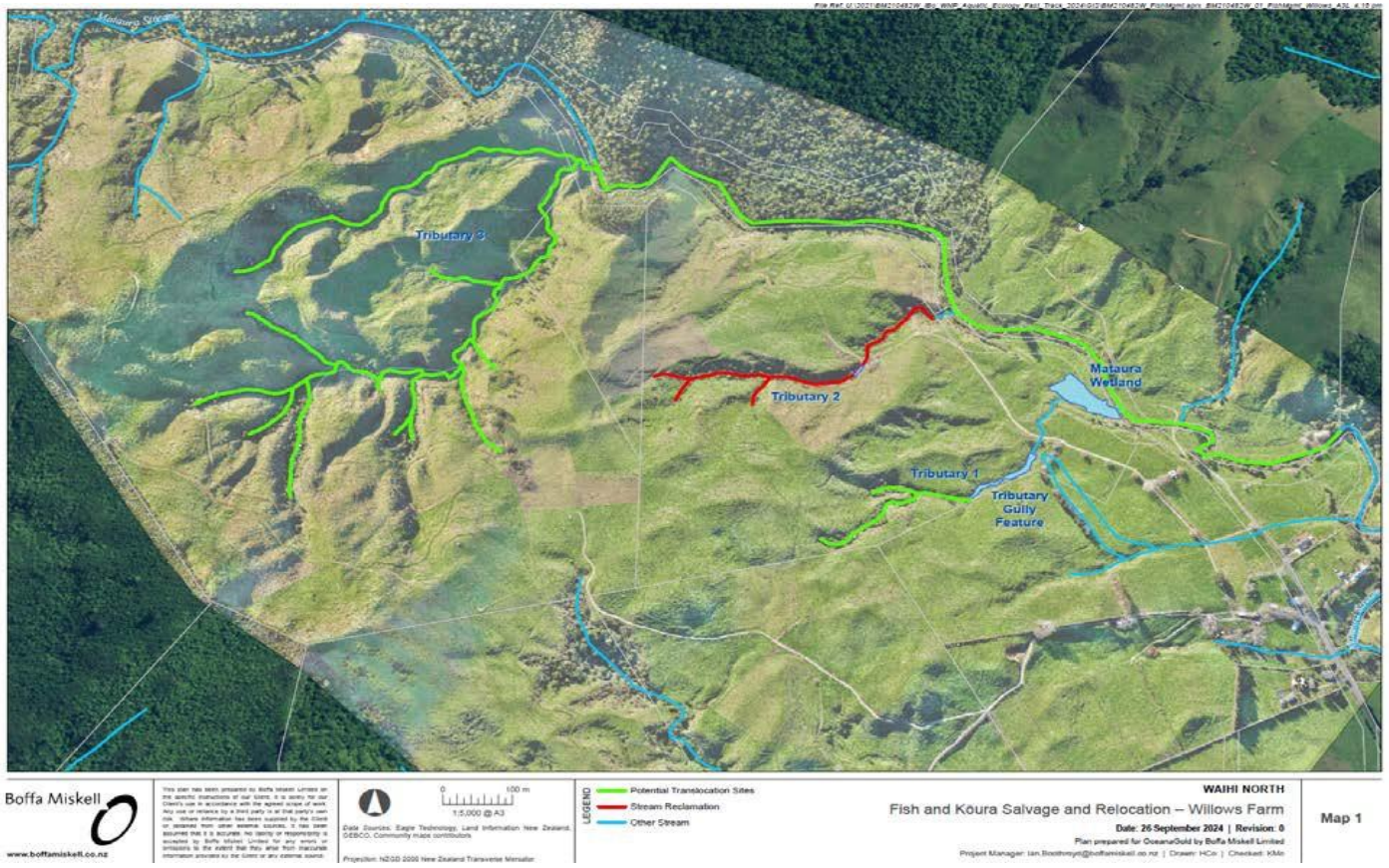

Figure 29~~Figure 2929~~: Location of stream reclamation / aquatic fauna salvage (shown in red) and relocation sites (shown in green) at Willows Fara.

~~6.2~~7.2 FISH COMMUNITIES

~~6.2.1~~7.2.1 Overview

Assessments of fish communities were undertaken across all watercourses proposed to be reclaimed for the WNP to ascertain what species were present and their approximate density. Surveys were undertaken using a backpack mounted Electric Fishing Machine (NIWA kainga EFM300) operated by suitably qualified freshwater ecologists. A summary of the fish communities at each location are provided in the following section.

No specific surveys for kōura or mussel have been undertaken. Kōura were occasionally collected whilst electric fishing but no mussels were observed during associated surveys.

The threat status of the fish observed are show in Table ~~12~~ 13 below.

Table 13: Threat status of species observed in waterways across the WNP Project (2017 – 2020). Threat status from Dunn et al (2017). Note* - Kōura threat status from Grainger et al. (2018).

Common Name	Species	Threat Status
Longfin eel	*Anguilla dieffenbachii*	**At – Risk - Declining**
Shortfin eel	*Anguilla australis*	**Not Threatened**
Common Bully	*Gobiomorphus cotidianus*	**Not Threatened**
Rainbow trout	*Oncorhynchus mykiss*	**Introduced and naturalised**
Kōura	***Paranephrops planifrons***	**Not Threatened***

~~6.2.2~~7.2.2 T ributary 2 – Willows Farm

During fish surveys three shortfin eel and several kōura, were confirmed within the watercourse. In addition, a fish species (suspected *Galaxias* species) and a number of unidentified eel species (*Anguilla sp.*) were observed during the fish survey.

~~6.3~~7.3 PRE-STREAMWORKS

The proposed WNP requires the reclamation of some 4.1 km of stream within the Project area. This reclamation will be staged as the Project progresses. It is anticipated that this staging will be undertaken across many years. The specific staging of the streamworks has not yet be undertaken and consequently the specific sites and timing of reclamation are not known.

As the project progresses and stream reclamation is required, then a pre-streamworks site visit must be undertaken by the Project Freshwater Ecologist and members of the Project Team to discuss and confirm the proposed reclamation. This site visit should discuss and confirm, but not be limited to, the following:

- The upper and lower extent of the stream reclamation.
- The proposed timing of the reclamation and adverse weather options.
- The proposed method of streamworks.
- The proposed method of fish salvage, which should be consistent with this plan, and its implementation.
- The potential requirement for undertaking the fish salvage in stages if long reaches of stream are proposed to be reclaimed.
- The use of any diversion channels, both temporary or permanent.
- The proposed areas of relocation and any access arrangements.
- If the proposed reclamation stream contains soft sediment that may be suitable mussel habitat.
- A source of bracken fern Pteridium esculentum should also be confirmed.
- Monitoring methods.

The Project Freshwater Ecologist must also undertake a site visit to the proposed relocation sites, to ensure they are suitable. GPS locations must be recorded and a general habitat assessment undertaken.

The pre-streamworks site visit and associated Project Team meeting will inform the Relocation Event Fish Salvage Plan.

~~6.3.1~~7.3.1 Mussel Surveys

Mussel surveys should be undertaken at sites where suitable mussel habitat has been identified during the Site Visit.

The mussel survey should follow Protocol 2 in Catlin et al. (2018). Protocol 2 is the recommended monitoring method in most situations and provides a good estimate of the species density and size structure. This level of detail will help to ascertain the size of the population and the extent of relocation site(s) and transportation methods that may be required.

In brief, this Protocol involves the following:

- Visual / hand searches of the stream bed by 2-4 people.
- The use of underwater viewers.
- Collection of habitat data.
- An initial 30-minute survey for Presence/absence.
- If mussels present, a more thorough survey using visual and hand search methods.
- Recording of individual mussel data such as species, length, width and depth.

Dependent on the length of stream reclamation, multiple surveys may need to be undertaken. The mussel survey will be used to inform the Relocation Event Fish Plan and if mussel salvage is required.

~~6.3.2~~7.3.2 Relocation Event Fish Salvage and Relocation Plan

Prior to each reclamation / relocation event a Relocation Event Fish Salvage and Relocation Plan should be prepared. The WNP requires reclamation of stream reaches with different fauna communities and habitat features. Not all methods proposed within this Plan may be applicable at the time of salvage and relocation. The exact timing and staging of streamworks is currently unknown and stream habitats may change over time.

The Relocation Event Fish Salvage and Relocation Plan will detail fish, kōura and mussel salvage and relocation methods for the individual relocation events. This Plan shall detail as a minimum the following:

- Proposed location(s), including GPS locations, and length of stream to be reclaimed.
- Proposed streamworks and the use of any diversions, temporary or permanent.
- Staging of any salvage.
- Site preparation methods.
- Presence of mussels and if there is a requirement of a mussel survey.
- Kōura, mussel and fish salvage methods.

- Dewatering method.
- Details of relocation site(s), including general habitat, suitability for expected species, GPS locations and access.
- Storage and transport methods.
- Details of personnel implementing the plan and their associated experience and any permits required to undertake the work.
- Reporting requirements, including recording of the species and abundance of all fauna relocated or euthanised.

Relocation events within a Relocation Event Fish Salvage and Relocation Plan may include different stream reaches if the fish salvage and relocation operation is undertaken concurrently or consecutively. However, the bulleted above must be detailed within the Plan for each individual streamworks reach.

Relocation Event Fish Salvage and Relocation Plans must be consistent with this Aquatic Fauna Salvage and Relocation Plan.

Each Relocation Event Fish Salvage and Relocation Plan must be approved by Waikato Regional Council prior to implementation.

~~6.4~~7.4 FISH, KŌURA AND MUSSEL SALVAGE METHODOLOGY

~~6.4.1~~7.4.1 Overview

Prior to starting any instream works, or construction activities that may affect watercourses aquatic fauna salvage must be undertaken. To successfully salvage as many fish, kōura and mussels from watercourses as practicable a combination of whakaweku, visual searches, netting, electric fishing, and channel dewatering are likely to be required. The best combination of methods for each stream reach will be determined prior to streamworks by the lead freshwater ecologist dependent on the habitat present at the time of salvage. However, each fish salvage operation should plan to include the following:

- Site preparation (inclu. exclusion nets)
- Tau Kōura / Kōura Salvage (whakaweku)
- Visual searches for mussels
- Set-nets for fish (fyke and Gees minnow)
- Electric fishing for fish

> Stream dewatering

The detail of each stage is further outlined below.

The project freshwater ecologist must be given as much notice of upcoming streamworks as possible. The successful implementation of this Plan is weather dependent and resource heavy and requires as much lead in time as possible. The execution of the Plan should be as close as practicable to the proposed streamworks, preferably finishing within 48 hours of streamworks, to limit the possibly of fish species re-entering the watercourse. The Plan should not be implemented during a time of high, or predicted high rainfall and weather forecasts, and stream water levels should be monitored regularly.

The methods described below are considered approved and appropriate practice for fish, kōura and mussel salvage respectively. The final method will be determined following a site visit. The plan must be implemented by a suitably qualified freshwater ecologist(s) who has the experience and associated permits and approvals required to safely undertake the work.

~~6.4.2~~7.4.2 Salvage Timing

The successful implementation of the Plan is dependent on weather and the staging of the Project associated streamworks. Generally, water levels within streams are lower during summer months and there is a reduced frequency of high rainfall events. This makes it easier to navigate streams and reduces the chance of damage to the exclusion nets. Any streams that are intermittent may also be dry during summer months, reducing the potential effects on fish.

The Project Freshwater Ecologist shall consult with the Project Team to plan the staging and sequence for work.

~~6.4.3~~7.4.3 Site Preparation

Prior to the start of fishing the reach must be isolated upstream and downstream to prevent the movement of fish species into or out of the reach. This can be created through the installation of fish exclusion nets, or by bunding the upstream and downstream extents using earth or large metal plates. The final method will depend on the stream and the water depth at the time of implementing the Plan.

~~6.4.3.1~~7.4.3.1 Fish Exclusion Nets

Fish exclusion nets can be installed by a suitably qualified and experienced ecologist prior to fishing. A fish exclusion net must be installed at the upstream and downstream extent of the proposed streamworks. The fish exclusion net prevents the movement of fish, while still allowing the flow of water. When installing a fish exclusion net, it's construction should include:

- Waratahs at 0.5m intervals to withstand potential high flows.
- Permeable mesh with aperture size less than 5 mm.
- Extra deep footing (400 mm below bed and 400 mm above water surface) that is secured to the streambed using rocks.
- Footings at each end extended 400 mm into bank and pinned.

The nets should be inspected daily to ensure they have not failed or been damaged. If high rainfall is forecast while the nets are in place, the nets must be inspected prior to and following the rainfall event. If water has overtopped the nets, or they have been damaged, a decision will need to be made by the Project Freshwater Ecologist about whether the salvage operation will need to start-again. This will be dependent on the stage at which the salvage operation is at and the extent of the fish exclusion breach.

~~6.4.3.2~~7.4.3.2 Bunding

If the stream is too deep or otherwise unsuitable for fish exclusion nets, then earth bund/metal plates may be used. The bund or metal plates must be of sufficient size to prevent any water breaching over, or around.

Dependent on the duration of fishing, water may need to be pumped past the area of fishing, or it may need to be pumped into and out of the exclusion area to keep cool, oxygenated water flowing within the channel. The pump must be fitted with a fish exclusion rose, or covered in shade cloth with an aperture of no more than 5 mm. This will be decided between the Project Freshwater Ecologist and the Project Team and will depend on the stream habitat, season, weather and associated streamworks.

Water levels of the bund should be inspected daily to ensure water has not breached the bund. If water has overtopped the bund, or have been damaged, a decision will need to be made by the Project Freshwater Ecologist about whether the salvage operation will need to start again.

This will be dependent on the stage at which the salvage operation is at and the extent of the breach.

~~6.4.4~~7.4.4 Tau Kōura / Kōura Salvage

The Tau Kōura (traditional Māori kōura harvest method) of using whakaweku has been adapted and undertaken in conjunction with modern practises to capture kōura. Tau kōura works by placing whakaweku (bundles of bracken fern *Pteridium esculentum*) on the stream bed that kōura then colonise. A variation of this will be utilised where individual fern bundles are used. Tau Kōura varied methods are:

- Individual whakaweku are to be constructed using bracken fern fronds that have been cut off near the ground and bound together using cable ties (See Appendix 6A for full method).
- Individual whakaweku are to be anchored to the streambed or streambank, in line with water flow. It should be set in water 0.2 m or deeper (Kusabs et al., 2018), and can include pools, runs, or be placed along the stream edge.
- The whakaweku should be left in place for a minimum of two weeks prior to sampling, ideally up to four weeks.
- When retrieving the whakaweku a large stop net is to be placed downstream of, then used to wrap and lift the whakaweku to the streambank to prevent the loss of any kōura.
- The kōura should then be placed in a large fish bin with an aquarium air pump. Some of the whakaweku fronds should be placed in the fish bin to provide cover.

Where possible kōura should be transported via vehicles in fish bins or lidded buckets, at low speed to the translocation site. Kōura should be placed into pools or areas of slow flow at the translocation site(s). Preference should be given to areas with abundant habitat cover (large wood, undercut banks, cobbles, boulders) to provide shelter to the newly introduced individuals.

Where possible, exclusion nets should be installed prior to the placement of whakaweku and stay in place for 2-4 weeks prior to sampling. The whakaweku should be inspected following any periods of high rainfall, to ensure they are still in place. Sampling should only occur once exclusion nets or bunds are in place.

The other fishing methods should commence once the whakaweku have been sampled. Whakaweku are to be re-deployed during netting methods and checked daily (after their initial 2-4 week soak). However, they should be removed from the stream prior to electrofishing.

Whakaweku also can catch smaller fish such as elver (juvenile Anguilla spp.), juvenile Galaxias species and bullies. These should also be harvested from the whakaweku and relocated with any kōura.

These methods may need to be adapted to the streams depending on factors such as debris, macrophyte cover, water depth, etc. This will be confirmed by the Project Freshwater Ecologist.

~~6.4.5~~7.4.5 Freshwater Mussel Salvage

Freshwater mussels (Kākahi, or Kāeo), are common and widespread throughout New Zealand with two species present within the Waikato Region: Echyridella menziesii and Echyridella aucklandica. Kākahi are free-living and semi-burrow themselves into substrates but can also move around using their muscular foot (Catlin et al, 2018.). No mussel specific surveys have been undertaken within the watercourses of the WNP. However, they may be present and accordingly salvage actions must be undertaken.

Freshwater mussel salvage should be undertaken prior any kōura or fish salvage, either netting or electric fishing (mussel salvage could be undertaken at the same time as the installation of whakaweku). The mussels must be given time to settle into their translocation habitat prior to the translocation of any kōura or fish species.

Mussels are found buried into sandy/silty substates and are typically found along banks, in undercut areas, amongst macrophytes, within shaded areas and next to logs (Catlin et al.2018). The following methods should be used for salvage and are based upon those outlined in Catlin et al (2018).

- An underwater viewer should be used to view the stream bed.
- The entire streambed, where practicable, should be systematically visually searched, identifying mussels that are emerging from the streambed.
- If a mussel is found visually, remove if from the substrate and then undertake a tactile hand search of the surrounding area to 8 cm deep, to detect any buried mussels.
- The base and stalks of macrophytes should be inspected for any juvenile species.
- The entire length of stream to be reclaimed should be searched for mussels.

Mussel health should be recorded including species, any shell thickening or erosion, length. The presence of any dead shells (both sides must be present) should also be recorded.

To transport captured mussels McEwan (2022) recommends they are submerged in water, with consideration given to physical movement within the transportation vessel. It is also recommended that mussels be planted into the substrate at the relocation site, by gently pushing the umbo (shell origin) end into the sand/silt, orientated upwards, to half cover the mussel as outlined in Catlin et al. (Appendix 6) (further details in Appendix 6B). Planting the mussel into the substrate may reduce their risk of predation (McEwan, 2022).

~~6.4.6~~7.4.6 Fish Salvage

~~6.4.6.1~~7.4.6.1 Netting: Fyke and G-Minnows

Netting is to use a combination of baited fyke nets and G-Minnow traps. The total number of nets/traps will be dependent on the site and will be determined at the time of deployment.

Netting should follow the following method:

- Nets should be set at regular intervals within the exclusion channel. All nets should be baited and set with an 'air gap' and left overnight.
- Channels with high macrophyte growth may require the creation of 'capture pits'. These pits are large pits made in the channel using a digger. They create clear areas in the channel within which fyke nets can be set. They also provide refugia for fish during the final dewatering process allowing efficient capture.
- Nets should be checked the following morning. Any fish captured are to be identified and transferred to a large fish bin prior to relocation.
- If large numbers of fish are captured, then fish may need to be released prior to the checking of all nets to minimise time spent within the fish bins.

If fish are captured then the nets are to be inspected for any damage, rebaited and redeployed for consecutive nights, until the total catch is less than 20% of the first nights catch, up to a maximum of four nights. It is recommended that fish salvage commences on a Monday to enable four consecutive nights of salvage more easily, if required. If very high numbers of fish are still being captured after the fourth consecutive night, a decision will be made by the Project Freshwater Ecologist if further netting is required.

If no fish are captured within the nets, then the nets do not need to be re-deployed, and the netting component of the Plan is considered complete.

~~6.4.7~~7.4.7 Electric Fishing

Following the completion of netting, or if netting is not suitable, then electrofishing should be undertaken. Electrofishing should only be undertaken by a suitably qualified freshwater ecologist who has necessary permits and approvals and the experience to use an electric fishing machine.

Electrofishing should be carried out as follows:

- All suitable areas within the exclusion channel should be electrofished using a NIWA Kainga EFM300 backpack fishing machine or similar.
- Three electrofishing passes are to be undertaken. If large numbers of fish are still being caught on the third pass then electrofishing shall continue until a capture rate of <20% off the first pass is achieved.
- If necessary, fish should be placed into a recovery bucket prior to being placed in larger fish bins, to allow the effects of the electrofishing machine to wear off.
- If large numbers of fish are captured, then fish may need to be released in between passes to minimise time spent within the fish bins.

All captured fish species shall be held in large fish bins filled with cool, oxygenated water. Large eel species should be separated from smaller fish species. Elvers and fish species may be held together.

During fish salvage operations it is possible that additional kōura may be captured. If this occurs, then kōura should be held separately from other fish species.

~~6.4.8~~7.4.8 Dewatering

Following the completion of netting and/or electrofishing then the channel can be dewatered. The following methods should be followed:

- Dewatering should occur as soon as practical following completion of fishing, to minimise the risk of fish exclusion barriers failing.
- The upstream source of water must be stopped. Depending on the type of streamworks to be undertaken, this may be through the blocking and diversion of the upstream reach to a new channel, or through pumping the water over and / or around the streamworks reach.
- If not already in place, an earth bund or a metal plate may be used to stop water entering the earthworks reach at the upstream and downstream ends. These must be

placed within the fish exclusion nets. Similarly, if the water is to be pumped, the pump head must be within the fish exclusion nets to prevent any fish entering the pump.

- Once the source of water has been stopped then the reach will be allowed to sufficiently drain either naturally or through use of a pump. The specialist ecologist may require capture pits to be dug if they were not created earlier.
- A suitably qualified and experienced freshwater ecologist must supervise the dewatering. A hand net should be used to capture any fish that are observed. If suitable, a single electrofishing pass may be undertaken within the channel or capture pits.

~~6.4.9~~7.4.9 Storage and Transport

~~6.4.9.1~~7.4.9.1 Mussels

During the salvage mussels shall be placed in fish bins or buckets of stream water, with an aquarium air pump, located in the shade. While contained the temperature and quality of the water must be monitored, with the water to be changed regularly. Mussels must be translocated to their new location on the day of salvage.

It is anticipated that mussels will be transported to their relocation site either through walking (generally through paddocks) or by driving (along roads or farm races). To transport the mussels, they should be placed in buckets of stream water, with an aquarium air pump. Where the transport to the relocation site may be over uneven ground, then stream vegetation may be placed in the buckets to reduce the occurrence of mussel shells abrading each other.

~~6.4.9.2~~7.4.9.2 Kōura

Captured kōura are to be held in a large fish bin prior to relocation, but not in the same bin as fish. The fish bin will have an aquarium air pump, some vegetation and will be located in a shaded spot. While contained, kōura will be monitored for signs of stress, with water to be changed regularly.

It is anticipated that kōura will be transported to their relocation site either through walking (generally through paddocks) or by driving (along roads or farm races). To transport the kōura, they should be placed in buckets of stream water, with an aquarium air pump.

~~6.4.9.3~~7.4.9.3 Fish

Any fish captured will be held in a large fish bin prior to relocation. The fish bin will have an aquarium air pump, some vegetation, and will be placed in a shaded spot. Whilst contained, fish will be monitored for signs of stress, with water to be changed regularly.

Smaller fish species (e.g. Galaxiidae or Gobiidae species) are to be kept separate from eels. Kōura should be kept on their own. Large eels will be separated and kept within mesh bags within fish bins.

It is anticipated that fish will be transported to their relocation site either through walking (generally through paddocks) or by driving (along roads or farm races). It is not anticipated that the fish will need to be transported through dense bush or for long distances. Therefore, fish will be transported in fish bins, or buckets. When transporting the bins or buckets to the relocation site the lids must be securely fastened. Where practicable, bins should be transported at low speeds to minimise the movement of water within the fish bins.

Fish must not be held overnight in fish bins.

~~6.4.10~~7.4.10 Relocation Sites

Prior to the implementation of this Plan suitable relocation sites must be identified. Relocation sites should be as close as possible to the fish salvage site, ideally upstream or downstream. The relocation sites must contain suitable, stable habitats for the relocation species. A number of salvage sites might be needed to be identified if high number of fish species are anticipated. The location of relocation site should be recorded, and any access requirements should be arranged prior to implementing this Plan. Proposed relocation sites are listed below, and shown on Figure ~~24~~29:

- Tributary 2 Willows Farm
- Tributary 1 Willows Farm
- Tributary 3 Willows Farm

If no/not enough suitable habitat is available within the same catchment, then additional catchments must be as close as possible.

All potential relocation sites must be inspected prior to starting the salvage to ensure suitable is present.

Detail of the relocation site must be recorded including location, photos and a general habitat assessment.

~~6.4.11~~7.4.11 Data Capture

The species, size and general health of all species (including kōura and mussels) caught must be recorded. This includes native and non-native or pest species, alive or dead. Their relocation site must also be recorded.

The final methods undertaken for each implementation of the Plan must be recorded and provided within a summary report.

~~6.4.12~~7.4.12 Biosecurity

Any pest fish species captured shall be humanely euthanised using AQUI-S solution and disposed of to landfill.

Two species of exotic freshwater clams (Corbicula) have been found in the Waikato Region and it is imperative to stop their spread. The two species, Corbicula fluminea and Corbicula australis have been given the legal status of an Unwanted Organism under the Biosecurity Act. Specific Controlled Area Notice's (CAN) are in force and have specific rules to follow for equipment that has been used within the area.

Any equipment used within the CAN area must follow the Check-Clean-Dry requirements to ensure that the clam is not transferred. Of particular relevance to this Plan is the treatment of the absorbent material on fyke and hand nets. If these have been used in any CAN area, then they must be frozen overnight, or submerged in hot water (refer to Ministry of Primary Industries).

It is recommended that no nets or associated equipment that has been in a CAN area is used.

~~6.5~~7.5 PERMITS AND APPROVALS

The Plan is to be implemented by a suitably qualified and experienced freshwater ecologist. Electrofishing should only be undertaken by an experienced operator who have their Electric Fishing Certification, as issued by the National Institute of Water and Atmospheric Research (or equivalent) and be familiar with using a NIWA Kainga300 Electrofishing machine. The following permits and approvals are required to undertake this work:

- Department of Conservation Authority to operate and Electric Fishing Machine
- Fish & Game New Zealand Authority to take sports fish within the Auckland/Waikato Region.
- Fisheries New Zealand Special Permit / MPI Special Permit

All conditions specified within the above permits and approvals must be adhered to. Notably notification and reporting requirements must be undertaken within the specified timeframes therein.

~~6.6~~7.6 REPORTING

Following the implementation of this Aquatic Fauna Salvage and Relocation Plan, a Summary Report will be prepared. For all species the following will be recorded:

- Date, time, location, and method of capture.
- Species, size and health.
- Location and basic habitat of release site.
- Details of species released at each site.

The results of any aquatic fauna captured will be uploaded into NIWA's Freshwater Fish Database. Results will also be provided to the Ministry of Primary Industries, Fish and Game and the Department of Conservation as a requirement of the required Permits.

Due to the large nature of the Project, it is likely that the Plan will be undertaken in stages across the WNP footprint. A summary report should be prepared for each area completed. The final report should incorporate results from all salvage operations undertaken.

7.7 KEY PERFORMANCE INDICATORS

Commented [MD20]: Linked in to more clearly identify how it will be determined if management measures are functioning as they are intended to.

As detailed above, following the salvage and relocation of aquatic fauna (and the implementation of the Aquatic Fauna Salvage and Relocation Plan), a summary report(s) is to be prepared outlining the:

- Date, time, location, and method of capture.
- Species, size and health.
- Location and basic habitat of release site.
- Details of species released at each site.

The summary report(s) is to be uploaded to NIWA's Freshwater Fish Database, and provided to the Ministry of Primary Industries, Fish and Game and the Department of Conservation

Following the relocation of any koura and mussels, the relocated population will be monitored to assess the effectiveness of the relocation. Such monitoring will occur 1 year, 3 years, and 5 years following relocation, with monitoring surveys to be undertaken in autumn.

In the instance that monitoring determined the effectiveness of relocation is not sufficient, the Project Freshwater Ecologist will review and amend the measures of the Aquatic Fauna Salvage and Relocation Plan as necessary.

~~6.7~~7.8 REFERENCES

Catlin, A., Collier, K., Pingram, M. and Hamer, M. 2018. Regional guidelines for ecological assessment of freshwater environments – standardised protocol for adult freshwater mussel monitoring in wadeable streams. Waikato Regional Council Technical Report 2016/23.

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Grainger, N., Harding, J., Drinan, T., Collier, K., Smith, B., Death, R., Makan, T., Rolfe, J. 2018. Conservation status of New Zealand freshwater invertebrates, 2018. New Zealand Threat Classification Series 28. Department of Conservation, Wellington.

Kusabs, I.A., Hicks, B.J., Quinn, J.M., Perry, W.L., Whaanga, H. 2018. Evaluation of a traditional Māori harvesting method for sampling kōura (freshwater crayfish, Paranephrops planifrons) and toi toi (bully, Gobiomorphus spp.) populations in two New Zealand streams. New Zealand Journal of Marine and Freshwater Research. Volume 52 (4), 603-625p.

APPENDIX 6A: TAU KŌURA METHODS

The below methods are taken from NIWA (2024).

Tau Kōura is a traditional method used for harvesting Kōura and has commonly been used in the Te Arawa and Taupō lakes, where kōura are abundant. A variation of tau kōura which makes use of individual fern bundles is also used to harvest kōura and small fish (e.g. elvers and whitebait) in streams, rivers and the shallow shoreline areas of lakes, ponds and wetlands. These fern bundles bundles are known as whakaweku in the Te Arawa and Taupō districts, and as koere and taruke in other areas (NIWA, 20242).

Whakaweku construction

Collect bracken fern (*Pteridium esculentum*) fronds by cutting them off near ground level. This leaves the rhizome intact so that the fern regrows quickly.

Construct bundles of about 10-12 fronds by binding their stems together. Using strong plastic cable ties, adjust the fronds so that they form an open bunch, and cut the ends off the fern bundles to make a “handle”

Figure 30~~Figure 3030~~: **Constructing a whakaweku (fern bundle) for catching kōura: (a) collecting bracken fern, (b) binding 10-12 bracken fern fronds together using cable ties, and (c) a finished whakaweku ready for use.**

Where to put your whakaweku

The individual whakaweku should be anchored on the streambed and positioned in line with stream flow. You can use a rope tied to the whakaweku to anchor the whakaweku to the bank or waratah. The whakaweku (once water-logged) is usually kept in position by its own weight in areas of low current velocity. In faster flows, or in deeper water, you may need to add weight (e.g., rocks) to the whakaweku or attach it to a waratah to anchor it in the desired location.

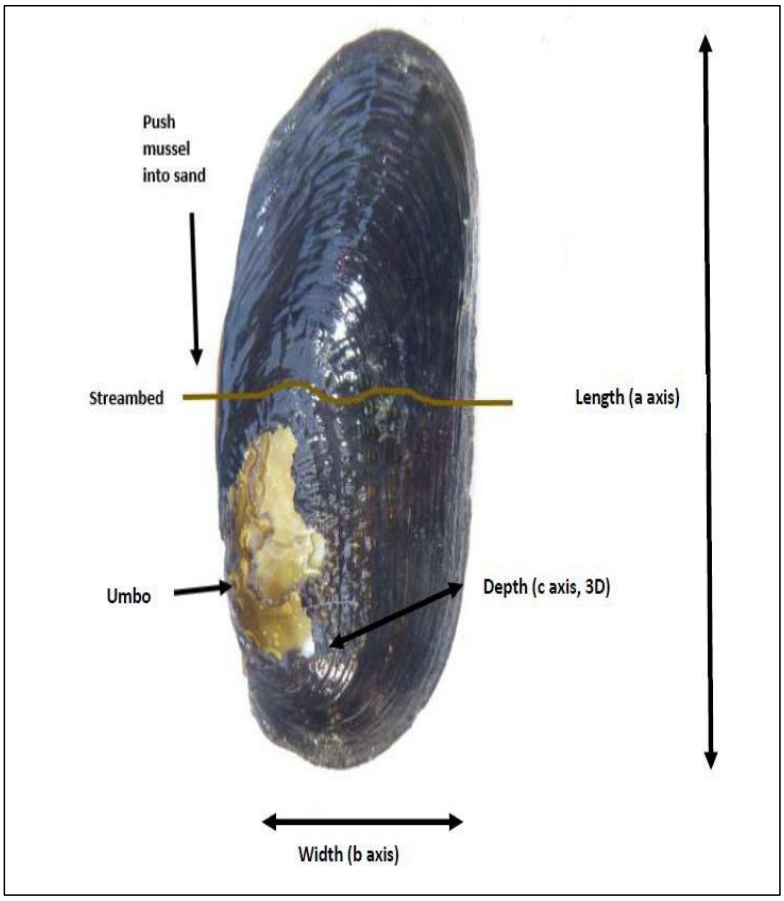
You can set whakaweku anywhere in a stream where the water depth is greater than about 50 cm, including in deep pools, beneath undercut banks or mid-stream. The whakaweku work even if they are not fully submerged in water.

Figure 31~~Figure 3131~~: Whakaweku set in a small stream

APPENDIX 6B: MUSSEL TRANSLOCATION

The below information is taken from Catlin et al. (2018).

All mussels have an umbo, or shell origin - it is usually obvious as the shell will be eroded around it. Return mussels into the substrate by gently *pushing* the umbo end down into the sand/silt to half cover the mussel. It is important to put the correct end downward, because their siphons (used for filter-feeding) are located inside the top of the shell if positioned like the photo), and need to be oriented upward to filter-feed the water column. Mussels in streams need to be embedded so that they can maintain their position in suitable habitat and not become “washed out” when flows increase.


Push
mussel
into sand
Streambed
Length (a axis)
Umbo
Depth (c axis, 3D)
Width (b axis)

Echyridella menziesii | *Echyridella aucklandica* (>80mm)

Echyridella menziesii | *Echyridella aucklandica* (<80mm)

Images from www.mollusc.co.nz

Echyridella menziesii	*Echyridella aucklandica*
Curved outline (usually) to top of shell (i.e., the dorsal edge) – often the shell outline is quite round.	Dorsal and ventral shell margins are parallel. Mussels often appear quite tubular (i.e., long and thin, rather than round).
	Some large mussels can be "bent", with a concave ventral margin (see top picture).
Growth lines curved up to 80mm	Growth lines up to 80mm are more or less parallel to dorsal and ventral margins
Weak nodules / ridges can be present	Nodules / ridges often obvious on upper (dorsal) part of shell
Maximum length is usually 80 mm, less commonly found 90-100 mm in length,	Generally grows to a larger size than *E. menziesii* and often >90 mm long.
Can be either brown or greenish in colour – colour does not distinguish the species	
Shells of both species can have no erosion or severe erosion and deformation	

PART G: KAURI DIEBACK MANAGEMENT PLAN

~~7.~~8. KAURI DIEBACK MANAGEMENT PLAN (KDMP)

~~7.1~~8.1 INTRODUCTION

~~7.1.1~~8.1.1 Purpose

This KDMP has been prepared to provide practical guidance on reducing the risk of *Phytophthora agathidicida* (“**PA**”) spread as a result of exploration works associated with the WNP.

Movement of machinery, equipment and people between sites is identified as a key pathway for the spread of Kauri Dieback Disease and the methods proposed here are specific to this project and its constraints. This plan includes a description of recommended hygiene procedures and how these could be applied to the WNP, as well as monitoring and site management recommendations.

In particular, this report considers:

- Machinery, equipment and personnel movement of contaminated soil as a vector;
- Practical techniques and hygiene practices to contain the spread of Kauri Dieback Disease at each stage of WNP activities;
- Baseline monitoring, surveillance and reporting; and
- Detection and escalation procedures.

This KDMP is consistent with the Biosecurity (National PA Pest Management Plan) Order (2022) and addresses the ten National PA Pest Management Plan (“**NPMP**”) rules set out in the Order. It is also consistent with guidance documents provided by Waikato Regional Council and Tiakina kauri (Kauri Protection) Management Agency, provided in Appendix 7A.

~~7.1.2~~8.1.2 Objectives

The objectives of the KDMP are to provide practical methods to:

- Minimise the risk of PA spreading into and (if present) within the Wharekirauponga catchment by reducing movement of soils; and
- Monitor the health of kauri within the Wharekirauponga catchment along walking tracks and within Sites; and

- Facilitate controlled access to kauri forests where it does not compromise the future or protection of kauri within the context of the Wharekirauponga Exploration Project works.

~~7.1.3~~8.1.3 Legal Status and Regulatory Framework

National and regional legal recognition of pests and unwanted organisms plays a key part in their management and containment. In 2008, PA was declared an 'Unwanted Organism' under the Biosecurity Act 1993.

In 2022, the Government confirmed a NPMP to provide consistency to manage the impact of PA. The NPMP is the strongest form of regulation that the Ministry of Primary Industries ("**MPI**") can put in place for an established pest. Tiakina Kauri is the management agency for the NPMP, which applies in its entirety in Waikato, Bay of Plenty, Coromandel, Auckland and Northland. The NPMP contains 10 rules to manage PA, these are listed below and provided in full in Appendix 7A. Bold rules are relevant to the activities associated with the WNP and are referenced where appropriate in this report.

- **Rule 1: Obligation to report**
- **Rule 2: Provision of information**
- Rule 3: Restriction on the movement of kauri
- Rule 4: PA risk management plans
- **Rule 5: Earthworks PA risk management plan**
- **Rule 6: Stock exclusion notice**
- Rule 7: Restriction on the release of animals
- **Rule 8: Obligation to clean items before entering or exiting kauri forest**
- **Rule 9: Obligation to use cleaning stations**
- **Rule 10: Open tracks and roads in kauri forest**

~~7.1.4~~8.1.4 Kauri Dieback Disease Characteristics

PA is the pathogen regarded as a primary causal agent of dieback disease in otherwise healthy kauri, while other *Phytophthora* species (in particular, *P. cinnamomi* and *P. multivora*) may also have a role in the expression and severity of disease symptoms.

Phytophthora infects trees through their roots, and spreads primarily through the movement of contaminated soil and water, as well as by root-to-root contact between trees.

Previous surveillance work identified that *P. agathidicida* infections showed a strong association with tracks and watercourses, and human activity and disturbance is assumed to be a key vector of the disease.

The kauri dieback pathogen has two types of propagule. The oospore is formed within infected tissue and released into the soil where it can remain latent for an indefinite period. Soil movement is a key mode of dispersal of this type of propagule. The oospore is resistant to sterigene and other disinfectants.

Ultimately, the oospore germinates and produces zoospores which can 'swim' through micropores in saturated soil, and in this way actively disperse themselves. In this form, the pathogen finds and infects tree roots. The zoospores can be destroyed with disinfectant.

Sources and locations of kauri dieback pathogen are:

- Infected tree roots of kauri;
- Parts of the forest floor and waterbodies where oospores have been dispersed; and
- Moist, porous soil layers where motile zoospores have emerged and dispersed.

Mineral sub-soil layers below the root zones of vegetation are at lower risk of contamination relative to organic soil layers, as inorganic parts of the substrate are not porous and do not contain living plant material.

~~7.2~~8.2 WAIHI NORTH PROJECT

~~7.2.1~~8.2.1 Kauri Dieback within the Project Area

In 2014 Kauri Dieback Disease was confirmed present in the Coromandel Peninsula, in the Whangapoua catchment and the Hukarahi Conservation Area. Upon these discoveries both TCDC and the WRC joined DOC and other agencies as partners in the Kauri Dieback Programme.

There are no records for PA, or observations of infected trees in the vicinity of the Wharekirauponga catchment.

~~7.2.2~~8.2.2 Consent, Access Arrangement and Concession Conditions

As set out in the WNP HDC consent conditions, the Wharekirauponga Access Arrangement conditions and the Northern Concession conditions, all activities in Area 1 must be undertaken in accordance with this KDMP.

~~7.2.3~~8.2.3 Roles and Responsibilities

~~7.2.3.1~~8.2.3.1 Site Supervisor

- Adhere to hygiene protocols before entering the Project site, when moving around the site and before exiting site [Rule 8, 9].
- Training all personnel on their responsibilities under the KDMP.
- Signing off on hygiene checks, conducting and documenting random inspections. Ensuring cleaning equipment (soap, water, brushes, plastic containers, Sterigene etc.) are fully stocked and cleaning stations are set-up at the campsite and operational work sites [Rule 8, 9].
- Primary point of contact for contractors (i.e., contractors will report to the Site Supervisor if they observe kauri with symptoms of Kauri Dieback Disease) [Rule 1].
- If symptoms of Kauri Dieback Disease are observed, contact the Geological Support Coordinator and Superintendent - Environment as soon as possible [Rule 1].

~~7.2.3.2~~8.2.3.2 Superintendent – Environment

- If symptoms of Kauri Dieback Disease are reported, the Site Supervisor will collaborate with the 'Manager', MPI / Tiakina Kauri and the Project Ecologists to produce and implement an adaptive management plan [Rule 1, Rule 2].

~~7.2.3.3~~8.2.3.3 Project Ecologists

- Adhere to hygiene protocols before entering the Project site, when moving around the site and before exiting site [Rule 8, 9].
- Mark out kauri along tracks and ensure tracks avoid KHZ [Rule 10].
- Undertake baseline visual kauri health assessment, describing the baseline condition of kauri within sites and along tracks between sites using standard surveillance documentation. This documentation can then be updated by trained staff throughout subsequent phases of the project.
- Mark out KHZ (3 x radius of dripline) for trees within sites.
- Remaining up-to-date with any advances in Kauri Dieback Disease research and legislation.
- Preparing and updating the KDMP and clearly communicating these with the Superintendent - Environment to ensure changes are implemented on the site [Rule 4, 5].

- If symptoms of Kauri Dieback Disease are observed, it is the role of the Project Ecologist to inform the Superintendent - Environment [Rule1].

~~7.2.3.4~~8.2.3.4 Exploration Contractors

- Adhere to hygiene protocols before entering the Project site, when moving around the site and before exiting site [Rule 8, 9].
- Report any occurrences of suspected Kauri Dieback Disease to the Site Supervisor [Rule1].

~~7.3~~8.3 WHAREKIRAUPONGA EXPLORATION DRILL SITE WORKS

~~7.3.1~~8.3.1 Work Phases

There will be four stages of work undertaken at each drill site and different stages may be occurring concurrently at different drill sites within the wider Project area (Figure ~~27~~32). These four stages are: pre-exploration (survey phase), vegetation clearance phase, exploration operations phase and site rehabilitation. Applicable rules from the NPMP are noted in the text where appropriate. Procedural details are provided in Section 7.4.

~~7.3.1.1~~8.3.1.1 Pre-exploration Phase (Sites)

The pre-exploration phase includes establishing sites and walking tracks between sites. Initially, all potential sites are briefly assessed to identify ecological features that may preclude their use as a drill site (e.g. large trees (e.g., > 50 cm DBH) or trees with obvious bat roosts). For sites without these features, a full ecological survey will be carried out to assess suitability. The ecological surveys required will involve working off track and within the root zone of kauri and other native trees. Kauri Hygiene Zones ("**KHZs**") will be avoided except where these need to be specifically surveyed, and contractors will work downslope of kauri where possible. Hygiene procedures will be undertaken at catchment boundaries, or where areas of bare/ disturbed soil within KHZs are encountered.

The objective of the KDMP in this phase is to:

- Record the presence of kauri trees within and adjacent to potential exploration drill sites;
- Visually assess the health of kauri trees;
- Avoid using sites with kauri present, and avoid contact with kauri where possible;
- Carry out hygiene procedures at wash stations and where areas of bare/ disturbed soil within KHZs are encountered.

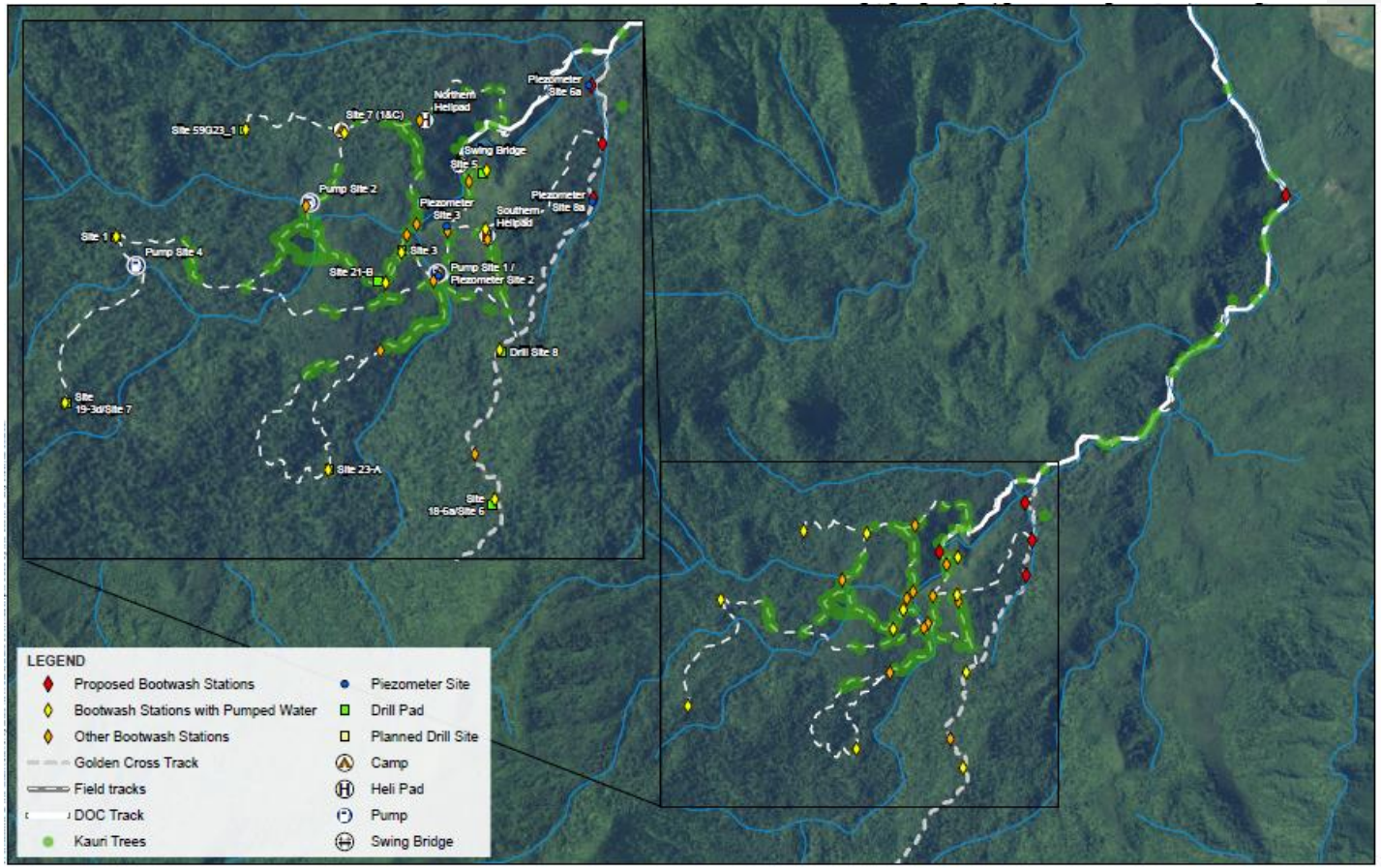


Figure 32~~Figure 3232~~: **Current and Proposed Cleaning Stations**

~~7.3.1.2~~8.3.1.2 Pre-exploration Phase (Walking Tracks)

The pre-exploration phase will also include visual health assessment (baseline survey) of any kauri at the sites or on/adjacent to the tracks between sites (Figure ~~27~~32).

All footwear and gear must be decontaminated at wash stations or using portable hygiene kits. If symptoms of infection are observed during surveillance surveys, or incidental observations, Section 7.4.5 of this plan will be invoked and this practice may be reviewed.

Demarcation of KHZs are described in Section 7.4.2.2.

The objective of the KDMP in this phase is to:

> Survey for kauri along tracks and within sites with the purpose of avoiding KHZ and groves of kauri where possible [Rule 10].

> Flag, georeferenced, and assess health of kauri adjacent to tracks for future surveillance.

~~7.3.1.3~~8.3.1.3 Vegetation Clearance Phase

The vegetation clearance phase will be carried out at each site as required and will include OceanaGold field personnel/contractors moving around and between sites to prepare the site for exploration operations. Vegetation will be felled by hand and stacked immediately outside of the site being cleared. Equipment will be cleaned before and after completion of felling at each site using cleaning stations kept at the site. Large equipment will be flown in and out by helicopter and cleaned offsite, at the Baxter Road facility.

If kauri are present within the area to be cleared, felled trees will be stockpiled and retained with the site boundary, on the inside of a silt fence (required to prevent frogs and/other fauna from moving into the site). All felled vegetation will remain at the site for rehabilitation purposes.

The objective of the KDMP in this phase is to ensure that:

> Machinery and equipment is clean before entering the site and before leaving the site [Rule 8]; and

> Contractors adhere to hygiene protocols as specified in this document [Rule 5, 8, 9].

~~7.3.1.4~~8.3.1.4 Exploration Operations Phase

To prepare a drill site, site is fenced with a silt fence[3], the vegetation on the site is felled, and a drill rig platform is constructed (Figure ~~28~~33). Earthworks within sites are minimised by selecting flat sites and / or using piles to create a level platform. If earthworks are required to level the site, then any earth moved will be stockpiled within the site and managed so it cannot erode offsite and will ultimately be used for rehabilitation of the site. If the site is in a KHZ then strict KDMP hygiene protocols will be required for personnel and equipment carrying out this activity. Equipment and cabins will be placed on the platform to avoid contact with soil.

Following the vegetation site preparation, drilling contractors will be on the site with a range of drilling machinery and related equipment.

The objective of the KDMP in this phase is to ensure:

> Machinery is clean before entering the Wharekirauponga catchment [Rule 8],

> Contact with soil is avoided or minimised, and that

> Contractors adhere to hygiene protocols [Rule 5, 8, 9].

~~7.3.1.5~~8.3.1.5 Site Rehabilitation Phase

Upon the completion of exploration operations at each drill site, the equipment will be flown out and the drill platform will be dismantled. The site will be re-contoured and disturbed topsoil and cleared vegetation will be laid over the site to promote regeneration. If the site is in a KHZ, recontouring will be minimised to avoid soil disturbance as far as practicable, and bed logs (untreated ~ 0.2 x 0.2m thick rough sawn pine logs placed beneath the drill rig and platform to raise above the ground) will remain on site to decompose.

The objective of the KDMP in this phase is to ensure:

> Hygiene standards are maintained and soil exposure is minimised [Rule 5, 8, 9].

> Machinery is cleaned to remove all soil before being flown out of the Wharekirauponga catchment, or after flying into the Baxter Road compound. Site Supervisor signoff is required before removing any tools or equipment from the site [Rule 5, 8, 9].

[3] The silt fence is used to prevent native frog access to the site, but also reduces the risk of soil movement from the site.

~~7.3.2~~8.3.2 Machinery and Personnel

The principal machinery involved in exploration operations is the drill rig and associated equipment; photos of this equipment are shown in Figure ~~28~~ 33 below.

Operation of this machinery requires 3 – 5 personnel to be on site during exploration operations. Later sections in this report describe the hygiene protocols these personnel will undertake to ensure both their personal equipment (e.g. footwear) and the machinery they are operating are free of soil and decontaminated.

Other personnel working on the Project site may include ecologists, OceanaGold staff or other contractors. These personnel will comply with the same hygiene protocols to ensure their equipment does not become a vector for soil movement. As stated above, this will be particularly important for personnel such as ecologists and weed control operators whose tasks require working off track.

Figure 33~~Figure 3333~~: Operational drill rig and rod storage

~~7.4~~8.4 KAURI DIEBACK MANAGEMENT IN WHAREKIRAUPONGA OPERATION

~~7.4.1~~8.4.1 General Principles

PA produces both motile waterborne spores (zoospores) and resting soil-borne spores (oospores). The primary purpose of this management plan is to prevent the introduction of PA to the Wharekirauponga area or contain the spread of PA within the Wharekirauponga area (if present) through the movement of spores through soil and water. Fundamental to the success of this management plan is ensuring the proposed approach is practicable during the activities described in this section. This will be achieved by employing the general principles identified below:

- Implement decontamination procedures whereby all soil is removed from footwear, equipment, tools and machinery that may have come into contact with soil, prior to entering the site.
- Avoid areas with kauri present where possible, and plan routes to avoid kauri, using established tracks where possible.
- Survey drill sites and walking tracks for trees with symptoms of Kauri Dieback Disease prior to project commencement.
- Avoid infected sites and report any potentially infected trees immediately.
- Avoid activities upslope of kauri and avoid muddy areas.
- Keep soil disturbance to a minimum and prevent the deposition of soil into watercourses.
- When vegetation felling is required, all vegetation should be retained on site in the immediate locality of the works.
- Implement ongoing surveillance throughout the life of the project.

~~7.4.2~~8.4.2 Kauri Dieback Disease Surveillance and Monitoring

There is little known about the timeframe between the initial PA infection and the onset of Kauri Dieback Disease symptoms. The regular surveillance recommended in this Management Plan is intended to provide an opportunity to detect any evidence of PA infection in the Project site.

Staff and contractors are also trained to recognize the symptoms of kauri dieback disease and report that observation for follow-up assessment. These measures will facilitate a rapid management response to any suspected infections.

~~7.4.2.1~~8.4.2.1 Approach

Surveys indicate that isolated kauri and small stands of kauri are present throughout the wider project area. For this reason, kauri dieback management procedures will apply to the Project site as a whole, and all kauri will be treated as at risk of infection and avoided where possible.

For the purposes of this management plan, a KHZ includes any area within 3 times the radius of the canopy drip line of any kauri tree (Figure ~~29~~34). Ecologists will undertake baseline surveys for the presence of kauri across all work areas within the site (i.e. drill sites, campsites, pump sites and along the tracks connecting these areas, including within 5 m of the tracks). KHZs will be delineated on sites in order to ensure decontamination measures are implemented wherever soil disturbance occurs within one of these zones, and to enable routing of any new access points so as to avoid or minimise contact with KHZs. The KHZ of kauri along tracks will not be delineated, but the track will be rerouted to avoid contact with the KHZ.

For practical purposes, wash stations and written hygiene protocols will be provided at the entrance to the public DOC Wharekirauponga Loop Track, on the helipads and the entry/exit points of field tracks that service the exploration operation sites from the main public track. Personal cleaning kits are to be carried when conducting surveys off the tracks and in the first instance personnel will endeavour to avoid kauri. The location of any kauri that display symptoms of Kauri Dieback will be noted and reported and if they cannot be avoided then hygiene measures will be undertaken with the personal cleaning kit upon exit of the KHZ.

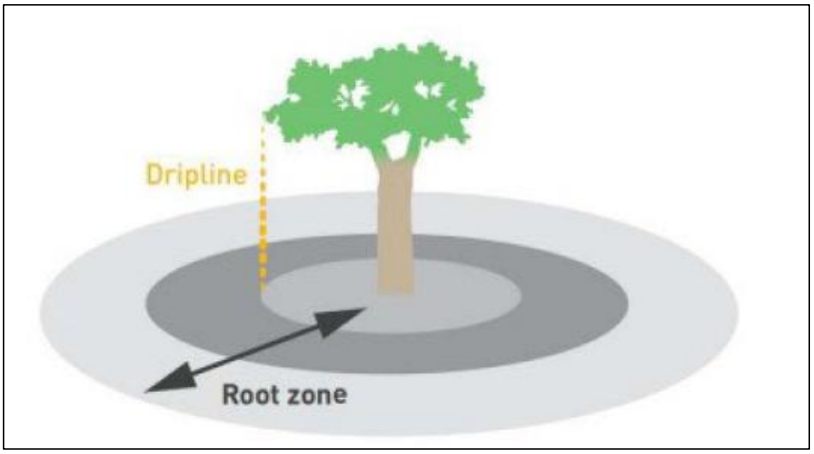


Figure 34~~Figure 3434~~: Hygiene zone of a kauri tree

~~7.4.2.2~~8.4.2.2 Baseline Surveys

Baseline Survey Methodology

- During the pre-exploration ecological surveys, ecologists will identify, GPS and also visually assess all kauri trees for symptoms of Kauri Dieback Disease in each 20 m X 20 m survey plot covering drill, camp sites, and pump sites (10 m X 10 m). Kauri locations will be mapped for reference for all staff working on the project.
- All trees will be flagged and their GPS coordinates will be recorded, along with a description of the severity of their conditions (if any) using the kauri surveillance form (Appendix 7B). Information about any tree displaying symptoms will be forwarded onto the Superintendent - Environment who will inform the DOC 'Manager', MPI and the Kauri Dieback Hotline (0800 69 52874).
- Further to the survey plots required, Kauri Dieback Disease visual assessments will be undertaken along the edges of the tracks that will be used to move between sites. As above, kauri trees will be flagged and marked with GPS.

Establishment of Kauri Hygiene Zones

- During the baseline surveys described above, measurements will be taken from the widest point of the canopy drip line to the trunk for all kauri trees within the drill and camp sites surveys where exploration operations will be undertaken. These measurements will be multiplied by three and this number will be marked down on flagging tape and attached the relevant tree. This number is the radius in metres of the contamination zone that will to be established around each kauri tree before the commencement of exploration operations.
- Before exploration operations commence at each working area, any KHZs present will be demarcated by biodegradable flagging tape around the kauri trees at the distance indicated on the flagging tape described above. Where there are groups of kauri that have KHZs that overlap, the flagging tape marker flags will only be set up around the outside of the kauri stand to avoid confusion.
- For clarity it will be assumed that all public walking tracks will traverse KHZs, and therefore boot wash stations will be established at the helipads, campsite, drill sites, and at the entry/ exit points of any field tracks off the public walking track that are used to access the aforementioned sites. It is recognised that the area is subject to moderate public use on the Wharekirauponga loop track and significant off track hunting throughout the area traversing many KHZs with no biosecurity measures in place.

- All workers on site will be informed about what the flagging tapes indicate and the correct hygiene procedures to be undertaken before entering, and after exiting, a KHZ.

~~7.4.2.3~~8.4.2.3 Ongoing Surveillance

Little is known about the timeframe of the onset of Kauri Dieback Disease symptoms and it is likely that symptoms of new infections will not become visible during the life of the project.

Monitoring the efficacy of hygiene protocols is the best means of identifying and minimising risks of PA spread throughout the duration of works. Included in this protocol is the requirement to conduct and document routine random equipment checking (audits) throughout all aspects of the work programme. This method will not only track potential movements of PA but also ensure compliance with hygiene protocols.

Routine random Kauri Dieback hygiene checks will be undertaken by the Site Supervisor and will involve:

- Approaching contractors at random in situations when hygiene procedures should have recently been undertaken i.e., when leaving a work site or the campsite.
- Inspecting footwear and/or equipment being moved for remnant soil.

Adaptive management may be required depending on the outcome of the review, adaptive procedures could include but are not limited to:

- New cleaning equipment, methods, or substances.
- The requirement for all hygiene procedure to be supervised by specifically appointed personnel to ensure the protocols are being properly adhered to.

Routine random checks will occur a minimum once a fortnight during exploration works and will not be limited to contractors operating drill rig equipment.

~~7.4.3~~8.4.3 Soil Removal Procedures

~~7.4.3.1~~8.4.3.1 Personnel, PPE and Handheld Equipment

Prior to Entering Project Site

All equipment and personnel will undergo decontamination procedures prior to entering the wider Project site and will be signed off by the site supervisor prior to entry. The priority for decontamination is to ensure that equipment and personal gear is free of soil, and ideally, dry (sunlight and temperatures above 45 degrees are most effective).

The currently approved disinfectant is 2% Sterigene however it is recognised that oospores are not killed by disinfectants and should not be relied upon to sterilise residual soil.

Protocols for gear and small equipment include:

- Wash all hand held equipment with warm soapy water to ensure it is completely soil free.
- Dry gear and/ or spray with 2% Sterigene.
- Footwear will be cleaned to ensure it is free of soil and left to dry in the sun before use (if possible).

  Once free of soil, footwear will be washed at wash stations containing 2% Sterigene located at the helipads and the main office in Waihi (Figure ~~30~~35). If personnel plan to enter the Project site on foot they will use the office wash station prior to leaving Waihi and then spray their boots with 2% Sterigene at the carpark immediately prior to entering the forest park. The wash station solution will be changed on a monthly basis, or more frequently if heavy usage requires, by placing the waste solution and solids into a sealed container for removal from site and disposal at an approved waste site and recharge of the station with fresh 2% Sterigene.
- The wash station will be set up a minimum of 20 m from waterways and native bush.

Figure 35~~Figure 3535~~: **Example of a wash station**

On-site Hygiene Procedures

Before land disturbance:

- Define on the ground the individual KHZs comprising either individual kauri trees or kauri management stands (a kauri management stand is a group of kauri where radii of 3 times the drip lines of individual trees overlap and is treated as one kauri hygiene zone) that will be affected by the land disturbance (Figure ~~31~~36).
- Establish wash stations at the access point(s) on the immediate margin of each KHZ.
- Establish the onsite infrastructure necessary to ensure that all equipment and boots can be cleaned to be free of soil and organic material and sprayed with 2% Sterigene before they enter/exit the KHZ.

Soil removal and decontamination will be undertaken whenever personnel are entering or exiting the drill site / camp site KHZ.

Personnel moving between sites will remain on designated tracks, designed to avoid KCZs as far as practicable, to reduce the risk of spreading potentially contaminated material. Wash stations will be established at the helipads, the campsite, the drill site and at the entry/ exit points from the public Loop track on any field tracks servicing the aforementioned sites.

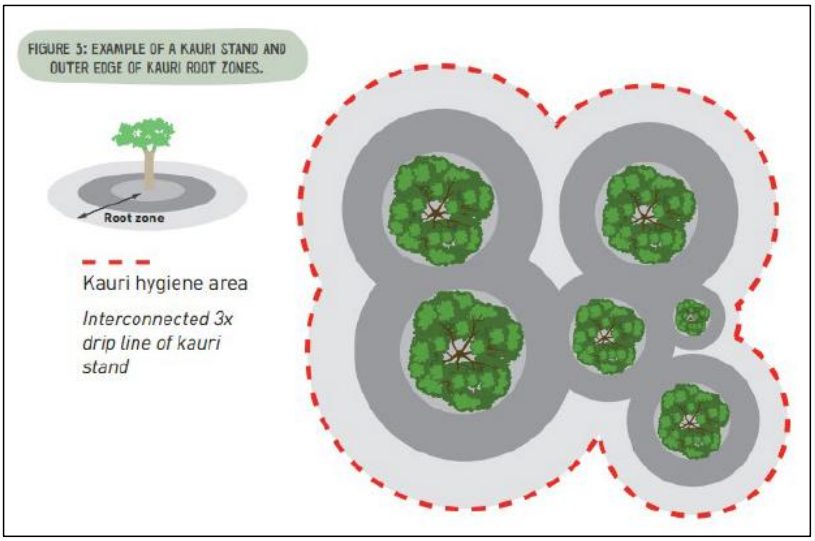


Figure 36~~Figure 3636~~: **Example of a kauri stand and outer edge of kauri root zones**

After sites become operational / soil disturbance begins:

> Once on site, before heading to work areas personnel will undergo soil removal procedures at the campsite. These same procedures will also be repeated before exiting work areas.

> Soil from PPE and handheld equipment will be cleaned off into wash stations. Solution from the wash stations is buried in a sump at least 20m from any watercourse.

~~7.4.3.2~~8.4.3.2 Procedures for Large Equipment and Machinery

Prior to Entering Project Site

The two approved helipads in the project area are not within KHZs. Should further helipads be approved that lie within a KHZ a protocol will be developed for ensuring the hygiene of helicopter skids.

All previously used machinery will be cleaned off site in an area where water will be going directly into a storm water drainage system without coming into contact with native vegetation, particularly kauri. Off-site hygiene protocols include:

- Machinery will be sprayed down with a water blaster to remove all soil.
- All cleaned machinery will be inspected by the Site Supervisor and if they are satisfied that it is soil free it will then be sprayed with 2% Sterigene.

On-site Hygiene Procedures

If a site is within a KHZ then cleaning with water onsite should be minimised to reduce the potential for spread of waterborne PA spores. On site hygiene protocols within a Kauri Contamination Zone include:

- The drilling rig and other pieces of large equipment will be placed on clean untreated pine bed logs that will remain on the work site after the rig has been removed, meaning the rig will not come into contact with the ground (see Figure ~~32~~ 37 and ~~33~~38).
- All equipment will still be put through the soil removal and decontamination process when leaving each work site.
    - Moveable equipment brushed down with a stiff brush to remove excess dirt.
    - The equipment will be inspected by the Site Supervisor and if they are satisfied that it is soil free it will then be sprayed with 2% Sterigene and signed off for moving by the Site Supervisor.
    - Where possible we will set up areas for changing out of and into area specific footwear (camp and the rig sites) and leaving footwear in labelled lockers/bags. This will minimise the amount of cleaning that we will need to do during the operation and keep the camp and rig areas clean from wet footwear.
- The equipment can then be airlifted to the next work site where it will be placed on new wooden bedlogs.

Figure 37~~Figure 3737~~: **Example of equipment shed elevated from ground on wooden slabs**

Figure 38~~Figure 3838~~: **Drill rig with wooden platform**

~~7.4.3.3~~8.4.3.3 Pumps and Other Equipment Entering Waterways

At present, no pump sites are located within KHZs, but if a new pump site is required within a KHZ, then any equipment movement will be minimised. Equipment that comes into contact with stream systems will undergo decontamination procedures prior to their use and will stay in situ for as long as possible to reduce the risk of spreading potentially contaminated material.

- Prior to entering the Project site, pumps, water lines and associated equipment will be cleaned as described throughout this report.
- If the pump site lies within a KHZ, prior to moving equipment:
  - Pump hose fittings will be cleaned and washed with a stiff brush.
  - The pump and pipe fittings will be inspected by the Site Supervisor and if they are satisfied that it is soil free it will then be sprayed with 2% Sterigene, left to stand for at least 1 minute and then signed off for moving by the Site Supervisor.
- Should the pipeline traverse a KHZ and come into contact with the soil within that zone then that section of pipe will be scrubbed with a stiff brush, washed and sprayed with 2% Sterigene and left to stand for at least 1 minute before moving it. Where possible, the pipe should be elevated to avoid contact with the ground.

~~7.4.4~~8.4.4 Detection and Escalation Procedures

PA is not known to be present in the vicinity of the Wharekirauponga catchment, and surveys of kauri trees within the project site have detected no evidence of infected trees. Protocols outlined in this plan are a precautionary measure to prevent the disease being introduced into the area, and to prevent its further spread if it is present but not detected. However, the Superintendent - Environment (in liaison with DOC and/ or MPI) may revise or expand management provisions if PA is confirmed within the locality.

Clear communication pathways will be key to a rapid response. Upon identification of changes in tree condition (identified in baseline assessment), the tree(s) will be photographed, and its condition updated including a description of the severity of its condition. This information will be forwarded onto the Superintendent - Environment who will inform the DOC 'Manager', MPI and Tiakina Kauri as soon as possible.

"Adaptive management" procedures will be context specific and be dependent on advice received from the 'Manager' and other expert parties (i.e., MPI / Tiakina Kauri) who can trigger a requirement for any or all of the following management actions that could include:

> Review of hygiene procedures.

> Review of soil disposal procedures.

> Stopping works and placing a quarantine over contaminated drill sites while hygiene procedures are reviewed.

~~7.4.5~~8.4.5 Training Communication and Signage

~~7.4.5.1~~8.4.5.1 Training

Ensuring all contractors are aware of the potentially severe impacts of kauri dieback disease and how it is spread is a critical aspect of this KDMP. All contractors will be trained before entering the site. Training should be carried out by the Site Supervisor and should include the following:

> The background of Kauri Dieback disease; the organism that causes it and how it infects kauri.

> The impacts of Kauri Dieback Disease on kauri and the wider forest ecosystem.

> How the disease is spread with particular emphasis on how only the smallest amount of contaminated soil could create a widespread infection in the long term.

- That there is no known cure for Kauri Dieback Disease and that if PA is introduced to the area it is not currently possible to eradicate it.
- How to identify kauri trees and the symptoms of kauri dieback.
- Where mapped kauri are located relative to tracks and sites within the project area.
- The appropriate escalation procedure if they find evidence of Kauri Dieback Disease.

The goal of this training is to engage with contractors about the potential and irreversible impacts of Kauri Dieback Disease and to ensure that they are fully aware that their actions are the primary defence against the spread of Kauri Dieback Disease. The training will focus on how each individual making sure their equipment is completely clean of soil is crucial and if procedures are not adhered to the potential outcomes will be irreversible. This aim of this approach is to facilitate contractors to understand that they have a key role in protecting the environment they are working in rather than just following instructions with little context as to why the protocols have been put in place.

Training will be undertaken at the beginning of the project and will be repeated for any new personnel before they enter the site. Refresher training will be undertaken as required should there be changes to the KDMP for example. This can be incorporated into the mandatory pre-checks carried out by the Site Supervisor to ensure all equipment is clean before entering the site.

~~7.4.5.2~~8.4.5.2 Signage

Signage will be placed around the campsite and active exploration sites to reinforce the hygiene procedures outlined in the training and to provide clear instructions on the escalation procedures if they find kauri with symptoms of dieback.

~~7.5~~8.5 UPDATES TO THE KDMP

It is the responsibility of the Project Ecologist to stay up to date with advances in the research of Kauri Dieback Disease.

If new information is supplied, the Project Ecologist will assess the need to update the KDMP, update it accordingly and send it to the Superintendent - Environment for review before sending onto the 'Manager' for approval. Once approved, the updated plan will be sent to the Site Supervisor who will implement it on the Project site.

~~7.6~~8.6 REPORTING

As indicated in multiple sections of the document, all suspected sightings of Kauri Dieback Disease, will be reported to the Superintendent - Environment who will report it to the DOC 'Manager', MPI and Tiakina Kauri.

Further to these case-by-case reports, an annual memo will be issued to the 'Manager' which consolidates these reports and provides information on the ongoing condition of infected trees as well as adaptive management procedures undertaken to contain the spread of the disease.

Reports will also be provided whenever new tracks are established to document any kauri near the track that should be included in surveillance monitoring.

Reports will accompany the Annual Work Programme summary report.

8.7 KEY PERFORMANCE INDICATORS

Kauri dieback management will be implemented in accordance with best practice standards and requirements, and the Project Ecologist will ensure management measures are updated within reasonable timing to reflect any new information that becomes available.

Any sightings or confirmed infections of kauri dieback will be reported, and an annual memo will be provided which reports on the ongoing condition of any infected trees. Linked in to more clearly identify how it will be determined if management measures are functioning as they are intended to.

Commented [MD21]: Specific performance indicators are not identifiable in relation to infection matters. As such, sightings or confirmed infections will be managed in accordance with best practice standards and requirements.

~~7.7~~8.8 CONCLUSION

Kauri Dieback Disease is a currently untreatable infection caused by the fungus-like organism (PA) that is having large scale impacts on forest ecosystems containing kauri throughout the Auckland and Northland regions. It is believed that people moving contaminated soil on their footwear and various other equipment is the primary long range vector of PA. To date Kauri Dieback Disease is contained to just two areas on the Coromandel Peninsula, and strict hygiene measures for anyone entering forested areas are pivotal in the containment of the disease in the Coromandel. This is particularly the case for projects such as the Wharekirauponga Exploration operation as it consists of multiple personnel and equipment/machinery of various sizes entering and moving around a forest site containing kauri on an ongoing basis.

The purpose of this KDMP is to set out the procedures to be used to prevent the activities authorised under this consent in the Coromandel Forest Park causing the introduction and/or spread of Kauri Dieback Disease. The KDMP achieves this by following the NPMP for PA and guidance from available supporting documents.

The plan outlines a set of simple principles and proposes achievable but effective hygiene procedures that minimise the risk of PA being introduced and/or spread around the Project site. Further to these procedures a rapid adaptive management response is provided for should the disease be identified in the area.

The management plan will be reviewed as new information relating to Kauri Dieback Disease comes to hand to ensure the plan provides the best known methods for preventing the introduction and/or spread of the disease to the Project area.

APPENDIX 7A: NATIONAL PEST MANAGEMENT PLAN FOR PA – RULES THAT APPLY TO THE WHAREKIRAUPONGA EXPLORATION PROJECT

Plan rule 1: obligation to report

(1) An occupier of land who recognises that a kauri on the land is exhibiting any symptoms of PA must, as soon as is reasonably practicable, report the symptoms and the location of the kauri to the management agency, an inspector, or an authorised person.

(2) Subclause (1) does not apply to an occupier who knows that the management agency is aware that the tree is or may be exhibiting symptoms.

Plan rule 2: provision of information

(1) A person must provide the management agency, an inspector, or an authorised person with any information of a kind described in subclause (3) that is requested in writing by the management agency, inspector, or authorised person.

(2) The person must provide the information within the time specified in the request, which must be reasonable and not less than 48 hours from the time the request is made.

(3) The information is any information about—

(a) kauri trees, including dead kauri trees, or any alternative PA host plant material; and

(b) soil or growing medium that has or may have come into physical contact with a kauri tree or alternative PA host plant material; and

(c) machinery, equipment, or persons that may have come into physical contact with—

(i) any kauri tree or alternative PA host plant material; or

(ii) any soil or other growing medium that has been in physical contact with any kauri tree or alternative PA host plant material.

Plan rule 4: PA risk management plans

(1) An occupier of land must have, and operate in accordance with, an approved PA risk management plan if a management agency, an inspector, or an authorised person gives the occupier written notice that the land is at risk of PA.

(2) The occupier must submit a PA risk management plan for approval by the management agency, an inspector, or an authorised person within a time that is reasonable and not less than 90 working days after the notice is given.

(3) The objective of a PA risk management plan is to detail how—

(a) the spread of PA will be controlled, including how it will be contained to exclude it from any kauri forest; or

(b) the effects of PA will be limited.

(4) A PA risk management plan must contain—

(a) the objective of the plan; and

(b) the actions to achieve the objective of the plan; and

(c) a map of the land identifying any kauri tree locations and other significant features such as roads, other trees, tracks, and cleaning stations; and

(d) procedures and practices to ensure that the actions in paragraph (b) meet the objective of the plan; and

(e) procedures for reporting to the management agency, inspector, or authorised person on the implementation of, and compliance with, the plan.

(5) In subclause (1), land is at risk of PA if—

(a) there is a risk of kauri trees on the land being infected by PA; or

(b) the land—

(i) has kauri or alternative host material that is infected by PA; or

(ii) is a pathway from land on which kauri or alternative PA host plant material is infected by PA to other land

Plan rule 5: earthworks PA risk management plan

(1) An earthworks risk management plan must contain—

(a) the objective of the plan; and

(b) the actions to achieve the objective of the plan; and

(c) a map of the land (which may include areas outside the kauri hygiene zone) identifying—

(i) kauri tree locations; and

(ii) the boundary of any earthworks; and

(iii) points from where the earthworks site may be accessed; and

(iv) signs identifying from where the earthworks site may be accessed; and

(v) where kauri hygiene protocols are displayed; and

(vi) where vehicles may be parked (if applicable); and

(vii) where items contaminated with soil may be washed down; and

(d) procedures for cleaning all vehicles and equipment to prevent PA entering or leaving the site; and

(e) procedures for—

(i) the management of any soil, sludge, or organic material that is retained within a kauri hygiene zone; and

(ii) transportation of that soil, sludge, or organic material to a landfill approved by the management agency, inspector, or authorised person for that purpose; and

(f) procedures to limit the risk of water potentially contaminated with PA entering—

(i) a kauri hygiene zone; or

(ii) a kauri forest; or

(iii) a water course connected to a kauri hygiene zone or kauri forest; and

(g) procedures to ensure that all persons entering the earthworks site are provided with a copy of the plan; and

(h) procedures for reporting to the management agency, inspector, or authorised person on the implementation of, and compliance with the plan, which must include—

(i) annual reporting on compliance with the plan; and

(i) immediate reporting when there is significant non-compliance with the plan; and procedures to ensure that the management agency, inspector, or authorised person is notified of the start and end of each earthworks

Plan rule 8: obligation to clean items before entering or exiting kauri forest

(1) Immediately before entering or exiting a kauri forest, a person must clean any risk item that is in their possession.

(2) The person must clean the risk item so that visible soil and organic matter is removed.

Plan rule 9: obligation to use cleaning stations

(1) A person who uses a track or road in a kauri forest must clean applicable items at each cleaning station they pass.

(2) The item must be cleaned so that visible soil and organic matter has been removed.

(3) An applicable item is an item that the cleaning station is designed to clean.

Plan rule 10: open tracks and roads in kauri forest

(1) This rule—

(a) applies to an owner of land in a kauri forest if a track or road passes through that land; but

(b) does not apply in respect of a track of which the owner is unaware or that is not intended for public use.

(2) The owner must comply with 1 or more of the following requirements:

(a) ensure all tracks and roads avoid the kauri hygiene zone:

(b) install 1 or more cleaning stations to remove visible soil and organic matter from risk items:

(c) install track surfacing to minimise the risk of—

(i) the spread of soil or organic matter into, within, or from a kauri hygiene zone; and

(ii) contact with kauri fibrous roots by risk items.

(3) If the owner complies with subclause (2)(b) or (c) the owner must ensure that groundwater and surface water drain away from kauri trees.

APPENDIX 7B: KAURI HEALTH ASSESSMENT FORM

Individual sampling tree Version 5

Sample Reference number _____

Site Name **Tree point number** **Date**

Soil temperature
__C Soil moisture Saturated/Wet/Moist/Dry

Collection Members _____

NZMGE	MZMGN	Altitude	Aspect (compass)	Tree location	
				Plateau / Ridge / Spur / Gully	
HEIGHT CLASS	Canopy/emergent	Ricker/pole >4m	Sapling 1-4 m	Seedling 0.1 <1 m	
Trunk diameter (m)					
MANAGEMENT and IMPACTS	Distance to track/road or disturbance (m)	Tree has insect damage to trunk (**if yes add comments back of sheet**)	Plantation or management (**if yes add comments back of sheet**)	Potentially swamped with water during the year	Lichens or epiphytes on trunk (**if yes take photo and comments on back of sheet**)
		yes / no	yes / no	yes / no	yes / no
CANOPY	Good condition (1)	Foliage thinning (2)	Some branch dieback (3)	Severe dieback (4)	Dead (5)
CIRCUMFERENCE OLD BLEEDS	None	<10%	10-50%	51-80%	81-100%
CIRCUMFERENCE NEW BLEEDS	None	<10%	10-50%	51-80%	81-100%
TOP HEIGHT OF FRESH RESIN BLEED	None	<20 cm	20-50 cm	>50-100 cm	
and PHOTOS	Trunk / Bleeds	Canopy shot	Insect damage photo Yes / no	Fungal bodies photo Yes / no	
PIG ROOTING	None	Few holes	Moderate (>10-<50%)	Extensive (>50%)	

APPENDIX 11C: PROTECTING KAURI: PRINCIPLES OF HYGIENE

PART H: LANDSCAPE AND VISUAL MITIGATION PLAN

Commented [MD22]: Added in at request of Hauraki District Council

9. LANDSCAPE AND VISUAL MITIGATION PLAN

9.1 OVERVIEW

The objective of the Landscape and Visual Mitigation Plan is to deliver an integrated management approach that works in tandem with ecological measures to ensure the landscape and visual impacts of the Waihi North Project (WNP) are comprehensively addressed. This approach guides how change is introduced, managed during operations, and carried through to closure, ensuring that adverse effects on the WNP area and its surrounds are avoided where possible, and otherwise remedied or mitigated. While the plan's purpose is to guide the management of visible change in the landscape, it does so by considering the interconnected physical, perceptual, and associative attributes of the landscape - ensuring outcomes that protect and enhance ecological values, natural character, and overall landscape integrity.

9.2 SUMMARY OF LANDSCAPE AND VISUAL VALUES AND EFFECTS

Existing Landscape Values

The WNP (WUG) lies within the Coromandel Forest Park, a large expanse of established and regenerating areas of native forest recognised at both the district and regional levels as an Outstanding Natural Landscape (ONL) under section 6(b) of the Resource Management Act (RMA). This landscape is defined by its steep, rugged topography, deeply incised catchments, and volcanic origins, all cloaked in continuous native forest cover. The Wharekirauponga area's remote character, ecological richness, and perceptual wildness contribute to its significant physical, perceptual, and associative landscape values. It is a place with strong tangata whenua associations, recreational value, and high natural character, forming part of a broader backdrop of legible and memorable landforms.

Landscape and Visual Effects – WUG

Because the WUG mine is proposed as a fully underground operation, there will be extremely limited direct surface expression of mining activity within the Coromandel Forest Park, limited to up to four isolated shaft raises and associated exploration activities comprising up to 24 sites in total sited within the extensive forest cover to minimise potential for adverse landscape effects. As a result, the physical integrity of the landscape—including its distinctive landforms, vegetation cover, and streams—will remain largely undisturbed. This underground approach avoids significant effects on natural character, ecological values, and perceptual attributes such as naturalness and remoteness. The assessment concludes that the landscape and visual effects of the WNP (WUG) are very limited and will not compromise the ONL status or the wider forest park values.

Landscape and Visual Effects – Willows Road Infrastructure

The supporting surface infrastructure associated with the underground mine, including an access portal, willows rock stack, surface facilities, and vehicle access, is proposed to be located at Willows Road, outside of the CFP. This site lies in a more modified rural environment with existing grazing and some forestry uses, meaning its landscape sensitivity is considerably lower than the land area above the WNP (WUG). While the infrastructure will introduce substantial earthworks and new built elements into the local area, the effects will remain limited, particularly with careful design incorporating screening through existing landform and vegetation alongside further mitigation planting proposed as part of the consent conditions. Overall, landscape effects will be appropriately managed, with the infrastructure well contained within an already modified landscape context.

9.3 METHODS FOR AVOIDING OR MANAGING EFFECTS

The Landscape, Natural Character and Visual Effects Assessment ("Assessment", Boffa Miskell, 2025) has been prepared concurrently with the project and has therefore influenced the anticipated project outcomes. Methods for avoiding or managing effects have been developed in two ways:

- Measures that intrinsically comprise part of the development design through an iterative process;
- Specific additional mitigation measures designed to reduce adverse effects of the final development proposals including areas of planting included on *Figure 21a*: Proposed Integrated Mitigation – WUG Surface Facilities Area, reproduced as Figure 39 below.

Within the Coromandel Forest Park the underground mine largely avoids physical modification of landforms or waterbodies, but may cause minor reductions in natural surface water flows in some streams due to groundwater drawdown, including the permanent loss of a single shallow warm spring. These changes are expected to be very low, largely indiscernible, and within the natural variability of the system. Where surface expression does occur, works will be remediated as per the vegetation remediation plan set out in Section 5 above.

Outside the CFP, areas of planting are indicated in *Figure 21a* of the Graphic Supplement supporting the Assessment which accords with Figure 2: Proposed Integrated Mitigation Planting Stages. Through proposed integrated mitigation, planting will commence concurrently with proposed mining activity and supports enduring landscape outcomes which will continue post mine closure.

The specific landscape mitigation methods which have been development seek to avoid or manage adverse effects during operation. The components and specific methods development to manage landscape effects are shown within a comprehensive Landscape Mitigation Plan which includes the following areas of planting, all of which occur during operation encompassing the following proposed planting areas (reproduced as Figure 39):

Riparian Planting

> Within OGNZL owned land = 12.4 ha.

> Owned by others = 3.7 ha.

Native Terrestrial Planting

> Within OGNZL owned land = 27.7 ha.

> Owned by others = 7.5 ha.

Wetland Planting

> Within OGNZL owned land = 0.2 ha

> Owned by others = 0.08 ha.

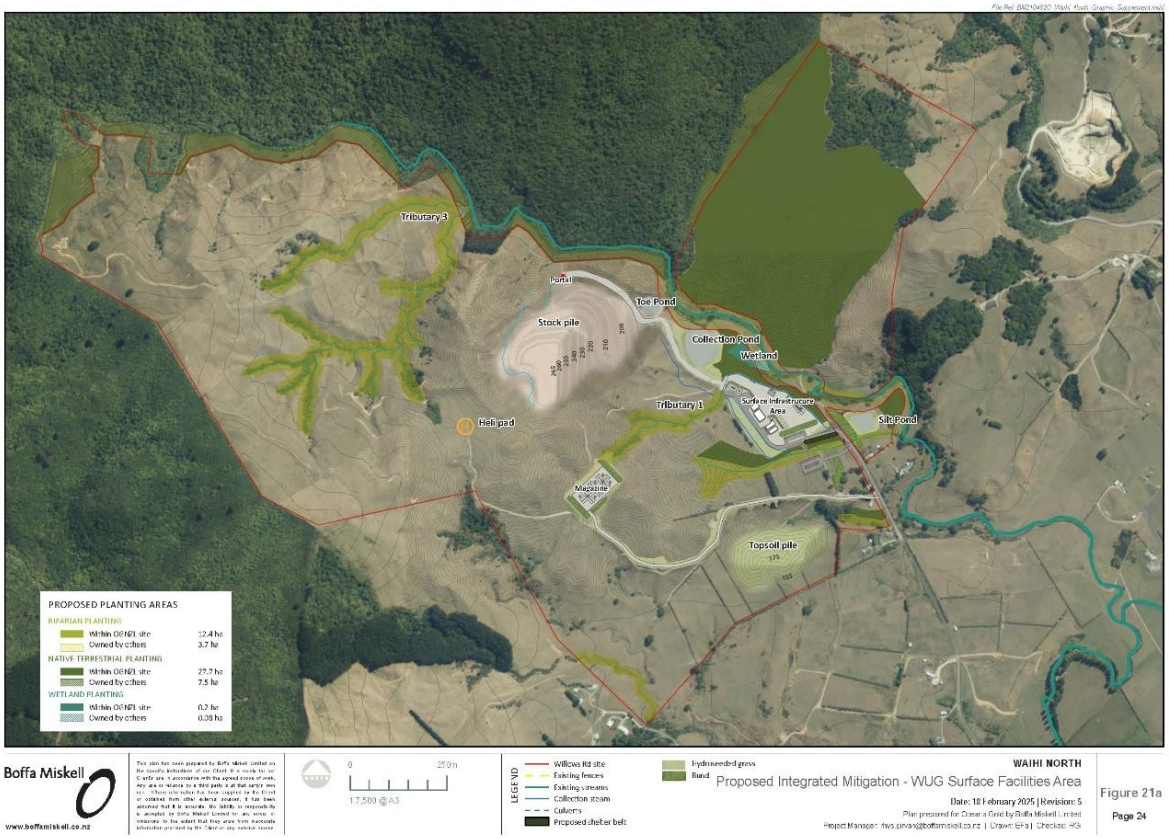


Figure 39~~Figure 39~~: Proposed Integrated Mitigation

As part of proposed mitigation at Willows Road, initial screen planting is proposed to visually integrate earthworks and surface infrastructure into the in the surrounding rural foothills landscape. This is supported with retention of existing shelterbelts, trees and hedges in the Willows Road site outside disturbed areas where practicable. In addition, extensive terrestrial and riparian planting designed to reinforce opportunities for biodiversity and connectivity with the adjoining vegetated backdrop of the Coromandel Forest Park. The treatment and timeframe for identified areas of planting is set out in Table 2: Planting Referred to in Condition 195 of the Hauraki District Council Conditions above.

Closure Plan

In accordance with Condition C65 of Waihi North Project - Schedule 1: Proposed Conditions Common to the Hauraki District Council and Waikato Regional Council Resource Consents, the Consent Holder must rehabilitate all areas within Area 2 that have been subject to mining activities authorised as part of this consent by:

g. *Restoration and riparian planting in general accordance with Figure A – Proposed Closure – WUG Surface Facilities Area annexed in Attachment 2 to these conditions;*

The closure plan directed via this condition is reproduced in Figure 40 below.

Figure 40~~Figure 40~~: Landscape Closure Plan

9.4 SUITABILITY OF MITIGATION MEASURES

The mitigation measures for the WUG are well suited to the sensitive ONL setting. By locating the mine underground and minimising surface expression, the proposal largely avoids adverse effects on landscape, natural character and visual amenity. Small-scale infrastructure such as vent shafts are designed to be discreet and are supported by restoration and offset planting to further reduce visibility and integrate them into the surrounding native forest.

At Willows Road, mitigation focuses on managing the landscape character and visual effects of upgraded access and infrastructure within a rural landscape. Measures include limiting vegetation clearance, controlling building colours and reflectivity, and establishing additional screen planting to soften views. These actions are appropriate to the receiving environment and help reduce views of surface infrastructure, although some change in rural character will be noticeable. The approach set out in Ecology and Landscape Management Plan also ensures that visible change is actively managed throughout the life of the project and contributes to longer-term rehabilitation and landscape coherence at closure.

9.5 MONITORING AND REPORTING

As an integrated landscape and ecological response, areas of planting included in *Figure 21b* of the Assessment (reproduced as Figure 39 above) provides the total aggregated areas for each planting type. This overfall quantum of planting aligns with planting included in Figure 2: Proposed Integrated Mitigation Staging Plan and Table 2: Planting included in Section 3 for the purpose of integrated monitoring and reporting.