



Rehabilitation Plan

Redlynch Intake Road, Redlynch, Queensland, 4870

Prepared for Boral Resources Pty Ltd

October 2021

Job 10276 E

1. Rehabilitation Plan

Overall Objectives

Requirements for the Redlynch Quarry site are as follows:

- Compliance with council approval (343831) 8/18/308-01, specifically Condition 7, Condition 8 and Condition 10.
- A 40m treed buffer along the ridgeline to be planted and maintained along eastern boundary of the extraction area between northings 8240N and 8500N (refer **Plan 1, 2.0** and **2.1**).
- Progressive rehabilitation of the site as each new stage begins.
- Rehabilitation of the existing quarry in accordance with the existing 'Alluvial Quarry Rehabilitation Management Plan' prepared by Saunders Havill Group, dated 13 June 2014 (Council Ref 4424683).
- Weed management in accordance with the Weed and Pest Management Plan (RPS, 29 July 2019).

The conditions of the Cairns Regional Council (CRC) approval that stipulate requirements associated with the continuation of the Redlynch Quarry are detailed within **Table 1**.

Table 1: Detailed Rehabilitation requirements

Event	Requirements
Rehabilitation Plan developed	Integrative with weed and pest management
	Detailed rehabilitation will be in accordance with concept rehabilitation plan
	Detailed rehabilitation plan to be submitted and approved by CRC prior to commencement
40m width tree buffer to be planted	Tree buffer to be minimum 40m width
	Trees to be minimum 2-5m in height prior to clearing adjacent areas for extraction
Progressive rehabilitation	Rehabilitation of previous extraction stage concurrently with clearing of next stage for extraction
	Clearing of site downhill from benches will be restricted to area required for next succeeding bench
	Site progressively rehabilitated as terminal faces developed
Weed Management	In accordance with Weed and Pest Management Plan (RPS, 29 July 2019)
Benching	No cut/earthworks to occur from top of buffer area
	Rolling rock retention methods to satisfy CRC and Dept of Resources rockfall hazards management compliance
	Maximum number of operational benches at any one time will be three
	Maximum face height of top three benches to be 7.5 metres
Existing alluvial quarry rehabilitation	To be rehabilitated in accordance with the existing Alluvial Quarry Rehabilitation Management Plan (SHG, 2014 - Council Ref: 4424683)

2. Site Plan

Plan 1 details the proposed site plan for Redlynch quarry, demonstrating the following features:

- Proposed “top down” extraction program
- Location of services and earthworks
- Buffers and setbacks
- Regional Ecosystems proposed to be removed and retained with the continued operation of the quarry.
- Locations of waterway and waterbodies on-site.

2.1. Extraction Program

To assist in mitigating visual impacts, Boral have elected to undertake a “top down” extraction program where the quarry benches will be progressively rehabilitated where one bench is completed and the next commences. This program will reduce the time period where bare rock faces will be visible to the surrounding area. This rehabilitation plan will detail the steps required for rehabilitation as per Condition 8 of the Development Approval. The western side of the ridgeline is proposed to be Phase 1, with Phase 2 on the eastern side of the ridgeline. These two phases once rehabilitated will create a treed buffer area to reduce visual impact to the surrounding area.

2.2. Location of Services and Earthworks

Plan 1 details the vegetation that will require removal to provide services and earthworks for the proposed quarry. These services will be concentrated along the north-eastern boundary of the quarry site.

2.3. Buffers and Setbacks

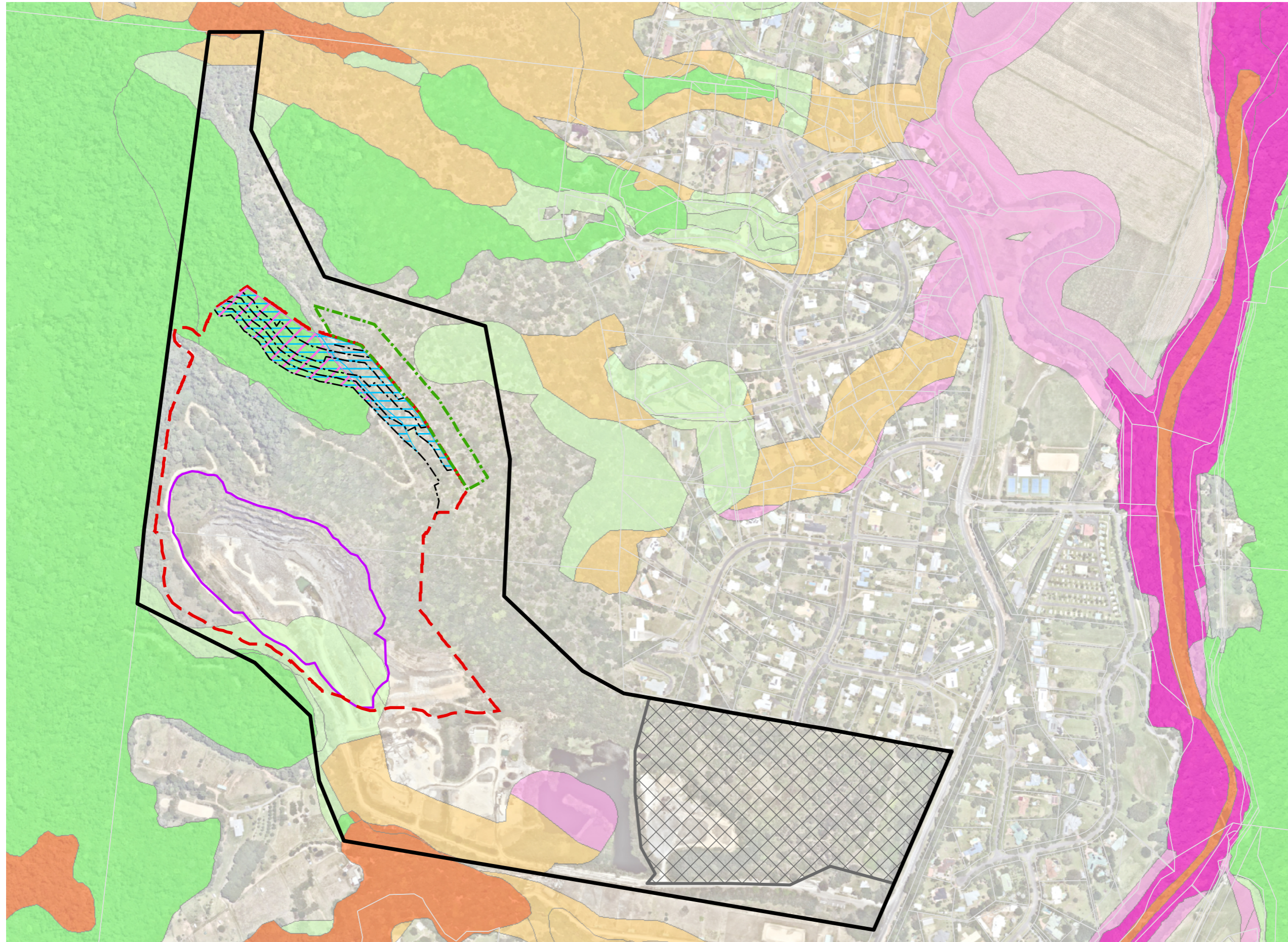
Buffers and setbacks lines are detailed in **Plan 1**. These lines ensure that retained site values will not be impacted by extractive activities.

The continuation of the quarry will require the clearing of Category B (remnant), Category R (Reef-regrowth-watercourse vegetation) and Category X (non-remnant) vegetation. The Regional Ecosystems that are proposed to be impacted include Least Concern RE 7.11.7a and 7.12.7a. Curranda Creek is located within the western portion of the site. This creek line vegetation is located within the Category R vegetation and not proposed to be impacted with the continuation of the quarry operations.

2.4. Stabilisation Methods for Exposed areas


The benches and other exposed areas from the extractive activities will require stabilisation activities to ensure the site does not increase the likelihood of erosion and to reduce the impacts if erosion was to occur. The main cause of erosion of the exposed areas will be from rainfall and wind events.

Plan 1. Site Plan

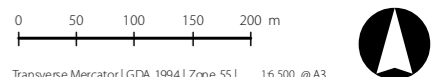


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Legend

-  Qld DCDB
-  Project Site Boundary
-  Quarry Pit
-  New Quarry Extent (2021)
-  40m Tree Buffer Area
-  Alluvial Quarry Rehabilitation Area (managed under existing Alluvial Quarry Management Plan, 13 June 2014)
-  Regional Ecosystem Area to Remove
-  Proposed Quarry and Rehabilitation Area
-  Category A or B area that is a least concern regional ecosystem
-  Category C area containing endangered regional ecosystems
-  Category C area containing of concern regional ecosystems
-  Category C area that is a least concern regional ecosystem
-  Proposed Benches

Issue	Date	Description	Drawn	Checked
A	01/10/2021	Preliminary	LS	MM
B	14/10/2021	Amenments	LS	MM



Transverse Mercator | GDA 1994 | Zone 55 | 16,500 @ A3

3. Rehabilitation

Redlynch Quarry Rehabilitation Plan is a multi-faceted plan targeting areas of the continuing quarry operations. Saunders Havill Group completed a Visual Assessment at Redlynch Quarry in 2014. The objectives of this report were to ensure the extraction will not have a negative visual impact on the surrounding area. The implementation of the 40-metre treed buffer as required by Condition 7 of approval (343831) 8/18/308-01 and proposed phases of works, with clearing areas and rehabilitation resulted from this assessment and will contribute to a reduction in visual impact.

Rehabilitation and restoration within ecosystems typical of high rainfall areas, tend to benefit from a higher planting density to reduce opportunities for fast-growing weed species to encroach and out-compete slower-growing native species. A planting distance of 1.5m – 2m is recommended to counter weed encroachment in the initial phases of restoration.

3.1. Rehabilitation Approach and Methods

Plan 2.0 demonstrates the areas requiring rehabilitation as per Condition 8 and 10 of Council approval (343831) 8/18/308-01. This Rehabilitation Plan details restoration prescription for two locations at Redlynch Quarry which require differing rehabilitation methods, with relation to slope and pre-clear Regional Ecosystem. These areas include:

- The **Alluvial Quarry** at the site entrance (lower slopes)
- **Quarry Benches - Progressive rehabilitation** (upper slopes).

Northeast Queensland does not have an approved Ecological Restoration Guidelines. However, Southeast Queensland local government areas have agreed to an SEQ Ecological Restoration Framework (SEQERF), which includes Code of Practice, Guideline and Manual. For the purpose of the rehabilitation plan, certain aspects from SEQ Ecological Restoration Guidelines will be recommended. The SEQERF has four common restoration approaches, with includes Natural Regeneration, Assisted Natural Regeneration, Reconstruction and Fabrication.

Table 2: Four common restoration approaches (modified from SEQ Ecological Restoration Framework)

Type of Ecological Restoration	Circumstances where appropriate
Natural Regeneration	Where the site resilience is intact and recovery occurs naturally without human intervention with the removal of cause of damage
Assisted Natural Regeneration	Where levels of resilience exists and 'triggering' interventions (either disturbance or resource provision) can affect recovery by natural regeneration.
Reconstruction	Resilience is depleted and abiotic or biotic elements need wholesale importation (soil to be restored from elsewhere) or major amendment before recovery can commence.
Fabrication	Where site conditions are permanently changed and a better adapted local system can be regenerated or constructed to restore integrity to the landscape.

3.2. Inclusion of culturally significant tree species

Cairns and surrounding areas are recognised for having a rich, indigenous heritage. The rehabilitation of Redlynch Quarry provides an opportunity to engage with the region's registered owners, to include culturally significant species within the rehabilitation of Redlynch Quarry.

3.3. Quarry Benches – progressive rehabilitation (upper slopes)

The Condition 8 of Council Approval (343831) 8/18/308-01 stipulate that a maximum of three benches can be operational at one time and each bench must be progressively rehabilitated before commencing a new bench. Due to the extractive activities proposed for the benches, these areas will be highly modified, with no vegetation remaining and a highly modified ground layer. Using the SEQERF as a reference (refer **Table 2**), these benches will require a Reconstruction approach for the rehabilitation. Reconstruction is preferred over Fabrication as the benches will be restored to the Preclear Regional Ecosystems and not converted to a different Regional Ecosystem.

Before the commencement of the reconstruction of the vegetation communities, the soil profile will need to be suitably rebuilt via "reconstruction" to support the vegetation. Soil profile will be reformed via the return of soil, stockpiled during the quarrying of the benches. Once the soil layer has been suitably restored and the soil stabilised to reduce the risk of erosion, planting can commence. Stabilisation methods with potential to reduce soil erosion includes jute/coir matting in addition to planting of soil stabilising ground cover species, where suitable within the ecosystem. These methods can reduce erosion from rainfall events, assist in maintaining soil moisture levels and deter species such as Orange Scrub-fowls and Australian Brush Turkeys from disturbing the soil.

It is recommended that the proposed benches rehabilitation areas includes species listed as per the preclear Regional Ecosystem, 7.12.61a, detailed under Progressive Rehabilitation – quarry benches, within, **Table 3**. **Table 3** presents the recommended species for each of the two distinct areas of rehabilitation covered within this rehabilitation plan. **Table 5** details preclear regional ecosystems mapped on-site.

Following initial planting, seedlings and infill plantings require on-going maintenance in the form of watering and weed removal during establishment period. Both supplementary watering and weed management reduce the likelihood of plant mortalities. Watering is required during the plant establishment phases, where the plants are establishing roots into the surrounding soil. Weed removal will be recommended for the 24-month maintenance period post-planting to reduce competition by weed species. The WPMP (refer to **Section 4**) outlines requirements for introduction of new soil, whereby the soil should be treated to reduce the weed seedbank in the soil. Despite this, there is potential for the weeds to establish within rehabilitation areas via wind dispersal, water run off or animal dispersion. Weed species typically grow faster and outcompete native species when weed management and native planting density is not applied optimally.

Following the initial plant establishment phase, assisted natural regeneration can occur in conjunction with weed management within the area. Continued weed management will minimise competition during the recruitment phase whereby canopy species and other natives within the community regenerate. The aim of ecological restoration is to restore areas to a resilient, self-sustaining ecosystem and no longer requires human intervention.

Figure 1 shows the recommended site restoration processes within each of the two distinct rehabilitation areas.

3.4. Alluvial Quarry Rehabilitation (lower slopes)

A Conceptual Rehabilitation Plan titled ‘Alluvial Quarry Rehabilitation Management Plan’ prepared by Saunders Havill Group, dated 13 June 2014 (Council Ref 4424683) was developed for Redlynch Quarry in 2014 (refer to **Plan 3** for extracted Plan). The conceptual rehabilitation plan (CRP) considers the eastern part of the quarry adjacent to Redlynch Intake Road. The CRP proposed soil mounding, weed management, a seeding area and scattering of native tree species. The CRP lists the control methods for major and minor weeds of subtropical rainforests of Eastern Australia as well as general weed removal techniques for types of weeds (e.g., vines, runners, scramblers etc.)

The construction of the soil mounding along the boundary will reduce visual and sound impacts of rehabilitation activities to neighbouring properties and surrounding areas. Removal of weed species from this management area is prioritised initially, with weeds prioritised (refer to **Figure 2 – weed prioritisation**). At present, no Weeds of National Significance (WONS) have been identified within the Alluvial Quarry Rehabilitation area however, where additional weeds of significance (WONS, Restricted or Prohibited Invasive Weeds under Queensland’s *Biosecurity Act, 2014*, Priority Weeds identified by Cairns Regional Council Plan) are identified onsite, these will be incorporated into the priority schedule as per **Figure 2**. Following weed removal, planting of canopy trees and native seeding can occur. It is recommended that once the revegetation efforts have completed, follow up maintenance in the form of watering and spot spraying should occur to prevent weeds from regenerating and outcompeting native species. Post establishment, the rehabilitation site will enter a 24-month maintenance period.

3.5. Standard Proposed Weed Treatments

There are a variety of weed treatments can be completed across the site. Treatments will be determined by the weed species that are present. Specific weed species and associated treatments require permits and licences from DAF and should be completed by a suitably qualified bush regeneration contractor. If herbicides will be applied on-site, the contractor completing the application of chemicals is required to hold a Commercial Operators Licence under the *Agricultural Chemical Distribution Control Act, 1996* (also known as an ACDC Licence). Standard data sheets and Herbicide application sheets should be completed after ant works completed and retained as a part of the monitoring and management process. **Table 4** lists generalised information on possible treatments for weed species. This does not apply to all plants and surrounding features should be considered before undertaking weed removal.

Table 3: Recommended species for rehabilitation areas

Regional Ecosystem	Species	Strata	Minimum Spacing
Alluvial Quarry Rehabilitation (lower slopes)			
7.3.17	<i>Alectryon tomentosus</i>	Sub-canopy	1.5 m
7.3.17	<i>Stenocarpus sinuatus</i>	Canopy	1.5 m
7.3.17	<i>Mallotus philippensis</i>	Sub-canopy	1.5 m
7.3.17	<i>Ficus rubignosa</i>	Canopy	1.5 m
7.3.17	<i>Ficus racemosa</i>	Canopy	1.5 m
7.3.17	<i>Melicope elleryana</i>	Sub-canopy	1.5 m
7.3.17	<i>Elaeocarpus grandis</i>	Canopy	1.5 m
7.3.17	<i>Commersonia bartramia</i>	Sub-canopy	1.5 m
7.3.17	<i>Ficus virens</i>	Canopy	1.5 m
7.3.17	<i>Homalanthus nutans</i>	Sub-canopy	1.5 m
7.3.17	<i>Melia azedarach</i>	Sub-canopy	1.5 m
7.3.17	<i>Alpinia caerulea</i>	Sub-canopy	1.5 m
7.3.17	<i>Jagera pseudorhus</i>	Sub-canopy	1.5 m
7.3.17	<i>Castanospermum austral</i>	Canopy	1.5 m
7.3.17	<i>Macaranga tanarius</i>	Sub-canopy	1.5 m
7.3.17	<i>Grevillea robusta</i>	Canopy	1.5 m
7.3.17	<i>Agathis robusta</i>	Sub-canopy	1.5 m
Quarry Benches – Progressive Rehabilitation (upper slopes)			
7.12.61a	<i>Eucalyptus tereticornis</i>	Canopy	1.5 m
7.12.61a	<i>Corymbia intermedia</i>	Canopy	1.5 m
7.12.61a	<i>Eucalyptus drepanophylla</i>	Canopy	1.5 m
7.12.61a	<i>Lophostemon suaveolens</i>	Canopy	1.5 m
7.12.61a	<i>Allocasuarina torulosa</i>	Canopy	1.5 m
7.12.61a	<i>Alphitonia excelsa</i>	Sub-canopy	1.5 m
7.12.61a	<i>Macaranga tanarius</i>	Sub-canopy	1.5 m
7.12.61a	<i>Melia azedarach</i>	Sub-canopy	1.5 m

Figure 1: Recommended Site Restoration Process

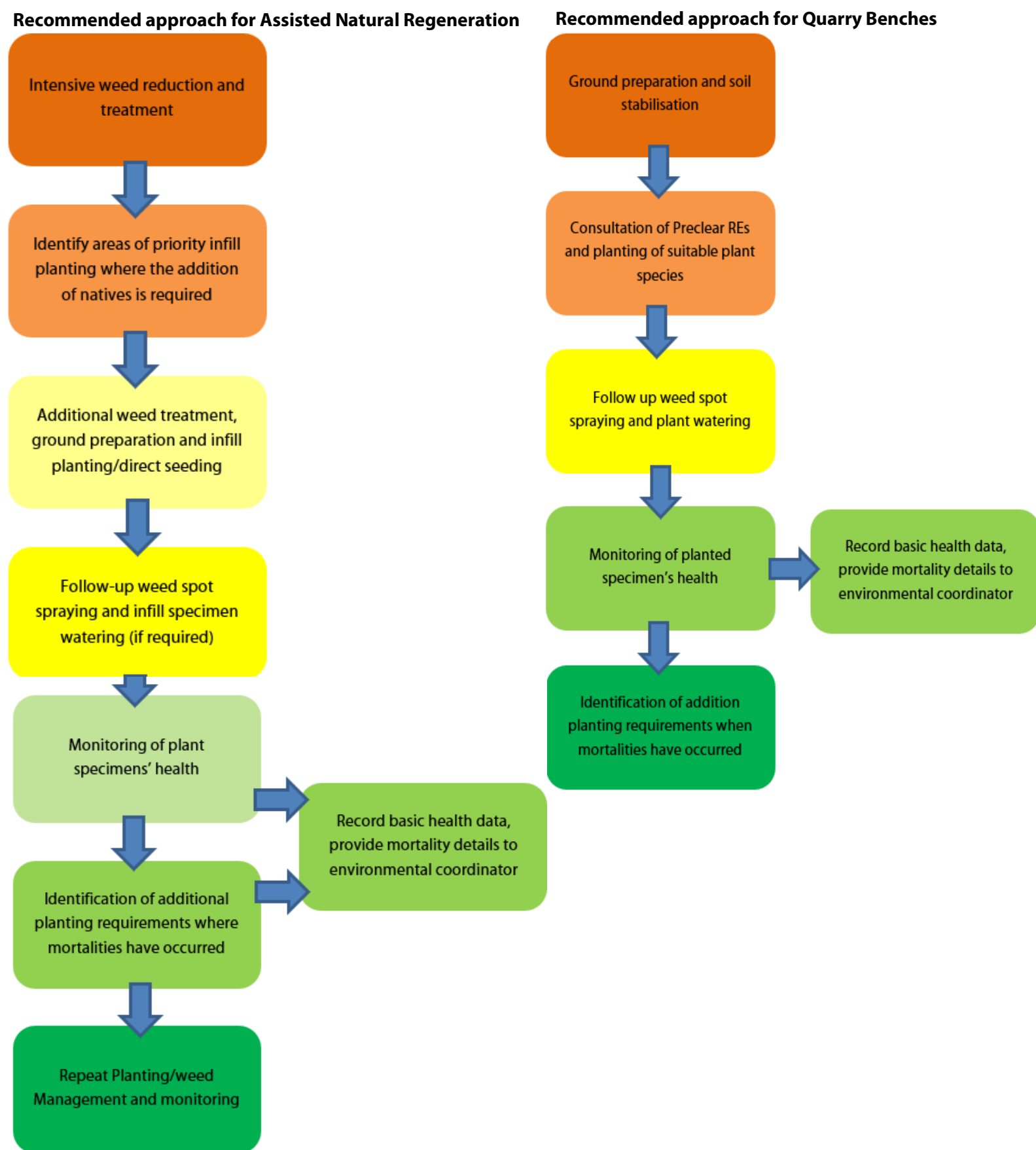


Figure 2: Weed Species Prioritisation

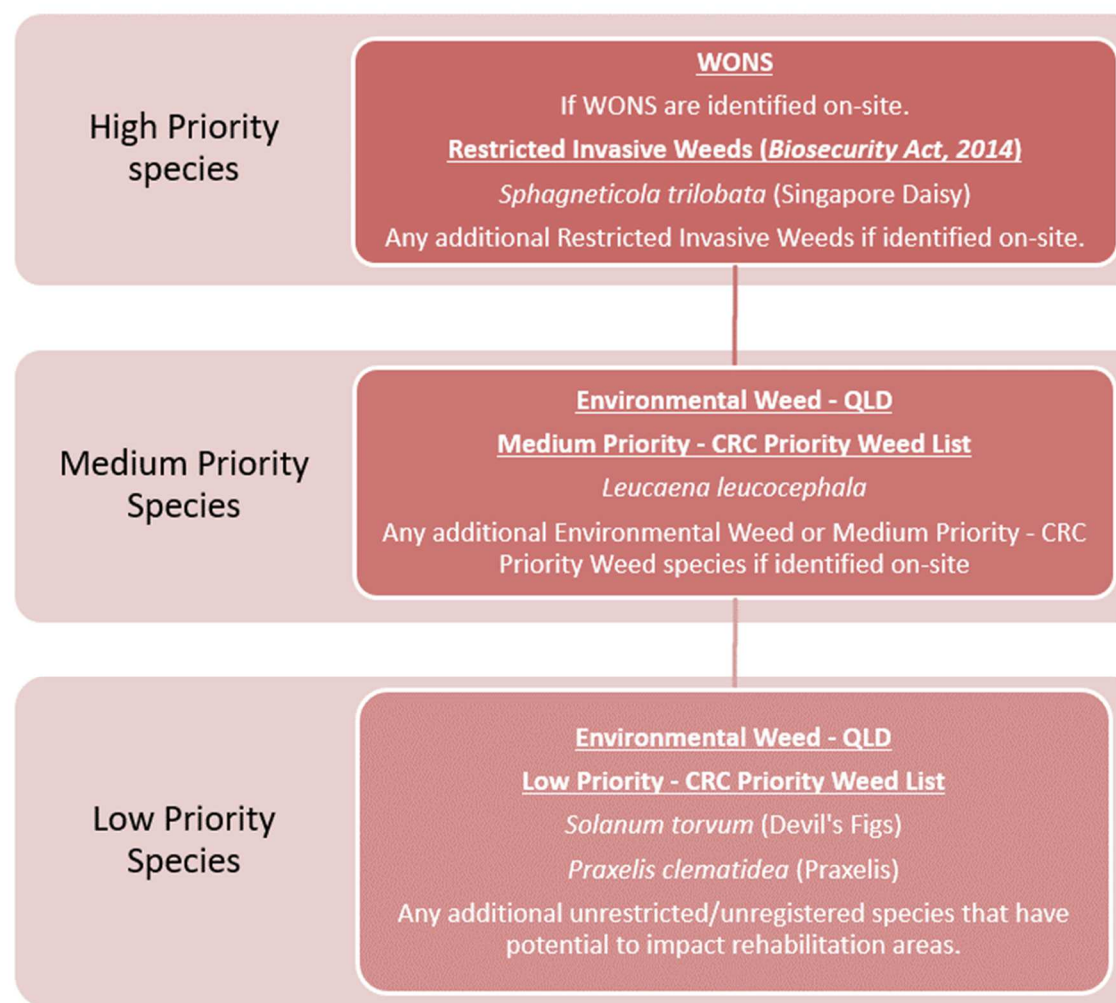


Table 4: Potential Weed Control Methods

Type of Weed	Potential Control Methods	
Woody Vegetation	<ul style="list-style-type: none"> Cut, scrape and paint Frill and inject Drill and inject 	<ul style="list-style-type: none"> Basal Barking (not suitable if natives are present) Cut and Paint
Vines and climbers	<ul style="list-style-type: none"> Scrape and paint 	<ul style="list-style-type: none"> Cut and spray
Shrubs	<ul style="list-style-type: none"> Cut and paint Hand removal 	<ul style="list-style-type: none"> Mechanical removal and spray regrowth
Herbs and Grass	<ul style="list-style-type: none"> Foliar Spray 	<ul style="list-style-type: none"> Hand removal (small densities in small areas)

Table 5: Targeted Regional Ecosystem for on-site rehabilitation

Regional Ecosystem	Structure Category	Description
Least Concern RE 7.12.7a	Dense	Complex notophyll vine forest (with emergent <i>Agathis robusta</i>). Foothills and uplands on granite and rhyolite north of the Herbert River. Moist rainfall zone. (BVG1M:5c)
Least Concern RE 7.11.7a	Dense	Complex notophyll vine forests (with emergent <i>Agathis robusta</i>). Foothills and uplands of areas excluding the Seaview Range Subregion. Moist Rainfall zone (BVG1M:5c)
Of Concern RE 7.12.61a	Dense	<i>Eucalyptus tereticornis</i> open forest to tall open forest and woodland. Includes communities from those dominated by <i>E. tereticornis</i> to mixtures of that species with <i>Corymbia intermedia</i> , <i>E. drepanophylla</i> , <i>Lophostemon suaveolens</i> and <i>Allocasuarina torulosa</i> . Foothills and uplands on granite and rhyolite, of the moist and dry rainfall zones (BVG1M:9c)
Landzone 11		Metamorphosed rocks, forming ranges, hills and lowlands. Primarily lower Permian and older sedimentary formations which are generally moderately to strongly deformed. Includes low- to high-grade and contact metamorphics such as phyllites, slates, gneisses of indeterminate origin and serpentinite, and interbedded volcanics. Soils are mainly shallow, gravelly Rudosols and Tenosols, with Sodosols and Chromosols on lower slopes and gently undulating areas. Soils are typically of low to moderate fertility.
Landzone 12		Mesozoic to Proterozoic igneous rocks, forming ranges, hills and lowlands. Acid, intermediate and basic intrusive and volcanic rocks such as granites, granodiorites, gabbros, dolerites, andesites and rhyolites, as well as minor areas of associated interbedded sediments. Excludes serpentinites (land zone 11) and younger igneous rocks (land zone 8). Soils are mainly Tenosols on steeper slopes with Chromosols and Sodosols on lower slopes and gently undulating areas. Soils are typically of low to moderate fertility.

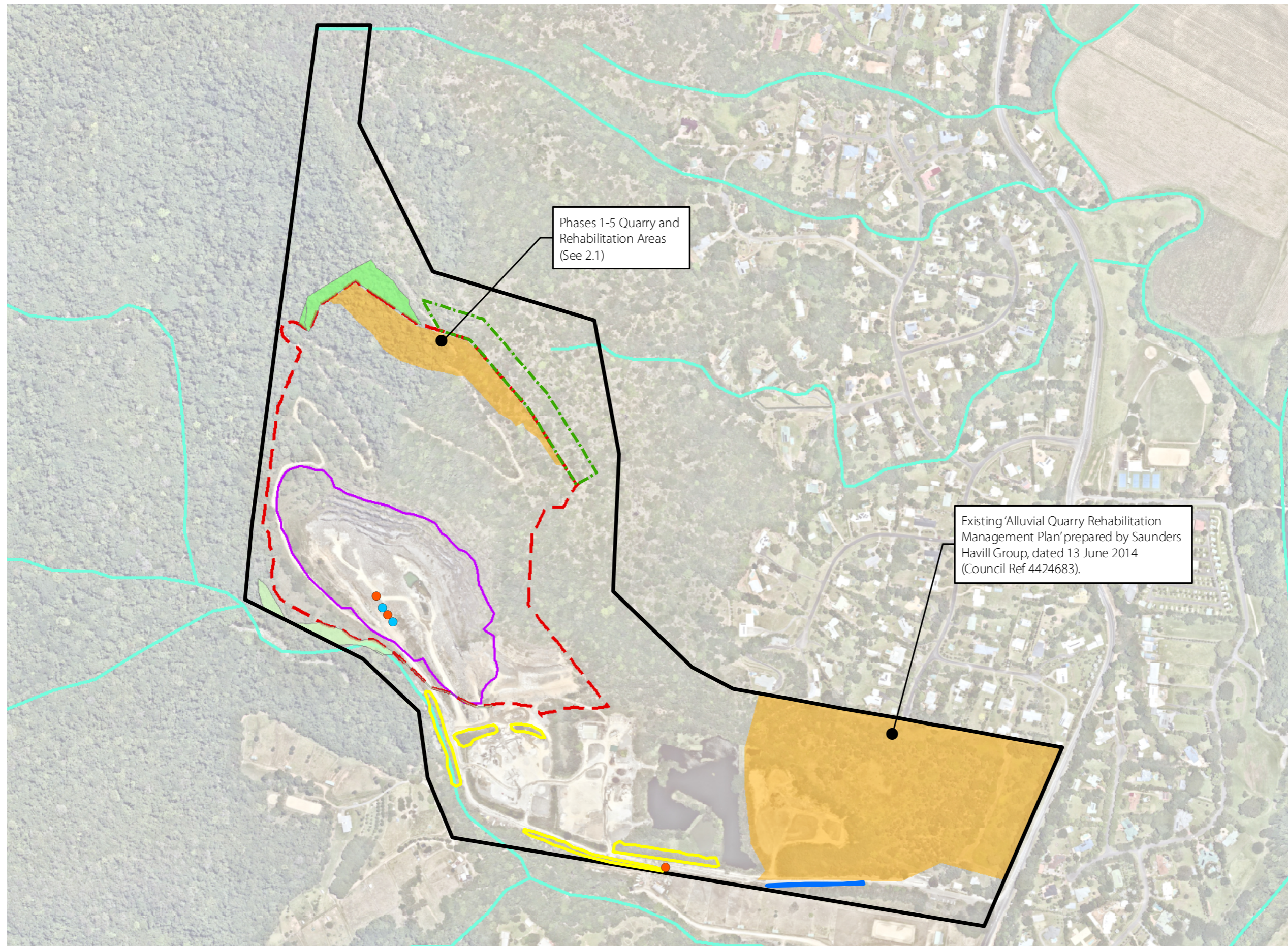
3.6. Rehabilitation Key Performance Indicators

As stipulated in Condition 8 of Council Approval (343831) 8/18/308-01, a maximum of three benches can be operational at one time and the benches just be progressively rehabilitated before the commencement of a new bench. In addition to this Condition 10 specifies that the Boral is responsible for the rehabilitation of the existing (alluvial) quarry in accordance with the "Existing Alluvial Quarry Rehabilitation Management Plan" prepared by Saunders Havill Group and dated 13 June 2014 (Council Ref 4424683). **Table 6** below details potential techniques and key performance indicator for the bench and alluvial quarry rehabilitation.

Table 6: Rehabilitation zone, designation, proposed techniques and key performance indicators.

Rehabilitation Zone	Rehabilitation Designation	Techniques	Key Performance Indicators
Quarry Benches- Progressive Rehabilitation	Reconstruction	<ul style="list-style-type: none"> Reconstruction and rebuilding of soil benches towards natural landform. Soil stabilisation techniques used; Use of wind breaks and edge plantings along benches where possible. Planting of some semi-mature specimens (60-70cm tall) as a part of rainforest ecosystem reconstruction. Vine species to be planted (where necessary) following full establishment of canopy tree species. 	<ul style="list-style-type: none"> Soil exhibits no/minimal acceptable slippage or erosion. New plantings have begun to be self-sustaining with minimal assisted intervention for survival. Weed management – maintain zones as free from WONS and Class 1 and 2 weeds. Monitoring and maintenance are completed over a 24 month post establishment maintenance period.
Alluvial Quarry Rehabilitation	Assisted Natural Regeneration	<ul style="list-style-type: none"> Mounding to occur on-site as per Plan 3. This will provide visual and auditory buffer between the infill area and residential zone. High levels of weed management and removal to allow native plants to regenerate throughout the zone. Areas of seeding in accordance with Plan 3. Seeding mixture to consist of temporary cover crop and native grass seed. Infill planting will occur in locations identified for scattered tree planting (refer to Plan 3). 	<ul style="list-style-type: none"> Zone is free from WONS and Class 1 and 2 weeds. Any large weed infestations will be progressively reduced and managed. Monitoring will occur to quantify and measure the components of the target RE 7.3.17 annually for the first two years to monitor regeneration efforts. Where insufficient regeneration has occurred after 2 years, infill planting will be required to assist the rehabilitation process.

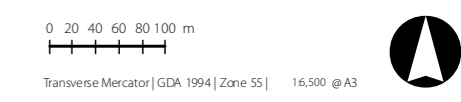
Plan 2.0 Rehabilitation Areas



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 - New Quarry Extent (2021)
 - 40m Tree Buffer Area
 - Rehabilitation Area
 - Regional Ecosystem Area to Retain**
 - Category A or B area that is a least concern regional ecosystem
 - Category C area that is a least concern regional ecosystem
 - Leucaena
 - Singapore Daisy
 - Watercourse/Drainage Feature
 - Devil's Fig
 - Praxelis

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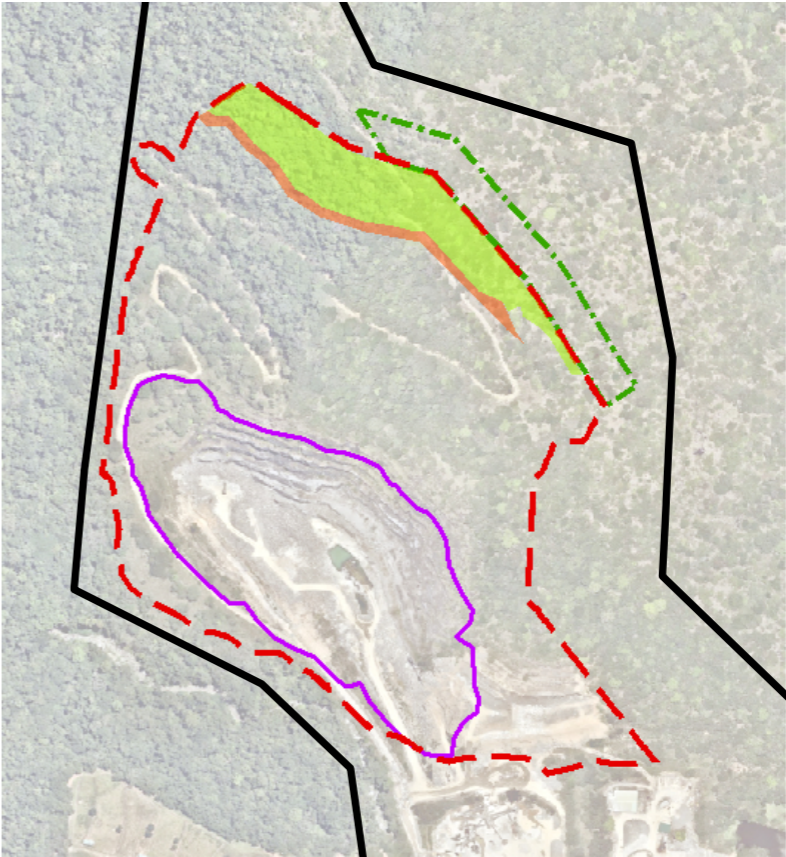
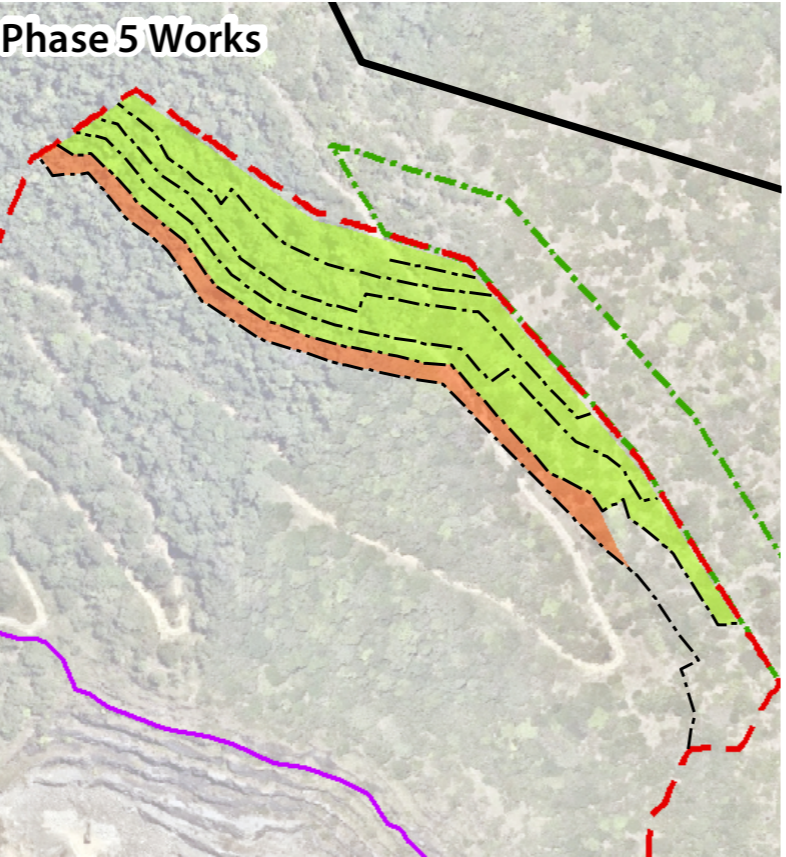
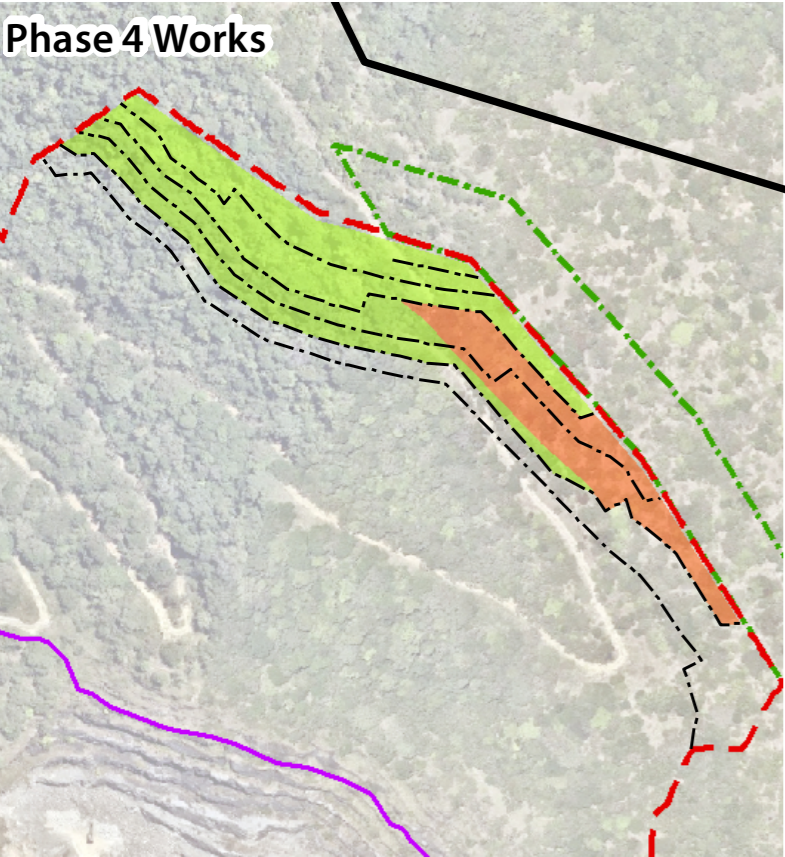
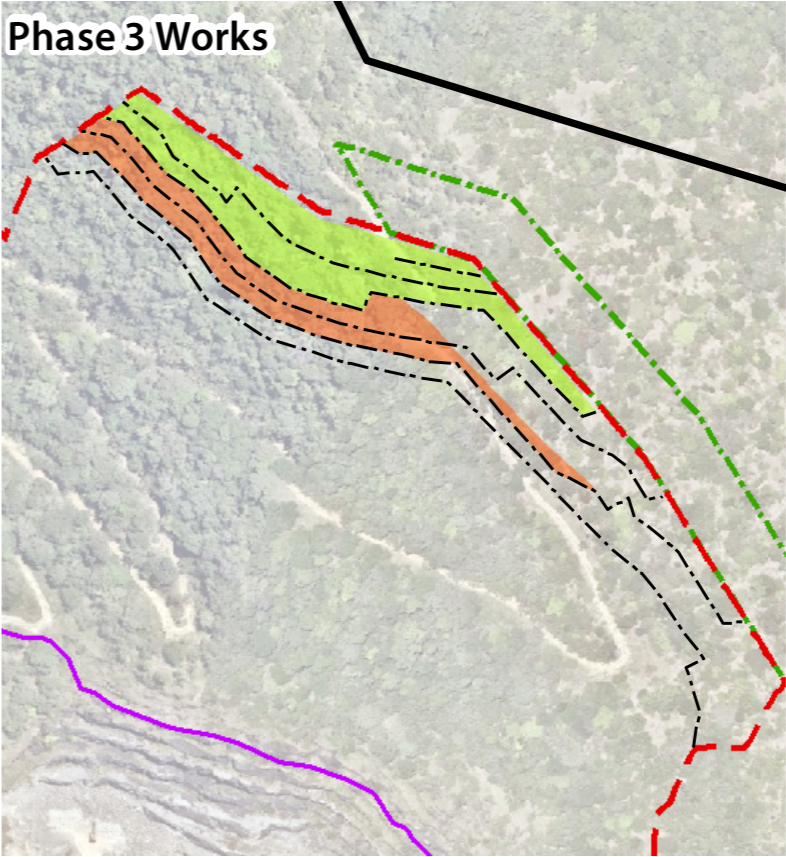
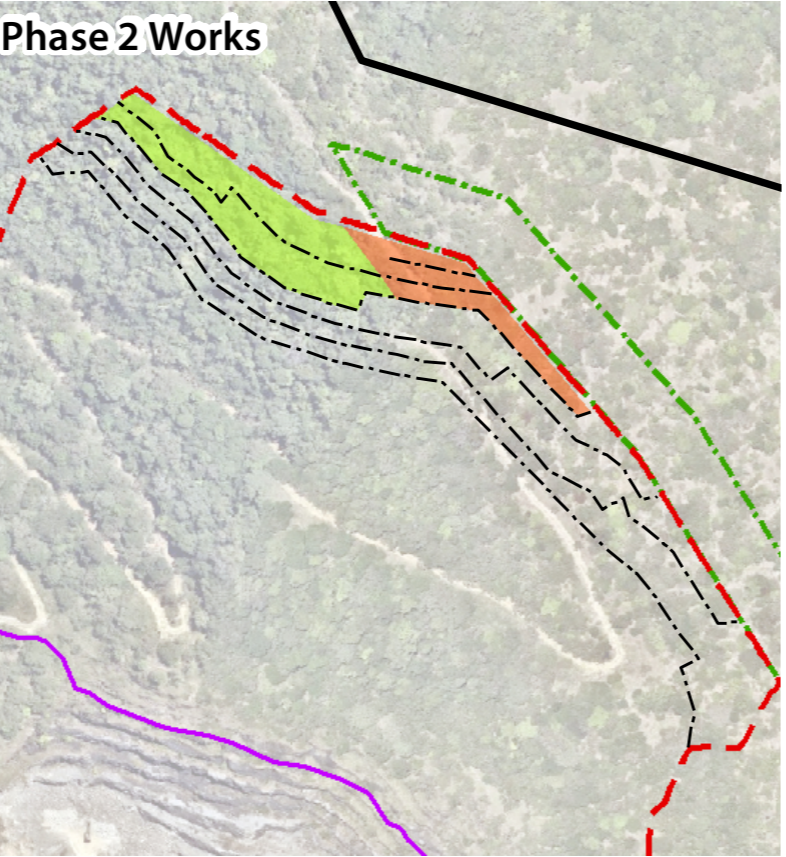
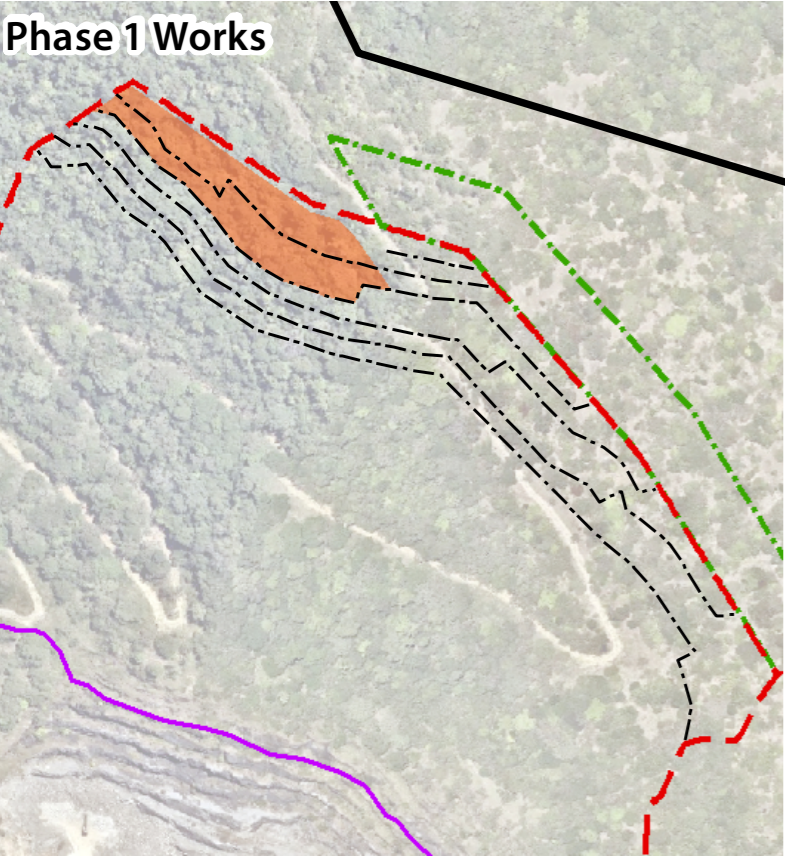


Redlynch Quarry

Address / RPD: Intake Road, Redlynch

14/10/2021 | 10276 E 02 Rehab Areas B

Plan 2.1 Phases 1-5 Quarry and Rehabilitation Areas



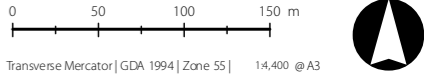
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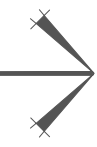
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Redlynch Quarry

Address / RPD: Intake Road, Redlynch
 14/10/2021 | 10276 E 02_1 Rehab Areas B

ALLUVIAL QUARRY CONCEPTUAL REHABILITATION PLAN

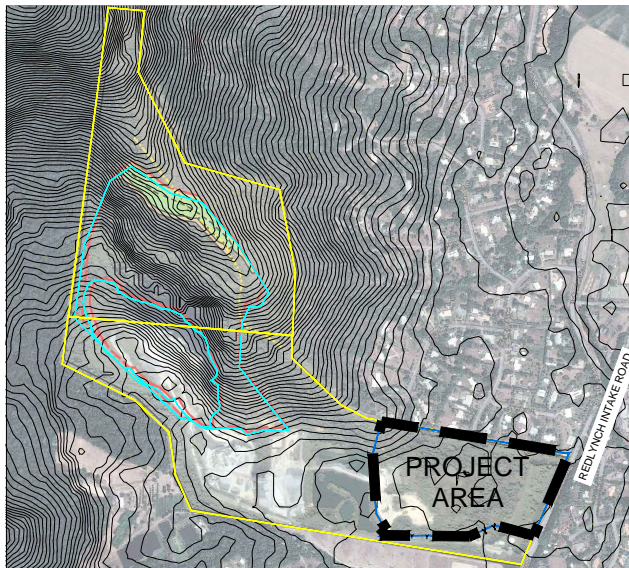


DRAWING SCHEDULE

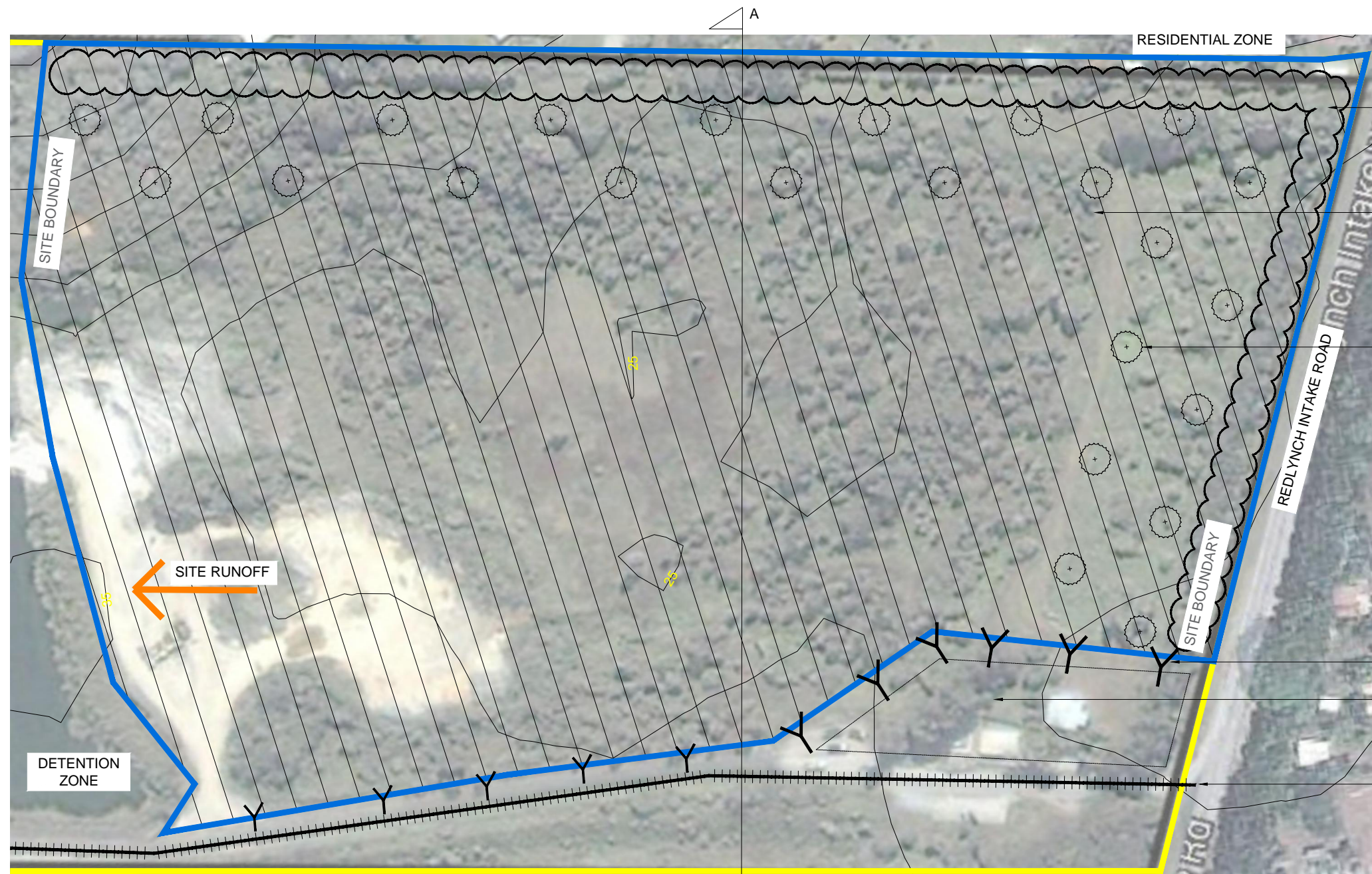
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7220 E 02	WEED MANAGEMENT SCHEDULE	B	30.06.2014
7220 E 03	WEED MANAGEMENT SCHEDULE	B	30.06.2014
7220 E 04	WEED MANAGEMENT SCHEDULE	B	30.06.2014

ISSUE B 30.06.2014
NOT FOR CONSTRUCTION

NOTE:
Extent of filling and filling footprint may vary subject to detailed engineering design and confirmation of the volume of overburden from the quarry extension area. Provision of stormwater treatment measures may also be required subject to the recommendations of a detailed stormwater management plan



SITE LOCATION



PROPOSED MOUNDING TO RESIDENTIAL ZONE:
Mounding will provide visual and auditory buffer between the infill area and the residential zone

PROPOSED WEED MANAGEMENT & SEEDING AREA:
Supply and install a seeding mixture of temporary cover crop and native grass seed - By Landscape Contractor. Refer to Weed Management Schedules for best practice.

PROPOSED SCATTERING OF NATIVE TREE SPECIES:
Supply and install native tree species - By Landscape Contractor

BATTER AREA

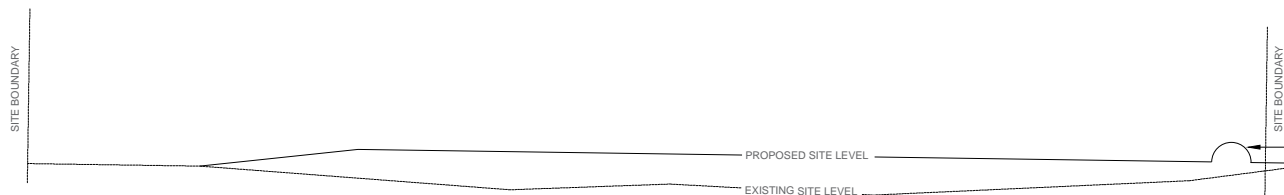
EXISTING SITE OFFICE

ACCESS TRACK

PROPOSED MOUNDING TO RESIDENTIAL ZONE:
Mounding will provide visual and auditory buffer between the infill area and the residential zone

01 REHABILITATION MANAGEMENT PLAN
Scale 1:1000

02 REHABILITATION MANAGEMENT SECTION A
Scale 1:1000



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Issue	Date	Description	Checked
A	13.06.2014	PRELIMINARY ISSUE	SM
B	30.06.2014	CLIENT COMMENTS	SM

CLIENT: **BORAL CONSTRUCTION MATERIALS LIMITED**
PROJECT: **REDLYNCH INTAKE ROAD, REDLYNCH**
SCALE: **AS NOTED**

environmental management
DRAWING: **REHABILITATION MANAGEMENT PLAN**
DATE: May 13
CLIENT REF.: 7220
DRAWING No.: 7220 E RP 01 B
CHECKED: SM
DRAWN: TB

3.7. Monitoring

Monitoring of the rehabilitation measures should routinely be conducted to ensure the site is progressing. Visual inspections of planting sites will take place following direct seeding and planting onsite. Inspections will occur at a minimum, in accordance with those set out in **Table 7**. Inspection of new planting and seeding sites will include general health check of specimens, any weed encroachment or herbivory impacts and record any loss of individual plantings. Details will be provided to Boral’s environmental coordinator who will initiate plans for supplementary plantings during suitable conditions.

Table 7: Recommended Monitoring Timeframes

Event	Timeframe	
	Post Establishment Initial 6-month time frame	Maintenance 24 months
Planted Site	Regular visual inspection for mortality.	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Direct Seeded Site	Regular visual inspection for mortality.	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Weed Control Areas	Monthly	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.

3.8. Corrective Actions

Where weed removal is not demonstrating an improvement, rehabilitation techniques will be reviewed, and alternate techniques and increased monitoring timeframes may be recommended and implemented.

Where planting mortalities are occurring, investigations to determine reason for failure will be implemented. Possible failures may include lack of support during establishment, maintenance, or predation. If high mortality continues, the techniques will be reviewed, and alternate techniques recommended and implemented.

4. Redlynch Quarry Weed and Pest Management Plan

RPS Australia East Pty Ltd (RPS) prepared a Weed and Pest Management Plan for Lot 8 and 9 on RP749301 in 2019 and submitted to council on 1 March 2021. Cairns Regional Council inspected the site and confirmed areas of *Leucaena leucocephala* (Leucaena). The Weed and Pest Management Plan (WPMP) was completed to meet the requirements of the Development Approval. No pest plant priority species under Cairns Regional Council were identified during the site inspection. However, the quarry manager acknowledged that it is possible for *Sus scrofa* (Feral Pigs) and *Canis familiaris* (Feral Dogs) to be utilising the site.

The objectives of the WPMP are listed below.

- Minimise weed colonisation and thereby control invasive biosecurity matters.
- Prevent environmental harm by preventing significance weeds from establishing on-site.
- Prevent weed spread off the subject site.
- Retain native vegetation areas.
- Improve habitat quality by reducing weed numbers.
- Introduce effective weed management strategies at the site during the construction and operational phases of the development.

Site surveys conducted by RPS in Jul 2019, identified four main weeds for management under the WPMP and the RP. These weeds are prioritised for management and are presented in **Table 8**, which outlines the requirements regarding weed management to achieve the outcomes outlined by the Rehabilitation Plan.

Table 8: Weed and Pest Management Requirements

Action	Requirements
Weed Treatment	Identified weeds to be sprayed by licensed herbicide contractor.
	Approved low toxicity herbicides or manual removal.
	Additional methods of weed treatment outlined within this rehabilitation plan to be used where appropriate.
Weed Monitoring	Monitoring of weeds to be employed regularly on-site.
	Monitoring to collect data on location and species of weed, control method employed , indicate if additional control is required , at a minimum.
Soil Management	Any soil imported to/exported from the site must be deemed free of weed seed or other propagules (cuttings etc).
	If possible, all topsoil (0-30cm) should be pushed to a low point where filling is required.
	topsoil should then be covered by at least 1 metre of clean fill to ensure that all weed seed containing material is buried and thus, destroyed.
Erosion and Sediment Controls	Ensure erosion and sediment controls are in place prior to construction in weed impacted areas.
	Erosion controls to include at a minimum, a shaker grid or wheel wash installed at the entry/exit point(s) for the site to ensure mud/dirt containing weed seed material is not transported off-site on machinery tyres.
Equipment management	Machinery and construction materials will be inspected prior to entering site and brushed/washed down at the designated machinery washdown area.
	Washing/brushing and air blasting will assist in the removal of vegetation matter, mud/earth deposits from wheels and chassis.
	Inspection of washdown areas located at the exit/entry of the site.
Inspections	Final works inspection to include searches of disturbed ground for weeds.
	Any significant weed populations to be controlled in accordance with current best practice and recommendations.

5. Risk Assessment

A risk assessment of the potential contraindicative events which may occur during implementation of the Rehabilitation Plan are outlined in **Table 9**. These events detail issues which may arise, negatively affecting the success of the site rehabilitation.

Table 9: Risk Assessment

Objective	Contraindicative event	Likelihood	Consequence	Risk level	Trigger	Contingency	Associated events
Implementation of 40m treed buffer	Treed buffer less than 40m width	Unlikely	High	Moderate	Visual inspection determines tree buffer area was less than 40 metres wide at commencement of clearing for staged quarrying	Ensure regular inspections of rehabilitation plantings post-planting, including initial and ongoing measurements of extent of planting area. Complete final inspection of buffer trees prior to commencing clearing. Record current width of area. Ensure regular inspections of treed buffer following the commencement of clearing to ensure no major plant deaths occur, reducing the width of the managed buffer	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Implementation of 40m treed buffer	Tree height less than required 2 metres in height	Unlikely	Moderate	Low	Visual inspection determines trees were less than 2 metres in height at commencement of clearing for staged quarrying	Ensure regular inspections of rehabilitation plantings post-planting, including height measurements. Complete final inspection of buffer trees prior to commencing clearing. Record	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Implementation of 40m treed buffer	Removal of 40m treed buffer	Unlikely	High	Moderate	Regular Monitoring (to ensure compliance) to detect the tree buffer has been removed.	SBMP to ensure that benching works will operate in the specified locations.	SBMP 6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Rehabilitation of Benches	Benches not progressively rehabilitated	Unlikely	High	Moderate	Monitoring and visual inspection	Ensuring that once a bench is completed that it is planned for progressively rehabilitation. Limits set for active benches implemented by benching requirements.	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Rehabilitation of Benches	Rehabilitation failure	Low	Moderate	Low	Regular monitoring determines high level of post-planting mortality in rehabilitated areas	Regular monitoring and inspections of early-stage plantings to allow for early intervention if mortality event occurs	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.
Weed Management	Presence of priority weed species is high in rehabilitation areas	Moderate	High	Moderate	Visual inspections and regular weed monitoring indicate high recurrence of priority weeds	Ensure regular weed management and monitoring events occur	6 monthly visual inspection by the Environmental Coordinator that includes completion of a report/audit with any required actions such as supplementary planting or weed management activities. 6 monthly report/audit to be submitted to Council for record of Rehabilitation observations/works undertaken/required works.

6. Roles and Responsibilities

Figure 3 outlines the chain of responsibility for on-site rehabilitation with **Table 10** detailing key contact personnel for the rehabilitation. **Table 11** lists the roles of the key personnel.

Table 10: Identified Roles

Role	Nominated Person	Company	Contact details
Proponent/ Project Coordinator	Kelli Adair	Boral	0416 846 220
Environmental Coordinator	Matthew Allan	Boral	0466 405 885
Administering Authority	James Thorne-Stones	Cairns Regional Council	j.thorne-stones@cairns.qld.gov.au
Site Supervisor	Quarry Manager – James Austin	Boral	(07) 4039 1206
Site Contractor	TBA	TBA	TBA

Figure 3: Chain of Responsibility

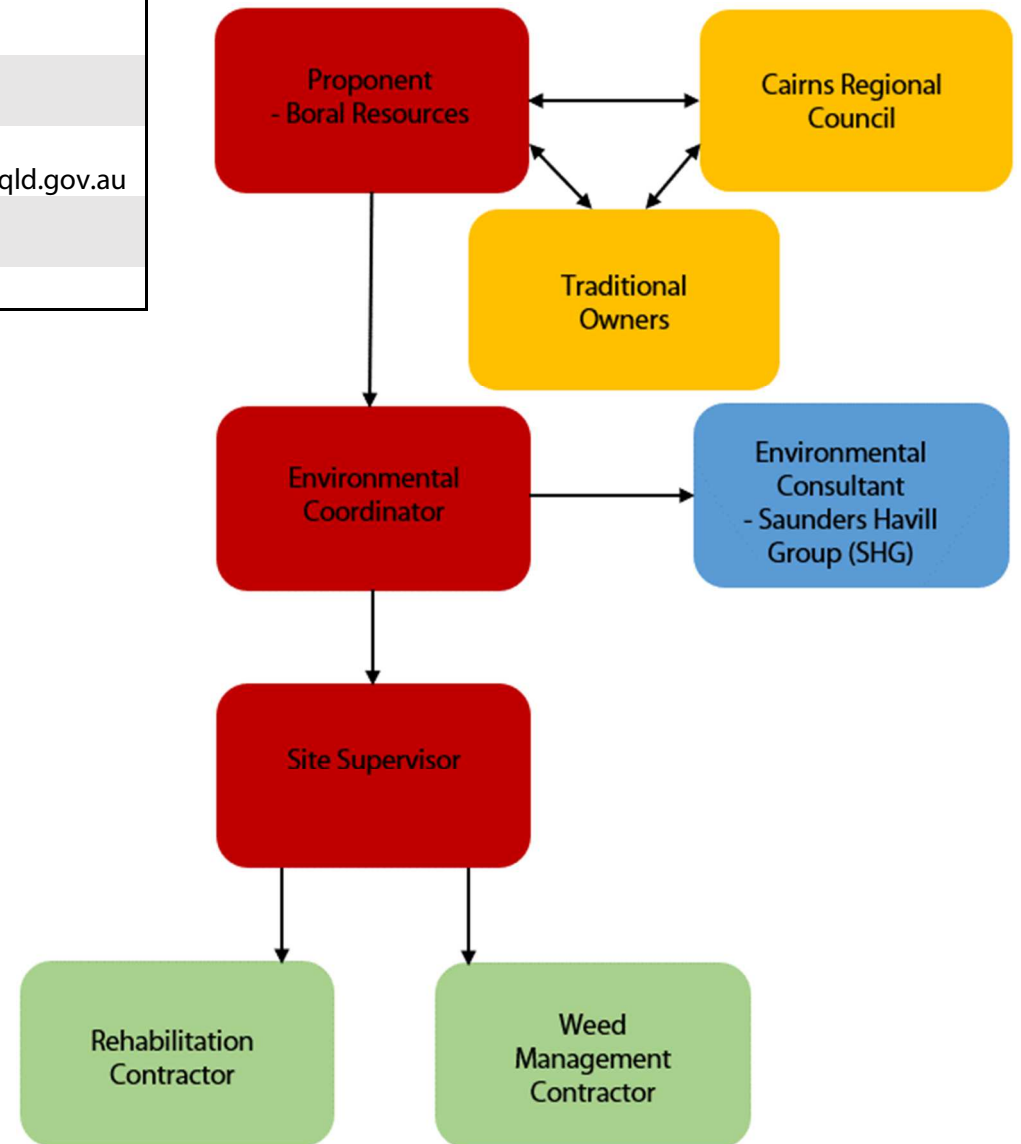


Table 11: Roles and Responsibilities

Role	Responsibilities	Timeframe
Proponent/Project Coordinator	Liase regularly with Environmental coordinator	As required, ongoing.
Environmental Coordinator	Coordinate and liase with Environmental Consultant (where needed)	As required, ongoing.
	Oversee onsite work and ensure sufficient data is available to support compliance checks where needed	As required, ongoing.
	Identify onsite non-compliance events for early intervention	As required, ongoing.
Site Supervisor	Coordinate rehabilitation contractor	Annually, ongoing.
	Ensure periodic inspection of site works is completed	As required, ongoing.
	Ensure sufficient data is collected to inform compliance checks where required	As required, ongoing.
Site Contractor	Liase with Environmental Coordinator regularly	As required, ongoing.
	Identify rehabilitation issues for early intervention	As required, ongoing.
	Complete rehabilitation and restoration works as specified under this rehabilitation plan and as directed by Site Supervisor and Environmental Coordinator	Ongoing Restoration practices to be suitably documented and data and photographs provided to Site Supervisor
Environmental Consultant	Review and provide advice to support rehabilitation plan	As required