



REVEGETATION MANAGEMENT PLAN

CPS 8327/1

December 2023

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1 INTRODUCTION

1.1 Background

J and P Group Corporation (the proponent) are proposing to clear 6.27 (ha) hectares on Lot 2 on Diagram 65861 Banksia Road, Crooked Brook (herein referred to as Lot 2).

The clearing is required to:

- Enable the expansion of the current Class III putrescible landfill operation;
- Achieve optimum utilisation of airspace and remain a best practice operated landfill for a longer term to service the community; and
- Utilise in-situ sand for daily cover and internal roads during the winter months, and gravel material for the construction of internal drains and stormwater infrastructure.

Following an assessment of the potential environmental impacts associated with the vegetation clearing, residual impacts were identified in association with clearing of native vegetation that provides foraging and breeding habitat for black cockatoos. According, suitable offsets have been identified which include the following:

- Revegetation and conservation of 2.1 ha of native vegetation within Lot 2148 on Plan 125383 (herein referred to as Revegetation Area A) (refer to **Figure 1**);
- Revegetation and conservation of 0.76 ha of native vegetation within Lot 2 on Plan 403943 (herein referred to as Revegetation Area B) (refer to **Figure 2**);
- Revegetation and conservation of 1.0 ha of native vegetation within Lot 2 on Plan 403943 (herein referred to as Revegetation Area C) (refer to **Figure 3**).

1.2 Purpose

The purpose of this Revegetation Management Plan (herein referred to as the Plan) is to provide a framework for improving the environmental values within these revegetation areas, particularly with the objective of enhancing onsite habitat for the three threatened species of Carnaby's, Baudin's and forest red-tailed black cockatoo (collectively referred to as black cockatoos).

The Plan will describe the proposed management measures necessary to ensure the restoration and improvement of the revegetation areas. This document has been structured and prepared to meet the requirements of the Department of Water and Environmental Regulation's (DWER's) *'A Guide to Preparing Revegetation Plans for Clearing Permits'* (2018) (Revegetation Guideline), and is based upon existing information available from applicable site studies and investigations.

Specifically, the scope of this Plan is to:

- Provide environmental management procedures that:
 - Return vegetation groups appropriate to the locality;
 - Provide habitat for local endemic native fauna species with particular focus on black cockatoo habitat;
 - Provide measures in accordance with relevant legislation, standards and government guidelines;
 - Identify those responsible for implementation;
- Define a monitoring and maintenance program that assesses the outcomes of the revegetation works; and

- Define contingency actions that will be implemented should the revegetation program not meet the success criteria.

2 MANGEMENT PLAN

2.1 Revegetation Areas

As a component of the proposed offsets associated with CPS 8327/1, it is proposed to conduct revegetation within three locations, as described below.

Revegetation Area A

This area is located within Lot 2148 on Plan 125383 and is comprised of 2.1 ha which has historically been cleared of all native vegetation with some regrowth evident. It is surrounded by a marri/jarrah forest in excellent condition and the lot adjoins Crown land.

Revegetation Area B

This area is located within Lot 2 on Plan 403943 and is comprised of 0.76 ha which has historically been cleared of all native vegetation. It will act as an extension of the vegetation buffer between the Dardanup Conservation Park and the operations within Lot 2.

Revegetation Area C

This area is located within Lot 2 on Plan 403943 and is comprised of 1.0 ha which has historically been cleared of all native vegetation. It is situated adjacent to Banksia Road and is currently comprised of sporadic blue gum trees.

2.2 Objectives

The overarching revegetation objective for the areas is to:

Establish a sustainable native ecosystem which:

- *Returns vegetation groups appropriate to the locality.*
- *Provides habitat for local endemic native fauna species with particular focus on black cockatoo habitat.*

The following completion criteria will be achieved:

Table 1. Revegetation objectives and completion criteria.

Closure Objectives	Completion Criteria	Measurement Tool
Provides habitat for black cockatoo and vegetation representative of the locality.	Revegetation area to be comprised of suitable habitat species at native density of approximately 2 plants/m ² in the revegetation areas.	Quantitative vegetation monitoring using monitoring plots within revegetation area and reference sites.
Reduce weed species and contain the spread of weeds to adjacent areas.	Reduce weed cover to less than 5% throughout the revegetation areas.	Quantitative vegetation monitoring using monitoring plots within revegetation area and reference sites.

Closure Objectives	Completion Criteria	Measurement Tool
Plants used in rehabilitation to be of local provenance.	All revegetation stock will be sourced from (preferably) local nurseries with NIASA accreditation.	Audit of rehabilitation records for sources of plant materials used in revegetation.

2.3 Timing

Revegetation within the three revegetation areas will commence during the first autumn upon commencement of vegetation clearing within the clearing footprint.

2.4 Site Preparation

The revegetation areas may be compacted due to disturbance from human activities and livestock. Ripping and mounding may be necessary in cleared areas to promote soil aeration and plant growth. If required, ripping to approximately one metre will occur in late summer or early autumn when the soil is dry, to maximise fracturing. Mounding will be applied to raise plants above waterlogged conditions in winter and will occur after the first rains, when the soil is moist.

Ripping and mounding/furrowing should be undertaken where suitable so as to ensure existing vegetation is not adversely affected (e.g. potential damage to tree roots). Where ripping is not possible, raking or other soil aeration techniques will be investigated.

Within Revegetation Area C, prior to commencement of any revegetation works, the blue gum trees will be harvested and removed from the revegetation area.

2.5 Weed Control

Within the proposed revegetation areas, the implementation of a weed control program will prevent weed species from competing with native vegetation for light, nutrients and moisture and will also reduce the fuel load. Predominant weed species within the revegetation areas include a variety of paddock grass species.

Weed control of rip lines and/or mounds is essential (especially for couch grass, sorrell, and dock). Weed control will be undertaken as early as practicable following site preparation works. Weed control events will be required both prior to and following planting. The objective is to achieve no declared, bulbous, rhizomatous or woody weeds within the revegetation area.

In this instance, the application of chemical control is the most efficient method with a range of herbicides available for different weed species (refer to **Table 2**). In consideration of the locality, the use of Bioactive Roundup® is recommended. This herbicide contains less toxic surfactant than typical Glyphosate and therefore minimises adverse effects on fish, amphibians and invertebrates in watercourses.

Herbicide should be applied during the plants growing phase, before flowering and prior to the development of seed heads. This period is typically just before or during autumn or spring. During the implementation of the weed control program, work should commence from areas in the best condition to those in the worst condition.

The application of herbicide should occur in still, dry conditions when no rain is predicted within 12 hours. Spraying should be conducted in such a manner that spray drift is minimised and that any nearby native

species are not affected. Following spraying, the ground should be left for a minimum of two weeks before planting commences.

Herbicide application should be undertaken by trained personnel in accordance with manufacturers' instruction, which will include the application of appropriate safety requirements.

Based on the location and species of weeds present, the weed control treatment detailed in **Table 2** will be undertaken. Weed control treatment should be undertaken as per the schedule provided within **Table 5**.

Table 2. Weed control treatment.

Treatment	Suggested Constituents	Target Species
Selective grass/monocot spray	2,2-DPA 10 g/L + Pulse®	Grasses and monocots (<i>Watsonia</i>)
Glyphosate spray	2% Glyphosate including Pulse®, wetting agent and Chlorsulfuron	Broadleaf species e.g. <i>Pelargonium capitatum</i> Woody weeds e.g. <i>Zantedeschia aethiopica</i>
Selective Grass Spray	Fusilade and approved adjuvant (e.g. Pulse®)	Grass species e.g. <i>Cenchrus clandestinus</i>

2.5.1 Disease and Weed Hygiene

To reduce the potential spread of *Phytophthora* dieback and weeds within the revegetation areas, the following hygiene practices will be employed during the revegetation works:

1. Hand held equipment, tools and footwear will be sterilised using methylated spirits;
2. The primary contractor shall inform all contractors that vehicles entering the subject site shall be free of soil and vegetative material to avoid the introduction of weeds and pathogens. Any vehicle not complying with this requirement must be denied access;
3. Plants shall be sourced from a supplier who can demonstrate compliance with industry standards for dieback hygiene and plant disease.

2.6 Revegetation

Tubestock will be utilised for revegetation. The maximum stock size will be limited to tubestock size as larger stock is likely to require supplementary watering to ensure survival. All revegetation stock will be sourced from (preferably) local nurseries with NIASA accreditation to ensure that tubestock soil is disease free. Only provenance stock will be used.

Plant layout will reflect natural conditions to the greatest extent possible by distributing plant species with adequate spacing for root development. It is necessary to ensure that planting density reflects the natural bush surroundings in order to create 'like for like' vegetation conditions.

Planting will preferably be undertaken with a motorised post hole digger by skilled personnel. The planting hole will be excavated vertically into free draining mulched soil to an approximate depth of 0.5 – 0.7 m to accommodate the root ball of the plant.

The planting of seedlings will occur between the months of May to July after substantial rain has saturated the soil profile. Prior to planting the seedling, any tangled roots will be loosened and good soil to plant contact will be made. Seedlings will not be staked for support as free standing plants have increased durability and strength as opposed to staked plants.

If deemed necessary, each seedling planted will have a biodegradable tree guard placed around them to reduce predation from rabbits and kangaroos. The tree guards will be held in place with three 60 cm to 80cm bamboo sticks. These tree guards will be removed after one year which will prevent damage to the growing seedlings caused by constriction of outward growth.

2.6.1 Planting Species

The species list for the revegetation areas has been compiled based on species which provide habitat for black cockatoos and are associated with vegetation in the locality. The final list will be compiled in consideration of the following:

- Utilise primary feeding plants for black cockatoos;
- Utilise plants present within local vegetation communities; and
- Aim to restore a sustainable natural ecosystem with species appropriate to the landscape.

An indicative species list for revegetation is provided within **Table 3**. Final selection of species will be subject to availability of stock.

Table 3. Indicative species for revegetation.

Species	Form
<i>Eucalyptus marginata</i>	Tree
<i>Eucalyptus haematoxylon</i>	Tree
<i>Corymbia calophylla</i>	Tree
<i>Acacia lasiocarpa</i> var <i>lasiocarpa</i>	Shrub
<i>Acacia pulchella</i>	Shrub
<i>Acacia saligna</i>	Shrub
<i>Allocasuarina fraseriana</i>	Tree
<i>Austrodanthonia</i> spp.	Grass
<i>Austrostipa compressa</i>	Grass
<i>Austrostipa sembarbata</i>	Grass
<i>Banksia grandis</i>	Tree
<i>Banksia littoralis</i>	Tree
<i>Eucalyptus decipiens</i>	Tree
<i>Eucalyptus drummondii</i>	Tree
<i>Eucalyptus megacarpa</i>	Tree
<i>Eucalyptus patens</i>	Tree
<i>Ficinia nodosa</i>	Rush
<i>Hakea cyclocarpa</i>	Shrub
<i>Hakea ruscifolia</i>	Shrub
<i>Hakea undulata</i>	Shrub
<i>Hibbertia hypericoides</i>	Shrub
<i>Hibbertia subvaginata</i>	Shrub
<i>Kunzea glabrescens</i>	Shrub
<i>Kunzea micrantha</i>	Shrub
<i>Leucopogon glabellus</i>	Shrub
<i>Lomandra sericea</i>	Rush
<i>Mesomelaena tetragona</i>	Sedge
<i>Microalaena stipoides</i> var <i>stipoides</i>	Grass
<i>Patersonia occidentalis</i>	Herb

Species	Form
<i>Persoonia longifolia</i>	Shrub
<i>Podocarpus drouynianus</i>	Shrub
<i>Pultenaea reticulata</i>	Shrub
<i>Themeda triandra</i>	Grass

2.6.2 Planting and Densities

Seedlings will be planted throughout the revegetation areas at the densities described below:

- Trees – one (1) plant per five (5) square metres;
- Shrubs – one (1) plant per two (2) square metres; and
- Groundcovers – four (4) plants per square metre.

2.7 Revegetation Maintenance

Maintenance will be undertaken following planting with all activities to be conducted in response to the maintenance inspections and monitoring (as discussed below). The key elements associated with maintenance works will include suppression of smothering weeds and infill planting. The requirement to implement revegetation maintenance and infill planting measures will be determined following each monitoring event.

To reduce the risk of mortality, watering will occur if required during the first summer after tubestock have been planted. This will entail periodic watering from December to April using a mobile watering container. It is expected that two watering events per month is sufficient to establish the revegetation planting, however if plants are suffering drought stress, additional water may be required. Watering will be undertaken at an approximate rate of 2 litres per plant.

2.8 Monitoring

A program of monitoring of the revegetation works is required to ensure that the revegetation objectives are achieved. This will involve an assessment of relative cover (% of area) of native plants and species, weeds and bare ground measured in permanent plots or quadrats (10m x 10m). Monitoring will be undertaken within two plots in the revegetation area annually for a minimum of two years until completion criteria (as specified within **Table 1**) have been met.

Quantitative vegetation monitoring will be conducted using quadrats which will be permanently installed in the revegetation areas. Two quadrats will be established in each revegetation area, within a location that provides a good representative sample of the revegetation activities. Monitoring data obtained from the quadrats will be used to assess the success of revegetation against the completion criteria.

At each of the quadrats the following will be recorded:

- A list of all species present in the quadrat, including their density and height;
- Vegetation condition;
- A photo of the vegetation from the north west corner of the quadrat;
- Any other general observation e.g. condition of plant protectors, litter, evidence of feral animals.

2.8.1 Reporting

Monitoring reports will be compiled within three months following each monitoring event. These reports will be submitted to the DWER for their records as a component of the annual monitoring report and will:

- Outline the date and description of works undertaken during the reporting period;
- Record and evaluate the success of revegetation works through analysis of data (both spatial and temporal trends against control and revegetated sites);
- Identify any follow up remedial or maintenance works to be undertaken to meet the completion criteria; and
- Set out a program for the remedial or maintenance works.

2.8.2 Contingency Measures

Contingency actions will only be required should the monitoring indicate that the completion criteria (refer to **Table 1**) are not being achieved. **Table 4** provides possible actions proposed to address or mitigate issues that may arise during the implementation of this Plan.

Table 4. Contingency measures.

Issue	Actions
Monitoring indicates revegetation areas do not comply with the completion criteria.	<ul style="list-style-type: none"> • Identify revegetation shortfalls (via monitoring report) • Identify likely cause of failure (e.g. weeds, lack of water, inappropriate timing of revegetation, lack of nutrients, poor soil condition, lack of water, insect/fungus attack, dieback, predation by herbivores) • Address cause of failure (this may include watering strategies, mulching, soil stabilisation, pest control, tree guards) • Plan infill planting/seeding to compensate for vegetation shortfalls
Inadequate tubestock/seed available in first year	<ul style="list-style-type: none"> • Commission alternative nurseries to germinate stock • Identify alternative species in consultation with DWER • Plant additional tubestock/seed in subsequent years

2.9 Tenure

To ensure that the revegetation areas are protected in perpetuity, a Notification on Title will be implemented in accordance with Section 70A of the *Transfer of Land Act 1893* which will state that clearing of native vegetation within the revegetation areas will be prohibited. Ongoing maintenance including mowing of grass, pruning and removal of dead branches can continue to be undertaken in these areas.

2.10 Revegetation Schedule

The following table provides a proposed schedule for the first two years of revegetation works within the revegetation area. The proposed schedule will be committed to by the proponent, subject to minor changes as required.

Table 5. Schedule of revegetation activities.

Timing	Action	Description	Responsibility
Year 1 - Spring	Weed Control	Initiate weed control as per Section 2.5 .	Proponent
Year 1 -Summer	Order Plants	Order local endemic plants on species list.	Proponent
Year 1 – Autumn	Weed control	Undertake weed control as per Section 2.5 .	Proponent
	Tubestock	Plant seedlings in accordance with Section 2.6 .	Proponent
Year 1 – October to March	Monitoring and reporting	Undertake monitoring to determine the required maintenance measures (i.e. weed control, pest control and infill planting). Submit annual report to DWER.	Proponent
			Proponent
Year 2 – Spring	Weed control	Undertake management of annual weed germinants in revegetation areas as required.	Proponent
	Pest control	Undertake control measures for pest incursion if found to be required during monitoring.	Proponent
Year 2 - Summer	Order Plants	Order local endemic plants on species list based on survival rates.	Proponent
	Watering	Water seedlings every second week from December to April at an approximate rate of two litres per plant.	Proponent
Year 2 - Autumn	Weed control	Undertake management of annual weed germinants in revegetation area as required.	Proponent
	Tubestock	Plant seedlings in accordance with Section 2.6 .	Proponent
Year 2 – October to March or after annual monitoring event.	Completion survey and closure report	Proponent to complete closure report and submit to DWER.	Proponent

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FIGURES



Legend

Revegetation Area A (2.1 ha)

PROJECT Lot 2 Banksia Road, Crooked Brook

DRAWING TITLE Figure 1 - Revegetation Area A

CLIENT J & P Group

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Project Number 2395
Drawing Number Figure 1
Revision A
Date 13/12/2023
Sheet 1 of 1

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Legend

Revegetation Area B (0.76 ha)

PROJECT Lot 2 Banksia Road, Crooked Brook

DRAWING TITLE Figure 2 - Revegetation Area B

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Revegetation Area C (1.0 ha)

PROJECT Lot 2 Banksia Road, Crooked Brook

DRAWING TITLE Figure 3 - Revegetation Area C

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