



## ATTACHMENT 4 - VISUAL CONCEPTS OF AREA 2 AND AREA 5 BUILDINGS

Area 2

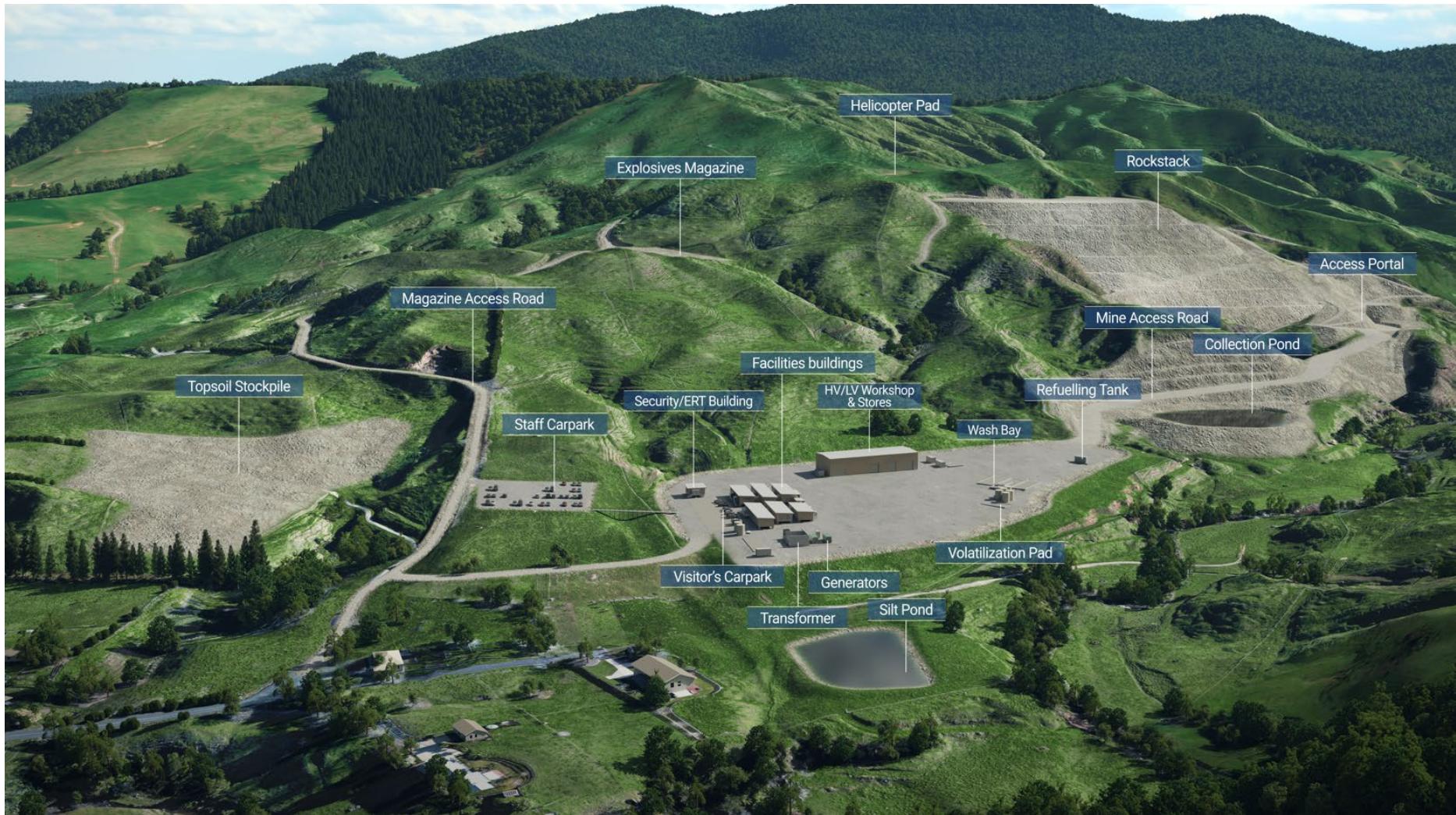


Figure 1 – Area 2 View 1



Figure 2 – Area 2 View 2

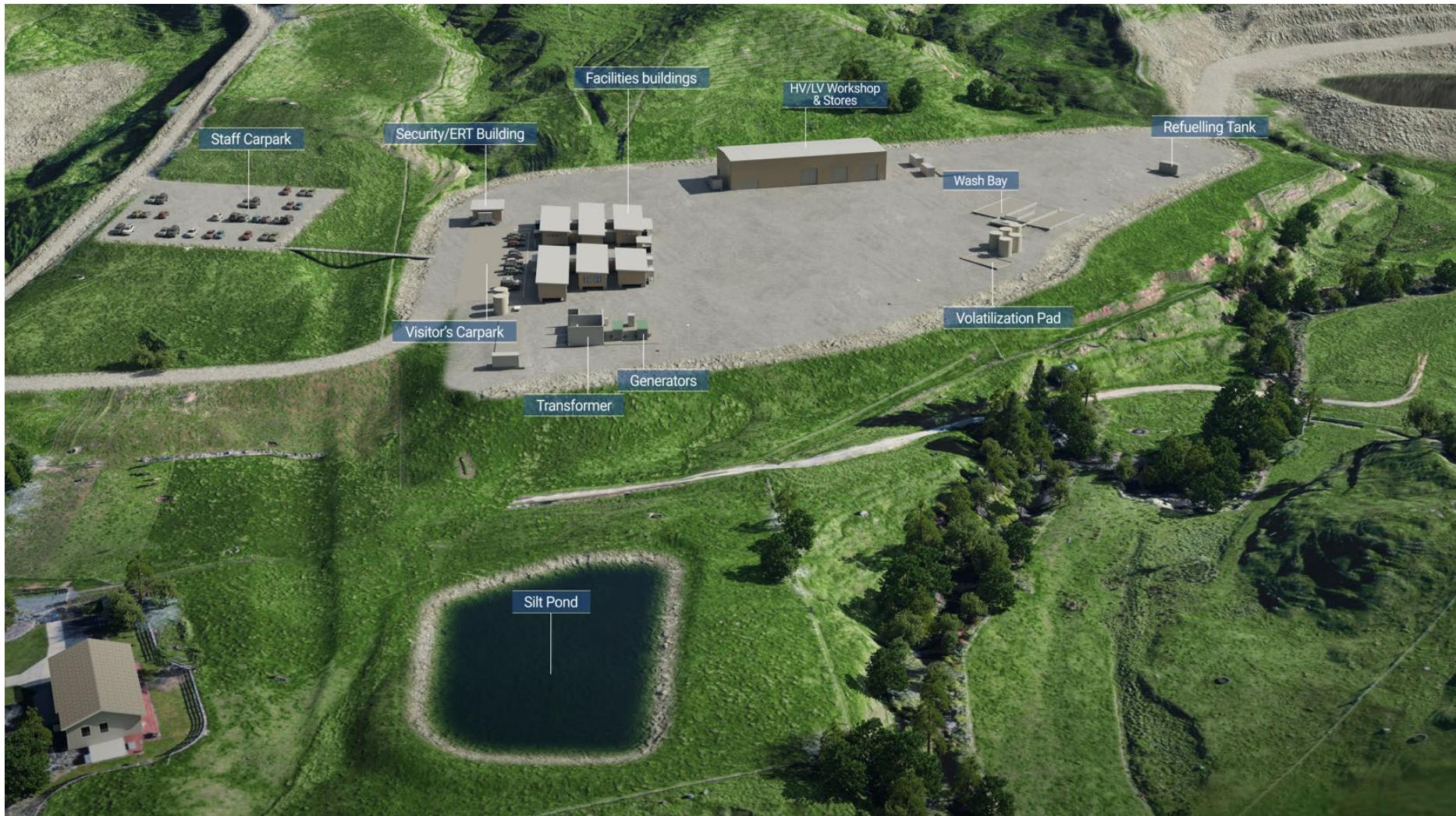


Figure 3 – Area 3 View 3



Figure 4 – Area 5 View 1



Figure 5 – Area 5 View 2

## **ATTACHMENT 5 – WAIHI NORTH PROJECT SITE SELECTION PROTOCOL**

### **SITE SELECTION PROTOCOL FOR THE LOCATION OF DRILL SITES, PUMPING TEST / VENTILATION SHAFT SITES, PORTABLE DRILL RIG SITES, AND WATER PUMP SITES**

#### **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 exploration drill sites, twelve investigative drill sites, up to four pumping test / ventilation shaft sites, up to fifty portable drill rig sites, and water pump sites at the proposed Wharekirauponga Underground Mine (“**WUG**”), located within the Coromandel Forest Park as part of the Waihi North Project (“**WNP**”).

The site selection protocol only applies to sites that are eligible for consideration in accordance with the conditions attaching to the Waihi North Project Wharekirauponga Access Arrangement and the Waihi North Project Northern Area Concession.

This protocol follows a cascading management approach whereby:

- > A short list of suitable drill sites will be selected based on the Consent Holder’s technical requirements;
- > A short list of suitable ventilation shaft sites will be selected based on the Consent Holder’s technical requirements.
- > A short list of suitable portable drill rig sites will be selected based on the Consent Holder’s technical requirements; and
- > A short list of suitable water pump sites will be selected based on the Consent Holder’s technical requirements.

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 sites, four ventilation shaft sites, fifty portable drill rig sites, and water pump 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.

#### **SHORT-LIST SITE IDENTIFICATION**

The Consent Holder shall create a short list of options for drill sites, ventilation sites, portable drill sites, and water pump sites which meet 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.

Note: all sites must meet engineering and geotechnical requirements in order to fulfil their intended function. For ventilation sites in particular, it is recognised that engineering and geotechnical requirements may result in a low number of potential options.

### **MULTICRITERIA ASSESSMENT**

Once the Consent Holder has established a shortlist of drill sites, ventilation shaft sites, portable drill sites, and/or water pump 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 exploration drill sites, twelve investigative drill sites, up to four ventilation shaft sites, up to fifty portable drill sites, and up to six water pump sites (two associated with exploration and four associated with tunnel alignment) at locations which meet engineering and geotechnical requirements in order to fulfil their intended function and best achieve the outcomes set out below.

The provisions of the Hauraki District Council ("HDC") conditions, the Wharekirauponga Access Arrangement ("WAA") conditions, the Northern Area Concession ("NAC") conditions, and the Thames Coromandel District Council ("TCDC") conditions stipulate a number of site exclusion criteria when determining if sites are suitable for use as drill sites, ventilation sites, portable drill sites, and water pump sites. The conditions prescribing these exclusions are provided in full within **Appendix A** to this document.

Note: If at the conclusion of undertaking the multicriteria assessment outlined in this document the appropriately qualified and experienced experts undertaking the assessment deem a site to have, or be of, such value that it should not be utilised for the purpose of drill sites, ventilation sites, portable drill sites, and / or water pump sites, the appropriately qualified and experienced experts hold the authority to deem that the site is not to be utilised. However, the experts are limited to excluding a maximum number of sites that will still leave the Consent Holder with sufficient approved sites to enable the number of activities authorised by the approvals to take place.

### **APPLICATION OF THE MULTICRITERIA ASSESSMENT AT EACH SITE**

For clarity, the sub-sections below set out the steps which are to be followed when applying the MCA at drill sites, ventilation shaft sites, portable drill sites, and water pump sites in accordance with the provisions of the HDC, WAA, NAC, and TCDC conditions. These steps include reporting and certification requirements.

A table is also provided as **Appendix B** to this document which summarises key site, survey, exclusion and clearance and herpetofauna salvage details for each site type.

#### **Drill Sites**

In accordance with Condition 115(a)(ii) of the HDC conditions and Condition 2.13(a)(ii) of the WAA conditions, in concurrence with the undertaking of ecological surveying (required by Condition 115(a)(i) of the HDC conditions and Condition 2.13(a)(i) of the WAA conditions, respectively), the requirements of this MCA shall

be applied to sites which are being considered for suitability as drill site locations.

In accordance with Condition 115(a)(iii) of the HDC conditions and Condition 2.13(a)(iii) of the WAA conditions, the results of the MCA's multicriteria analysis shall be reported in a Siting Report.

In accordance with Condition 115(a)(iv) of the HDC conditions and Condition 2.13(a)(iv) of the WAA conditions, the Siting Report shall be submitted to the HDC, the Waikato Regional Council, and the Department of Conservation ("DOC") for certification that the MCA has been appropriately applied.

These requirements are to be met at least 20 working days prior to clearing vegetation or undertaking drilling or construction activities at any of the drill sites.

#### **Ventilation Shaft Sites**

In accordance with Condition 115(b)(i) of the HDC conditions and Condition 2.13(b)(i) of the WAA conditions, the requirements of this MCA shall be applied to those sites which have been identified (under Condition 114 of the HDC conditions and Condition 2.12 of the WAA conditions, respectively) as suitable sites for ventilation shaft sites.

In accordance with Condition 115(b)(ii) of the HDC conditions and Condition 2.13(b)(ii) of the WAA conditions, the results of the MCA's multicriteria analysis shall be reported in a Siting Report.

In accordance with Condition 115(a)(iii) of the HDC conditions and Condition 2.13(b)(iii), the Siting Report shall be submitted to the HDC, the Waikato Regional Council, and DOC for certification that the MCA has been appropriately applied.

These requirements are to be met at least 20 working days prior to clearing vegetation or undertaking drilling or construction activities at any of the ventilation shaft sites.

#### **Portable Drill Rig Sites**

In accordance with Condition 115(c)(ii) of the HDC conditions, Condition 2.13(c)(ii) of the WAA, Condition 3(b) of the NAC conditions, and Condition 13(b) of the TCDC conditions, in concurrence with the undertaking of ecological surveying (required by Condition 115(c)(i) of the HDC conditions, Condition 2.13(c)(i) of the WAA conditions, Condition 3(a) of the NAC conditions, and Condition 13(a) of the TCDC conditions, respectively), the requirements of this SPP shall be applied to sites which are being considered for suitability as portable drill rig sites.

In accordance with Condition 115(b)(ii) of the HDC conditions, Condition 2.13(c)(iii) of the WAA conditions, Condition 3(c)(i) of the NAC conditions, and Condition 13(c) of the TCDC conditions, the results of the MCA's multicriteria analysis shall be reported in a Siting Report.

In accordance with Condition 115(a)(iii) of the HDC conditions, Condition 2.13(c)(iv) of the WAA conditions, Condition 3(c)(iv) of the NAC conditions, and Condition 13(d) of the TCDC conditions, the Siting Report shall be submitted to the HDC, the Waikato Regional Council, DOC, and TCDC for certification that the MCA has been appropriately applied.

These requirements are to be met at least 20 working days prior to clearing vegetation or undertaking drilling or construction activities at any of the portable drill rig sites.

### **Water Pump Sites**

In accordance with Condition 115(c)(ii) of the HDC conditions and Condition 2.13(c)(ii) of the WAA, in concurrence with the undertaking of ecological surveying (required by Condition 115(c)(i) of the HDC conditions and Condition 2.13(c)(i) of the WAA conditions, respectively) the requirements of this MCA shall be applied to sites which are being considered for suitability as water pump sites.

In accordance with Condition 115(b)(ii) of the HDC conditions and Condition 2.13(c)(iii) of the WAA conditions, the results of the MCA's multicriteria analysis shall be reported in a Siting Report.

In accordance with Condition 115(a)(iii) of the HDC conditions and Condition 2.13(c)(iv) of the WAA conditions, the Siting Report shall be submitted to HDC, the Waikato Regional Council, and DOC for certification that the MCA has been appropriately applied.

These requirements are to be met at least 20 working days prior to clearing vegetation or undertaking drilling or construction activities at any of the water pump sites.

## **MULTICRITERIA ASSESSMENT OUTCOMES**

### **Terrestrial Fauna**

- > The loss of 'At Risk' or 'Threatened' native frogs is avoided;
- > The loss of 'At Risk' or 'Threatened' lizards is avoided;
- > The loss of 'At Risk' or 'Threatened' terrestrial invertebrates is avoided;
- > The removal of trees where bats are actively roosting is avoided; and
- > The removal of trees in which birds<sup>1</sup> 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**

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<sup>1</sup> Any reference to birds means birds protected under the Wildlife Act 1953.

- > Sites selected are located as far from surface waterbodies (including natural inland wetlands) as is reasonably practicable; and
- > The loss of riparian vegetation within 20 m of a waterway is minimised where practicable.

#### **Landscape and Visual Amenity Values**

- > Sites selected can be visually contained, including any consequent plume from ventilation shafts, and assimilated into the environment so that they are reasonably difficult to see.
- > 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 **ventilation shaft sites**.

#### **Recreation Values**

- > Sites selected are located as far away as is practicable from the Te Wharekirauponga Track.

#### **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, noting that the grading is relative to the other effects, not absolute:

Lower effects	Moderate effects	Higher effects
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The criteria for assessing each value set is set out in **Table 1**.

Table 1: MCA Assessment Tool.

Criteria	Lower effects	Moderate effects	Higher effects
<b>Terrestrial Fauna</b>			
Habitat value for native frogs	<20 % cover of kiekie and / or fern species	≥20 %, ≤50% cover of kiekie and / or fern species	>50 % cover of kiekie and / or fern species
Habitat value for native lizards	<50 cover of kanuka / manuka scrub with closed canopy and no light gaps	> 50% cover of kanuka / manuka scrub with light gaps	Previous records of native lizards within 20 m of the Site
'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 ventilation shaft 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 ventilation shaft site (as assessed by a suitably qualified and experienced ecologist).
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).
<b>Indigenous Terrestrial Flora</b>			
'At Risk' and / or 'Threatened' flora  NB This does not include kauri and Myrtaceae species (classified as 'Threatened - Nationally Vulnerable' or 'At Risk – Declining' in response to disease risk.)	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), or retained on site by bending back without cutting.	'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), or retained on site by bending back without cutting.
Removal of mature trees (applicable at vent sites only as removal of mature trees at portable rig sites is not proposed, and removal of mature trees at drill sites is controlled via conditions) <sup>2</sup>	No removal of trees greater than 50 cm in diameter at breast height is required.	Removal of <=4 trees greater than 50 cm in diameter at breast height is required.	Removal of >4 trees greater than 50 cm in diameter at breast height required.
<b>Freshwater</b>			
Proximity to rivers and streams	Site is more than 100 m from nearest river or stream.	Site is between 50-100 m from nearest river or stream.	Site is less than 50m from nearest river or stream.
Proximity to wetland	Site is more than 100 m from nearest wetland.	Site is between 10 - 100 m from a wetland.	Site is within or within 10 m of a wetland. <sup>3</sup>

<sup>2</sup> Condition 118A of the Hauraki District Council Conditions and Condition 2.17 of the Wharekirauponga Access Arrangement Conditions.

<sup>3</sup> NB: Resource Consent will be required under the NES-Freshwater for any earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland, or outside a 10 m, but within a 100 m, setback from a natural inland wetland results, or is likely to result, in the complete or partial drainage of all or part of the wetland.

Criteria	Lower effects	Moderate effects	Higher effects
Riparian vegetation	No riparian vegetation removal required.	Minimal riparian vegetation removal is required.	More than minimal riparian vegetation removal is required.
<b>Landscape and Visual Amenity</b>			
Visibility	Site cannot be seen from any formal walking track or viewpoints beyond the Coromandel Forest Park.	Site can partially be seen from any formal walking track or viewpoints beyond the Coromandel Forest Park.	Site can be clearly seen from any formal walking track or viewpoint beyond the Coromandel Forest Park.
<b>Heritage</b>			
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.
<b>Recreation</b>			
Proximity to recreational tracks	Site is at least 750 m from nearest formal walking track.	Site is between 400 -750 m from nearest formal walking track.	Site is within 400 m of nearest formal walking track.
Proximity to <i>Waikato Conservation Management Strategy</i> recreation remote zones	Site is more than 500 m outside of a recreation remote zone.	Site is within 500 m of a recreation remote zone.	Site is within a recreation remote zone.

## APPENDIX A: SITE SELECTION EXCLUSION CRITERIA

The provisions of the Hauraki District Council conditions, the Wharekirauponga Access Arrangement conditions, the Northern Area Concession conditions, and the Thames Coromandel District Council conditions stipulate a number of site exclusion criteria when determining if sites are suitable for use as drill sites, ventilation sites, portable drill sites, and water pump sites.

These exclusion criteria are set out in full below.

### HDC CONDITIONS

#### Drill Sites

**119A.** If a frog nest, or a frog brooding eggs or froglets (i.e. a number of small, tailed frogs) is observed during ecological surveys, or during vegetation clearance, all activities at that site will cease and an alternative site(s) will be selected.

**124.** If five or more 'At Risk' or 'Threatened' frogs or lizards are found during any ecological survey(s), or one or more northern striped gecko (*Toropuku inexpectatus*) are found in a survey undertaken under Condition 119, or during any subsequent ecological survey(s), then the Consent Holder must determine if there is an alternative 22 m X 22 m area within the ecological survey area(s) that is suitable for use as a Drill Site (i.e. a 22 m X 22 m area where four or less frogs, lizards, or northern striped gecko have been found, and where the boundaries of that 22 m X 22 m area have applied a 3 m buffer from any frog, lizard, or northern striped gecko that have been found within the ecological survey area(s)). If no such alternative 22 m X 22 m area is available, an alternative site must be selected.

**126.** The Consent Holder must impose a minimum buffer of 3 m around any 'At Risk' or 'Threatened' frog found during the ecological survey(s) and position the Drill Site outside of the buffer area.

**131.** If one or more northern striped gecko (*Toropuku "Coromandel"*) or five or more 'At Risk' or 'Threatened' frogs or lizards are found on the proposed Drill Site(s) immediately prior to, or during vegetation clearance then all vegetation clearance and exploration operations at the Drill Site(s) will immediately cease and alternative site(s) must be selected.

#### Vent Sites

**140.** If one or more northern striped gecko (*Toropuku "Coromandel"*) is found during vegetation clearance, then all site clearance work must immediately cease and an alternative site must be selected.

#### Portable Rig Sites / Water Pump Sites

**157.** If five or more 'At Risk' or 'Threatened' frogs or lizards are found during any ecological survey(s), or one or more northern striped gecko (*Toropuku "Coromandel"*) is found during any ecological survey(s), then the Consent Holder must determine if there is an alternative 8 m X 3 m area within the ecological survey area(s) that is suitable for use as a site (i.e. a 8 m X 3 m area where four or less frogs, lizards, or northern striped gecko have been found, and where the boundaries of that 8 m X 3 m area have applied a 3 m buffer from any frog, lizard, or northern striped gecko that has been found within the ecological survey area(s)). If no such alternative 8 m X 3 m area is available, an alternative site must be selected.

**166.** Disturbance of *Pterostylis puberula*, *Pretrostylis tasmanica* or king fern *Ptisana salicina* to establish any Portable Rig Site or Water Pump Site must be avoided.

### WHAREKIRAUPONGA ACCESS ARRANGEMENT

#### Exclusion Conditions

**2.6** The Permit holder must not undertake the following activities on the land:

(a) Exploration operations at any site(s) within 400 m of any open section of the Wharekirauponga track during the high visitor period of 23rd December to 6th February (inclusive) excepting those activities required to maintain the security and safety of the site(s);

(h) Establish any Drill Sites, Vent Shaft / Pump Test Site or any Portable Rig Sites that are not authorised under the Hauraki District Council landuse consent or the \_Thames Coromandel District Council landuse consent .

**2.7** The Permit holder must ensure that a minimum buffer of 30 m is maintained between the location of any Drill Site Site or Portable Rig Site and any part of the Wharekirauponga Track. No Drill Sites or Portable Rig Sites can be located within this buffer.

**2.8** The Permit holder must ensure that a minimum buffer of 250 m is maintained between the location of any Vent Shaft / Pump Test Site and any part of the Wharekirauponga Track. No Vent Shaft / Pump Test Sites can be located within this buffer.

#### **Vegetation Clearance and Site Disturbance Associated with Drill Site Locations**

**2.11** Vegetation clearance and disturbance at each Drill Site must comply with Conditions 118 to 137 of the Hauraki District Council land use consent.

*[Of the conditions referenced in Condition 2.11 above, those of particular relevance to the site selection exclusion protocol are Conditions 119A, 124, 126 and 131]*

#### **Vegetation Clearance and Site Disturbance Associated with Portable Rig Sites and Water Pump Sites**

**2.13** Vegetation clearance and disturbance at each Portable Rig Site and Water Pump Site must comply with Conditions 150 to 166 of the Hauraki District Council land use consent or conditions 15 to 24 of the Thames Coromandel District Council landuse consent.*[Of the conditions referenced in Condition 2.13 above, those conditions of particular relevance to the site selection exclusion protocol are Condition 157 of the Hauraki District Council land use consent and Condition 21 of the Thames Coromandel District Council landuse consent]*

#### **Management of 'At Risk' and/or 'Threatened Flora**

**2.26** The Permit holder must comply with Conditions 148 and 149 of the Hauraki District Council land use consent regarding the disturbance of *Pterostylis puberula*, *Pterostylis tasmanica* or king fern *Ptisana salicina*.

#### **NORTHERN AREA CONCESSION**

##### **Exclusions Conditions**

**2.** The Concessionaire must not undertake the following activities on the land:

- Disturb or hinder public use, access or enjoyment of the Land otherwise unaffected by the authorised Activities under this Concession);
- Use permanent paint on vegetation or rock for marking purposes; and
- Construct any new tracks involving vegetation clearance without prior approval.

#### **Vegetation Clearance and Site Disturbance Associated with Portable Drill Rig Sites**

10. Vegetation clearance and disturbance at each Portable Drill Rig Site must comply with Conditions 118 to 137 of the Hauraki District Council land use consent or conditions 15 to 24 of the Thames Coromandel District Council landuse consent.

*[Of the conditions referenced in Condition 10 above, those conditions of particular relevance to the site selection exclusion protocol are Condition 124 of the Hauraki District Council land use consent and Condition 21 of the Thames Coromandel District Council landuse consent]*

#### **Management of 'At Risk' and/or 'Threatened' Flora Associated with Portable Rig Sites**

25. The Concessionaire must comply with Conditions 148 and 149 of the Hauraki District Council land use consent regarding the disturbance of *Pterostylis puberula*, *Pterostylis tasmanica* or king fern *Pteris* *salicina*.

## APPENDIX B: SITE TYPE, SURVEY DETAILS, EXCLUSION DETAILS, AND VEGETATION AND HERPETOFAUNA SALVAGE DETAILS

Site Type	Number of Sites	Site Size	Survey Area Size	MCA	Pre-clearance Ecology Surveys	Exclusions	Vegetation Clearance and Herpetofauna Salvage
Drill Site	20	12m x 12m	22m x 22m	Yes	3 days / nights	<p>A site is disqualified/excluded if:</p> <ul style="list-style-type: none"> <li>- A frog nest, or brooding site is located within the site;</li> <li>- Five or more native frogs or lizards, or one or more northern striped gecko are located within the site;</li> <li>- The site is within 30 m of Wharekirauponga Track;</li> <li>- The site is within 10m of a natural inland wetland;</li> <li>- The site is within 25m of a river or stream.</li> </ul>	<p>Daytime vegetation clearance supervised by ecologist</p> <p>Salvaged frogs and lizards translocated to native fauna release area.</p>
Portable Rig Site / Water Pump Site	50	8m x 3m	18m x 13m	Yes	1 day / night	<p>A site disqualified/excluded if:</p> <ul style="list-style-type: none"> <li>- A frog nest, or brooding site is located within the site;</li> <li>- Five or more native frogs or lizards, or one or more northern striped gecko are located within the site;</li> <li>- The site is within 30 m of Wharekirauponga Track;</li> <li>- The site is within 10m of a natural inland wetland (excepting wetland piezometer sites);</li> <li>- The site is within 25m of a river or stream (excepting near stream piezometer sites);</li> <li>- <i>Pterostylis puberula</i>, <i>Pterostylis tasmanica</i> or king fern <i>Pteris</i> <i>salicina</i> are located within the site.</li> </ul>	<p>Daytime vegetation clearance supervised by ecologist</p> <p>Salvaged frogs and lizards translocated to native fauna release area.</p>
Vent Site	4	30m x 30m	50m x 50m	Yes	1 day	<p>A site disqualified/excluded if:</p> <ul style="list-style-type: none"> <li>- One or more northern striped gecko (<i>Tropidophorus</i> "Coromandel") is found during vegetation clearance;</li> <li>- The site is within 250 m of Wharekirauponga Track;</li> <li>- The site is within 10m of a natural inland</li> </ul>	<p>Two nights of nocturnal search and salvage of herpetofauna prior to vegetation clearance.</p> <p>Salvaged frogs and lizards translocated to native fauna release area.</p> <p>Daytime vegetation clearance supervised by ecologist.</p>

						wetland.	
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## ATTACHMENT 6 – FROG HYGIENE AND HANDLING PROTOCOLS

# Native frog hygiene and handling protocols



### Background

Over the past 25 years' amphibian populations have declined throughout the world and disease is considered to play a major role. One disease we have in New Zealand which is thought to be a major threat to frogs is the amphibian chytrid fungus. Given the transmission risk of the fungus and other diseases, strict hygiene and handling protocols are required to ensure the safety of our native frog populations. 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 research purposes.

### Principles

- Transmission risk can be managed/reduced through good hygiene practices.
- New or disinfected equipment/footwear should be used at every new site.
- New or disinfected equipment should be used for each frog, where practicable.

#### What should I do before entering known frog habitat?

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

### Site hygiene

- Remove all dirt/mud from footwear, gaiters and field equipment. Pay particular attention to field gear likely to come in contact with amphibians, soil/ground, freshwater, and/or that is already dirty e.g. boot soles.
- Disinfect all field gear. Mud/dirt etc. will be cleaned off first before disinfecting.
- Wash and dry everything. **\*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.
- **\*Important\*** If you have been to an area infected with the amphibian chytrid fungus you will clean and disinfect all your gear. Gear will also be cleaned between each field trip into the same native frog area, regardless of whether you are going in the same way or not.

### Tips

- Clean ahead to allow time for drying and consider having multiple sets of high use items if no time is available to clean 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 Department of Conservation office for the most up to date hygiene information.**

#### **What disinfectant should I use and how much?**

<b>Purpose</b>	<b>Disinfectant</b>	<b>Concentration</b>	<b>Time</b>	<b>Rinse</b>
Disinfecting footwear/gaiters	Sodium hypochlorite (bleach)	1%	1min	Yes
	Hot Wash	4%	15 mins	Yes
Disinfecting collection equipment, instruments and containers	Trigene/	1%	1min	Yes
	SteriGene	1%	1min	Yes
	F10			
	Virkon (NB: corrosive)	1:100	10 mins	Yes
	Sodium hypochlorite (bleach)	1%	1min	Yes
	Virkon (NB: corrosive')	4%	15 mins	Yes
	Trigene	1%	1min	Yes
	F10	1%	1min	Yes
	Ethanol	70%	1min	Air dry
	Complete drying		3+ hrs	No
Heat	37°C		4 hours	No
	60°C or greater		15 mins	No
Sterilising UV light			1min	No

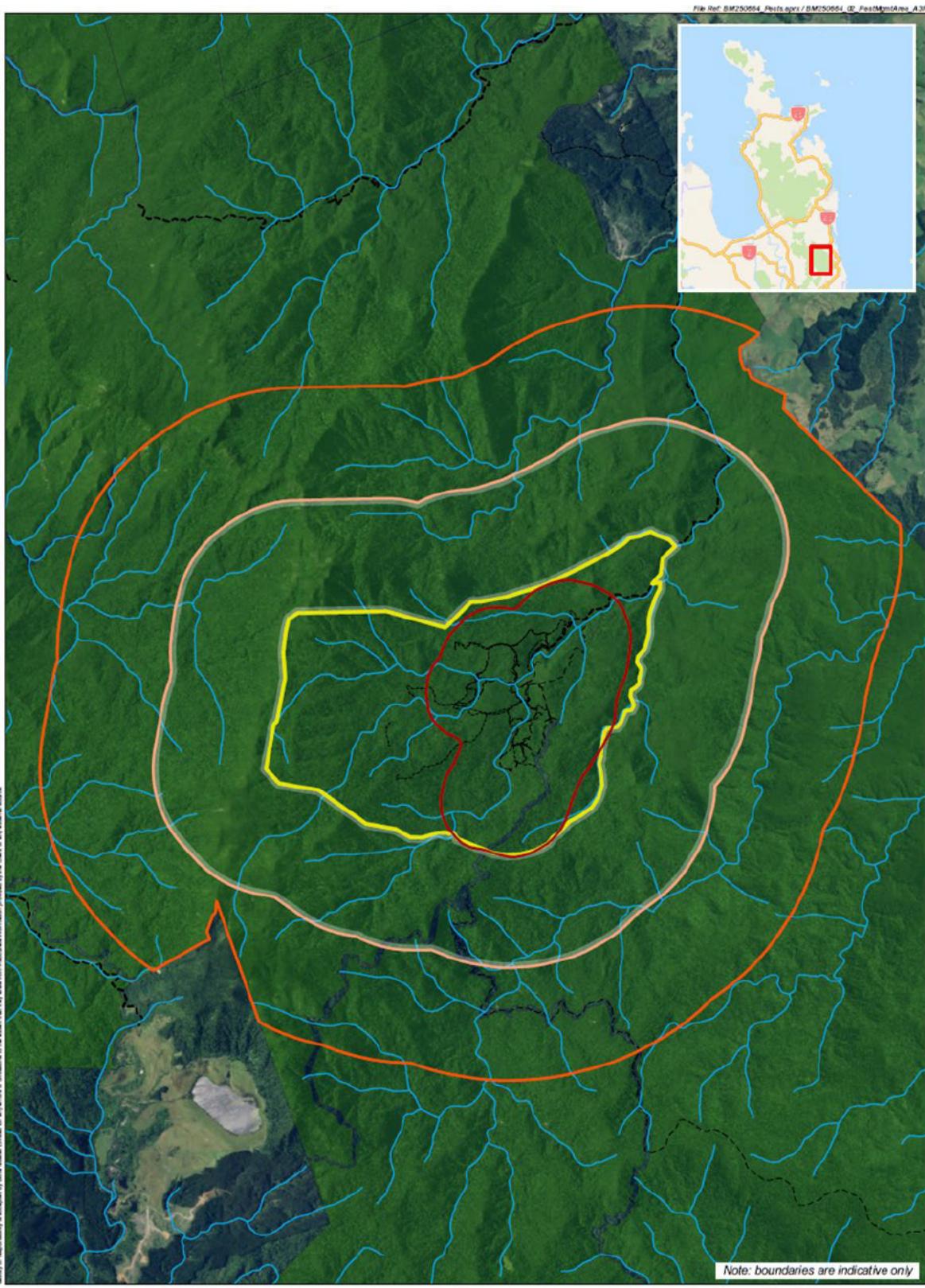
Trigene/SteriGene and Virkon and can be purchased from your local vet clinic.

#### **Frog handling hygiene**

- A new plastic bag or new powder-free nitrile gloves will 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 for searching for frogs and 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 please ensure a separate glove is used to handle these individuals.
- Each frog should be housed in a separate plastic bag.
- For researchers working in native frog habitat - please ensure all frog handling/measuring equipment that comes into direct contact with the frog is disinfected prior to use, between frogs and between sites.
- Each frog will be weighed and measured in the plastic bag to reduce unnecessary contact.
- Ensure the frogs are kept cool at all times; avoid keeping frogs in the cupped hand if possible to allow proper thermoregulation.
- 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 will never be used with any native frog (*Leiopelma*) species.

**If you find a sick or dead frog please take it to or contact your local Department of Conservation office.**

## **ATTACHMENT 7 – WHAREKIRAUONGA ANIMAL PEST MANAGEMENT AREA**



Boffa Miskell  
[www.boffamiskell.co.nz](http://www.boffamiskell.co.nz)



1:30,000 @ A3

LEGEND

- Tracks
- River/Stream
- Proposed pest control area
- Ungulate Control (1km buffer)
- Aerial control buffer
- Area potentially subject to vibrations
- Drainage Conservation Line (DCL)

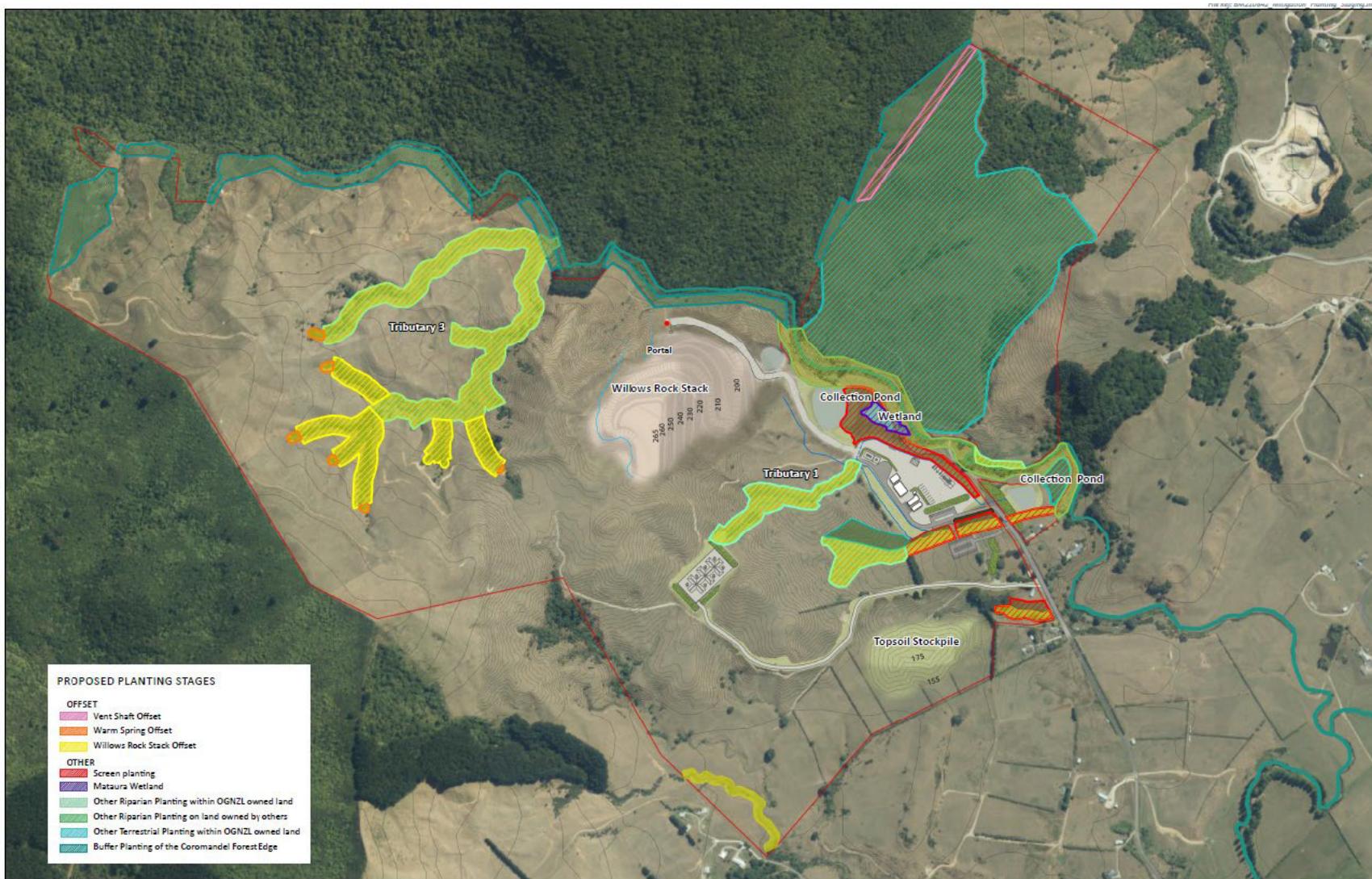
Map 2. Wharekiraupenga Pest Management Area

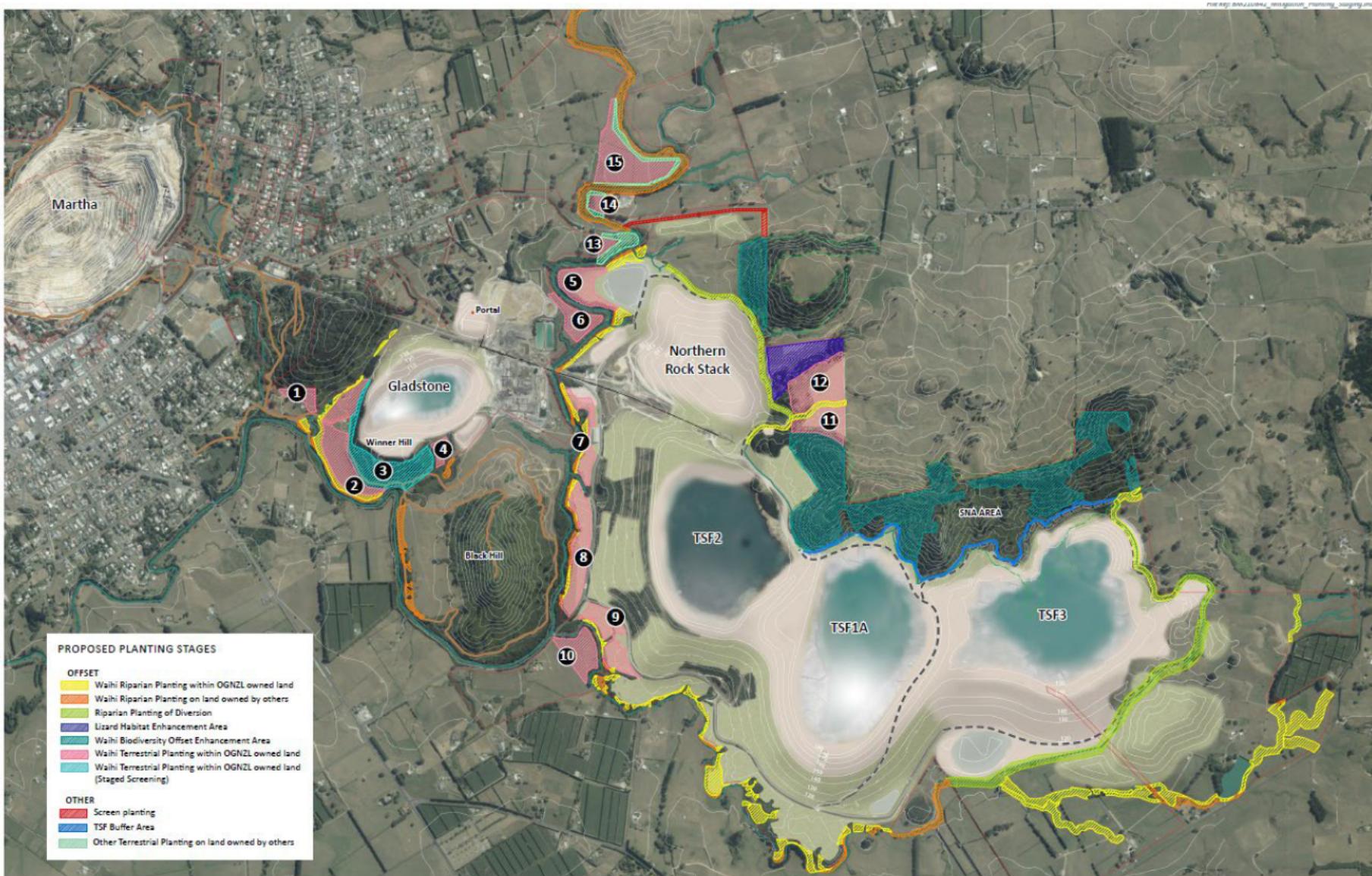
## Pest Management Area

Date: 15 October 2025 | Revision: 4

Prepared by Botts Miskell Limited  
Version 142a, 1 October 2014

## ATTACHMENT 8 - PROPOSED INTEGRATED MITIGATION PLANTING STAGES MAPS





## ATTACHMENT 9 - PROPOSED INTEGRATED MITIGATION PLANTING DETAILS

Table 1: Planting Referred to in Condition 195

Area	Trigger Activity	Objective	Treatment	Timeframe
<b>Figure A</b>				
<b>Offset Planting</b>				
Vent Shaft Offset	<ul style="list-style-type: none"> <li>&gt; Clearance of vegetation for first vent shaft / pump test site.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; To offset for the loss of vegetation and habitat associated with the vent raises in Area 1;</li> <li>&gt; To recreate complex broadleaf native forest habitat with species and vegetation tiers consistent with the Coromandel Forest Park (CFP);</li> <li>&gt; To provide an extension of habitat for native fauna in the CFP;</li> <li>&gt; To promote natural reseeding from the CFP;</li> <li>&gt; General ecological and landscape enhancement.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Stock and pig exclusion;</li> <li>&gt; Low density native planting with suitable broadleaf species, for example kanuka (<i>Kunzea robusta</i>), pigeonwood (<i>Hedycarya arborea</i>), mahoe (<i>Melicytus ramiflorus</i>). Once established (3-5 years), enrichment planting with specimen tawa (<i>Beilschmiedia tawa</i>), miro (<i>Prumnopitys ferruginea</i>), pukatea (<i>Laurelia novae-zelandiae</i>) and rimu (<i>Dacrydium cupressinum</i>);</li> <li>&gt; Planting should be staged to support natural forest regeneration processes particularly where natural seedling establishment is observed;</li> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Pioneer planting completed by the end of the first planting season following vegetation clearance for vent shafts within Area 1;</li> <li>&gt; 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).</li> </ul>

Area	Trigger Activity	Objective	Treatment	Timeframe
<b>Other Planting</b>				
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.	<ul style="list-style-type: none"> <li>&gt; Stock exclusion;</li> <li>&gt; Site preparation;</li> <li>&gt; Standard mass planting of riparian and adjoining terrestrial areas using representative native pioneer species and non-invasive exotic shelter belt in specified area;</li> <li>&gt; Enrichment with future representative canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species;</li> <li>&gt; Establishment of a shelterbelt in the location shown in Figure A;</li> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control.</li> </ul>	> 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	> Commencement of Willows SFA construction.	<ul style="list-style-type: none"> <li>&gt; To recreate complex broadleaf native forest habitat with species and vegetation tiers consistent with the CFP;</li> <li>&gt; To provide an extension of habitat for native fauna in the CFP;</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Stock and pig exclusion;</li> <li>&gt; Low density native planting with suitable broadleaf species, for example kanuka (<i>Kunzea robusta</i>), pigeonwood (<i>Hedycarya arborea</i>), mahoe (<i>Melicytus ramiflorus</i>). Once established (3-5 years), enrichment</li> </ul>	> As soon as practicable but no more than 10 years following commencement of activities within Area 2.

Area	Trigger Activity	Objective	Treatment	Timeframe
		<ul style="list-style-type: none"> <li>&gt; To promote natural reseeding from the CFP;</li> <li>&gt; General ecological and landscape enhancement</li> </ul>	<ul style="list-style-type: none"> <li>planting with specimen tawa (<i>Beilschmiedia tawa</i>), miro (<i>Prumnopitys ferruginea</i>), pukatea (<i>Laurelia novae-zelandiae</i>) and rimu (<i>Dacrydium cupressinum</i>);</li> <li>&gt; Planting should be staged to support natural forest regeneration processes particularly where natural seedling establishment is observed;</li> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control.</li> </ul>	
Buffer Planting of the Coromandel Forest Edge (subject to approval being provided by the Department of Conservation)	<ul style="list-style-type: none"> <li>&gt; Commencement of Willows SFA construction.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Minimise edge effects and provide a buffer between the CFP and the farmland;</li> <li>&gt; To recreate complex broadleaf native forest habitat with species and vegetation tiers consistent with the CFP;</li> <li>&gt; To provide an extension of habitat for native fauna in the CFP;</li> <li>&gt; To promote natural reseeding from the CFP;</li> <li>&gt; General ecological and landscape enhancement.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Stock exclusion;</li> <li>&gt; Low density native planting with suitable broadleaf species, for example, kanuka (<i>Kunzea robusta</i>), pigeonwood (<i>Hedycarya arborea</i>), mahoe (<i>Melicytus ramiflorus</i>). Once established (3-5 years), enrichment planting with specimen tawa (<i>Beilschmiedia tawa</i>), miro (<i>Prumnopitys ferruginea</i>), pukatea (<i>Laurelia novae-zelandiae</i>) and rimu (<i>Dacrydium cupressinum</i>);</li> <li>&gt; Planting should be staged to support natural forest regeneration</li> </ul>	<ul style="list-style-type: none"> <li>&gt; As soon as practicable but no more than 10 years following commencement of activities within Area 2.</li> </ul>

Area	Trigger Activity	Objective	Treatment	Timeframe
			<p>processes, particularly where natural seedling establishment is observed;</p> <ul style="list-style-type: none"> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control.</li> </ul>	

**Figure B**

**Offset Planting**

Lizard Habitat Enhancement Area	<ul style="list-style-type: none"> <li>&gt; Vegetation removal in Area 7.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; To enhance an existing 1.3 ha area of known habitat for Nationally 'At Risk' moko skinks (<i>Oligosoma moco</i>);</li> <li>&gt; To provide a safe (pest managed) refuge for relocated lizards;</li> <li>&gt; General ecological and landscape enhancement with additional habitat creation of 4.04 ha adjacent to SNA166 (including the 1.3 ha of known habitat listed above).</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Stock exclusion;</li> <li>&gt; Pine tree removal;</li> <li>&gt; Provision of permanent lizard refuge structures;</li> <li>&gt; Standard mass planting of targeted lizard habitat species, for example flax (<i>Phormium tenax</i>), Pohuehue (<i>Muehlenbeckia complexa</i>), Toetoe (<i>Austroderia toetoe</i>), Mingimingi (<i>Leucopogon fasciculatus</i>), Pohutukawa (<i>Metrosideros excelsa</i>) and Cabbage Tree (<i>Cordyline australis</i>);</li> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control (until mine closure).</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Pine tree removal before any vegetation removal in Areas 5, 6 or 7;</li> <li>&gt; Pioneer planting complete by end of first planting season following vegetation removal in Area 7;</li> <li>&gt; Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).</li> </ul>
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Area	Trigger Activity	Objective	Treatment	Timeframe
Waihi Biodiversity Offset Planting Area	> Vegetation removal in Area 7.	> 17.5 ha of new planting in, adjacent to, and in the wider landscape of the SNA to offset loss of 8.3 ha of SNA vegetation;  > 20 ha of new planting in wider WNP area to offset loss of 10.1 ha of site-wide indigenous vegetation;  > General ecological and landscape enhancement	> Stock exclusion;  > Site preparation;  > Standard mass planting using native pioneer species;  > Enrichment with WF11 future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species;  > Weed control;  > Mammalian pest control.	> Pioneer planting complete by end of first planting season following vegetation removal in Area 7;  > Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).
Waihi Biodiversity Offset Enhancement Area	> Vegetation removal in Area 7.	> 20 ha of enhancement actions within pine-dominant areas of SNA 166 to offset loss of 1.2 ha of non-SNA native vegetation;  > General ecological and landscape enhancement.	> Stock exclusion;  > Pine tree removal or poison, top & delimb;  > Infill planting SNA Enrichment species at 5 m spacing where pine trees are removed;  > Weed control;  > Mammalian pest control.	> Pine tree management, SNA enhancement planting (pine tree areas) complete by end of first planting season following vegetation removal in Area 7;  > Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).
<b>Other Planting</b>				
TSF Buffer Area	> Vegetation removal in Area 7.	> To rapidly buffer the edges of SNA166 to reduce weed reinvasion	> Buffer planting a minimum of 10 m wide along the southern boundary of	> Pioneer planting complete by end of first planting season following vegetation removal in Area 7.

Area	Trigger Activity	Objective	Treatment	Timeframe
		<p>and other edge effects following vegetation removal;</p> <p>&gt; General ecological and landscape enhancement.</p>	<p>the Southern Fragment of SNA 166 with fast growing native shrubs;</p> <p>&gt; Weed control;</p> <p>&gt; Mammalian pest control.</p>	
Replacement Planting Zones 1, 2 and 4	> Vegetation removal in Areas 5, 6 or 7.	<p>&gt; Replacement planting for - unprotected planted vegetation (including pine) that would be removed;</p> <p>&gt; Provide for and enhance ecological connectivity;</p> <p>&gt; Provide ecological buffers to existing ecological values;</p> <p>&gt; General ecological and landscape enhancement.</p>	<p>&gt; Stock exclusion;</p> <p>&gt; Site preparation;</p> <p>&gt; Standard mass planting using native pioneer species;</p> <p>&gt; Enrichment with WF11 future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species;</p> <p>&gt; Weed control;</p> <p>&gt; Mammalian pest control.</p>	<p>&gt; Pioneer planting complete by end of fifth planting season following vegetation removal in Areas 5, 6 or 7;</p> <p>&gt; Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).</p>
Replacement Planting Zones 5 – 9	> Vegetation removal in Areas 5, 6 or 7.			<p>&gt; Pioneer planting complete by end of seventh planting season following vegetation removal in Areas 5, 6 or 7;</p> <p>&gt; Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).</p>
Replacement Planting Zone 3	> Commencement of works at GOPTSF.			<p>&gt; Existing pine trees retained whilst Gladstone Pit is in operation;</p> <p>&gt; Pine tree management and pioneer planting completed within the first</p>

Area	Trigger Activity	Objective	Treatment	Timeframe
				<p>planting season following completion of surface mining in Gladstone Pit. This requires planting to occur before or whilst GOPTSF is in operation;</p> <p>&gt; Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).</p>
Replacement Planting Zone 10	> Vegetation removal in Areas 5, 6 or 7.			<p>&gt; Pioneer planting complete by end of second planting season following vegetation removal in Areas 5, 6 or 7;</p> <p>&gt; Enrichment planting undertaken once the pioneer plantings have reached a sufficient size to shelter enrichment species (likely to be between 3 and 5 years following pioneer planting).</p>
Screen Planting	> Vegetation removal in Areas 5, 6 or 7.	> To screen temporary stockpiles and Northern Rock Stack from Golden Valley Road.	> Establishment of fast growing native planting.	> Planting complete within the first planting season following the commencement of the consent.
Other Terrestrial Planting on OGNZL owned land	> As above.	> General ecological and landscape enhancement.	> Stock exclusion; > Site preparation; > Standard mass planting using native pioneer species;	> As soon as practicable but no more than 10 years following commencement of activities within Areas 5, 6 or 7.

Area	Trigger Activity	Objective	Treatment	Timeframe
			<ul style="list-style-type: none"> <li>&gt; Enrichment with WF11 future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species;</li> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control.</li> </ul>	
Other Terrestrial Planting on land owned by others	<ul style="list-style-type: none"> <li>&gt; Vegetation removal in Areas 5, 6 or 7.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; General ecological and landscape enhancement.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Stock exclusion;</li> <li>&gt; Site preparation;</li> <li>&gt; Standard mass planting using native pioneer species;</li> <li>&gt; Enrichment with WF11 future canopy species once the pioneer plantings have reached a sufficient size to shelter enrichment species;</li> <li>&gt; Weed control;</li> <li>&gt; Mammalian pest control.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; As soon as practicable but no more than 10 years following commencement of activities within Areas 5, 6 or 7.</li> </ul>

