

APPENDIX 4

PIT REHABILITATION AND MAINTENANCE MANAGEMENT PLAN

PIT REHABILITATION AND MAINTENANCE MANAGEMENT PLAN

**LOT 5 OLD COAST ROAD, MYALUP
SHIRE OF HARVEY**

PREPARED FOR

CARBONE PTY LTD

BY

LUNDSTROM ENVIRONMENTAL

EARTH, WATER AND ENVIRONMENTAL CONSULTANTS

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JUNE 2013

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1. INTRODUCTION

The purpose of this report is to describe the measures that will be taken to rehabilitate and screen the area of land impacted by limestone quarrying on Lot 5 Old Coast Road, Wellesley, Shire of Harvey. This document should be read in conjunction with other documents submitted to the Shire of Harvey in regard to the proposed limestone quarry on this property. These documents are listed as follows:

Lot 5 Old Coast Rd Application for Extractive Industries Licence (Lundstrom Environmental)
Weed Management Plan (Lundstrom Environmental)
Visual Management Plan Lot 5 Old Coast Road (Lundstrom Environmental)

2. PROPOSED EXTRACTION

A broad summary of the proposed extraction operation is contained in Table 1.

Table 1: Stages of the Mining Operation

Stage	Action	21	2022	2023	2024	2025	26
Contract site	Rip and blade limestone						
3	Topsoil stripping (2 weeks)						
3	Rip and blade limestone (8 weeks)						
3, contract site	Crush, screen and stockpile limestone (4 weeks)						
2,3 and contract site	Load and truck out stockpiled crushed limestone						
1-3	Progressively rehabilitate mined areas						
1-3	Monitoring and remediation of rehabilitated areas						

3. REHABILITATION

3.1 PROPOSED REHABILITATION MEASURES

3.1.1 Local, State and Federal Government Compliance

In order to comply with local, state and federal government approvals for this project, the following rehabilitation commitments have been made by Carbone Bros (Figure 1):

- A staged approach to the project is to be undertaken. Within the overall area of 11.3ha, three stages of 3.7ha have been defined. A performance based approach to the release of Stages 2 and 3 has been adopted. Performance criteria and targets are identified in Table 3.
- Within the extraction area of 11.7ha, 10ha will be returned to pastures and 1.9ha (600 trees) will be planted to native vegetation.
- As a further offset to vegetation clearing and to perform the function of visual screening, 300 native trees are to be planted in a belt to the east of the proposed extraction area. The details of this planting are contained in Appendix 1.
- It should be noted that rehabilitation commitments from previous extraction phases which resulted in less than 5 trees being lost, have achieved the successful establishment of approximately 1,600 endemic trees on the property over the past 4 years.

3.1.2 Rehabilitation of Stages 1, 2, and 3

It is proposed to rehabilitate the pit over the time period shown in Table 1 and this will involve the following actions:

- All batters behind the active working face will be contoured to achieve a slope of no more than 1:6.
- Final land surface will be no lower than 1 metre above the highest seasonal water table as determined from surrounding groundwater data as well as from a recently installed monitoring bore on the site.
- Within each Stage, once the planned extraction depth has been reached, the pit floor will be ripped to approximately 1 metre and then stockpiled topsoil/overburden will be replaced as quickly as possible in order to maintain its viability. The final surface will be smoothed and easily trafficable by agricultural machinery.

- Within each cell 200 trees will be planted in a continuous belt from north to south as illustrated in Figure 1. The tree species will be planted as described in 3.1.3 below.
- Rehabilitation work will only be carried out just prior to or at the commencement of the wet season.
- Weed Management will be undertaken regularly and this is described in a separate Weed Management Plan.

3.1.3 Native Plant Species and Planting Rates

Table 2 contains proposed species and planting rates for the 1.9ha area identified for in-pit rehabilitation (Figure 1).

Table 2: Proposed Species and Planting Rates

Storey	Species	Planting Rate
Upper	<i>Eucalyptus gomphocephala</i>	Treelings to be planted at a rate of 169 stems per ha, staggered.
Middle	<i>Agonis flexuosa</i>	As above

All planting will be undertaken at the start of the wet season.

3.2 MONITORING AND MAINTENANCE

Monitoring of rehabilitated areas will ensure that any areas requiring remedial work are identified. Monitoring will be carried out on an annual basis to assess:

- The physical stability of the landform in the rehabilitated areas.
- Success of germination of pasture grasses and native endemic species.
- The emergence of weeds.

Monitoring will continue until the completion criteria presented in Section 3.3 have been fulfilled. Maintenance procedures will be carried out where necessary and will include:

- Repair of any erosion damage.
- Replanting/seeding areas that may not have regenerated.
- Weed control.

3.3 COMPLETION CRITERIA

Completion criteria must be sufficiently stringent to ensure that the overall objectives of the rehabilitation have been met. These criteria must also be designed to allow effective reporting and auditing to define an endpoint for the rehabilitation activities.

The completion criteria proposed for extractive operations on Lot 7 are presented in Table 3.

Table 3: Closure Criteria, Objectives, Monitoring, Maintenance and Interim Targets

Criteria	Objective	Interim Targets
1. Safety	The site is safe to humans.	<ul style="list-style-type: none"> Site is safe to humans during operations.
2. Sustainability	The site is sustainable in the long term without additional management inputs.	-
3. Suitability	The site is suitable for agricultural uses.	-
4. Visual amenity and heritage	The rehabilitated extraction area blends into the surrounding environment.	-
5. Off-site impacts	Significant adverse off-site impacts are prevented.	-
6. Hydrology	<ol style="list-style-type: none"> Site hydrology does not prevent the establishment of desired vegetation. Site hydrology does not reduce the stability of the landform. Stormwater is contained within the site. 	<ul style="list-style-type: none"> Stormwater is contained within the site during operations. Identification and mitigation of any hydrology related issues during operations.
7. Soils and stability	<ol style="list-style-type: none"> Soil profiles and structures are sufficient to ensure vegetation establishment. The landform is stable. 	<ul style="list-style-type: none"> Topsoil is respread in all rehabilitation areas. Identification and mitigation of potential erosion scars and scours during operations.
8. Vegetation	<ol style="list-style-type: none"> Pasture grasses cover the entire targeted area of 10ha. Pasture grass cover is sufficiently resilient to sustain grazing pressure. Native species planted as belts within the extraction areas include <i>E. gomphocephala</i>, and <i>Agonis flexuosa</i>. Survival rates to be 100%. Monitoring will be conducted on a weekly basis just after planting and any dead plants will be replaced immediately. Maintenance will include the replacement of plants in all areas that do not meet the interim targets 	<p>After 1 year pasture grasses cover 60% of target area, increasing by 20% per annum thereafter.</p> <p>For native plants:</p> <ul style="list-style-type: none"> After the first season at least 70% survival rate after the following dry season. All dead plants to be replaced. Successful establishment of 100% of all plant propagules after 5 years, thereafter plants allowed to achieve a more natural density The existence of at least 1 tree per 31m² (on average) after a period of 8 years
9. Weeds	<ol style="list-style-type: none"> Declared pest weeds are absent. The level of weed species should not be detrimental to the planted seedlings or pasture grasses. 	<ul style="list-style-type: none"> Weed species removed systematically during operations.

379731 m 379785 m 379839 m 379893 m 379947 m 380001 m 380055 m 380109 m 380163 m 380217 m 380271 m 380325 m 380379 m

Proposed tree belt 27m x 696m (4 rows x 9m) with approx 300 Tuart and 300 Peppermint trees planted at 4.5x9m spacing. Tuart density will be 169 per ha. Planting to be done progressively after extraction of each stage has been completed.



Areas planted to pastures after completion of extraction

Stage 1
3.76ha
(2013 to 2015)

Stage 2
3.76ha
(2015 to 2017)

Stage 3
3.76ha
(2017 to 2019)

Final contours

Base of pit at 1m AHD

LAKE PRESTON BUFFER 200m

More than 1600 Tuarts planted during the life of the pit to date

Proposed new tree plantings

Visual buffer trees



379731 m 379785 m 379839 m 379893 m 379947 m 380001 m 380055 m 380109 m 380163 m 380217 m 380271 m 380325 m 380379 m

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Original Size: A4
Air Photo Date: Landgate 2012
Datum: Australian Geocentric 1994 (GDA94)

Carbone Bros Pty Ltd
Lot 5 Old Coast Rd Myalup
Limestone Extraction

Final Contours
and Rehabilitation

Figure 1

APPENDIX 1
VISUAL MANAGEMENT PLAN

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LOT 5 OLD COAST ROAD REVISED VISUAL MANAGEMENT PLAN (REV 1)

1. INTRODUCTION AND BACKGROUND

The purpose of this document is to describe the measures that are proposed by Carbone Bros Pty Ltd to deal with any potential negative visual impacts that might arise from the proposed 11.3ha extension of the limestone pit on Lot 5 Old Coast Road.

The background to this proposed pit extension is as follows:

- A clearing application was made to the Department of Environment and Conservation (DEC) in 2010 and after inspection by one of the field officers, a Decision Report was written that indicated that they would most likely approve the clearing should the pit extension be approved by the Shire.
- The application for an extractive industries licence (EIL) over the full 11.3ha was submitted to the Shire of Harvey in 2010 and Planning Consent (PC) only was given for a much reduced area of 2.2ha.
- Carbone Bros appealed the decision of the Shire of Harvey through the State Administrative Tribunal (SAT). Through the subsequent mediation process the Shire of Harvey agreed to approve the larger area of 11.3 ha if the referral, in terms of the EPBC Act to the Federal Department of Sustainability, Environment, Water, Population and Communities (SEWPaC), was determined not to be a controlled action.
- The SEWPaC referral process was initiated and has resulted in a decision being made that the project is "Not a Controlled Action if undertaken in a particular manner".
- At a SAT mediation session on 19th April, Lundstrom Environmental was requested to provide further detail on initial visual management proposals. This document details these proposals

2. VISUAL MANAGEMENT PLAN

Carbone Bros proposes to undertake the following measures to mitigate potential negative visual impacts that might be associated with the proposed 11.3ha pit:

- Clearing and extraction will be in 3 Stages of 3.7ha with performance based extensions controlled by Shire (Figure 1).
- Progress of extraction and clearing will be controlled to allow time for planted visual buffers to develop.
- Stockpiles will be kept below the top edge of the pit (Figure 2).

- To link up with the trees to be planted by Ivankovich Farms (for shed screening purposes), Carbone Bros will plant an additional tree buffer that extends to the southern boundary of the property (Figure 1). Carbone Bros will liaise with Ivankovich farms to ensure that all trees are planted during winter 2013.
- All trees to be planted will be endemic to the area and will comprise mainly tuarts and peppermints. The detailed layout of these trees is illustrated in Figure 3.

3. TREE SCREEN PLANTING AND MAINTENANCE

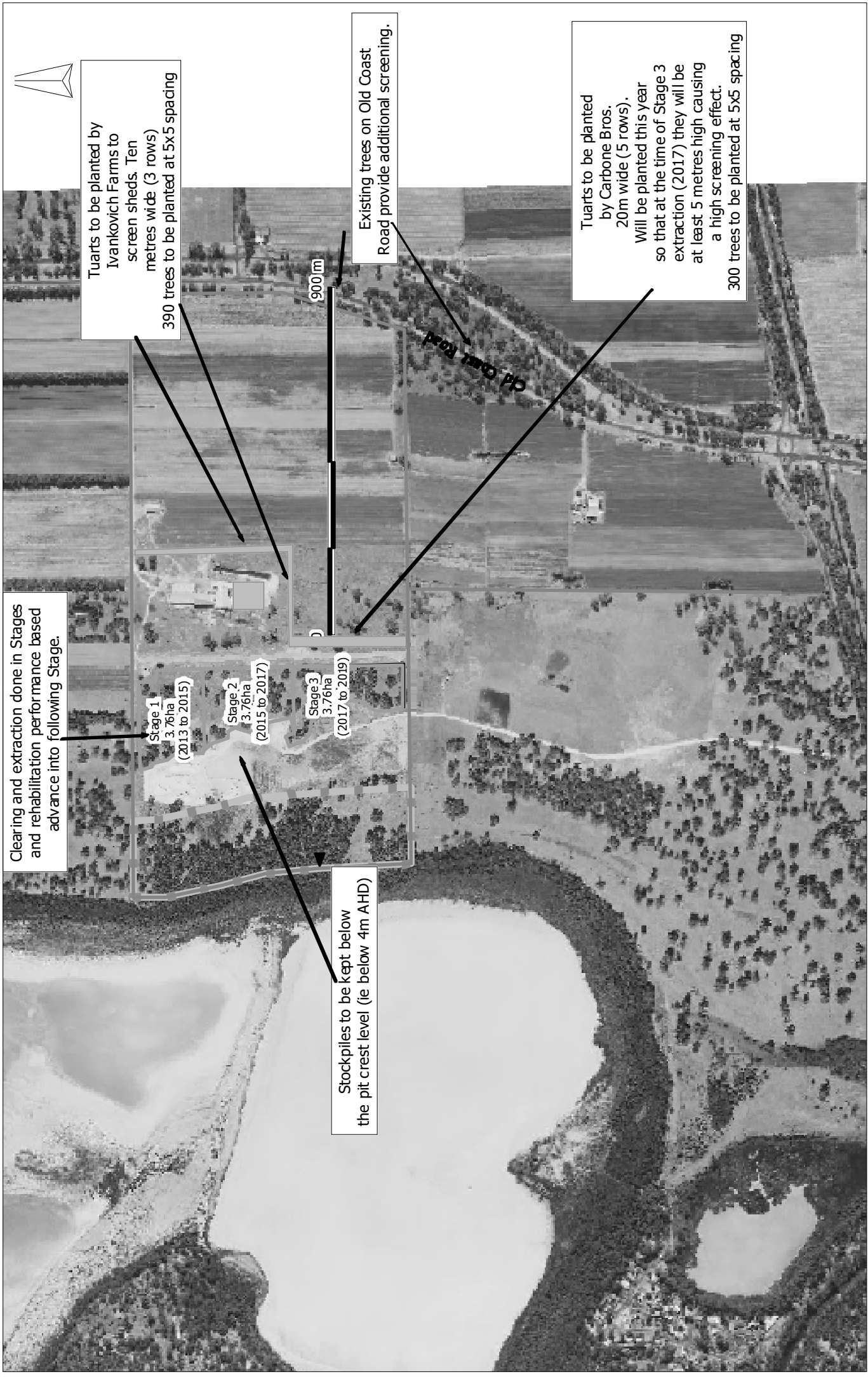
The following points describe the actions that will be taken by Carbone Bros to ensure that tree planting is in accordance with a program that will result in the survival of the trees and that a significant screening effect be achieved as quickly as possible.

- Ground preparation and initial weed management will occur as soon as final approval for the project is achieved.
- Once the ground is sufficiently moist after initial rain this year, landscape contractors will be employed to undertake the tree planting as illustrated in Figure 3.
- Plantings will be monitored on a weekly basis within the first 6 weeks after planting and any dead plants will be replaced immediately.
- Weed management will be undertaken by an experienced contractor with appropriate weed management measures being undertaken at least twice a year in spring and autumn.
- Success criteria for these plantings will be a 90% survival rate at the end of winter 2013, with all dead trees being replaced the following wet season. In this manner it is planned to achieve a 100% survival rate after 4 years. After this period an attrition process will be allowed to achieve a more natural density whilst still maintaining a successful vegetation screen over the long term.
- Carbone Bros will maintain and manage the tree screen over the full period that they are active on the property, after which the trees will be large enough to be self maintaining.



Michael Lundstrom (MSc)
Principal Consultant
19th April 2013

Figures 1, 2 and 3 attached



Clearing and extraction done in Stages and rehabilitation performance based on advance into following Stage.

Tuarts to be planted by Ivankovich Farms to screen sheds. Ten metres wide (3 rows) 390 trees to be planted at 5x5 spacing

Stockpiles to be kept below the pit crest level (ie below 4m AHD)

Existing trees on Old Coast Road provide additional screening.

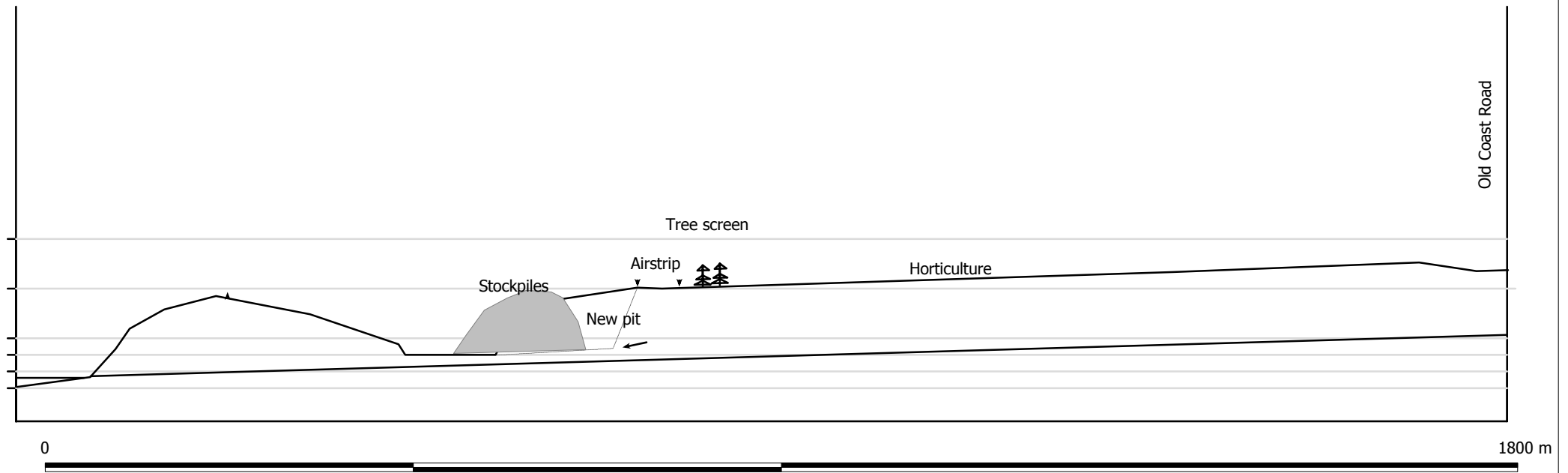
Tuarts to be planted by Carbone Bros. 20m wide (5 rows). Will be planted this year so that at the time of Stage 3 extraction (2017) they will be at least 5 metres high causing a high screening effect. 300 trees to be planted at 5x5 spacing

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CARBONE BROS PTY LTD
 Lot 5 Old Coast Rd, Myalup
 Limestone Extraction

Visual Impact Management Plan
 Figure 1



Lundstrom Environmental

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CARBONE BROS PTY LTD

**Lot 5 Old Coast Rd, Myalup
Limestone Extraction**

Cross section Through Property

Figure 2



PROPOSED EXTRACTIVE INDUSTRY

AIRFIELD

Proposed tree screen.
Dimensions 300 x 20m.
Comprising 300 trees at
5m spacing. Tuart and Peppermint
trees placed in alternating pattern.

20m
setback

Property boundary

0 100 m

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Carbone Bros Pty Ltd
Lot 5 Old Coast Road
MYALUP

Proposed Tree Screen

Figure 3