



Government of **Western Australia**
Department of **Environment and Conservation**

Your ref: 08/2569, 09/5380-02
Our ref: CPS 818/5
Enquiries: Jeremy Quartermaine
Phone: 9219 8766
Phone: 9219 8701
Fax: nvp@dec.wa.gov.au
Email:



Mr Shane Collins
Environmental Officer
Metropolitan Region
Main Roads Western Australia
PO Box 6202
EAST PERTH WA 6892

Dear Mr Collins

CPS 818/5 – OFFSET PROPOSAL – INDIAN OCEAN DRIVE OVERTAKING LANES, NORTH OF YANCHEP – PROPOSED OFFSET

Thank you for your email dated 19 November 2010, providing Main Roads Western Australia's (MRWA) addendum to offset proposal "Indian Ocean Drive (M045) – Road Construction of Northbound and Southbound Overtaking Lanes between 6.3 and 9.2 SLK". This offset proposal is submitted to meet the requirements of conditions 5(a)(ii), 9(c) and Part V of clearing permit CPS 818/5 for the purpose of MRWA's overtaking lanes along Indian Ocean Drive.

As indicated in the Department of Environment and Conservation's (DEC's) submission dated 8 July 2010, the proposed clearing of 1.023 hectares of native vegetation 'is at variance' with clearing principle (h). An appropriate offset for this proposed clearing would address impacts on Bush Forever Site 396, Gngangara-Moore River State Forest and Yanchep National Park.

In summary, MRWA proposes to offset the proposed clearing of the 1.023 hectares through the revegetation of 1.91 hectares in two disused roads (an old military road {UCL} and Clover Road {Gngangara-Moore River State Forest}) and a disused gravel pit within Gngangara-Moore River State Forest and a research plot within Yanchep National Park.

The following is a summary of the measurable components of the proposed offset:

- Overall objective: to address impacts to bush forever site 396 by providing buffer to the site and enhancing ecological values, as well as achieving 'good' condition native vegetation in all offset areas consistent with the composition, structure and diversity of mapped complexes for the area.
- Criteria for success: > 60% survival rate (planting density 1500 stems/ha), >25 species, <20% weed cover, to be achieved by 2014.
- Site preparation: seed collection and soil ripping between December and February 2010, soil ripping and weed spraying between March and May 2011.
- Vegetation establishment: seedlings planted in Jun/Jul 2011 at a density of 1500 stems/hectare, direct seeding in Jun/Jul at a rate of 5 kilograms of seed/hectare.
- Monitoring: weeds and revegetation establishment to be monitored monthly from September 2011 to August 2014, using visual and quantitative assessment. If criteria not met, additional monitoring will occur for an additional 2 years.

Native Vegetation Conservation Branch

Phone: (08) 9219 8700 or (08) 9219 8744 Fax: (08) 9219 8701 Email: nvp@dec.wa.gov.au
Postal Address: Locked Bag 104, Bentley Delivery Centre, BENTLEY WA 6983

www.dec.wa.gov.au/nvc
wa.gov.au

- Management / remedial action: weed control and infill planting will occur as necessary until the criteria for success are met (to be achieved by August 2014). If criteria not met, additional monitoring and infill planting will occur for an additional 2 years.
- Timetable / timeframe: site preparation will occur between December and February 2010, vegetation establishment will occur between March and May 2011, monitoring will occur between September 2011 and August 2014, management / remedial actions will occur until August 2014, and criteria for success will be achieved by August 2014. If criteria not met, additional monitoring and infill planting will occur for an additional 2 years.

In accordance with conditions 5(a)(ii), 9(c) and Part V of clearing permit CPS 818/5, I agree to the above measurable components of MRWA's offset proposal for the Indian Ocean Drive (M045) – Road Construction of Northbound and Southbound Overtaking Lanes project. In addition, it is recommended that MRWA endeavour to achieve a target structure (e.g. 20% overstorey, 50% midstorey, 30% understorey species) which closely resembles that which was present pre-clearing. A target structure is an essential component and should be stated within all offset proposals and revegetation plans.

If you have any queries regarding the matters raised above, please contact Jeremy Quartermaine at DEC's Native Vegetation Conservation Branch on (08) 9219 8744.

Yours sincerely



Kelly Faulkner
MANAGER
NATIVE VEGETATION CONSERVATION BRANCH

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

30 November 2010

Att: *"Indian Ocean Drive (M045) – Road Construction of Northbound and Southbound Overtaking Lanes between 6.3 and 9.2 SLK, Vegetation Offset Plan" (6 June 2010)*

"Addendum to Indian Ocean Drive (M045) – Road Construction of Northbound and Southbound Overtaking Lanes between 6.3 and 9.2 SLK, Vegetation Offset Plan" (19 November 2010)

Cc: **Murray Limb**, Environmental Manager, Main Roads WA, PO Box 6202, East Perth 6892



Metropolitan Region

INDIAN OCEAN DRIVE (M045)

ROAD CONSTRUCTION OF NORTHBOUND AND SOUTHBOUND OVERTAKING LANES

BETWEEN 6.3 and 9.2 SLK

VEGETATION OFFSET PLAN

April 2010

Table of Contents

1.	Indian Ocean Drive Project Description.....	3
1.1	Purpose	3
1.2	Project Details and Location	3
1.3	Existing Vegetation	6
2.	Vegetation Rehabilitation Plan	6
2.1	Scope of Works	6
2.2	Stakeholder Consultation	6
2.3	Environmental Impact Assessment Recommendations	7
2.4	Site Preparation	7
3.	Revegetation Methodology	7
3.1	Planting requirements	7
3.2	Weed control	8
3.3	Dieback Management.....	8
3.4	Ongoing Maintenance and Monitoring	8
	APPENDIX A – AERIAL PHOTOGRAPHS SHOWING PROJECT CLEARING AND OFFSET AREAS	9
	APPENDIX B – SITE PHOTOGRAPHS	13

1. INDIAN OCEAN DRIVE PROJECT DESCRIPTION

1.1 Purpose

The purpose of this report is to outline the proposed landscaping and revegetation strategy plan that will be undertaken on cleared redundant areas to offset the vegetation clearing requirements for the construction of overtaking lanes on Indian Ocean Drive (ex-Wanneroo Road). This plan meets the conditions of Main Roads' Purpose Permit CPS818/4.

1.2 Project Details and Location

Main Roads is proposing to construct northbound and southbound overtaking lanes on the Indian Ocean Drive at the location between north of Yanchep National Park and south of Breakwater Road, 6.3-9.2 SLK as shown on Figure 1. As part of the works the existing parking bay located within the project area will be decommissioned and a new parking bay will be constructed approximately 5 kms north of its current position. The works will occur within the City of Wanneroo and the Department of Environment and Conservation's (DEC) Swan Coastal District.

The proposed works will require the vegetation clearing of approximately 1.023ha within the DEC-managed State Forest (SF65) and the Bush Forever Site 396 – "East Link from Wilbinga to Yanchep National Park" as shown in detail in the table below.

TABLE 1 – Vegetation Clearing Details

Clearing Area No.	Location Description	Clearing Area (Ha)
1	Main alignment at the southern end (BFS 396)	0.614
	Military Road Realignment (BFS 396)	0.200
2	Military Rd Realignment (SF 65)	0.175
	Main alignment at the northern end (BFS 396)	0.034
Total Area of Clearing		1.023

The clearing of vegetation within a Bush Forever Site is a variance with the Clearing Principle "h", that "Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values or any adjacent or nearby conservation area". Main Roads' Clearing Purpose Permit CPS 818/4 requires offsets to be approved by the DEC prior to any clearing at variance with the Ten Clearing Principles in s51 of the *Environmental Protection Act 1986*.

Main Roads has endeavoured to locate the proposed overtaking lanes where vegetation comprises the least area cover and condition, and to avoid impacts to the Bush Forever Site, while achieving the required safe sightline distances.

This project, including impacts and proposed offset sites, has been discussed with officers from the Swan Coastal District of Department of Environment and Conservation. The location of the proposed works and offsets are shown on Figure 1, with the alignment for the proposed roadworks shown on Figure 2.



INDIAN OCEAN DRIVE M045
PROPOSED NORTHBOUND & SOUTHBOUND OVERTAKING LANES
6.3 TO 9.2 SLK



Figure 2 – New alignment for passing lanes and intersection modifications

1.3 Existing Vegetation

Much of the vegetation within and adjacent to the project works comprises plantation and state forest, with vegetation condition ranging from Degraded to Completely Degraded (Keighery scale 5-6). Good condition (Keighery scale 4) Banksia woodland, part of Bush Forever Site 396, occurs at the northern end of the project area. In the vicinity of the parking bay to be decommissioned, the vegetation is comprises a few *Eucalyptus* sp. and is Completely Degraded (Keighery scale 6).

Heath vegetation with numerous *Xanthorrhoea* spp., occasional *Eucalyptus* spp. and diverse herbaceous understorey surrounds the former gravel pit site and pine research plot proposed for rehabilitation, considered to be in Good to Very Good condition (Keighery scale 3-4).

2. VEGETATION REHABILITATION PLAN

2.1 Scope of Works

It is proposed that five areas nominated for revegetation offsets totalling 2.29 ha are located in close proximity of the project as presented in the table below. The location of these offset sites is shown in Figure 1 together with aerial photographs shown in Appendix A.

Land tenure of the proposed rehabilitation areas are described below:

OFFSET AREAS No.	DESCRIPTION	OFFSET AREAS (Ha)	LOT TYPE	FID	LAND ID NUMBER	PI PARCEL	LOT NUMBER
1	Disused Military Road	0.28	Freehold	394865	3139045	Closed Road	
			Crown	652058	3659267	P208677	5611
2	Old Gravel Pit	0.79	Crown	451257	2010481	SWAN L 05609	SWAN Location 5609
			Reserve	908273	3760215	F 65	
3	Old Parking Bay	0.38					
4	Disused Clover Road	0.22					
5	Pine Research Plot	0.62	Crown	660112	2015020	P217799	11544
			Reserve	398008	3292001	R 9868	R 9868
	Total Area	2.29					

2.2 Stakeholder Consultation

Under the terms of Main Roads Purpose Permit CPS818/4, several stakeholders have been given the opportunity to comment on the proposed works, specifically with regard to clearing at variance with the Clearing Principles. These include DEC's Native Vegetation Conservation Branch, the Office of the Commissioner of Soil and Land Conservation, the

Department of Water, the Conservation Council of Western Australia and the City of Wanneroo.

Concurrent with this, Main Roads is required under the terms of the Metropolitan Regional Scheme to submit a Development Application through the Western Australian Planning Commission for works impacting a Bush Forever Site.

2.3 Environmental Impact Assessment Recommendations

Recommendations from an Environmental Impact Assessment Report for this project (GHD Pty.Ltd., 2008) will be adopted by this project, namely that:

- 1) the conditions in Main Roads Purpose Permit CPS818/4 will be complied with;
- 2) weed management strategies should be applied, including post-construction monitoring and control;
- 3) dieback hygiene measures should be implemented; and
- 4) dust control procedures will be specified in the Contractor's Environmental Management Plan and standard Main Roads contract documentation.

2.4 Site Preparation

Clearing will be done using mechanical means, with cleared vegetation mulched and stockpiled in existing cleared areas adjacent to the project area to be spread over verges following completion of construction works. Topsoil will be scraped and stockpiled for respread on verges following lane construction and prior to mulching. This topsoil will be selected for low weed and dieback risk, with any unsuitable or excess topsoil appropriately disposed off-site.

Weed control and ripping will be done at the gravel pit site. Spoil soil from the past pit operations will be brought into the pit from the edges to aid plant growth on the relatively poor, shallow ground medium.

Main Roads proposes to remove roadside furniture from the parking bay within the project area. Although DEC's Swan Coastal District commented that they would not want to do any works in this parking bay, with complete removal of the road surface, Main Roads intends breaking up the asphalt surface and leaving it situ. This has been shown to provide a bed conducive to the establishment of native vegetation.

Existing pine trees covering around half the area of the old pine research plot to be rehabilitated will be cleared prior to revegetation works.

3. REVEGETATION METHODOLOGY

3.1 Planting requirements

The proposed methods of rehabilitation will comprise herbicide spraying, ripping, mulching and direct seeding at a rate of 5 kg/ha. We propose to achieve "good" condition native vegetation consistent with the composition, structure and diversity of mapped complexes for the area. Together, the proposed revegetation offsets represent a larger area than that to be cleared by the interchange project, with "no net loss" of native vegetation. The rehabilitation areas will contain similar species to the area to be cleared and the adjacent remnant bushland, to provide buffering and enhance the ecological values of the Bush Forever site being impacted and to reflect the pre-European vegetation community.

These species will include:

Acacia pulchella
Allocasuarina fraseriana
Banksia attenuata
Banksia ilicifolia
Banksia menziesii
Banksia sessilis
Calothamnus sanguineus
Eremaea fimbriata
Eremaea pauciflora
Eucalyptus tottiana
Hakea costata
Hibbertia hypericoides

Hibbertia racemosa
Jacksonia hakeoides
Jacksonia sternbergiana
Macrozamia reidii
Melaleuca scabra
Melomelaena stygia
Nuytsia floribunda
Petrophila brevifolia
Petrophila serruriae
Stirlingia latifolia
Synaphea polymorpha
Xanthorrhoea preissii

3.2 Weed control

Control of weeds in these areas, including *Pelargonium capitatum*, *Lagurus ovatus* (Hare's Tail) and *Pinus* sp., will include restricting movement of vehicles and equipment, appropriate chemical spraying prior to ripping, mulching and seeding, and burial of weedy, mechanically-cleared material at the old gravel pit to be revegetated.

3.3 Dieback Management

All machinery, plant and equipment shall be free of soil and vegetative matter prior to entering the road reserve and rehabilitation sites and when leaving these sites. No entry will be permitted to vegetated areas outside the proposed works area. The movement of soil in wet conditions will be avoided or kept to an absolute minimum where the work is essential.

These hygiene measures will also help to reduce the spread of weeds.

3.4 Ongoing Maintenance and Monitoring

The DEC's Swan Coastal District have advised that they have the resources to conduct these rehabilitation works, monitoring and maintenance. Main Roads will provide funds to a value agreed with the Swan Coastal District to allow for a three-year Vegetation Establishment Period. This includes 6-monthly visual and quantitative monitoring of weed and native species cover, stem density and native species diversity, with follow-up weed control and infill planting of like native species as required to achieve completion criteria.

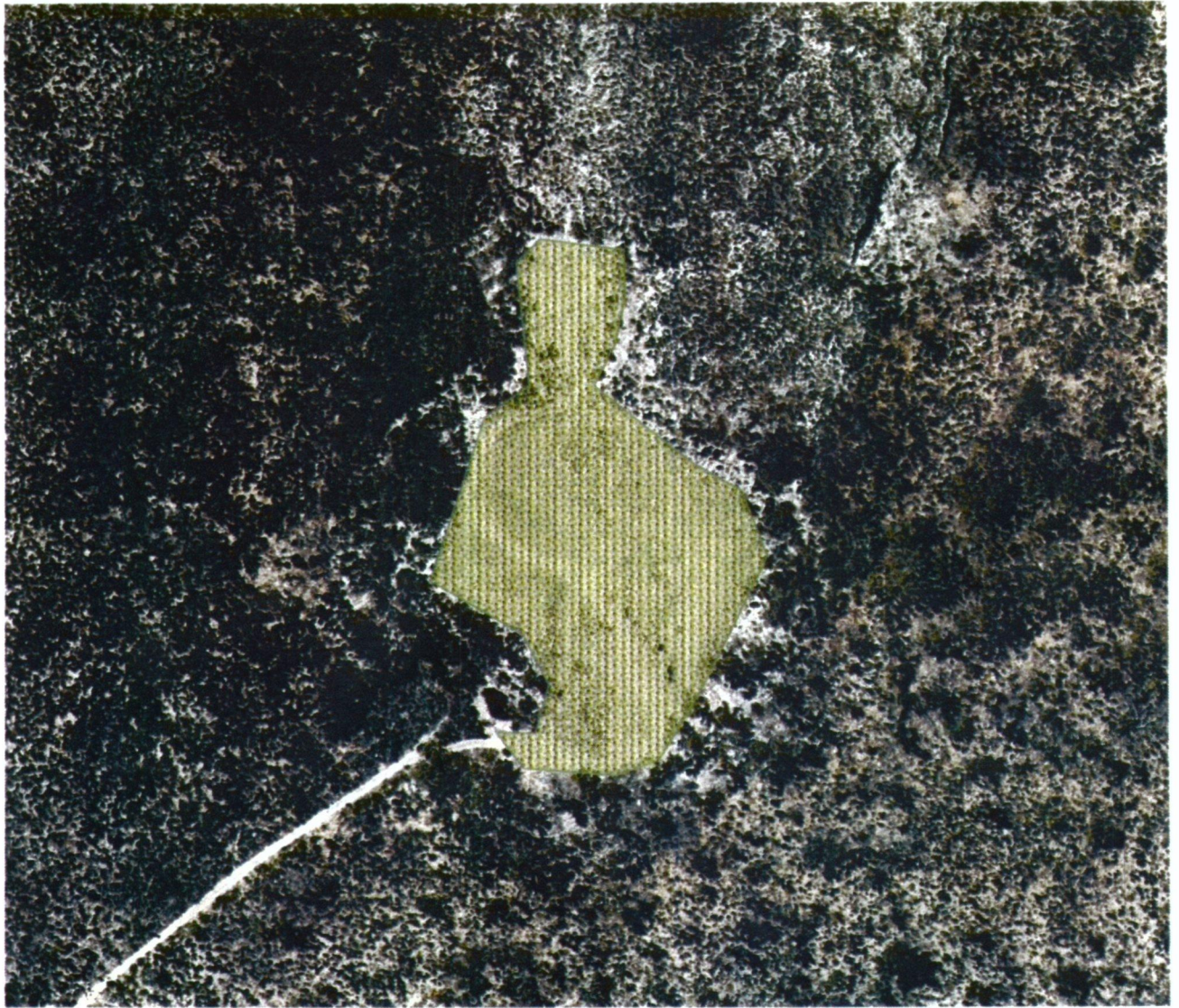
The proposed completion criteria are:

Species diversity:	> 15 species per site
Native plant occurrence:	> 50 % cover within the rehabilitated area
Weed occurrence:	< 20 % cover within the rehabilitated area

**APPENDIX A – AERIAL PHOTOGRAPHS SHOWING PROJECT CLEARING AND OFFSET
AREAS**



Aerial 1 – Clearing area 1 – orange hatching (Bush Forever) and red hatching (pine plantation)
Offset area 1 – green speckling showing the proposed rehabilitation of disused
Military Road.



Aerial 2 – Offset area 2 – green speckling showing the proposed rehabilitation of old gravel pit.



Aerial 3 – Clearing area 2 – orange hatching, potential area of impact in Bush Forever Site 396
Offset area 3 – green speckling showing the proposed rehabilitation of a decommissioned parking bay
Offset area 4 – green speckling showing the proposed rehabilitation of the western end of Clover Road



Aerial 4 – Offset area 5 – green speckling showing the proposed rehabilitation of pine research plot

APPENDIX B – SITE PHOTOGRAPHS



Photo 1 – SOUTH END OF CURRENT MILITARY ROAD, FACING SOUTH TOWARDS INDIAN OCEAN DRIVE



Photo 2 – NORTHERN TIE-IN OF PROPOSED ROAD TO EXISTING MILITARY ROAD, FACING SOUTH – BUSH FOREVER



Photo 3 – BUSH FOREVER VEGETATION TO BE CLEARED, EAST OF INDIAN OCEAN DRIVE, SOUTHERN END OF PROJECT, VIEW NORTH-EAST



Photo 4 – BUSH FOREVER VEGETATION TO BE CLEARED, WEST OF INDIAN OCEAN DRIVE, NORTHERN END OF PROJECT, VIEW SOUTH-WEST



Photo 5 – ENTRANCE TO LOWER PIT, FACING NORTH-EAST

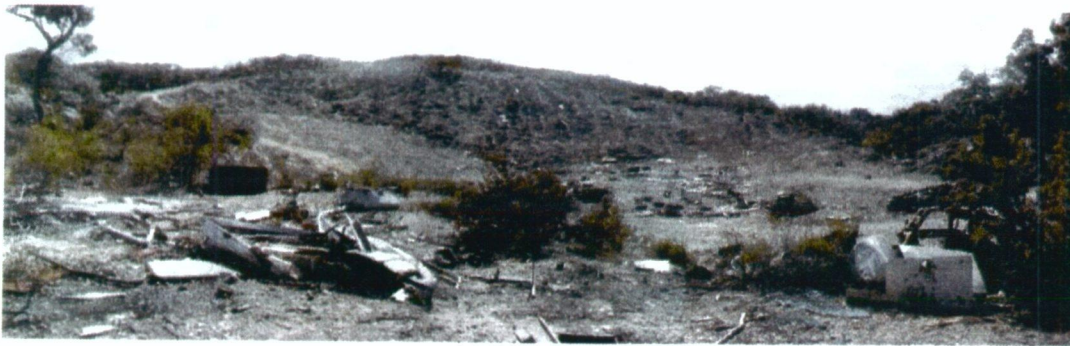


Photo 6 – LOWER PIT, FACING NORTH



Photo 7 – LOWER PIT, FACING SOUTH



Photo 8 – UPPER "PIT" FACING NORTH



Photo 9 – UPPER "PIT" FACING SOUTH



Photo 10 – OLD PARKING BAY TO BE REHABILITATED, VIEW SOUTH-EAST



Photo 11 – OLD PINE RESEARCH PLOT TO BE REHABILITATED, VIEW SOUTH



Enquiries: Shane Collins
Our Ref: 08/2569, 09/5380-02
Your Ref:

18th November 2010

Kelly Faulkner
Manager
Native Vegetation Conservation Branch
Locked Bag 104
Bentley Delivery Centre
BENTLEY WA 6983

Dear Ms. Faulkner,

Thank you for your advice dated 16 September 2010 relating to Main Roads Western Australia's offset proposal for "Indian Ocean Drive (M045) - Road Construction of Northbound and Southbound Overtaking Lanes". This was developed to help address the impacts of clearing 1.023 hectares of native vegetation within Bush Forever Site 396 (East link from Wilbinga to Yanchep National Park).

Please find attached an addendum to our offset proposal that includes the following additions as requested:

- an expanded species list to better address the diversity within the area to be cleared;
- more stringent completion criteria;
- a timeline of revegetation aspects; and
- a commitment to provide up to two years additional funding to assist the achievement of the proposed completion criteria in addition to our commitment to fund infill planting and weed control during a three-year establishment period, in the event of significant aggravating circumstances such as extreme weather conditions.

If you have any further concerns, please phone me on (08) 9323 4424 or 0422 340 641.

Yours faithfully,

Shane Collins

Shane Collins
Environmental Officer, Metropolitan Region
Main Roads Western Australia

ADDENDUM TO OFFSET PLAN



Metropolitan Region

INDIAN OCEAN DRIVE (M045)

ROAD CONSTRUCTION OF NORTHBOUND AND SOUTHBOUND OVERTAKING LANES

BETWEEN 6.3 and 9.2 SLK

VEGETATION OFFSET PLAN - ADDENDUM

November 2010

1. INTRODUCTION

The purpose of this document is to provide extra information requested by the Native Vegetation Conservation Branch of the Department of Environment and Conservation (DEC) prior to their approval of an offset proposal previously submitted by Main Roads Western Australia for proposed construction of overtaking lanes on Indian Ocean Drive (ex-Wanneroo Road).

2. VEGETATION REHABILITATION PLAN

2.1 Variation to Offset Areas

Main Roads acknowledge that proposed works for the old parking bay on Indian Ocean Drive will not be considered an offset to the project clearing following advice to this effect by the DEC Native Vegetation Conservation Branch. The proposed offset area is therefore 1.91 ha, greater than the 1.023 ha proposed clearing of Bush Forever and State forest.

2.2 Timetable of Activities

Summer 2010 – Machine works around 4 days shaping Bailey Road Quarry, bringing spoil back to pit floor, ripping floor and pit shoulders.

- Machine works to remove limestone surface from Old Military Road and replace with topsoil from the new Military Road alignment. Significant machine works to close old road alignment to stop public from the degrading rehabilitation site.

Autumn 2011 – Weed control at all offset sites using Roundup® Bi-Active.

- Machine works at Yeal Swamp pine plot to heap and burn remaining pine trees on-site.

June/July 2011 – Scarification of surface of Bailey Road Quarry with dozer.

- Ploughing of Yeal Swamp pine plot, Old Military Road and disused Clover Road.
- Direct seeding at all offset sites using 5 kg of seed per hectare.

August 2011 – Minor follow-up weed control at Yeal Swamp pine plot.

- Machine work to close access to the Bailey Road Quarry. Ripping track and the placement of habitat logs through pit and entrance road.
- Closure of access to Yeal Swamp pine plot with cleared remaining pine logs to protect rehabilitation.
- Plant survey of all offset sites.
- Submit first annual report to DEC Inspection and Compliance Branch.

Spring 2011 – Follow up weed control at Yeal Swamp pine plot, Old Military Road and disused Clover Road, particularly targeting veldt and love grass near Old Military Road.

- Monthly monitoring of all offset sites – rehabilitation success and weed control.

- Autumn 2012 – Follow up weed control at all offset sites as required, check for line wildings.
– Monthly monitoring of all offset sites – rehabilitation success and weed control.
- Winter 2012 – If seeding rate produces less than 1500 stems per hectare then follow up reseeding is to be done and monitored until at least 1500 stems per hectare is achieved.
– Submit annual report to DEC Inspection and Compliance Branch.
- Spring 2012 – Follow-up weed control at all offset sites as required.
– Monthly monitoring of all offset sites – rehabilitation success and weed growth.
- May-June 2013
– Visual and quantitative monitoring and reporting of weed and native species cover, stem density and native species diversity.
– Follow-up weed control, reseeding and infill planting as required.
- August 2013 – Submit annual report to DEC Inspection and Compliance Branch.
- October-November 2013
– Visual and quantitative monitoring and reporting of weed and native species cover, stem density and native species diversity.
– Follow-up weed control as required.
- May-June 2014
– Visual and quantitative monitoring and reporting of weed and native species cover, stem density and native species diversity.
– Follow-up weed control and infill planting as required.
- July-August 2014
– Target completion date for rehabilitation works.
– Final site monitoring.
– Anticipated final report to DEC Inspection and Compliance Branch.

* Monitoring and annual reporting may continue for a further two years in the event of exceptional aggravating circumstances i.e. monitoring and annual reporting to DEC may be extended to August 2016.

2.3 Ongoing Maintenance and Monitoring

Main Roads will provide funds to a value agreed with the Swan Coastal District DEC to allow for infill planting and weed control during a three-year Vegetation Establishment Period following initial revegetation works. Main Roads also commit to provide up to two years additional funding to attain the proposed completion criteria only if required in the event of significant aggravating circumstances such as extreme weather conditions.

The proposed completion criteria are:

- | | |
|--------------------------|--|
| Species diversity: | > 25 species per site |
| Native plant occurrence: | > 60 % cover within the rehabilitated area |
| Weed occurrence: | < 20 % cover within the rehabilitated area |

2.4 Native species mix

Species to be seeded will include:

Acacia pulchella
Acacia sessilis
Allocasuarina fraseriana
Allocasuarina humilis
Banksia attenuata
Banksia grandis
Banksia ilicifolia
Banksia menziesii
Banksia sessilis
Calothamnus quadrifidus
Calothamnus sanguineus
Eremaea asterocarpa
Eremaea fimbriata
Eremaea pauciflora
Eucalyptus marginata
Eucalyptus todtiana
Hakea costata
Hakea prostrata
Hibbertia hypericoides
Hibbertia racemosa
Hovea pungens
Jacksonia calcicola
Jacksonia hakeoides
Jacksonia sternbergiana
Kunzea ericifolia
Macrozamia reidlii
Melaleuca scabra
Melaleuca systema
Melomelaena stygia
Nuytsia floribunda
Petrophila brevifolia
Petrophila serruriae
Stirlingia latifolia
Synaphea polymorpha
Verticordia nitens
Xanthorrhoea preissii

This will be adjusted for the Bailey Road Quarry as deemed appropriate by the local DEC to accommodate the limestone-based soil at the site.

Main Roads usually obtains seed from commercial seed merchants for use in revegetation, specifying the revegetation site location and requiring seed to be obtained from a specified provenance, generally within 50-100 km of the revegetation site depending on the species and the nature of the revegetation. Where an adequate source exists, we also either collect ourselves or engage a contractor to collect seed from road reserve to be cleared or adjacent bush if permitted. The practices to be undertaken for this project will be decided and implemented by DEC Swan Coastal District.