

PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT FOR THE SOUTH COAST HIGHWAY (H008) INTERSECTION IMPROVEMENT PROJECTS

NEDS CORNER ROAD (391.4 SLK)

DALYUP ROAD (441.49 SLK)

CASCADES ROAD (429.40 SLK)

SHARK LAKE ROAD (460.61 SLK)

May 2008

Contents

1.	Execu	itive Summary4	4
2.	Introd	duction	5
3.	Projec	ct Locations	3
4.	Mater	ial Sources	3
5.	Enviro	onmental Aspects and Management	7
	Acid S	Sulfate Soils	7
	Salinit	ty	7
	Air Qu	ıality	7
	Dust .		7
	Noise	and Vibration	7
	Visual	Amenity	7
	Public	Safety and Risk	7
5	5.1	Geology and Soils	3
5	5.2	Land Use	3
5	5.3	Sensitive Adjoining Land Use / Sensitive Receivers	3
5	5.4	Conservation Areas and Reserves	3
5	5.5	Weeds	
5	5.6	Dieback and other Pathogens / Diseases	9
5	5.7	Contaminated Sites	1
5	5.8	Surface Water Drainage	
5	5.9	Public Drinking Water Source Area	1
5	5.10	Wetlands12	2
5	5.11	Groundwater and Dewatering	2
5	5.12	Vegetation	3
5	5.13	Clearing1	4
5	5.14	Environmentally Sensitive Areas	4
5	5.15	Threatened Flora	4
5	5.16	Threatened Ecological Communities	3
5	5.17	Threatened Fauna	3
5	5.18	Aboriginal Heritage	3
5	5.19	European Heritage	7
5	5.20	Consultation	
6.		onmental Approvals	
7.	Recor	nmendations1	9
8.	Refere	ences2	2

List of Tables

Table 1	Environmental Aspects Considered Not relevant to this Project
Table 2	Vegetation Associations and Condition
Table 3	Threatened Flora Species with the Potential to
	Occur in the Project Region

List of Appendixes

Α	Project location and aerial photography
В	Environmental Constraints Map
С	Contaminated Sites
D	DEWHA Environmental Reporting Tool
E	DEC's Environmentally Sensitive Areas (ESA's)
F	Assessment Against the 10 Clearing Principles
G	DIA Aboriginal Heritage Sites and Surveys Register
Н	Heritage Council of WA Database Search
I	Consultation

1. Executive Summary

In February 2007 GHD were commissioned by Main Roads WA Goldfields Esperance Region (Main Roads) to carry out a Road Safety Audit of the existing South Coast Highway (H008). The aim of the audit was to assess compliance with required safety standards taking into consideration that the there has been an increase in grain-carting traffic in the area and that the commencement of the Ravensthorpe Nickel Operations will significantly increase traffic volumes (heavy haulage) in the future.

The audit concluded that the following intersections pose a safety concern given the limited sight distances and the narrowness of the sealed pavement;

- Neds Corner Road (391.4 SLK)
- Dalyup Road (441.49 SLK)
- Cascades Road (429.40 SLK)
- Shark Lake Road (460.61 SLK)

Main Roads is proposing to upgrade these four intersections to meet required safety standards, the works will include the following;

- road reconstruction and realignment
- correction of vertical and horizontal alignments
- widening of sealed pavement to accommodate passing bulges
- clearing of native vegetation

A low impact environmental screening checklist was completed for each project by the regions' Planning and Asset Manager, Glenn Rowan and reviewed by the regions' Environmental Graduate, Joann Johnston. As the projects require the clearing of native vegetation a Preliminary Environmental Impact Assessment is required, this document fulfils this requirement.

The most significant environmental impact associated with these projects is the clearing of 5.6 ha of native vegetation. Due to the low significance of the projects impacts to the surrounding environment, the project does not warrant referral to the Environmental Protection Authority or the Commonwealth Department of Environment, Water, Heritage and the Arts.

No additional permits, licences or approvals are required. The project may be implemented using standard Main Roads practices.

2. Introduction

In February 2007 GHD were commissioned by Main Roads WA Goldfields Esperance Region (Main Roads) to carry out a Road Safety Audit of the existing South Coast Highway (H008). The aim of the audit was to assess compliance with required safety standards taking into consideration that the there has been an increase in grain-carting traffic in the area and that the commencement of the Ravensthorpe Nickel Operations will significantly increase traffic volumes (heavy haulage) in the future.

The audit concluded that the following intersections pose a safety concern given the limited sight distances and the narrowness of the sealed pavement;

- Neds Corner Road (391.4 SLK)
- Dalyup Road (441.49 SLK)
- Cascades Road (429.40 SLK)
- Shark Lake Road (460.61 SLK)

Main Roads is proposing to upgrade these four intersections to meet required safety standards, the works will include the following;

- road reconstruction and realignment
- correction of vertical and horizontal alignments
- widening sealed pavement to accommodate passing bulges
- clearing of native vegetation

In accordance with Main Roads Project Management System, a low impact environmental screening checklist was completed for each project by the regions' Planning and Asset Manager, Glenn Rowan and reviewed by the regions' Environmental Graduate, Joann Johnston (See relevant project TRIM file; Neds Corner 08/828, Cascades Road 07/2993, Dalyup Road 07/2994 and Shark Lake Road 07/2995). As the projects require the clearing of native vegetation a Preliminary Environmental Impact Assessment is required. This report fulfils this requirement and has been prepared by the Goldfields Esperance Regions' Environmental Graduate, Joann Johnston.

In accordance with the Main Roads Guideline; Environmental Assessment and Approval Process this report;

- describes the significant aspects of the existing environment
- details the primary environmental and social impacts of the proposed works

- identifies any matters likely to warrant referral to the Environmental Protection Authority (EPA), the Department of Environment and Conservation (DEC) or the Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA) for formal assessment and
- provides recommendations for;
 - additional investigations that may be required
 - developing appropriate management measures
 - obtaining the necessary statutory approvals.

3. Project Locations

The location of the four projects and aerial photography can be seen in **Appendix A**. All four projects are located within the Shire of Esperance between 15 km and 85 km west of Esperance townsite on the South Coast Highway.

4. Material Sources

Road building materials shall be imported from commercial pits or previously cleared areas (e.g. adjacent agricultural areas). The "temporary" clearing of native vegetation under Main Roads Purpose Clearing Permit will not be required and the preparation of a project specific Revegetation Management Plan is not required.

5. Environmental Aspects and Management

The following section provides a description of the existing environment to adequately describe the project sites. Environmental and social aspects and impacts are also identified and discussed relevant to the proposed works. Where appropriate, recommendations to minimise the risk to the environment have been made. Where required, project specific concerns and requirements have been discussed.

Main Roads Guideline; Environmental Assessment and Approval Process identifies a number of environmental aspects to be assessed in a preliminary environmental impact investigation however some of these aspects are considered irrelevant to these projects. Table 1 identifies these aspects and provides reasons why they were considered irrelevant for this project.

Table 1
Environmental Aspects Considered Not Relevant to the Project

Environmental Aspect	Justification of Irrelevance
Acid Sulfate Soils	 The Western Australian Planning Commission released Planning Bulletin No. 65 in 2003 and identified areas in Western Australia where ASS are likely to occur including; the southwest of WA, the Kimberly, the Pilbara and some parts of the wheatbelt where land salinisation has occurred. This project is not located within any of these areas. Site characteristics (i.e. >5 AHD, no seasonal waterlogging of soil) do not suggest that ASS are present in the project areas. Given the superficial nature of the proposed works, impacts to acid sulphate soils are considered negligible and this aspect is considered irrelevant.
Salinity	 Given the nature of the works proposed and the small area of vegetation proposed to be cleared, the project is unlikely to have an impact on salinity and this aspect is considered irrelevant.
Air Quality	 Given that the works proposed are not expected to have an impact on traffic volume in the area, impacts to air quality are considered negligible and this aspect is considered irrelevant.
Dust	- The project is likely to create only short term and localised increases in wind borne dust however it is expected that these will be readily managed by Main Roads standard control measures and does not require further consideration.
Noise and Vibration	- Given that there are no sensitive receivers (i.e. residential areas/buildings) within close proximity of the project area (150 m), noise and vibration impacts are expected to be negligible and this aspect is considered irrelevant.
Visual Amenity	- Given that the proposed works are to upgrade an existing infrastructure, visual amenity impacts are considered negligible and this aspect is considered irrelevant.
Public Safety and Risk	 Given that this will be managed using Main Roads standard controls (i.e. traffic management and OHS standards) this aspect does not warrant further consideration.

5.1 Geology and Soils

Information on the soils and geology of the project area was obtained from an online database through the Department of Industry and Resources (DIOR) website. GoeVIEW.WA is an online browser-based visual tool for exploring Geological Survey of Western Australia's (GSWA's) geosciences datasets. The geology of the project area is described as a mosaic of:

- "Phanerozoic" and mainly composed of "marine limestone, sandstone, and valleyfill deposits",
- "Archaean" and mainly composed of "granite and gneiss"
- "Proterozoic" and mainly composed of "granite and gneiss"

5.2 Land Use

The project is located within the Shire of Esperance where the land use is predominately agricultural, some mineral exploration and mining also occurs in the region.

5.3 Sensitive Adjoining Land Use / Sensitive Receivers

There are no sensitive adjoining land uses adjacent to the project sites that are expected to be impacted by the proposed works.

5.4 Conservation Areas and Reserves

The Western Australian Department of Environment and Conservation (DEC) supplies a geographically referenced database of the states conservation areas and reserves to Main Roads annually (See Appendix B). A search of this database identified that the Dalyup Road intersection is located within close proximity to the Dalyup Nature Reserve. This is a C Class Nature Reserve set aside for the conservation of flora and fauna. The works proposed are located within the designated road reserve and the Dalyup Nature Reserve isn't expected to be impacted by the proposed works.

5.5 Weeds

There is a risk of introducing or spreading weeds within and out of the project areas. The Dalyup Road and Neds Corner Road intersections are at a greater risk of infestation given that the native vegetation at these locations contains minimal weed populations. Weeds at these two intersections mainly occur in the native vegetation that fringes the road reserve.

The DEC have advised that Bridal Creeper (*Asparagus asparagoides*) is present on the south side of the road South Coast Highway at the Dalyup Road Intersection. This is a weed of National Significance and should be eradicated from the site.

RECOMMENDATION 1

Ensure all machinery and equipment is clean of any vegetative or soil material prior to entering and leaving the project site to avoid the introduction or spread of weeds both into and out of the project area.

RECOMMENDATION 2

Ensure all imported materials are free of weeds e.g. during revegetation works.

RECOMMENDATION 3

Ensure weed infested topsoil is only disposed of at sites approved by the Environmental Officer (EO).

RECOMMENDATION 4

Ensure all temporarily cleared areas are revegetated as soon as possible to avoid the establishment of weed populations.

RECOMMENDATION 5

Undertake works to eradicate all Bridal Creeper (*Asparagus asparagoides*) plants from the Dalyup Road intersection. For best results spray the plants when in flower (August-September) with Glyphosphate 1% + Pulse or metsulfuron methyl 0.15g/10L + Pulse (*Brown and Brooks 2002*). Only dispose of plants at sites approved by the EO.

5.6 Dieback and other Pathogens / Diseases

The south-western region and the north-west and south-east extensions of the 600 mm rainfall isohyet are the areas where the dieback pathogen (*Phytophthora sp.*) is known to occur in Western Australia. This includes the Shire of Esperance and the four project sites.

According to the DEC Dieback Atlas the project areas were not known to be infected with dieback in 2001 however given the mobility of the pathogen, Dieback maps are

only considered relevant for a period of twelve months, and infestation should be verified during a site visit.

There are native species of Western Australia's flora which are extremely susceptible to Dieback. These species quickly begin to show the signs and symptoms (i.e. "sudden death") that dieback is present in an area and can be used as an indictor of infestation. The main indicator species are from the following genuses;

Banksia

Dryandra

Adenanthos

Leucopogon

Patersonia

Acacia

Bossiaea

Daviesia

Species from this list were noted as looking unhealthy at the Neds Corner Road and Dalyup Road intersection on the 29th of November 2007. Further advice regarding the dieback status of these intersections and their management is currently being sought however Main Roads Standard Tender Documentation - Specification 204 Environment and in particular the clause below should be included in the contract documentation for the works.

204.96 DIE BACK CONTROL

- 1. The Contractor shall treat the site as being dieback infected unless otherwise detailed in Table 204 G3.
- 2. Where dieback infection is present, or suspected to be present, the Works shall be carried out under strict hygiene controls to prevent any further spreading of the disease. The Contractor shall prepare a Contract specific Hygiene Management Plan, and shall observe the requirements of the Managing Phytophthora Dieback Guidelines for Local Government (2000).

RECOMMENDATION 6

Main Roads Standard Tender Documentation - Specification 204 Environment and the example clause on dieback should be included in the contract documentation for the project.

RECOMMENDATION 7

Ensure machinery is free of soil and vegetative material prior to entering or leaving the project site. This can be achieved by brushing or washing down machinery.

RECOMMENDATION 8

Ensure that vegetative and soil material taken from the project site is only disposed of at sites approved by the EO.

5.7 Contaminated Sites

A search of DEC's Contaminated Sites Database was undertaken in order to determine if a known contaminated site exists with the project area. According to the DEC's contaminated sites database search there are no known sites of contamination within the project area (**See Appendix C**). Given the historic use of the project sites, contaminated materials are not expected to be intercepted during proposed works. In the instance that contaminated materials are intercepted during works, the DEC must be notified and further investigation will be required in consultation with the DEC.

RECOMMENDATION 9

In the occurrence that contaminated materials are intercepted during works, all activity should cease immediately and the EO notified.

5.8 Surface Water Drainage

The Western Australian Land Information System (WALIS) database indicates that surface drainage of the project area flows in a southern direction and most tributaries flow into the Southern Ocean. The Lake Warden System which is an internationally (RAMSAR) recognised wetland of significance, is located in the Shire of Esperance. There are no wetlands or watercourses within the project areas and the proposed works are not expected have an impact on natural surface drainage regimes.

According to the *DoW Rights in Water and Irrigation Act* (1914) *Surface Water Management Areas 2006* map, the project area is not located within or adjacent to a proclaimed surface water management area. If the project required disturbance of the bed or banks of a watercourse, a permit would not be required to undertake this activity.

5.9 Public Drinking Water Source Area

The Western Australian Department of Water (DoW) supplies a geographically referenced database of the states Public Drinking Water Source Areas (PDWSA) to Main

Roads annually (<u>See Appendix B</u>). A search of this database identified that the Dalyup Road intersection is located adjacent to a Priority 1 PDWSA.

Given the superficial nature of the works there is minimal risk that this PDWSA will be impacted by the project. Care should be taken during on-site refuelling to ensure the risk of contamination is minimised.

RECOMMENDATION 10

Refuelling sites shall be approved by the EO and will be limited to bunded areas not located adjacent to any drainage areas or watercourses.

5.10 Wetlands

The following databases were searched for significant wetlands within the project area;

- DEWHA Environmental Reporting Tool which indicates that there are two Internationally Significant Wetlands (RAMSAR) and Nationally Important Wetlands within the region (See Appendix D). None of these wetlands occur within a 5 km radius of the project locations and are not expected to be impacted by the proposed works.
- DEC's Environmentally Sensitive Areas database which indicates that there are no wetlands of significance within 5 km radius of the project area (<u>See Appendix</u>
 E).
- The DEC's supply to Main Roads a geographically referenced database of all the States significant wetlands annually (<u>See Appendix B</u>). A search of this database did not identify any significant wetlands within a 5 km radius of the project areas.

Given that there are no wetlands located within close proximity to the project areas, the project is not expected to have an impact on a significant wetland.

5.11 Groundwater and Dewatering

According to the DoW *Rights in Water and Irrigation Act* (1914) *Groundwater Management Areas 2006* map, the project area is not located within a proclaimed groundwater management area. Under the *Rights in Water and Irrigation Act* (1914) a license is required to take groundwater from a new or existing bore or other

groundwater source within a proclaimed area. Taking groundwater within these areas would not require a license.

5.12 Vegetation

The Western Australian Government is committed to protecting vegetation associations where less than 30% of their pre-European (pre-clearing) extent remains (EPA, 2000). A search of the Western Australian Shared Land Information Platform (SLIP) was undertaken to identify the vegetation associations of the project sites (See Table 2) and their current extent.

Table 2
Vegetation Associations and Condition

			Vegetation Condition Area Proposed to be Cleared				
Vegetation Association No.	Vegetation Association Description	Pre – European Extent Remaining	Neds Corner Road	Cascades Road	Dalyup Road	Shark Lake Road	
47	Tallerack Malleee Heath	35.60%	Good to Pristine		Good to Degraded		
			1.4 ha		1.4 ha		
5048	Shrublands; Banksia and Lambertia Scrubland in the Esperance Plains Region	5.00%		Completely Degraded 1.4 ha			
6048	Shrublands; Banksia Scrub Heath on Sandplain on the Esperance Plains Region	15.40%				Completely Degraded 0.7 ha	
7048	Shrublands: Banksia Scrub Heath on Coast Plain in the Esperance plains Region	80.90%				Completely Degraded	
		TOTAL	1.4 ha	1.4 ha	1.4 ha	1.4 ha	į

The EPA / DEC are unlikely to be concerned with the clearing of vegetation from the Cascades Road and Shark Lake Road intersections given the small area of vegetation proposed to be cleared (<1.4 ha) and the degraded condition of the vegetation.

The Good condition vegetation to be cleared form the Neds Corner Road and Dalyup Road intersection should be utilized in revegetation works within the road reserve.

RECOMMENDATION 11

Utilise cleared vegetation that is free of weeds in revegetation works under the direction of the EO.

5.13 Clearing

Approximately 5.6 ha of vegetation will need to be cleared in order to complete the projects (Table 2). The clearing will be undertaken under Main Roads State Wide Purpose Clearing Permit (CPS 818/4) and has therefore been assessed against the 10 clearing principles in accordance with the conditions of this permit (**Appendix E**). As the proposed clearing is not at variance to the 10 clearing principles further consultation and offsets are not required.

Given that all of the clearing associated with this project is considered "Permanent" a Revegetation Management Plan is not required.

The area of vegetation cleared shall be mitigated by the revegetation of a similarly sized area in accordance with Main Roads corporate objectives and a Regional Revegetation Management Plan.

RECOMMENDATION 12

Clearing of vegetation for the extraction of road building materials from areas other than those assessed in this report will require assessment of compliance to CPS 818/3.

5.14 Environmentally Sensitive Areas

According to the DEC's Environmentally Sensitive Areas Database there are no ESAs within a 5 km radius of the project areas (**Appendix E**).

5.15 Threatened Flora

A search of the DEWHA Environmental Reporting Tool (<u>Appendix D</u>) database indicates that the following Declared Rare Flora species have the potential to occur in the project

areas. These species and their habitat type are detailed in Table 2 below. None of these species are likely to occur in the project area given the dissimilarity between landscapes.

Table 3
Threatened Flora Species with the Potential to Occur in Project Region

SPECIES	STATUS	COMMON	HABITAT	TO OCCUR IN PROJECT AREA
Anigozanthos	Endangered	Small Two-	Sandy well watered sites	Unlikely
bicolor subsp.		colour		
minor		Kangaroo Paw		
Conostylis	Endangered	Sedge	Grey or yellow-brown sand over	Unlikely
lepidospermoides		Conostylis	laterite	
Kennedia	nnedia Vulnerable Northcliffe Soil pocket		Soil pockets, sandy soils and	Unlikely
glabrata		Kennedia	granite outcrops.	

The DEC's supply to Main Roads a geographically referenced database of all the States known populations of threatened flora annually (**See Appendix B**). A search of this database through ARC GIS software did not identify any threatened flora populations within a 5 km radius of the project areas.

The DEC's Esperance office was contacted to discuss potential environmental issues in regards to the projects. It was identified that the Priority 3 species *Isopogon alcicornis* had the potential to occur and be impacted upon by the Dalyup Road intersection (**See Appendix I**). On the 29th of November 2007 a site inspection of the intersections was undertaken by the DEC's Conservation Officer Emma Adams and the Main Roads Environmental Officer Joann Johnston. The following species were recorded from the site;

- Acacia saligna
- Adenanthos cuneatus
- Astartea sp.
- Banksia repens
- Billardiera fusiformis
- Caustis dioica
- Dampiera sp.
- Dianella revolute
- Goodenia incana

- Hakea nitida
- Hibbertia acerosa
- Hibbertia racemosa
- Hypolaena (fastigiata?)
- Jacksonia sp.
- Kunzea baxteri
- Leschenaultia tubiflora
- Lepidosperma sp.
- Leptospermum laevigatum*

- Leptospermum sp.
- Melaleuca eurystoma
- Melaleuca striata
- Phymatocarpus maxwellii
- Thysanotus sparteus
- Verticordia (plumosa?)
- Xanthorrhoea platyphylla

None of these species are considered Rare or Priority species and *Isopogon alcicornis* was not recorded at the Dalyup Road intersection. The proposed projects are not expected to impact upon a threatened flora population.

5.16 Threatened Ecological Communities

The DEC's supply to Main Roads a geographically referenced database of all the States Threatened Ecological Communities (TECs) annually (<u>See Appendix B</u>). A search of this database did not identify any TECs within a 5 km radius of the project areas. The proposed projects are not expected to have an impact upon a TEC.

5.17 Threatened Fauna

A search of the DEWHA Environmental Reporting Tool (See Appendix D) database indicated that 27 threatened fauna species have the potential to occur in the area. The majority of these species are unlikely to be impacted by the proposed works due to small area of vegetation proposed to be cleared, the mobile nature of the species and because the projects are not located within or adjacent to the Southern Ocean.

5.18 Aboriginal Heritage

According to the National Native Title Tribunal there are two Native Title Groups claiming a cultural affiliation with the lands in which the project is located. These include:

- The Won-Ber (WC96/105) and
- The Esperance Nyunars (WC 96/64).

According to the Department of Indigenous Affairs (DIA) Aboriginal Heritage Inquiry System database, there are no registered heritage sites within the project area (<u>See Appendix G</u>). Given the number of surveys conducted in the vicinity of the project areas (<u>See Appendix G</u>), it is unlikely that further sites will be discovered within the project area.

RECOMMENDATION 13

Ensure all site workers are made aware of their obligations under the *Aboriginal Heritage Act* (1972).

RECOMMENDATION 14

In the event that human remains are identified contact the Environmental Officer as soon as possible and cease works immediately.

5.19 European Heritage

According to the Australian Heritage Place Inventory database and the Western Australian Heritage Council database there are numerous European heritage sites within the Shire of Esperance (**See Appendix H**). No suspected European heritage sites were identified within the project areas during the site investigation.

Main Roads is provided with a geographically referenced database of Western Australia's European Heritage sites and trails on an annual basis from the Western Australian Heritage Council (See Appendix B). A review of this database did not identify any sites or trails within close proximity to the project areas. During the site investigations, no suspected European heritage sites were identified at the project locations. No impacts to European Heritage sites or trails are expected during the works.

5.20 Consultation

The local DEC office in Esperance was consulted in regards to the four projects and their potential environmental impacts (See Appendix I).

No major concerns regarding the projects impacts were raised by the individuals contacted.

6. Environmental Approvals

The upgrade of the Neds Corner Road, Cascades Road, Dalyup Road and Shark lake Road intersections with the South Coast Highway (H008) is unlikely to interest the DEC, EPA or DEWHA given the minimal impact the project will have on the environment. Referral under the *Environmental Protection Act* (1986) or the *Environmental Protection and Biodiversity Conservation Act* (1999) to the EPA or the DEWHA is not required.

The project meets the requirements for authorised clearing under the Main Roads Purpose Clearing Permit (CPS 818/4) and the proposed clearing is not at variance to the 10 clearing principles. The clearing may therefore be undertaken using the Main Roads clearing permit and an application for a project specific clearing permit is not required.

7. Recommendations

The following recommendations and actions should be incorporated into the project contractual documentation and the environmental management plan for the project where applicable

RECOMMENDATION 1

Ensure all machinery and equipment is clean of any vegetative or soil material prior to entering and leaving the project site to avoid the introduction or spread of weeds both into and out of the project area.

RECOMMENDATION 2

Ensure all imported materials are free of weeds e.g. during revegetation works.

RECOMMENDATION 3

Ensure weed infested topsoil is only disposed of at sites approved by the Environmental Officer (EO).

RECOMMENDATION 4

Ensure all temporarily cleared areas are revegetated as soon as possible to avoid the establishment of weed populations.

RECOMMENDATION 5

Undertake works to eradicate all Bridal Creeper (*Asparagus asparagoides*) plants from the Dalyup Road intersection. For best results spray the plants when in flower (August-September) with Glyphosphate 1% + Pulse or metsulfuron methyl 0.15g/10L + Pulse (*Brown and Brooks 2002*). Only dispose of plants at sites approved by the EO.

RECOMMENDATION 6

Main Roads Standard Tender Documentation - Specification 204 Environment should be included in the contract documentation for the works, in particular the clause below;

204.96 DIE BACK CONTROL

- 1. The Contractor shall treat the site as being dieback infected unless otherwise detailed in Table 204 G3.
- 2. Where dieback infection is present, or suspected to be present, the Works shall be carried out under strict hygiene controls to prevent any further spreading of the disease. The Contractor shall prepare a Contract specific Hygiene Management Plan, and shall observe the requirements of the Managing Phytophthora Dieback Guidelines for Local Government (2000).

RECOMMENDATION 7

Ensure machinery is free of soil and vegetative material prior to entering or leaving the project site. This can be achieved by brushing or washing down machinery.

RECOMMENDATION 8

Ensure that vegetative and soil material taken from the project site is only disposed of at sites approved by the EO.

RECOMMENDATION 9

In the occurrence that contaminated materials are intercepted during works, all activity should cease immediately and the EO notified.

RECOMMENDATION 10

Refuelling sites shall be approved by the EO and will be limited to bunded areas not located adjacent to any drainage areas or watercourses.

RECOMMENDATION 11

Utilise cleared vegetation that is free of weeds in revegetation works under the direction of the EO.

RECOMMENDATION 12

Clearing of vegetation for the extraction of road building materials from areas other than those assessed in this report will require assessment of compliance to the Clearing Permit (CPS 181/3).

RECOMMENDATION 13

Ensure all site workers are made aware of their obligations under the *Aboriginal Heritage Act* (1972).

RECOMMENDATION 14

In the event that human remains are identified contact the Environmental Officer as soon as possible and cease works immediately.

8. References

Government of Western Australia (2000). Volume 2: Directory of Bush Forever Sites. Department of Environmental Protection, Western Australia.

Brown, K. and Brooks, K. (2002). Bushland Weeds; A practical guide to their management with case studies from the Swan Coastal Plan and beyond. Environmental Weeds Action Network. Greenwood, Western Australia.

Department of Environment and Conservation (2004). Contaminated Sites Management Series: Potentially Contaminating Activities, Industries and Landuses. Department of Environment and Conservation.

Department of Environment and Conservation (2006¹). Contaminated Sites Management Series: Reporting of Known or Suspected Contaminated Sites. Department of Environment and Conservation, Perth.

Department of Environment and Conservation (2006²). CAR RESERVE ANALYSIS 2006. Unpublished data. Department of Environment and Conservation, Perth.

Environmental Protection Authority (2000). Environmental Protection of Native Vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. Environmental Protection Authority, Perth.