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# Main Roads Western Australia

Report for Madura Cattle Grid  
Replacement

Preliminary Environmental  
Impact Assessment and  
Environmental Management  
Plan

April 2011



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# 1. Introduction

Main Roads Western Australia – Goldfields-Esperance Region (Main Roads) proposes to replace the Madura Cattle Grid (Grid) on the Eyre Highway at 559.3 SLK (Appendix A, Figure 1). The Grid is nearing the end of its economical life and requires replacement. For the replacement of the Grid to occur, a side track is required on the northern side of the Eyre Highway (Appendix A, Figure 2). The sidetrack will be rehabilitated back to Main Roads specifications upon completion of the project.

The material for the sheeting of the sidetrack will be sourced from an existing gravel pit located approximately 500 m west of the Madura roadhouse. No assessment of the gravel source area is required given that no new clearing or ground disturbance is necessary.

In accordance with Main Roads corporate environmental assessment and approvals process, a Low Impact Environmental Screening Checklist was completed (Appendix B). This Preliminary Environmental Impact Assessment was required as the works involve clearing of native vegetation outside the maintenance zone. This report intends to fulfil this requirement. This report also intends to fulfil the requirements of Main Roads State-wide Project Purpose Clearing Permit (CPS 818/5) which is proposed for use for the project.

## 1.1 Project Location

The project area is located within the Shire of Dundas, 32 km east of Madura on the Eyre Highway (Appendix A, Figure 1).



## 2. Assessment Methodology

### 2.1 Preliminary Desktop Study

A preliminary assessment of the project and its potential constraints has been undertaken by reviewing a number of government agency managed databases. Appendix C contains relevant government database generated reports. The following sections provide a summary of the methodology used for each potential environmental aspect associated with the project.

#### 2.1.1 Threatened Flora, Fauna and Communities

The presence of Threatened Flora and Fauna and Threatened and Priority Ecological Communities (TECs & PECs) was determined by a search of the Department of Environment and Conservation (DEC) NatureMap (for threatened flora and fauna) and TEC and PEC databases.

#### 2.1.2 Environmentally Sensitive Areas (ESAs) and Conservation Reserves

DEC's Native Vegetation Map Viewer was used to determine the location of any ESAs and Conservation Reserves (<http://www.dec.wa.gov.au/content/view/2920/1572/1/1/>).

#### 2.1.3 Vegetation Type, Extent and Status

Vegetation associations were determined by examining the Shared Land Information Platform (SLIP) Natural Resource Management (NRM) database (<http://spatial.agric.wa.gov.au/slip/>). The native vegetation association extent and status represented in the survey areas is drawn from Shepherd, *et al.* (2002).

#### 2.1.4 Air Quality

The need for a local air quality assessment was determined using the criteria outlined in the Main Roads environmental guideline, Air Quality ([http://intranet/online/branches/environment/word/guide\\_air\\_quality.doc](http://intranet/online/branches/environment/word/guide_air_quality.doc)).

#### 2.1.5 European Heritage

European heritage was examined by searching the Australian Heritage Places Inventory (<http://www.heritage.gov.au>) and the Heritage Council of Western Australia database (<http://register.heritage.wa.gov.au/>).

#### 2.1.6 Aboriginal Heritage

A search of the Department of Indigenous Affairs' (DIA) database (<http://www.dia.wa.gov.au/Site-Search/Aboriginal-Heritage-Inquiry-System.aspx>) was undertaken to determine whether the project area contains or is located adjacent to any registered Aboriginal Heritage sites.

#### 2.1.7 Wetlands

The location of wetlands within the project area was determined by examining DEC's Wetland Base (<http://spatial.agric.wa.gov.au/wetlands/>).



### **2.1.8 Sensitive Water Resources**

The Department of Water's (DoW) Geographic Data Atlas (<http://www.water.wa.gov.au/Tools/Maps+and+atlases/Geographic+data+atlas/default.aspx>) was examined to determine whether the project area supported, or was adjacent to, any significant lakes, rivers, wetlands or proclaimed areas including public drinking water source areas (PDWSAs).

### **2.1.9 Contaminated Sites**

The presence of contaminated sites in the project area was determined by examining DEC's contaminated sites database (<http://www.dec.wa.gov.au/content/view/5627/2295/>).

### **2.1.10 Acid Sulphate Soils**

A search of the Australian Soil Resources Information System (ASRIS) website (<http://www.asris.csiro.au/mapping/viewer.htm>) was conducted to determine the probability of the occurrence of acid sulphate soils within the project area.

### **2.1.11 Weeds**

Weeds were only considered a potential issue for the project if any Weeds of National Significance (WONS) or Declared Plants pursuant to the *Agriculture and Related Resources Protection Act 1976* were recorded in the project area during the site visit.

### **2.1.12 Dieback**

Dieback was only considered a potential issue for the project if both the mean annual rainfall of the area is >400 mm, and if the project area resides below the 26<sup>th</sup> parallel.

## **2.2 Statutory Referral Decisions**

The decision whether to refer the project to the Commonwealth's Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) was based upon whether the project would impact upon matters of national environmental significance (refer to Appendix C– DSEWPC's EPBC Act Protected Matters Database search). These matters of national environmental significance are assessed for impact in Section 4.

The decision whether to refer the project to the Western Australian Environmental Protection Authority (EPA) was based upon whether the project would be a "significant proposal" as defined by the *Environmental Protection Act 1986*. As a result, all potential environmental aspects relating to the project have been examined for their level of significance (refer Section 4).

## **2.3 Site Investigation**

A site visit was carried out by the GHD's Environmental Scientist, Casey Skalski, on the 10 April 2011 to examine the general features of the project area. Site photos were taken and are included in Appendix D.



### 3. Existing Environment

Information relating to the existing environment of the project area has been summarised in Table 1 below. This information has been compiled through both desktop assessments and the site visit.

**Table 1 Existing environment information**

Factor	Value
Vegetation Association	122
Vegetation Association Description	Succulent steppe with open low woodland; <i>Acaia papyrocarpa</i> over saltbush & bluebush
Current Extent (ha)	Vegetation Extent and Status
	<i>Pre-European Extent (ha) in Hampton IBRA subregion</i> <i>Current Extent (ha) in Hampton IBRA subregion</i>
	252377.905      252377.905
% Pre-European Extent Remaining	100.00%      100.00%
Topography /Geology <sup>^</sup>	Topography: The project area is flat. Geology: The geology of the project area consists of carbonate-rich shelf deposits; predominantly calcarenite and granule calcirudite with minor marginal sandstone.
Climate <sup>#</sup>	<i>Closest Meteorological Station with representative data: Eyre</i> <i>Avg. Annual rainfall: 307.5 mm</i> <i>Avg. Max Temp ranges: 18.1 °C (Jul) to 26.5 °C (Jan)</i> <i>Avg. Min Temp ranges: 5.8 °C (Jul) to 16.1 °C (Feb)</i>
Surrounding Land Use	Pastoral
Weed prevalence	Low

<sup>^</sup> Source: Department of Mines and Petroluem (2011)

<sup>#</sup> Source: Bureau of Meteorology (2011)



## 4. Assessment of Aspects and Impacts

A summary of all potential environmental aspects associated with the project and their subsequent assessment for environmental impact is provided in Table 2. Environmental constraints are mapped in Figure 3, Appendix A.

Please note: The project area is defined as the extent of the proposed clearing footprint shown in Figure 2, Appendix A.

**Table 2 Aspects and Impacts**

Aspect	Evaluation of Potential Impacts
Air quality	Likely to be a minor issue during earth works only (due to generation of dust). Implementation of the project is not expected to cause significant increases in traffic volumes in the area meaning that long term air quality levels are not expected to change. No major sensitive receivers are present within 10 km of the project area. No significant impacts expected.
Dust	Likely to be a minor issue during earth works. No major sensitive receivers are present within 10 km of the project area. No significant impacts expected.
Fauna	<p>The following nationally (DSEWPC) protected species and/or their habitat have been identified as potentially occurring within the project area (refer to Appendix C for further information):</p> <ul style="list-style-type: none"> <li>▶ Slender-billed Thornbill (western) (<i>Acanthiza iredalei iredalei</i>)</li> <li>▶ Malleefowl (<i>Leipoa ocellata</i>)</li> <li>▶ Mulgara (<i>Dasyercus cristicauda</i>)</li> <li>▶ Rainbow Bee-eater (<i>Merops ornatus</i>)</li> <li>▶ Great Egret, White Egret (<i>Ardea alba</i>)</li> <li>▶ White-bellied Sea-Eagle (<i>Haliaeetus leucogaster</i>)</li> <li>▶ Oriental Plover, Oriental Dotterel (<i>Charadrius veredus</i>)</li> <li>▶ Cattle Egret (<i>Ardea ibis</i>)</li> </ul> <p>Given the relatively small amount of clearing involved (1.25 ha) and the large areas of intact native vegetation surrounding the project area, no significant impacts are expected to any nationally protected species of fauna. Most species should be able to relocate to adjacent habitat, with the number of individual casualties caused by clearing activities considered highly unlikely to be significant. No active nesting sites were observed in the proposed clearing area when completing the site visit. The proposed clearing method involves felling of trees before reducing (cutting up) and re-spreading in adjacent areas. This should assist in maintaining some of the habitat value offered by the proposed clearing area.</p>





Aspect	Evaluation of Potential Impacts
Vegetation – clearing	<p><i>Vegetation clearing</i></p> <p>A maximum of 1.25 ha of clearing of native vegetation is required to complete the proposed works. (For clearing boundaries, please refer to Figure 2 of Appendix A.)</p> <p>A breakdown of proposed clearing is as follows:</p> <ul style="list-style-type: none"> <li>▶ Indicative clearing area – 1.25 ha</li> </ul> <p>The material for the sheeting of the sidetrack will be sourced from an existing gravel pit located approximately 500 m west of the Madura roadhouse. No assessment of the gravel source area is required given that no new clearing or ground disturbance is necessary.</p> <p><i>Vegetation condition</i></p> <p>The condition of native vegetation in the project area ranges from <i>degraded</i> to <i>very good</i> (using the Keighery scale (Keighery, 1994)). Vegetation was noted to be degraded alongside the road. Vegetation condition improved to very good as the distance from the road increased.</p> <p>The Hampton IBRA subregion in which the project area is located, is considered to be of <i>Least Concern</i> in terms of its regional extent with no apparent reduction in area recorded from its pre-European extent (&gt;50% pre-European extent exists and subject to little or no degradation over a majority of this area.)</p> <p>The native vegetation to be cleared does not occur within an ESA and no ESAs are located within 10km of the project area.</p>
Significant Flora / Ecological Communities	<p>According to various database searches, there are no records of TECs or, Declared Rare Flora (DRF) located within the proposed clearing area. The following Priority Flora (PF) taxon has been recorded within 40 km of the project site:</p> <ul style="list-style-type: none"> <li>▶ <i>Galium leptogonium</i> (P3).</li> </ul> <p>The following nationally (DSEWPC) protected species and/or their habitat have been identified as potentially occurring within 10 km project area (refer to Appendix C for further information):</p> <ul style="list-style-type: none"> <li>▶ <i>Adenanthos eyrie</i> (threatened).</li> </ul> <p>It is unlikely that <i>A. eyrie</i> will occur in the project area as the species prefers sand dunes on cliffs which is not present in the project area.</p> <p>The following PEC is located approximately 25 km from the project area:</p> <ul style="list-style-type: none"> <li>▶ ‘Priority 1’ ecological community – ‘Subterranean faunal ecosystems of Nullabor caves’.</li> </ul> <p>No significant impacts to any significant flora or ecological communities are expected.</p>
Vegetation – weeds	<p>Weed prevalence within the proposed clearing areas is considered low but standard weed hygiene measures should still be applied in order to limit the risk of any further weed spread (Appendix E). No WoNS or Declared Plants pursuant to the <i>Agriculture and Related Resources Protection Act 1976</i> were identified in or near the project areas during the site visit.</p>



Aspect	Evaluation of Potential Impacts
Vegetation – dieback	Dieback is not considered a potential issue for the project given that the project area receives less than 400 mm of average annual rainfall. (The nearest meteorological station with representative data is Eyre with an average annual rainfall of 307.5 mm.)
Reserves / Conservation areas	<p>The closest DEC managed reserve/conservation area to the project area is the Nuytsland Nature Reserve (approximately 30 km south). Indirect impacts to this Reserve (e.g. breaking of habitat linkages etc.) are considered highly unlikely due to the condition of the surrounding environment. No significant impacts are expected.</p> <p>The Great Western Woodland, a Natural Heritage Place, exists 80 km west of the project area. No impacts as a result of the project are expected on the Great Western Woodland.</p>
Heritage (European)	<p>No potential significant European heritage sites were identified during the site visit nor are any sites listed in the relevant government databases.</p> <p>No significant impacts are expected.</p>
Aboriginal heritage	A search of DIA’s database revealed that there are two sites of Aboriginal heritage significance located within 20 km of the project area (Figure 3, Appendix A). These sites are not within with clearing boundary and are not within 10 km of the project area. No archaeological or ethnographic surveys are, therefore, considered necessary. No significant impacts are expected.
Native Title	Given the fact that works are confined to the road reserve and are relatively minor in nature, no actions in regards to native title are considered necessary.
Surface water/drainage	During the site visit, no drainage or surface run-off patterns were identified. As a result, the project is considered highly unlikely to significantly disturb or interrupt any surface water flows.
Wetlands	No wetlands are located within 10 km of the project area. As a result, no significant impacts to wetlands are expected.
Groundwater	Given that no dewatering or significant drainage modifications are required, no significant changes to the current groundwater level or quality are expected. Any water required for construction purposes is likely to be minimal and will be the responsibility of the contractor delivering the works to obtain.
Noise and vibration	No major sensitive local receivers are present within the immediate vicinity of the project area. The works are not expected to significantly contribute to noise levels at the nearest receivers (Madura township, 32 km west).
Visual amenity	No significant impacts to visual amenity are expected.
Hazardous substances	Not considered relevant to the proposed works.
Contamination	<p>Given the relatively superficial nature of the required earthworks, there appears to be a low risk of any significant contamination issues. No significant impacts are expected.</p> <p>Furthermore, any risk of contamination from site works will be addressed in the environmental management plan (Appendix E).</p>



Aspect	Evaluation of Potential Impacts
Salinity	<p>Although water required for construction activities is likely to come from a brackish to saline groundwater resource, significant impacts are not considered likely given the small amount of water required (&lt;1,000kL), and the proposed areas of application (road surface).</p> <p>The proposed clearing is not considered likely to result in any significant groundwater salinity issues given the fact that the surrounding landscape is not highly cleared.</p>
Acid Sulphate Soils	<p>According to a search of ASRIS, the occurrence of acid sulphate soils is considered to be “extremely low.” Furthermore, no dewatering or excavation below the water table is planned and therefore the risk of exposing or exacerbating acid sulphate soils is considered to be low. No significant impacts are expected.</p>
Environmentally Significant Landforms	<p>No environmentally significant landforms were identified within 10 km of the project areas when carrying out the site visits. The Hampton Tableland exists approximately 2.5 km north of the project area. No significant impacts are expected.</p>
Statutory Land Use Planning / Adjacent Land Use	<p>Expansion of the existing road reserve is not required. No significant impacts to surrounding land uses are expected.</p>



## 5. Clearing of Native Vegetation

Native vegetation for this project will be cleared using Main Roads State-wide Project Purpose Clearing Permit (CPS 818/5). Native vegetation describes all indigenous aquatic and terrestrial vegetation (living or dead). The term does not include vegetation that was intentionally sown, planted or propagated unless it was required under a statutory condition.

### 5.1 Avoiding, Minimising and Reducing the Impact of Clearing

In accordance with Condition 6 of CPS 818/5, the following measures are proposed in an effort to avoid, minimise and reduce the impact of clearing associated with the project:

- ▶ All efforts will be made during clearing activities to avoid any unnecessary impacts to native vegetation (e.g. marking of clearing lines, parking of machinery in already cleared areas etc.).
- ▶ Cleared vegetation will be cut up and respread in redundant cleared area in order to help prevent weed establishment and land degradation as well as to provide habitat and encourage natural regeneration of the redundant areas.

### 5.2 Assessment against the Clearing Principles

In accordance with condition 9 of CPS 818/5, the project has been assessed against the DEC's 10 clearing principles. The assessment has indicated that the project is not likely to be at variance with any of the clearing principles.

**Table 3 Assessment against the 10 clearing principles**

Principle (a)	Native vegetation should not be cleared if it comprises a high level of biological diversity.
Assessment	<p>The proposed clearing area is not be considered to contain a high level of biological diversity given its small size and the extensive areas of native vegetation in very good or better condition that surround the project area. No priority flora were identified in the proposed clearing areas as a result of a desktop assessment of these areas.</p> <p>One flora species of Commonwealth significance was noted to potentially occur within the project area. The proposed clearing will not impact upon this species (refer to Table 2).</p> <p>One PEC was identified approximately 25 km south west of the project area:</p> <ul style="list-style-type: none"> <li>▶ 'Priority 1' ecological community – 'Subterranean faunal ecosystems of Nullabor caves'.</li> </ul> <p>It is unlikely that the proposed clearing will impact upon this PEC.</p>
Conclusion	<i>The proposal is not likely to be at variance with this clearing principle.</i>



<b>Principle (b)</b>	<b>Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</b>
Assessment	Given the relatively small amount of clearing proposed and that the surrounding environment is virtually intact with its original vegetation remaining, no significant impacts to native fauna or its habitat are expected. No active nesting sites were observed in the proposed clearing area when carrying out the site visit.
Conclusion	<i>The proposal is not likely to be at variance with this clearing principle.</i>
<b>Principle (c)</b>	<b>Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</b>
Assessment	No rare flora was identified within the proposed clearing areas as a result of a desktop assessment. The assessment did not identify any records of DRF within 40 km of the proposed clearing areas. It is therefore considered highly unlikely that any rare flora will be impacted by the proposed works.
Conclusion	<i>The proposal is not likely to be at variance with this clearing principle.</i>
<b>Principle (d)</b>	<b>Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community.</b>
Assessment	No TECs were identified as being within 50 km of the project area.
Conclusion	<i>The proposal is not at variance with this clearing principle.</i>
<b>Principle (e)</b>	<b>Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</b>
Assessment	Vegetation within and adjacent to the project area is considered to be of <i>Least Concern</i> , with approximately 100% remaining of the known Vegetation Association in the Hampton IBRA subregion. The project area is not considered to contain fragmented vegetation.  Vegetation within the study area is not considered to contain communities required to maintain ecosystem services (e.g. hydrological processes).
Conclusion	<i>The proposal is not at variance with this clearing principle.</i>
<b>Principle (f)</b>	<b>Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</b>
Assessment	No defined wetlands or water courses are located within the clearing boundaries, nor within 10 km of the project area.  No groundwater dependent ecosystems occur within or adjacent to the project area
Conclusion	<i>The proposal is not at variance with this clearing principle.</i>



<b>Principle (g)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</b>
Assessment	<p>Erosion from wind or water is considered to be low. Much of the surrounding land surface is well vegetated. The clearing of native vegetation is not expected to alter the quality or quantity of water run-off in or adjacent to the project area. Waterlogging and changes to nutrient levels are not expected to be altered by the clearing of vegetation in the project area.</p> <p>The clearing of vegetation is not considered to alter soil acidity in or adjacent to the project area.</p> <p>The clearing of vegetation is not considered to significantly alter the hydrological balance and cause a change in the salinity either on- or off-site.</p>
Conclusion	<i>The proposal is not likely to be at variance with this clearing principle.</i>
<b>Principle (h)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</b>
Assessment	<p>The project area is not adjacent to, or in the vicinity of a conservation reserve or protected area. The closest conservation area is Nuysland Nature Reserve, which is situated approximately 30 km south.</p> <p>The project area occurs in a region where the vegetation extent is of <i>Least Concern</i>. Little fragmentation of vegetation has occurred.</p> <p>The project area occurs in a region where the vegetation has not been significantly altered. The project area does not provide a buffer or outlier to a conservation area. Ecological linkages and corridors are not considered to be significantly altered by any proposed clearing activities in the project area</p>
Conclusion	<i>The proposal is not at variance with this clearing principle.</i>
<b>Principle (i)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</b>
Assessment	<p>The project area does not occur within a proclaimed Public Drink Water Supply Area.</p> <p>The clearing of vegetation is not considered to cause an alteration to the quality of groundwater in or adjacent to the project area.</p> <p>No groundwater dependent ecosystems occur in or adjacent to the project area.</p> <p>The clearing of vegetation is not considered to cause an alteration to the quality of surface waters in or adjacent to the project area.</p>
Conclusion	<i>The proposal is not at variance with this clearing principle.</i>
<b>Principle (j)</b>	<b>Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.</b>
Assessment	No significant change to the hydrology of the area is expected given the climate and topography of the local area, and relatively superficial nature of the works. Natural surface water flow patterns will not be obstructed by the clearing meaning it is highly unlikely that the works will cause or exacerbate the incidence of flooding in the area.
Conclusion	<i>The proposal is not likely to be at variance with this clearing principle.</i>



### **5.3 Project Specific Requirements Relating to CPS 818/5**

The project does include clearing for temporary works. As a result, a revegetation plan is required in accordance with the conditions of CPS 818/5. Appendix F contains the Main Roads Revegetation for Pastoral Areas.

No offsets or management strategies are required given that no variance with any of the ten clearing principles is considered likely to exist.



## 6. Stakeholder consultation

Given the minor nature of the project, no stakeholder consultation is considered necessary.





## 7. Environmental Management Plan

An Environmental Management Plan (EMP) has been developed for the project (Appendix E) taking into account the assessments carried out above. The main aim of this EMP is to provide a management plan to assist in minimising the environmental impacts of the activities associated with the proposed works and to identify who is responsible for the implementation of any subsequent management strategies. This EMP is predominantly for the Main Roads Project Manager's reference and provides basic requirements for any Contractor produced EMP (subject to any conditions outlined in the actual Contract). It may, however, be used to complement the contractor's EMP.

The EMP will only address site-specific issues that were identified during the PEIA. The areas that require special management will be addressed in terms of:

- ▶ the timing of various management actions;
- ▶ the topic (e.g. vegetation);
- ▶ the objectives for each area;
- ▶ the actions that are necessary to minimise the impact;
- ▶ the responsible party for implementing the action; and
- ▶ whether the action arose from external advice or is a Main Roads requirement.



## 8. Monitoring

No environmental monitoring is considered necessary given the small scale of the project.



## 9. Auditing

Audits against the EMP may be carried out depending on regional priorities and perceived risk. On-ground checking post-construction will be carried out as a minimum by the Main Roads Goldfields-Esperance Region Environment Officer.



## 10. Decision to Refer

Given the small scale of the project, the low significance of its impacts to the surrounding environment, and the environmental management measures proposed, it is recommended that the project does not require referral to the EPA. It is also recommended that the project does not require referral to the DSEWPC as no items of national environmental significance were identified as likely to be significantly impacted by the proposed works.



## 11. Report limitations

This report presents the results of a field visit and desktop assessment findings, prepared for the purpose of this commission. The data and advice provided herein relate only to the project described herein and must be reviewed by a competent scientist before being used for any other purpose. GHD accepts no responsibility for other use of the data.

Where reports, searches, any third party information and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with GHD.

For these investigations GHD has conducted desktop data searches and a field survey. The conclusions of this report were based on the information gathered during these investigations and thus reflect the environment of the project area at the time of survey. GHD accepts no responsibility for any variation in the flora present in the project area due to natural and seasonal variability.



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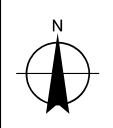
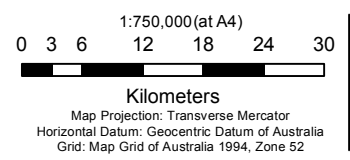
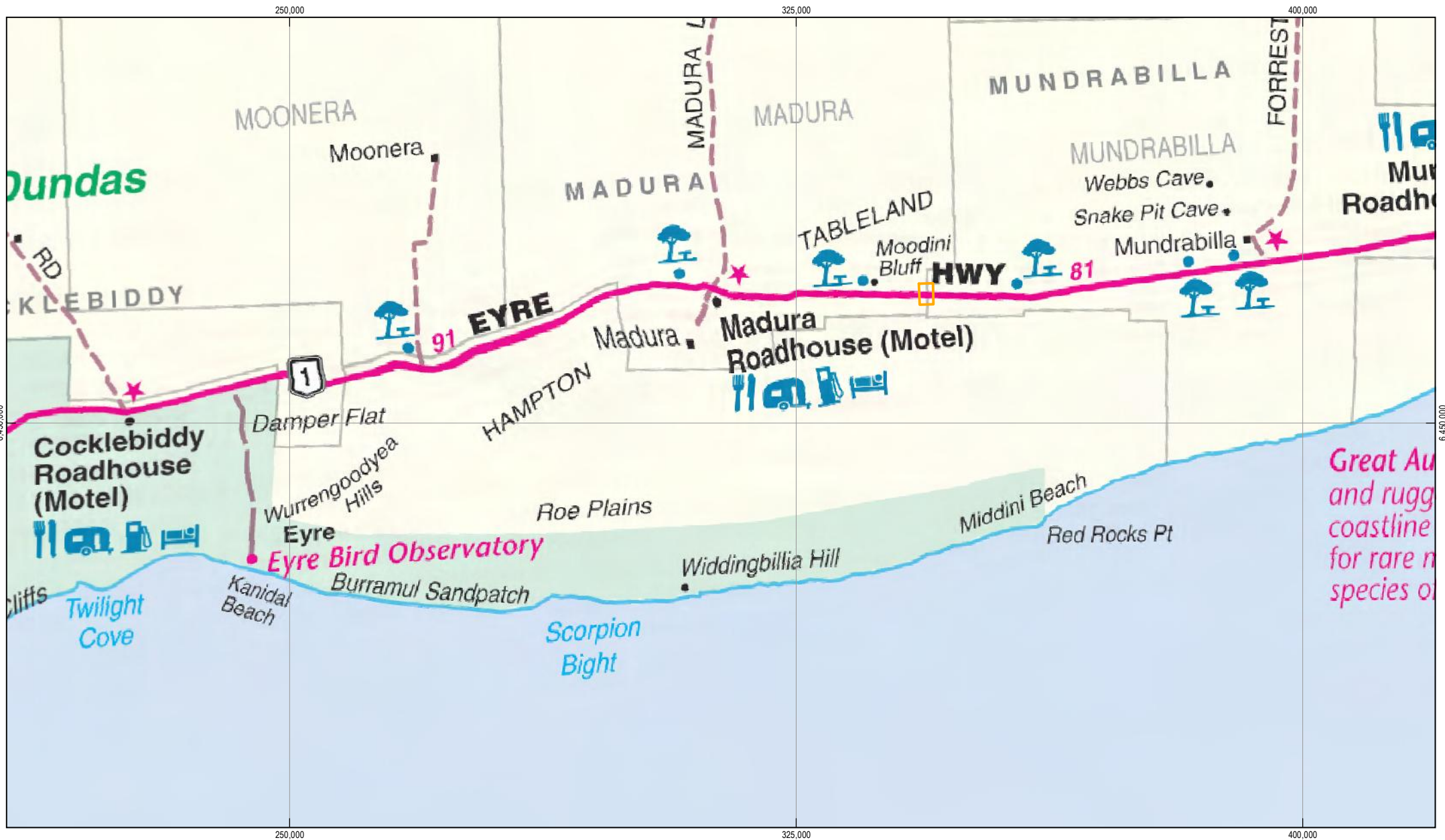
## Appendix A

# Figures

Figure 1 – Project Location

Figure 2 – Site Layout/ Clearing Boundaries

Figure 3 – Environmental Constraints



LEGEND  
 Cattle Grid Location



Main Roads Western Australia  
 Madura Cattle Grid  
 Replacemen PEIA and EMP

Job Number 61-26802-00  
 Revision A  
 Date 17 APR 2011

Project Location

Figure 1

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 Data source: Landgate: Travellers Atlas 2004; GHD study area mga51 20110408. Created by: CSkalski  
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Eyre Highway at 359.3 SLK  
 Cattle Grid Replacement Sidetrack

Scale 1,500 @ A3

LEGEND	
	Indicative Clearing Area (1.25ha)



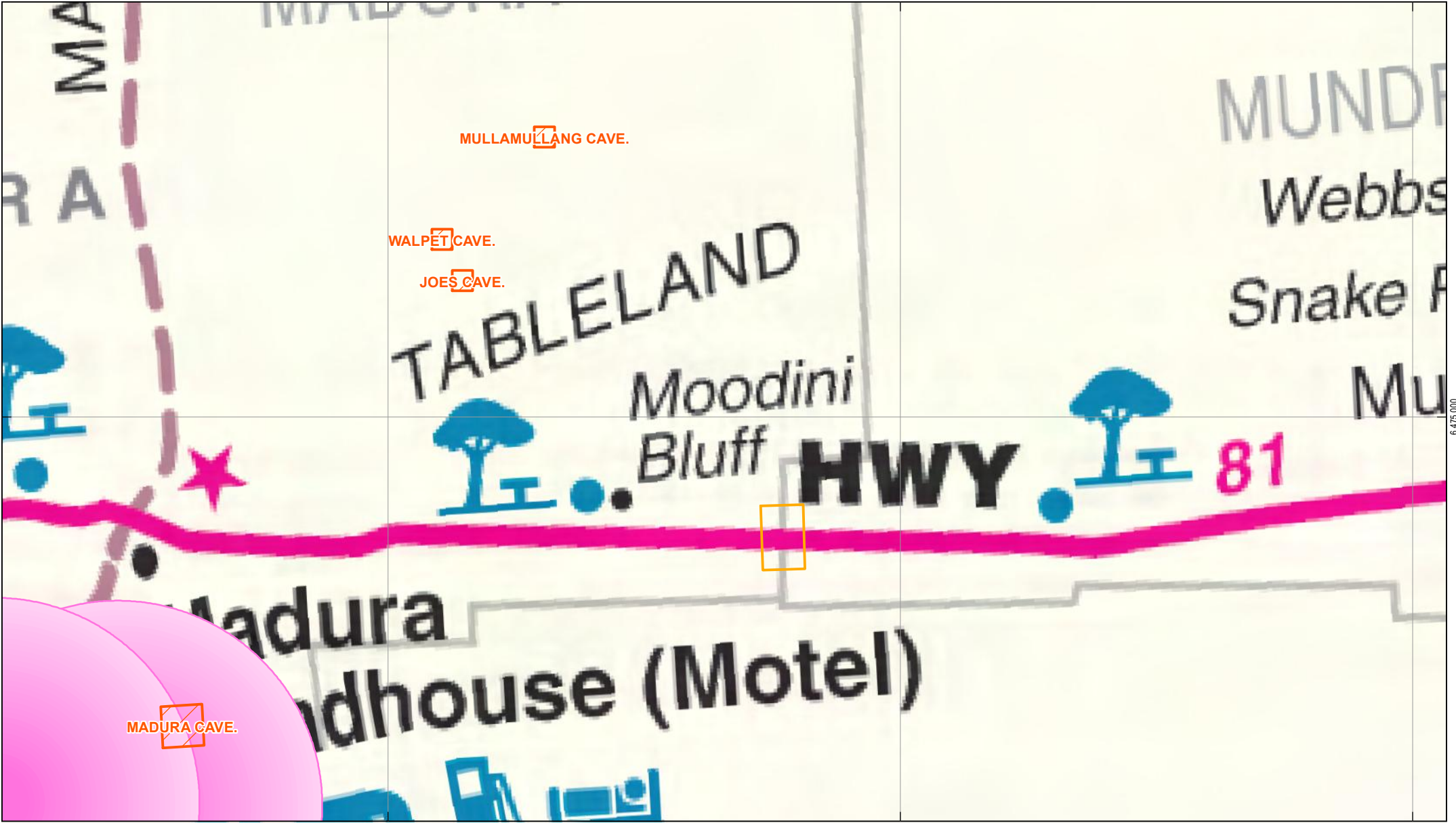
325,000

350,000

375,000

6,475,000

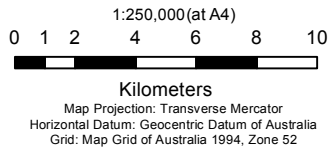
6,475,000





325,000


350,000

375,000



LEGEND

-  Cattle Grid Location
-  Aboriginal Heritage Site

- Priority Ecological Communities
-  P1- Priority Ecological Communities



Main Roads Western Australia  
Madura Cattle Grid  
Replacemen PEIA and EMP

Job Number | 61-26802-00  
Revision | A  
Date | 08 APR 2011

Environmental Constraints

Figure 3

C:\61\2680200\GIS\Maps\MXD\61-2680200-G002.mxd

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Data source: Landgate: Travellers Atlas 2004; GHD study area mga51 20110408. DEC: Madura GHD TecPecSearch Results 11042011 DIA: Aboriginal heritage clip 20110412 Created by: CSKalski

239 Adelaide Terrace Perth WA 6004 Australia T 61 8 6222 8222 F 61 8 6222 8555 E permail@ghd.com.au W www.ghd.com.au



Appendix B

# Low Impact Environmental Screening Checklist

**Checklist - Low Impact Screening Checklist**

The Low Impact Screening Checklist is part of the environmental assessment and approval process, refer to in Figure 2 in the Main Roads environmental guideline Environment Assessment and Approvals. It should be noted that the checklist does not address Aboriginal heritage issues. Please refer to Main Roads guideline *Aboriginal Heritage* for the heritage assessment process.

All projects are to be screened to identify those that are Low Impact.

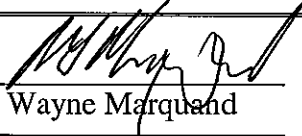
Projects that have "No" to **all** items are classed as Low Impact and should be implemented using standard contract clauses in the Tender Document Process.

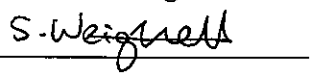
Projects that have "Yes" to **any** item will require further environmental assessment and will be implemented using an Environmental Management Plan.

Tick "Yes" or "No" for every item.

**Project Name** Remove and install new Grid Eyre Highway Slk:559.30

ITEM NO.	ITEM	Y	N
1	New road or road reserve to be created or expansion of existing road reserve.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Works require clearing of native vegetation outside the maintenance zone.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Works require clearing of native vegetation that is older than 10 years old within the maintenance zone.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Works to occur outside normal working hours.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Passes over, adjoins or drains directly into a wetland or sensitive watercourse.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Local natural drainage regime / hydrology will be changed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Dewatering, or a new water bore required.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Known potential source of hazardous materials within or adjoining project area. e.g. Acid Sulphate Soils, existing petrol station, industrial site or waste disposal site (landfill)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Buildings will require demolition.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Completed By: *Signature*  *Date* 16<sup>th</sup> March 2011  
*Name* Wayne Marquand *Title* A/Contract Manager-TNC

To be reviewed by a Main Roads Environment Officer *Signature*  *Date* 21/3/11  
*Name* SIMON WEIGHELL *Title* ENVIRONMENT OFFICER

Comments: Project requires a two way sidetrack to be installed on LHS of road between shoulder hinge point and fence line.

Removal of existing Grid and supply and install new pre-cased Grid.

All waste material will be carted back to Norseman rubbish tip and sidetrack rehab back to Main Roads specification. Works to be completed by May 2011

*PEIA & EMP Required*



## Appendix C

# Government Agency Managed Databases Search Results



Department of Environment and Conservation - Native Vegetation - Windows Internet Explorer

http://maps.dec.wa.gov.au/delve/hv/index.jsp

Department of Environment and Conservation - Native Vegetation Map Viewer

Planning and Cadastre  
Environment  
Inland Waters  
Boundaries  
Location  
Economy  
Transportation  
Society

Project Area

Welcome Search Metadata Help

Welcome  
Welcome to the Native Vegetation Map Viewer. This site helps you to identify the following:

- The location of environmentally sensitive areas, as declared by a Notice under section 51B of the Environmental Protection Act 1986.
- Areas where low impact mineral and petroleum activities can NOT occur, as defined under Schedule 1 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004.

Click on the links below for more information on:

- [Environmentally Sensitive Areas](#)
- [Low Impact Mineral and Petroleum Activities](#)
- [Native Vegetation Disclaimer](#)

Click [here](#) for a quick tutorial on using the Native Vegetation Protection map viewer.

UTM 52S 343,834 East 6,468,123 North  
0 20km 1:108,882  
Coords: 127.34834 East 31.91205 South

Policy & Legislation | Clearing Permits & Public Reports  
DEC Home | Copyright | Disclaimer

Internet 100%



## Search Criteria

2 sites in a search box. The box is formed by these diagonally opposed corner points:

GDA94	
Latitude	Longitude
-31° 44' 3"	127° 8' 30"
-32° 5' 23"	127° 34' 52"



## Disclaimer

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

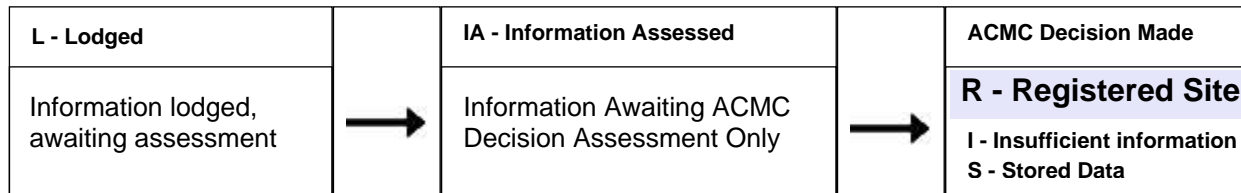
## Copyright

Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Aboriginal Sites established and maintained under the Aboriginal Heritage Act 1972 (AHA).

## Legend

Restriction	Access	Coordinate Accuracy
<b>N</b> No restriction	<b>C</b> Closed	Accuracy is shown as a code in brackets following the site coordinates.
<b>M</b> Male access only	<b>O</b> Open	<b>[Reliable]</b> The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
<b>F</b> Female access	<b>V</b> Vulnerable	<b>[Unreliable]</b> The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

## Status



### \*Explanation of Assessment

Sites lodged with the Department are assessed under the direction of the Registrar of Aboriginal Sites. These are not the final assessment.

Final assessment and decisions will be determined by the Aboriginal Cultural Material Committee (ACMC).

## Spatial Accuracy

Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

## Sites Shown on Maps

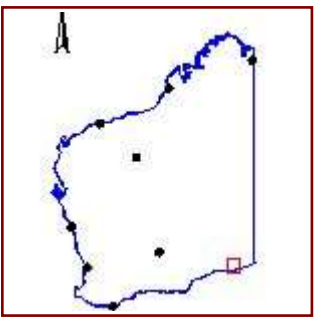
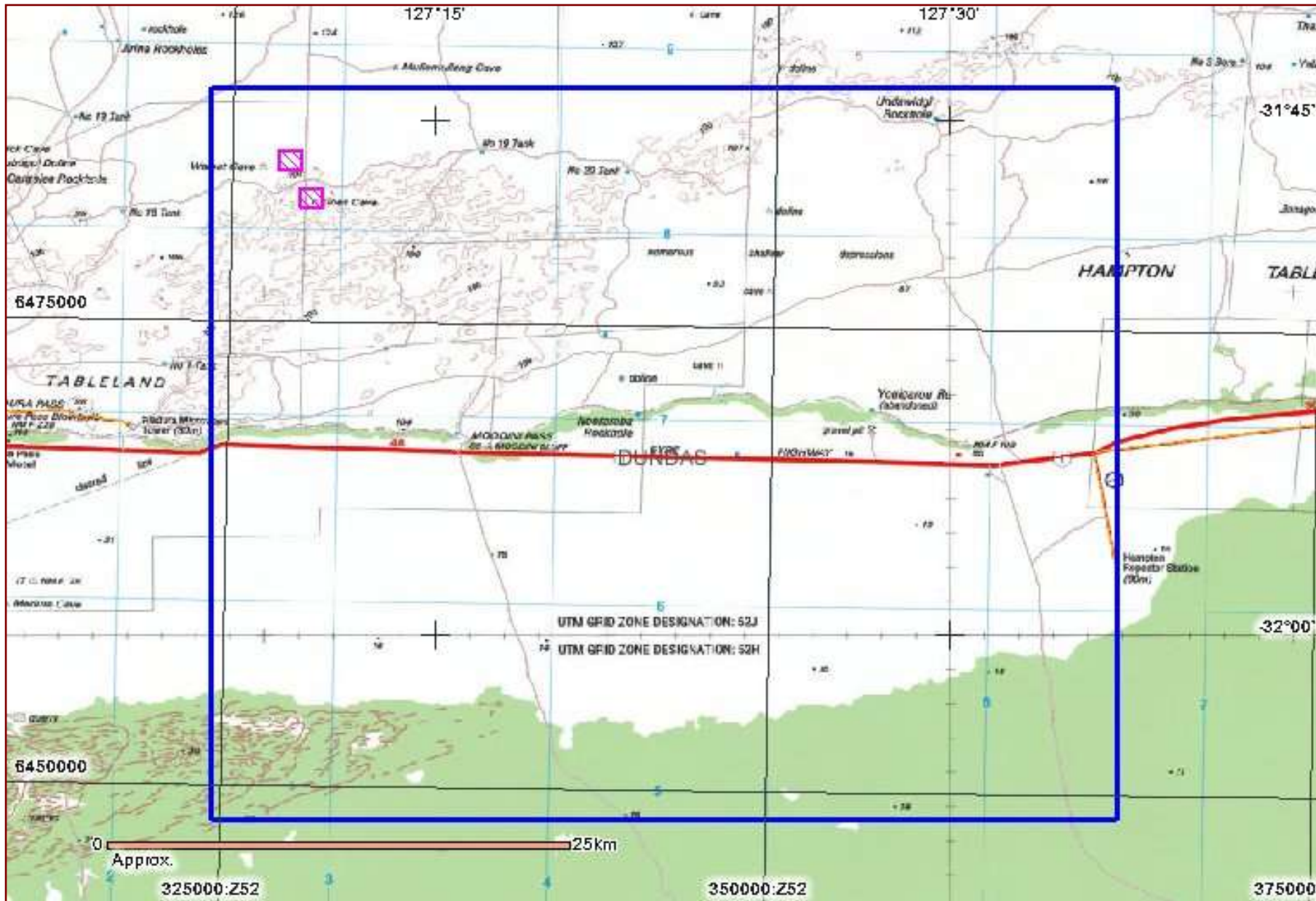
Site boundaries may not appear on maps at low zoom levels









## List of 2 Registered Aboriginal Sites with Map

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
2002	R	O	N	Walpet Cave.	Artefacts / Scatter	Archeological Deposit, Rockshelter		327633mE 6483665mN Zone 52 [Unreliable]	W01197
2003	R	O	N	Joes Cave.	Artefacts / Scatter	Archeological Deposit, Rockshelter		328633mE 6481664mN Zone 52 [Unreliable]	W01198



### Legend

**Selected Heritage Sites**

-  Registered Sites
-  Town
-  Map Area
-  Search Area

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Cadastre, Local Government Authority, Native Title boundary data copyright © Western Australian Land Information Authority trading as Landgate (2011).

Geothermal Application, Geothermal Title, Mining Tenement, Petroleum Application, Petroleum Title boundary data copyright © the State of Western Australia (DMP) (2011.4).

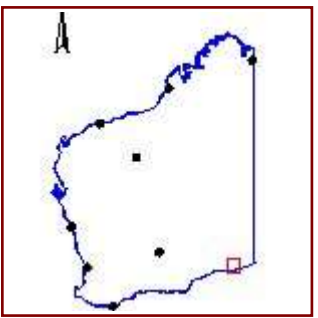
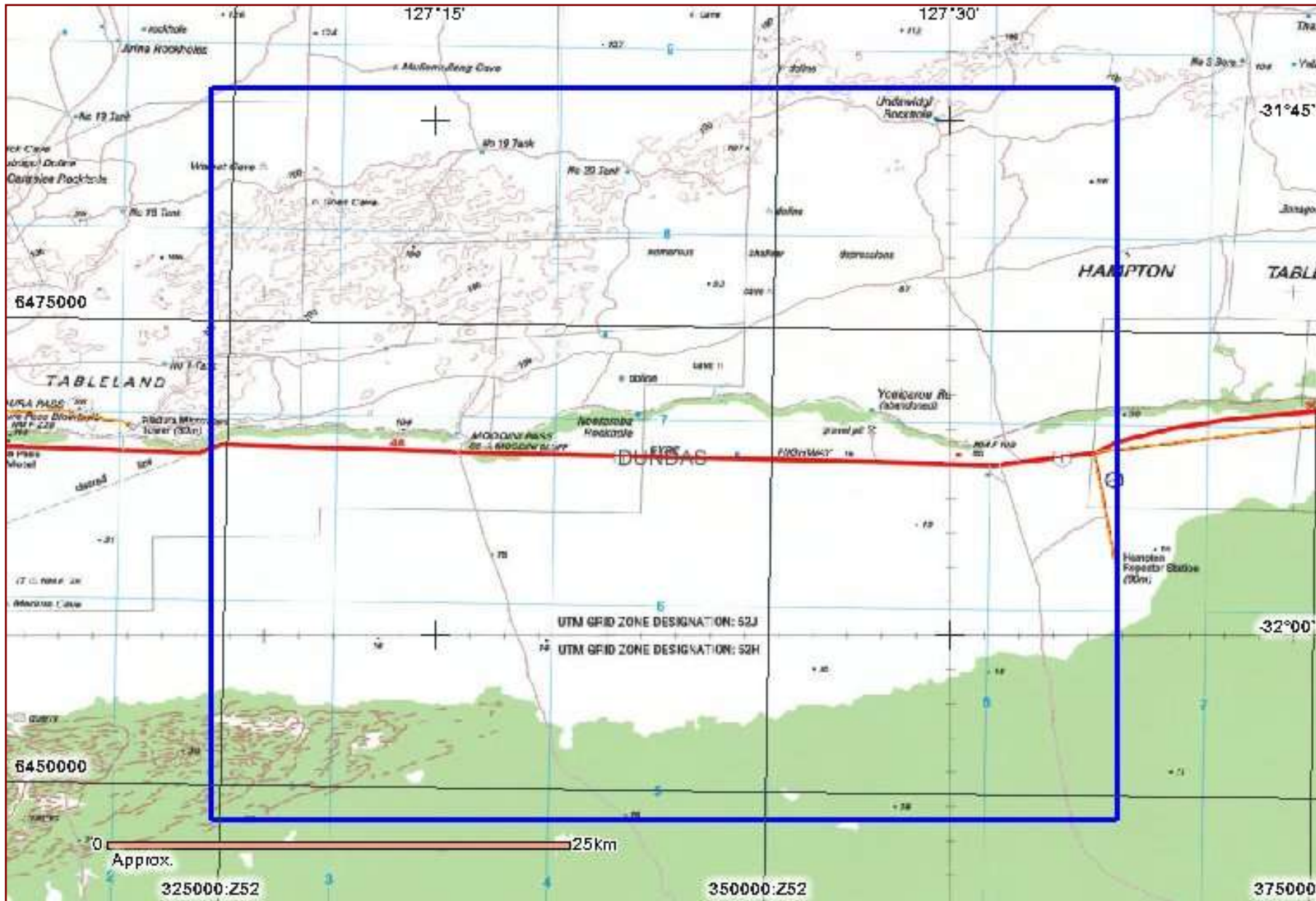
For further important information on using this information please see the Department of Indigenous Affairs' Terms of Use statement at <http://www.dia.wa.gov.au/Terms-Of-Use/>



---

## List of Other Heritage Places with Map

**No results**



### Legend

- Selected Heritage Sites
- Other Heritage Places
- Town
- Map Area
- Search Area

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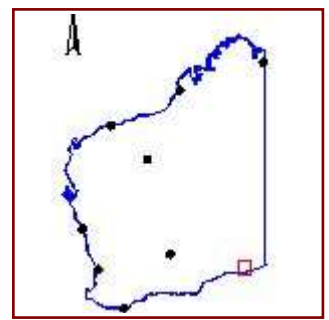
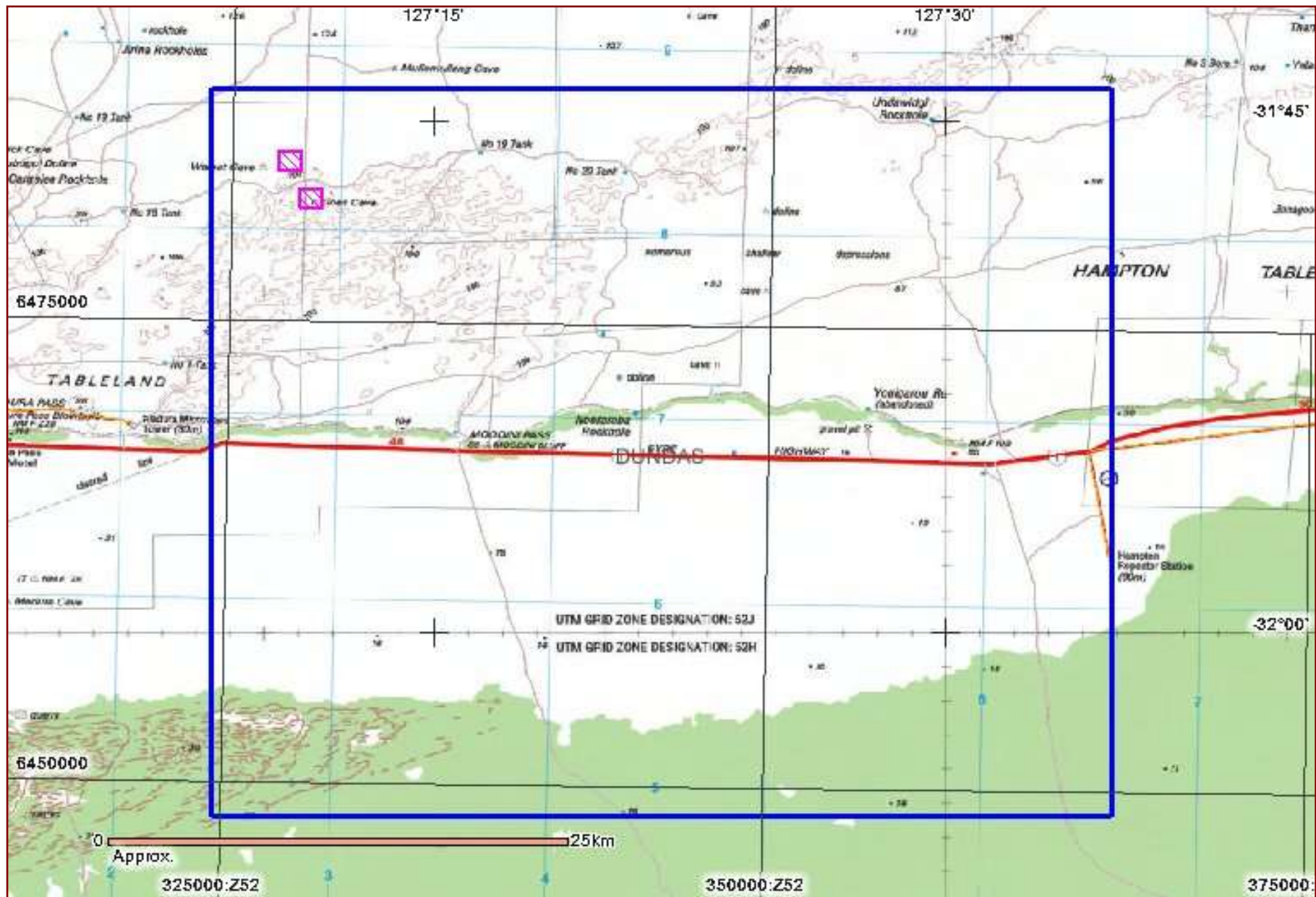
Geothermal Application, Geothermal Title, Mining Tenement, Petroleum Application, Petroleum Title boundary data copyright © the State of Western Australia (DMP) (2011.4).

For further important information on using this information please see the Department of Indigenous Affairs' Terms of Use statement at <http://www.dia.wa.gov.au/Terms-Of-Use/>



## Map Showing Registered Aboriginal Sites and Other Heritage Places





### Legend

- Registered Sites
- Other Heritage Places
- Town
- Map Area
- Search Area

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Cadastre, Local Government Authority, Native Title boundary data copyright © Western Australian Land Information Authority trading as Landgate (2011).

Geothermal Application, Geothermal Title, Mining Tenement, Petroleum Application, Petroleum Title boundary data copyright © the State of Western Australia (DMP) (2011.4).

For further important information on using this information please see the Department of Indigenous Affairs' Terms of Use statement at <http://www.dia.wa.gov.au/Terms-Of-Use/>



# EPBC Act Protected Matters Report: Coordinates

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

**Report created: 08/04/11 13:47:47**

## [Summary](#)

## [Details](#)

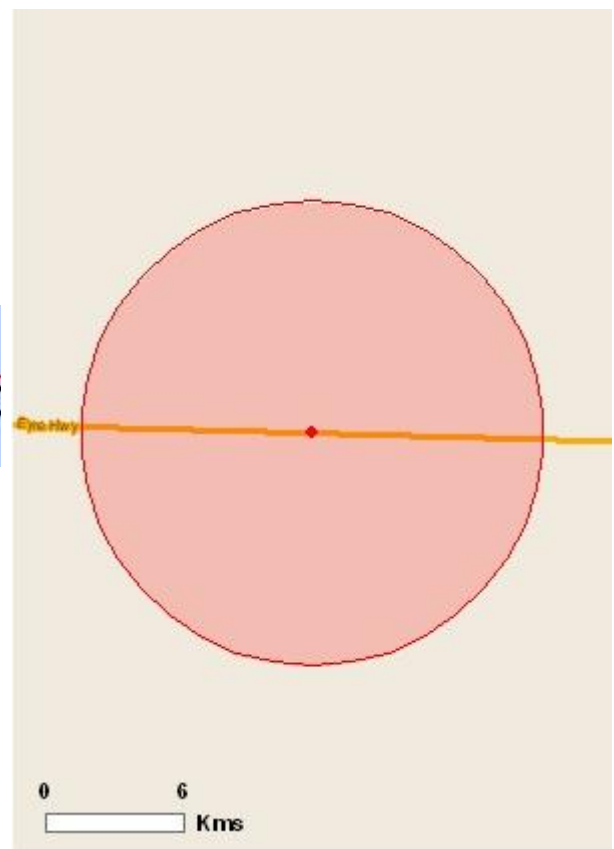
[Matters of NES](#)

[Other matters protected by the EPBC Act](#)

[Extra Information](#)

## [Caveat](#)

## [Acknowledgements](#)



This map may contain data which are  
©Commonwealth of Australia (Geoscience  
Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 10Km

# Summary

## Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	1
<a href="#">Wetlands of International Significance (Ramsar Wetlands):</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Areas:</a>	None
<a href="#">Threatened Ecological Communities:</a>	None
<a href="#">Threatened Species:</a>	4
<a href="#">Migratory Species:</a>	8

## Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

<a href="#">Commonwealth Lands:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	5



<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves:</a>	None

## Report Summary for Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

<a href="#">Place on the RNE:</a>	None
<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	5
<a href="#">Nationally Important Wetlands:</a>	None

## Details

### Matters of National Environmental Significance

#### National Heritage Places [\[ Resource Information \]](#)

Name	Status
<b>Natural</b>	
<a href="#">Great Western Woodlands of Western</a>	Nominated place

#### Threatened Species [\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>BIRDS</b>		
<a href="#">Acanthiza iredalei iredalei</a>		
Slender-billed Thornbill (western) [25967]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Leipoa ocellata</a>		
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area

#### MAMMALS

<a href="#">Dasyercus cristicauda</a>		
Mulgara [328]	Vulnerable	Species or species habitat likely to occur within area

#### PLANTS

<a href="#">Adenanthos eyrei</a>		
Toolinna Adenanthos [7763]	Endangered	Species or species habitat may occur within area

#### Migratory Species [\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Ardea alba</a>		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a>		
Cattle Egret [59542]		Species or species habitat may occur within area

#### Migratory Terrestrial Species

[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle [943]

Species or species habitat likely to occur within area

[Leipoa ocellata](#)

Malleefowl [934]

Vulnerable

Species or species habitat likely to occur within area

[Merops ornatus](#)

Rainbow Bee-eater [670]

Species or species habitat may occur within area

**Migratory Wetlands Species**

[Ardea alba](#)

Great Egret, White Egret [59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Charadrius veredus](#)

Oriental Plover, Oriental Dotterel [882]

Species or species habitat may occur within area

**Other Matters Protected by the EPBC Act**

**Listed Marine Species**

**[ Resource Information ]**

Name

Status

Type of Presence

**Birds**

[Ardea alba](#)

Great Egret, White Egret [59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Charadrius veredus](#)

Oriental Plover, Oriental Dotterel [882]

Species or species habitat may occur within area

[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle [943]

Species or species habitat likely to occur within area

[Merops ornatus](#)

Rainbow Bee-eater [670]

Species or species habitat may occur within area

**Extra Information**

**Invasive Species**

**[ Resource Information ]**

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name

Status

Type of Presence

**Mammals**

[Felis catus](#)

Cat, House Cat, Domestic Cat [19]

Species or species habitat likely to occur within area

[Oryctolagus cuniculus](#)

Rabbit, European Rabbit [128]

Species or species habitat likely to occur within area

[Vulpes vulpes](#)

Red Fox, Fox [18]

Species or species habitat may occur within area

## Plants

[Carrichtera annua](#)

Ward's Weed [9511]

Species or species habitat likely to occur within area

[Lycium ferocissimum](#)

African Boxthorn, Boxthorn  
[19235]

Species or species habitat may occur within area

## Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

## Coordinates

127.32416 -31.91196

# Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Department of Environment, Climate Change and Water, New South Wales](#)
- [-Department of Sustainability and Environment, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- Other groups and individuals

Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Last updated: Thursday, 16-Sep-2010 09:13:25 EST

[Department of Sustainability, Environment, Water, Population and Communities](#)

GPO Box 787

Canberra ACT 2601 Australia

+61 2 6274 1111 [ABN](#)

| [Australian Government](#) |

# NatureMap Species Report

Created By Guest user on 08/04/2011

Method 'By Circle'

Centre 127°21' 14" E,31°54' 14" S

Buffer 40km

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	3213 <i>Acacia anceps</i>			
2.	3262 <i>Acacia cochlearis</i> (Rigid Wattle)			
3.	12672 <i>Acacia cupularis</i>			
4.	3440 <i>Acacia merrallii</i>			
5.	3473 <i>Acacia oswaldii</i> (Miljee)			
6.	3481 <i>Acacia papyrocarpa</i> (Western Myall)			
7.	12272 <i>Acacia verrucula</i>			
8.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
9.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill (Inland Thornbill))			
10.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
11.	24263 <i>Acanthiza iredalei</i> subsp. <i>iredalei</i>			
12.	-1576 <i>Actitis hypoleucos</i>			
13.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
14.	24860 <i>Amphibolurus norrisi</i>			
15.	2378 <i>Amyema melaleucae</i>			
16.	2380 <i>Amyema miquelii</i> (Stalked Mistletoe)			
17.	2383 <i>Amyema preissii</i> (Wireleaf Mistletoe)			
18.	24312 <i>Anas gracilis</i> (Grey Teal)			
19.	-6162 <i>Angianthus</i> sp.			
20.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
21.	-1612 <i>Anthus novaeseelandiae</i>			
22.	25528 <i>Aphelocephala leucopsis</i> (Southern Whiteface)			
23.	24988 <i>Aprasia inaurita</i>			
24.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
25.	2992 <i>Arabidella trisecta</i>			
26.	-1578 <i>Ardea modesta</i>			
27.	24610 <i>Ardeotis australis</i> (Australian Bustard)		P4	
28.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
29.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
30.	64 <i>Asplenium trichomanes</i> (Maidenhair Spleenwort)			
31.	2452 <i>Atriplex cinerea</i> (Grey Saltbush)			
32.	11516 <i>Atriplex nummularia</i> subsp. <i>spatulata</i> (Old Man Saltbush)			
33.	2481 <i>Atriplex vesicaria</i> (Bladder Saltbush)			
34.	17950 <i>Austrodanthonia caespitosa</i>			
35.	17236 <i>Austrostipa drummondii</i>			
36.	17246 <i>Austrostipa nitida</i>			
37.	17247 <i>Austrostipa platychaeta</i>			
38.	32315 <i>Barbula calycina</i>			
39.	-1633 <i>Barnardius zonarius</i>			
40.	24161 <i>Bettongia lesueur</i> subsp. <i>graii</i> (Burrowing Bettong, Boodie)			
41.	24722 <i>Cacatua leadbeateri</i> (Major Mitchell's Cockatoo)		S	
42.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
43.	3002 <i>Cakile maritima</i> (Sea Rocket)	Y		
44.	24269 <i>Calamanthus campestris</i> (Rufous Fieldwren)			
45.	-1607 <i>Calamanthus cautus</i>			
46.	3008 <i>Carrichtera annua</i> (Ward's Weed)	Y		
47.	2953 <i>Cassytha melantha</i> (Large Dodder-laurel)			
48.	32462 <i>Ceratodon purpureus</i> subsp. <i>convolutus</i>			
49.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
50.	-1624 <i>Chalcites basalis</i>			
51.	-1581 <i>Chalcites lucidus</i>			
52.	-1615 <i>Chalcites osculans</i>			
53.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
54.	24187 <i>Chalinolobus morio</i> (Chocolate Wattled Bat)			
55.	25573 <i>Charadrius bicinctus</i> (Double-banded Plover)			
56.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
57.	25233 <i>Christinus alexanderi</i>			
58.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
59.	-1637 <i>Chroicocephalus novaehollandiae</i>			
60.	24833 <i>Cincloramphus cruralis</i> (Brown Songlark)			
61.	-1620 <i>Cinclosoma castanotum</i>			
62.	30956 <i>Cinclosoma castanotus</i> (Chestnut Quail-thrush)			
63.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
64.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
65.	26677 <i>Codium mamillosum</i>			
66.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
67.	24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike)			
68.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
69.	29624 <i>Corunastylis tepperi</i>			
70.	24416 <i>Corvus bennetti</i> (Little Crow)			
71.	25592 <i>Corvus coronoides</i> (Australian Raven)			
72.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i>			
73.	-1666 <i>Corvus</i> sp.			
74.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
75.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
76.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
77.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
78.	7949 <i>Cratystylis conocephala</i> (Greybush)			
79.	32341 <i>Crossidium davidai</i>			
80.	30893 <i>Cryptoblepharus buchananii</i>			
81.	30888 <i>Cryptoblepharus pulcher</i> subsp. <i>clarus</i>			
82.	24878 <i>Ctenophorus maculatus</i> subsp. <i>dualis</i>			
83.	24884 <i>Ctenophorus pictus</i> (Painted Dragon)			
84.	30823 <i>Ctenotus euclae</i>			
85.	25052 <i>Ctenotus leonhardii</i>			
86.	25074 <i>Ctenotus schomburgkii</i>			
87.	24435 <i>Cuculus pallidus</i> (Pallid Cuckoo)			
88.	25091 <i>Cyclodomorphus melanops</i> subsp. <i>siticulosus</i>			
89.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella )			
90.	24089 <i>Dasycercus cristicauda</i> (Crest-tailed Mulgara)		T	
91.	25247 <i>Demansia psammophis</i> subsp. <i>psammophis</i>			
92.	11636 <i>Dianella revoluta</i> var. <i>divaricata</i>			
93.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
94.	32345 <i>Didymodon australasiae</i>			
95.	32346 <i>Didymodon torquatus</i>			
96.	4753 <i>Dodonaea amblyophylla</i>			
97.	4780 <i>Dodonaea stenozyga</i>			
98.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
99.	25300 <i>Drysdalia mastersii</i> (Master's Snake)			
100.	25104 <i>Egernia richardi</i>			
101.	-1577 <i>Egretta novaehollandiae</i>			
102.	-1647 <i>Egretta sacra</i>			
103.	-1569 <i>Eolophus roseicapillus</i>			
104.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
105.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
106.	7180 <i>Eremophila altemifolia</i> (Poverty Bush)			
107.	7198 <i>Eremophila deserti</i>			
108.	7283 <i>Eremophila weldii</i>			
109.	2514 <i>Eriochiton sclerolaenoides</i> (Woolly Bindii)			
110.	14377 <i>Erymophyllum ramosum</i> subsp. <i>ramosum</i>			
111.	10757 <i>Eucalyptus brachycalyx</i> (Gilja)			
112.	5576 <i>Eucalyptus calcareana</i> (Nundroo Mallee)			
113.	5624 <i>Eucalyptus discreta</i>			
114.	17728 <i>Eucalyptus diversifolia</i> subsp. <i>hesperia</i>			
115.	5662 <i>Eucalyptus gracilis</i> (Yorrell)			
116.	5726 <i>Eucalyptus oleosa</i> (Giant Mallee)			
117.	5764 <i>Eucalyptus rugosa</i> (Kingscote Mallee)			
118.	5801 <i>Eucalyptus yalatensis</i> (Yalata Mallee)			
119.	24368 <i>Eurostopus argus</i> (Spotted Nightjar)			
120.	25621 <i>Falco berigora</i> (Brown Falcon)			
121.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
122.	25623 <i>Falco longipennis</i> (Australian Hobby)			
123.	11672 <i>Frankenia sessilis</i> var. <i>sessilis</i>			
124.	25727 <i>Fulica atra</i> (Eurasian Coot)			
125.	34216 <i>Galium leptogonium</i>		P3	
126.	24959 <i>Gehyra variegata</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
127.	4481 <i>Geijera linearifolia</i> (Oilbush)			
128.	32381 <i>Gemmabryum preissianum</i>			
129.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
130.	24735 <i>Glossopsitta porphyrocephala</i> (Purple-crowned Lorikeet)			
131.	7535 <i>Goodenia pinnatifida</i> (Cutleaf Goodenia)			
132.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
133.	32386 <i>Grimmia laevigata</i>			
134.	32473 <i>Grimmia pulvinata</i> var. <i>africana</i>			
135.	2802 <i>Gunniopsis calcarea</i>			
136.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
137.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
138.	2187 <i>Hakea nitida</i> (Frog Hakea)			
139.	6684 <i>Halgania andromedifolia</i>			
140.	24295 <i>Haliastur spheurnus</i> (Whistling Kite)			
141.	25114 <i>Hemiergis initialis</i> subsp. <i>brookeri</i>			
142.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
143.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
144.	-1642 <i>Hydroprogne caspia</i>			
145.	24125 <i>Lagorchestes hirsutus</i> subsp. <i>hirsutus</i> (Rufous Hare-wallaby)			
146.	24128 <i>Lagostrophus fasciatus</i> subsp. <i>fasciatus</i> (Bernier Is. Banded Hare-wallaby)		T	
147.	-1641 <i>Lalage sueurii</i>			
148.	25638 <i>Larus pacificus</i> (Pacific Gull)			
149.	24557 <i>Leipoa ocellata</i> (Malleefowl)		T	
150.	34821 <i>Lepidosperma</i> sp. A2 Inland Flat (G.J. Keighery 7000)			
151.	24218 <i>Leporillus apicalis</i> (Lesser Stick-nest Rat)		X	
152.	24219 <i>Leporillus conditor</i> (Greater Stick-nest Rat)		T	
153.	25124 <i>Lerista baynesi</i>			
154.	25131 <i>Lerista distinguenda</i>			
155.	25132 <i>Lerista dorsalis</i>			
156.	24573 <i>Lichenostomus cratitius</i> (Purple-gaped Honeyeater)			
157.	25659 <i>Lichenostomus leucotis</i> (White-eared Honeyeater)			
158.	24576 <i>Lichenostomus leucotis</i> subsp. <i>novaenoriae</i>			
159.	24577 <i>Lichenostomus ornatus</i> (Yellow-plumed Honeyeater)			
160.	24581 <i>Lichenostomus virescens</i> (Singing Honeyeater)			
161.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
162.	-1635 <i>Lophochroa leadbeateri</i>			
163.	36375 <i>Lysimachia arvensis</i> (Pimpernel)	Y		
164.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte)		T	
165.	2542 <i>Maireana erioclada</i>			
166.	2568 <i>Maireana trichoptera</i> (Downy Bluebush)			
167.	2570 <i>Maireana turbinata</i>			
168.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
169.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
170.	24551 <i>Malurus pulcherrimus</i> (Blue-breasted Fairy-wren)			
171.	31351 <i>Malva preissiana</i>			
172.	4962 <i>Malvastrum americanum</i> (Spiked Malvastrum)	Y		
173.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
174.	5922 <i>Melaleuca lanceolata</i> (Rottnest Teatree)			
175.	-1570 <i>Melanodryas cucullata</i>			
176.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
177.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
178.	25184 <i>Menetia greyii</i>			
179.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
180.	2813 <i>Mesembryanthemum crystallinum</i> (Iceplant)	Y		
181.	25693 <i>Microeca fascians</i> (Jacky Winter)			
182.	3055 <i>Microlepidium pilosulum</i> (Hairy Shepherds Purse)			
183.	8107 <i>Minuria cunninghamii</i> (Bush Minuria)			
184.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)		S	
185.	25188 <i>Morethia adelaidensis</i>			
186.	25190 <i>Morethia butleri</i>			
187.	25192 <i>Morethia obscura</i>			
188.	-1595 <i>Morus serrator</i>			
189.	2412 <i>Muehlenbeckia adpressa</i> (Climbing Lignum)			
190.	24223 <i>Mus musculus</i> (House Mouse)	Y		
191.	7291 <i>Myoporum insulare</i> (Blueberry Tree)			
192.	30941 <i>Nephrurus milii</i> (Barking Gecko)			
193.	6975 <i>Nicotiana goodspeedii</i>			
194.	4366 <i>Nitraria billardierei</i> (Nitre Bush)			
195.	-1608 <i>Northiella haematogaster</i>			
196.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
197.	24196 <i>Nyctophilus timoriensis</i> subsp. <i>timoriensis</i> (Greater Long-eared Bat)			
198.	15450 <i>Olearia dampieri</i> subsp. <i>eremicola</i>			
199.	8140 <i>Olearia muelleri</i> (Goldfields Daisy)			
200.	8146 <i>Olearia ramosissima</i> (Much-branched Daisy Bush)			
201.	6723 <i>Omphalolappula concava</i> (Burr Stickseed)			
202.	24137 <i>Onychogalea lunata</i> (Crescent Naitail Wallaby, Wurrung)		X	
203.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
204.	25679 <i>Pachycephala pectoralis</i> (Golden Whistler)			
205.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
206.	25257 <i>Parasuta spectabilis</i> subsp. <i>nullarbor</i>			
207.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
208.	24626 <i>Pardalotus punctatus</i> subsp. <i>xanthopyge</i> (Yellow-rumped Pardalote)			
209.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
210.	24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i>			
211.	1762 <i>Parietaria debilis</i> (Pellitory)			
212.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
213.	-1640 <i>Petrochelidon nigricans</i>			
214.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
215.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
216.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
217.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
218.	24098 <i>Phascogale calura</i> (Red-tailed Phascogale)		T	
219.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
220.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
221.	8180 <i>Podolepis rugata</i> (Pleated Podolepis)			
222.	24909 <i>Pogona nullarbor</i> (Nullarbor Bearded Dragon)			
223.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
224.	4815 <i>Pomaderris forrestiana</i>			
225.	24683 <i>Pomatostomus superciliosus</i> (White-browed Babbler)			
226.	-1655 <i>Psephotus varius</i>			
227.	25201 <i>Pseudemoia baudini</i>			
228.	36137 <i>Pseudocrossidium crinitum</i>			
229.	24236 <i>Pseudomys fieldi</i> (Shark Bay Mouse)		T	
230.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
231.	28000 <i>Psora decipiens</i>			
232.	1688 <i>Pterostylis mitchellii</i> (Mitchell's Greenhood)			
233.	1689 <i>Pterostylis mutica</i> (Midget Greenhood)			
234.	2747 <i>Ptilotus obovatus</i> (Cotton Bush)			
235.	2764 <i>Ptilotus symonii</i>			
236.	32417 <i>Ptychostomum angustifolium</i>			
237.	-1625 <i>Purnella albifrons</i>			
238.	24278 <i>Pyrrholaemus brunneus</i> (Redthroat)			
239.	4964 <i>Radyera farragei</i> (Knobby Hibiscus)			
240.	2580 <i>Rhagodia crassifolia</i> (Fleshy Saltbush)			
241.	11254 <i>Rhagodia preissii</i> subsp. <i>preissii</i>			
242.	24451 <i>Rhipidura fuliginosa</i> subsp. <i>alisteri</i>			
243.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
244.	13293 <i>Rhodanthe haigii</i>			
245.	11151 <i>Rostraria pumila</i>	Y		
246.	32426 <i>Rosulabryum campylothecium</i>			
247.	2356 <i>Santalum acuminatum</i> (Quandong)			
248.	2599 <i>Sclerolaena brevifolia</i>			
249.	2609 <i>Sclerolaena diacantha</i> (Grey Copperburr)			
250.	2625 <i>Sclerolaena obliquicuspis</i> (Limestone Bindii)			
251.	2627 <i>Sclerolaena patentiscuspis</i> (Spear-fruit Saltbush)			
252.	2633 <i>Sclerolaena uniflora</i> (Two-spined Saltbush)			
253.	8207 <i>Senecio glossanthus</i> (Slender Groundsel)			
254.	25881 <i>Senecio lacustrinus</i>			
255.	25889 <i>Senecio spanomerus</i>			
256.	-9718 <i>Senna artemisioides</i> subsp. <i>artemisioides</i> x <i>filifolia</i>			Y
257.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
258.	16924 <i>Sida spodochroma</i>			
259.	3070 <i>Sisymbrium irio</i> (London Rocket)	Y		
260.	30948 <i>Smicronis brevirostris</i> (Weebill)			
261.	7037 <i>Solanum symonii</i>			
262.	16104 <i>Stenopetalum saxatile</i>			
263.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
264.	12355 <i>Swainsona affinis</i>			
265.	32437 <i>Syntrichia antarctica</i>			
266.	32438 <i>Syntrichia pagorum</i>			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
267.	24185 <i>Tadarida australis</i> (White-striped Freetail-bat)			
268.	33923 <i>Tartarus murdochensis</i> (Murdoch Sink Cave Spider)		T	
269.	33925 <i>Tartarus nurinensis</i> (Nurina Cave Spider)		T	Y
270.	31492 <i>Tecticornia disarticulata</i>			
271.	28065 <i>Teloschistes chrysophthalmus</i>			
272.	4256 <i>Templetonia retusa</i> (Cockies Tongues)			
273.	2822 <i>Tetragonia eremaea</i>			
274.	-1622 <i>Thalasseus bergii</i>			
275.	-1621 <i>Thinornis rubricollis</i>			
276.	24844 <i>Threskiornis molucca</i> (Australian White Ibis)			
277.	25519 <i>Tiliqua rugosa</i>			
278.	25204 <i>Tiliqua rugosa subsp. aspera</i>			
279.	-8739 <i>Tortella leucostega</i>			Y
280.	-5643 <i>Tortella rubripes</i>			
281.	12652 <i>Trichanthodium skirrophorum</i>			
282.	19175 <i>Triglochin</i> sp. B Flora of Australia (P.G. Wilson 4294)			
283.	30815 <i>Tympanocryptis houstoni</i> (Nullabor Earless Dragon)			
284.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
285.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
286.	11387 <i>Vittadinia cervicalaris</i> var. <i>cervicalaris</i>			
287.	32455 <i>Weissia controversa</i>			
288.	28108 <i>Xanthoparmelia bellatula</i>			
289.	28172 <i>Xanthoparmelia reptans</i>			
290.	28327 <i>Xanthoparmelia semiviridis</i>			
291.	30455 <i>Xanthoria elixii</i>			
292.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye (Silvereye))			
293.	4387 <i>Zygophyllum billardierei</i> (Coast Twinleaf)			
294.	12359 <i>Zygophyllum simile</i>			

**Conservation Codes**

T - Rare or likely to become extinct  
X - Presumed extinct  
IA - Protected under international agreement  
S - Other specially protected fauna  
1 - Priority 1  
2 - Priority 2  
3 - Priority 3  
4 - Priority 4  
5 - Priority 5

<sup>1</sup> For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



Appendix D  
Site Photos



**Figure 1 Looking at the cattle grid from the west to the east**



**Figure 2 Looking at the vegetation north of the cattle grid from the west to the east**





**Figure 3 Looking at the vegetation on the north western side of the cattle grid**



**Figure 4 Looking at the vegetation on the north eastern side of the cattle grid**





**Figure 5 Looking west from the eastern extent of the clearing boundary**



**Figure 6 Looking at the vegetation east of the cattle grid from the south**



**Figure 7** Looking at the vegetation west of the cattle grid from the south



Appendix E

# Environmental Management Plan



**Table 4 Environmental Management Plan**

Timing	Topic	Objective	Action(s)	Responsible Party	Advice
All phases of construction	Induction / Start-up meeting / Progress meetings	Create awareness in all personnel of the Main Roads Environmental Policy as well as the environmental aspects associated with the project.	<p>Main Roads Environmental Policy to be communicated to all personnel.</p> <hr/> <p>All personnel to be informed of the environmental aspects associated with the project prior to undertaking any works.</p> <hr/> <p>Attendance / participation records for inductions / meetings to be kept. Such records must demonstrate adequate communication of environmental policies and aspects.</p>	Contractor	Main Roads
All phases of construction	Vegetation Clearing - Record-keeping	All projects should maintain the required records relating to clearing native vegetation under CPS 818/5.	<p>Retain on records:</p> <ul style="list-style-type: none"> <li>▶ a copy of the PEIA,</li> <li>▶ a map showing the location where the clearing occurred, recorded in an ESRI Shapefile,</li> <li>▶ the size of the area cleared (in hectares), and</li> <li>▶ the dates on which the clearing was done.</li> </ul>	Main Roads Project Manager	DEC
All phases of construction	Weed Management	Ensure that the risk of weed spread or establishment is minimised as far as is practically possible.	<p>Contractor is to ensure that all equipment brought on to site is free of soil and vegetative material. Weed infested material is to be cleaned from equipment prior to traversing areas of good or better quality native vegetation and prior to leaving the work site.</p> <hr/> <p>No weed infested material (e.g. spoil) to be stockpiled / moved adjacent to or within areas of good or better quality native vegetation.</p>	Contractor	Main Roads





Timing	Topic	Objective	Action(s)	Responsible Party	Advice
			<p>No weed infested material / spoil to be removed to land other than that vested within Main Roads without approval from the landowner / manager, Main Roads Project Manager and Main Roads Environment Officer (unless removed to an approved Shire waste disposal facility – e.g. rubbish tip).</p> <p>Movement of soil will be avoided in wet conditions.</p> <p>If imported soils and materials are to be used, they will be certified weed free.</p> <p>Any Declared Plant species located in the area will be controlled in accordance with Sections 49 and 51 of the <i>Agriculture and Related Resources Protection Act 1976</i>.</p>		
All phases of construction	Aboriginal & European Heritage	“To ensure that changes to the biophysical environment do not adversely affect historical and cultural associations and comply with relevant heritage legislation” (EPA, 2009).	<p>If during Project works, the Contractor uncovers any materials that could be considered significant to Aboriginal people, Main Roads will immediately cease works within 50 m of the material and notify Department of Indigenous Affairs immediately.</p> <p>If during Project works, the Contractor uncovers any human skeletal material, work shall cease within 20 m of the material and it shall be reported to the Police as soon as possible.</p>	<p>Contractor – ceasing of works</p> <p>Main Roads Project Manager – obtaining of approvals</p> <p>Contractor</p>	<p>Main Roads / DIA</p> <p>Main Roads</p>



Timing	Topic	Objective	Action(s)	Responsible Party	Advice
All phases of construction	Pollution and Litter	Ensure that the works are managed to a standard that minimises pollution or the risk of pollution occurring.	<p>The designated servicing area is to be bunded to contain any spills or leaks or it will drain into a temporary sump. It is not to be located in an area adjacent to drainage areas or watercourses / wetlands.</p> <hr/> <p>Emergency cleanup procedures shall be implemented in the case of any spillage. These are to include the control of spilled material and removal of contaminated soil to an approved Shire waste disposal facility. Appropriate equipment is to be available on site at all times in the case of a spill.</p> <hr/> <p>All waste oil is to be collected for disposal / recycling and any empty fuel / oil containers, used filters and waste hydraulic parts are to be collected and stored in an allocated area before being removed to an approved Shire waste disposal / recycling facility.</p> <hr/> <p>The project area, including hardstand areas, are to be kept in a tidy manner at all times. No littering is to be tolerated and an adequate number of rubbish bins are to be provided on site at all times.</p>	Contractor	Main Roads
All phases of construction	Flora and Fauna	“To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge” (EPA, 2009).	<p>Care is to be taken when clearing in order to avoid death of / injury to any native fauna. Any death of / injury to native fauna is to be reported to the Main Roads Project Manager immediately and the appropriate actions taken (e.g. contact DEC, RSPCA or Veterinarian).</p> <hr/> <p>Where possible, nests or nesting sites are to be avoided or relocated.</p>	Both	Main Roads / DEC



Timing	Topic	Objective	Action(s)	Responsible Party	Advice
Construction	Clearing	To reduce the impact of project related clearing on the surrounding environment	<p>Main Roads will seek to have the project clearing approved under the Main Roads State-wide Purpose Clearing Permit (CPS 818/5).</p> <hr/> <p>The areas to be cleared will be minimised by preferentially using areas of existing disturbance, including existing access tracks and former material pit areas. Where possible, removal of trees should be avoided.</p> <hr/> <p>Areas to be cleared will be pegged prior to commencing earthworks.</p> <hr/> <p>No vegetation outside the designated areas will be removed during earthworks, construction or operation.</p> <hr/> <p>Earthmoving equipment will be cleaned of soil and vegetation prior to entering and leaving the area to be cleared.</p> <hr/> <p>Access tracks, vehicle parking and temporary materials storage will be located on existing cleared areas which incur minimum loss of trees and shrubs.</p> <hr/> <p>Material cleared will be utilised in rehabilitation works where practicable.</p> <hr/> <p>Cleared vegetation will be used in site rehabilitation and erosion control via mulching, chipping or brush cover. Larger logs will be left on-site to provide additional habitat.</p> <hr/> <p>Cleared vegetation will not be burnt on-site (as per Appendix F).</p>	<p>Main Roads</p> <hr/> <p>Contractor</p>	Main Roads



Timing	Topic	Objective	Action(s)	Responsible Party	Advice
			<p>Stripped topsoil will be salvaged for use in site rehabilitation, where possible.</p> <hr/> <p>Materials and topsoil stockpiles will be located so as not to restrict or interfere with existing site drainage.</p>		
Construction	Noise, Vibration and Dust	To protect the amenity of road-users and construction staff from noise, vibration and dust impacts resulting from activities associated with the project area.	<p>All equipment will be regularly maintained and serviced, including exhaust systems.</p> <hr/> <p>A speed limit of 20 km/hr will be enforced on the site.</p> <hr/> <p>Smooth driving will be enforced, vehicles will not be permitted to accelerate quickly.</p> <hr/> <p>Any complaints regarding dust, noise or vibration are to be attended to and dealt with as soon as possible.</p>	Both	Main Roads
			<p>Dust from movement of vehicles will be managed at all times. This will include wetting down, road sweeping, and the implementation of suitable speed limits.</p>	Contractor	Main Roads
Construction	Fire	Ensure that the fire risk associated with the construction of the project is minimised.	<p>No fires shall be lit within the project area and standard fire prevention methods (e.g. spark arresting mufflers) are to be employed at all times.</p> <hr/> <p>Fire response equipment to be present and readily available on site at all times.</p> <hr/> <p>All machinery will be shut down during periods of extreme fire hazard as advised by the DEC or Main Roads or the Shire of Dundas</p>	Contractor	Main Roads



Timing	Topic	Objective	Action(s)	Responsible Party	Advice
			<p>All machinery to be fitted with fire extinguishers.</p> <p>Smoking on site will be controlled and all cigarettes will be disposed of in an appropriate vessel.</p>		
Construction	Environmental Incidents	<p>Ensure that any environmental incidents that occur during works do not have a significant or long term impact on the environment.</p> <p>Ensure that the details of any environmental incidents are recorded in accordance with corporate requirements.</p>	<p>Implement corrective and preventive actions in liaison with an environmental specialist and Main Roads Manager Environment where necessary.</p> <p>Complete and submit environmental incident report forms in accordance with the Main Roads corporate procedure 6707/042 <i>Environmental Incident Reporting and Investigation</i>. Environmental Incident report forms are available on the Main Roads Internet site at <a href="http://www.mainroads.wa.gov.au/UnderstandingRoads/Environment/Pages/incident_report.aspx">http://www.mainroads.wa.gov.au/UnderstandingRoads/Environment/Pages/incident_report.aspx</a></p>	Both	Main Roads
Construction	Soil & Erosion Management	Ensure that soil is managed in a way that prevents future land degradation and erosion.	Stripped topsoil that is not infested with weeds is to be stockpiled separately and re-used on site.	Contractor	Main Roads
Construction	Ground and Surface Water Management	“To maintain the quantity of water so that existing and potential environmental values, including ecosystem maintenance, are protected” (EPA, 2009).	<p>Water required for project activities to be sourced legally and used in a sustainable manner.</p> <p>Water extraction activities to be carried out in a way which prevents the potential for contamination of the water source (e.g. bunding of pumping equipment).</p>	Contractor	Main Roads



Timing	Topic	Objective	Action(s)	Responsible Party	Advice
Post-Construction	Clean-up	Ensure that the project area is left clean and tidy.	All waste materials from the development are to be completely removed from the site and disposed of at an approved Shire waste disposal facility upon completion of works.	Contractor	Main Roads
			All remaining road building materials (e.g. gravel, aggregate) to be removed from the site upon completion of works to an approved stockpile site.	Both	Main Roads
			All rubbish, materials heaps or other debris will be removed.	Both	Main Roads
Post-Construction	Rehabilitation	To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values.	Any compacted ground will be ripped or scarified where revegetation is required.	Contractor	Main Roads/ DEC
			Site rehabilitation works will be conducted as per Appendix F.		
			If imported soils and materials are required, they will be certified weed free.		
			All rubbish, materials heaps or other debris will be removed.		

Note: "Both" refers to both the Main Roads Project Manager and Contractor.



Appendix F

# Main Roads Pastoral Revegetation Plan

# Main Roads WA – Revegetation Plan for Pastoral Areas

## Condition 14(e), CPS 818

<b>Date:</b>	Unknown.	<b>Project:</b>	Unknown.
<b>Manager:</b>	Main Roads WA.		
<b>Location and size of clearing:</b>	For project areas located within the pastoral / rangelands region north of the agricultural area as described in the Environmental Protection Authority's Position Statement No.2.		
<b>Location and size of revegetation:</b>	Primarily for areas that were cleared for searching and extracting road building materials (e.g. borrow pits, etc.), and other project related temporary clearing.		
<b>Clearing description:</b>	Machine clearing.		
<b>Revegetation description:</b>	Replacement of topsoil material regeneration.		
<b>Reason for revegetation:</b>	Revegetation of temporary cleared areas, in accordance with condition 14 of clearing permit CPS 818.		
<b>Revegetation / rehabilitation requirements:</b>			
<b>Site preparation:</b>	<p>All vegetation will be cleared from the works area and non-weed infested vegetation is stockpiled. Stockpiled vegetation will be placed in a manner that will prevent damage to adjacent vegetation by machinery. Weed infested vegetation will be disposed of at an appropriate site and not used for revegetation purposes. Burning of the cleared vegetation will not be permitted.</p> <p>Topsoil will be stripped to a maximum depth of 100mm, and will be stored in a weed free (as far as possible) area, as close as possible to the area to be rehabilitated. Topsoil will be placed in windrows of less than 1.5m in height and reinstated as soon as practicable to maintain viability of in-situ seeds.</p>		
<b>Weed control:</b>	<p>Appropriate weed control will be carried out when weeds are present, both prior to topsoil stripping and where weeds become established on or between the stockpiled materials. Weed control will take place prior to the respreading of topsoil to ensure weeds are killed and not transported to other areas.</p> <p>Control measures include the removal of weeds to an approved dumpsite, or treatment of weeds such as by using herbicides mixed in accordance with manufacturer's instructions and applied by a licensed operator. Where practicable, weeds will be removed prior to or when they are in flower, and prior to seeding.</p> <p>All machinery will be cleared of soil build up and vegetative material before entering and leaving the site to help minimise the transportation of weeds and their seeds.</p> <p>Exposed areas such as bare batters and borrow pits shall be promptly rehabilitated to reduce the potential for weed establishment. Where works are adjacent to good quality vegetation, where weeds from within the project area are likely to spread to and result in environmental harm to the adjacent area, those weeds will be controlled annually until 12 Dec 2011.</p>		



# Main Roads WA – Revegetation Plan for Pastoral Areas

## Condition 14(e), CPS 818

### ***Regeneration / direct seeding / planting at an optimal time:***

The following rehabilitation works are undertaken on areas of disturbed earth requiring rehabilitation:

- Topsoil is uniformly respread to a typical depth of 100mm over the project area. In project areas where topsoil has not been removed and/or is not available, other substrate, such as gravel, may be substituted as a growth medium.
- Project areas will be ripped to a minimum depth of 200mm deep with rip lines approximately 300mm apart. Where slopes are present, rip lines shall follow natural contours.

The following rehabilitation works are undertaken at borrow / gravel pits:

- Overburden and then topsoil will be uniformly and evenly spread over the disturbed areas of the pit. Depending on the slope of drainage lines within the pit, small swales from the topsoil will be formed to reduce erosion velocities and encourage the deposition of seeds.
- The whole of the existing pit floor, including drainage lines, will be ripped to a depth of 300-500mm deep with rip lines between 500-800mm apart (if the material in the pit is able to be ripped).
- All stockpiled vegetation will be spread along the contour and the pit floor to help promote seed deposition and to reduce erosion velocities.

### ***Vegetation establishment period:***

The vegetation establishment period is for at least twelve months following the completion of the works. During this period, maintenance and monitoring will be undertaken (see below).

### ***Ongoing maintenance and monitoring:***

After revegetation works, revegetated areas will be inspected annually for a minimum of two years to monitor and control weeds and to measure the effectiveness of revegetation works.

When unwanted weed foliage cover exceeds 25% after the initial two year period, further actions will be implemented to monitor and control these weeds. The additional monitoring and weed control will be conducted annually until 12 Dec 2010 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

### **Monitoring commitments:**

Post revegetation site inspections will be carried out annually for a minimum of two years to monitor unwanted weeds and measure the effectiveness of revegetation works. Monitoring of sites where unwanted weed foliage cover exceeds 25% after the initial two year period will continue annually until 12 Dec 2010 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

### **Management commitments:**

Undertake annual weed control of unwanted weeds annually until 12 Dec 2011 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

### **Agencies consulted and submissions received:**

Nil.




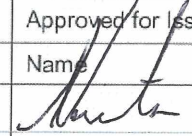
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**Document Status**

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	C Skalski	P Moonie			A. Venter	15/4/11