



## Monarch Gold Mining Company Ltd: Davyhurst Gold Mine

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Flora Survey of:

- Salmon Gums (M16/220);
- Two Gums (M16/268);
- Federal Flag (M30/63);
- Walhalla (M30/63);
- Golden Eagle (M30/005);
- Makai (M30/044, M30/132, M30/073 and M30/042);
- Sand King (M24/352 and M24/039);
- Missouri (M24/290); and
- Lady Bountiful (M24/862)

March 2007



**MONARCH GOLD**  
MINING COMPANY LIMITED

**Flora Survey of Salmon Gums (M16/220), Two Gums (M16/268), Federal Flag (M30/63), Walhalla (M30/63), Golden Eagle (M30/005), Makai (M30/044, M30/132, M30/073 and M30/042), Sand King (M24/352 and M24/039), Missouri (M24/290) and Lady Bountiful (M24/862)**

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## Executive Summary

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The Monarch Gold Mining Company Ltd (Monarch) Davyhurst Gold Mine (Davyhurst) is located within the Shire of Menzies, approximately 130 km north of the township of Kalgoorlie and 60 km southwest of Menzies. The Davyhurst Gold Mine encompasses a number of tenements that cover an area of approximately 2000 km<sup>2</sup>. Monarch plans to commence mining activity within the Davyhurst Gold Mine, utilizing a combination of cutbacks of existing pits and the creation of new pits. Details of the proposed mining activities are detailed within the Mining Proposal to which this document has been appended.

Outback Ecology Services (OES) was engaged by Monarch in March 2007 to conduct a Declared Rare Flora (DRF) and Priority Flora search, flora survey and vegetation association description, mapping and condition assessment within the following tenements:

- **Salmon Gums (M16/220)**
- **Two Gums (M16/268)**
- **Federal Flag (M30/63)**
- **Walhalla (M30/63)**
- **Golden Eagle (M30/005)**
- **Makai (M30/044, M30/132, M30/073 and M30/042)**
- **Sand King (M24/352 and M24/039)**
- **Missouri (M24/290)**
- **Lady Bountiful (M24/862)**

This report details the results of a two – day field survey conducted between the 21<sup>st</sup> – 22<sup>nd</sup> March 2007. This report also details the results of a search of the Department of Environment and Conservation (DEC) *Threatened (Declared Rare) Flora*, *Western Australian Herbarium (WAHERB) Specimen* and *Declared Rare and Priority Flora List* databases and the *Environment Protection and Biodiversity Conservation Act (EPBC) Protected Matters Search Tool* and *National Land and Water Resources Audit (NLWRA)* databases.

During the survey, a total of 66 taxa (including subspecies and variants) from 22 families and 31 genera were recorded. The dominant families were Mimosaceae, with 15 species from one genus, Chenopodiaceae with 10 species from four genera, Myoporaceae with seven species from one genus and Myrtaceae with six species from one genus. No DRF or Priority Flora were observed during the survey. Two alien taxon were recorded, *Cucumis myriocarpus* (Prickly Paddy Melon, Cucurbitaceae) and *Nicotiana glauca* (Tree Tobacco, Solanaceae).

A search for Threatened Ecological Communities and 'At Risk' Ecological Communities was undertaken within the *EPBC Protected Matters Search Tool* for the Shire of Menzies. There are no

EPBC listed Threatened Ecological Communities occurring within the Shire of Menzies. However, one identified area of National Heritage significance, Goongarrie National Park, was identified in the report. Goongarrie National Park is located within 20 km of the Davyhurst Gold Mine.

A summary of the key findings in relation to each site is presented below:

### **Salmon Gums (M16/220)**

Salmon Gums is presently an undisturbed site that was previously surveyed by Matiske Consulting Pty Ltd in 2002. Matiske (2002) identified two communities within the Salmon Gums area, both of which were Low Open Woodlands with *Eucalyptus* species as dominants. Records of the Priority 3 species, *Grevillea georgeana* were made within the Salmon Gums area (Matiske, 2002). During this survey, the site was visited and was condition assessed as being pristine, according to the scale of Keighery (1994). No observations of the previously identified Priority species were made.

### **Two Gums (M16/268)**

Two Gums is a presently undisturbed site that was previously surveyed by Matiske Consulting Pty Ltd in 2002. Matiske (2002) identified five vegetation communities within the Two Gums area, all of which were *Eucalyptus* Woodlands of differing levels of cover and with different dominant species. One record of the Priority One species *Eremophila* sp. Mt Jackson was made by Matiske (2002) within this area. During this survey, the site was visited and was condition assessed as being pristine. No observations of the previously identified Priority species were made.

### **Federal Flag (M30/63)**

Federal Flag consists of two currently decommissioned pits. The area was previously surveyed by Matiske Consulting Pty Ltd in 2005. The area surveyed during this site visit were located within or immediately adjacent to the existing mine footprint. Further, the areas were located within the abandonment bund. There was a limited amount of remnant native vegetation within the area defined by the abandonment bund, which was assessed as being degraded. The remaining vegetation was rehabilitation vegetation.

### **Walhalla (M30/63)**

Walhalla is a largely undisturbed site that was previously surveyed by Matiske Consulting Pty Ltd in 2005. Matiske (2005) identified five vegetation communities within the tenement (M30/63), all of which were *Eucalyptus* Woodland with different levels of cover and different dominant species. No DRF or Priority Flora were identified in M30/63 by Matiske (2005). The area surveyed during this site visit consisted of a section of vegetation assessed as pristine and a section that was assessed as degraded. The cause of the degradation was deemed to be related to exploration activities.

### **Golden Eagle (M30/005)**

Golden Eagle is a currently decommissioned pit. The area surveyed was located adjacent to the existing pit and a waste landform. Golden Eagle was previously surveyed by Shepherdson Environment Services in 2000. A Level 1 assessment, as described in the EPA Guidelines No 51, was undertaken, which involved a walkover survey of the area to enable a census of species to be undertaken and to facilitate mapping of vegetation associations. One vegetation association was described, a *Eucalyptus* Woodland. Whilst the Priority 3 species *Eremophila pustulata* was previously recorded at Golden Eagle (Shepherdson, 2000), no observations of this species were made during the March 2007 survey. Vegetation at Golden Eagle was assessed as being degraded. Causes of degradation were deemed to be related to proximity to an existing mine and the presence of a road dissecting the vegetation.

### **Makai (M30/004, M30/132, M30/073 and M30/042)**

The area of Makai surveyed was adjacent to a decommissioned pit and a rehabilitated waste landform. No detailed surveys appear to have been conducted in the area. A Level 1 assessment was undertaken, which involved a walkover survey of the area to enable a census of species to be undertaken and to facilitate mapping of vegetation associations. Four vegetation associations were described in the area;

- Open *Eucalyptus salmonophloia* Woodland (floodplain) Over Open Low Scrub B;
- Low *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland over *Acacia* Thicket Over Open Dwarf Scrub;
- *Acacia* Thicket with emergent *Eucalyptus salubris*; and
- An area of rehabilitation vegetation.

No DRF or Priority Flora were observed during the survey. Vegetation condition ranged from degraded to very good. The floodplain vegetation and the area of rehabilitation vegetation were assessed as being degraded, generally due to loss of structure that was considered to be related to historic mining activities.

### **Sand King (M24/352 and M24/039)**

The area of Sand King surveyed consisted of a section of remnant native vegetation located between a decommissioned pit and waste landform and a section of vegetation located immediately adjacent to the abandonment bund. A Level 1 assessment was undertaken. Two vegetation associations were described in the area:

- Low *Eucalyptus griffithsi* and *Eucalyptus oleosa* subsp. *oleosa* Woodland Over Open Low Scrub Over Open Dwarf Scrub; and
- Low *Eucalyptus oleosa* subsp. *oleosa* Woodland Over Open Low Scrub A.

The vegetation located between the existing pit and the waste landform was degraded. The degradation was due to mining activity. The vegetation located outside the abandonment bund was in good to very good condition.

An area of vegetation located in close proximity to the Sand King waste landform (hereafter called SM) was also surveyed. A Level 1 assessment was undertaken during which one vegetation association was described in the area; Low *Grevillea nematophylla* subsp. *nematophylla* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Forest B with an emergent canopy of *Eucalyptus salmonophloia* Over Dwarf Scrub C Over Open Hummock Grass. The vegetation was assessed as being in very good to pristine condition.

#### **Missouri (M24/290)**

The area of Missouri surveyed was adjacent to a currently decommissioned pit and a waste landform. A Level 1 assessment was undertaken. Two vegetation associations were described within the area:

- Open Woodland A of *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* over Low Scrub A over Dwarf Scrub C; and
- *Acacia* spp. Thicket.

The vegetation was assessed as being in degraded to good condition. Causes of degradation were deemed to be associated with proximity to mining activity.

#### **Lady Bountiful (M24/862)**

The Lady Bountiful pit, located adjacent to Ora Banda, was visited during the March 2007 site visit. Due to safety issues, the area for which a survey was sought could not be accessed. As such, there are no results to be presented for the site.

In the process of collating data for this report, a pre-existing clearing permit was identified as existing over the majority of tenements visited during the survey. The permit was issued by DoIR whilst the tenements were held by Croesus Mining NL. Monarch should consider determining whether an application to transfer the clearing permit is an option.

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	PURPOSE AND SCOPE .....	1
<b>2.0</b>	<b>SITE INFORMATION.....</b>	<b>1</b>
2.1	OWNERSHIP .....	1
2.2	LOCATION .....	1
2.3	LAND TENURE AND USE .....	1
<b>3.0</b>	<b>EXISTING ENVIRONMENT.....</b>	<b>4</b>
3.1	CLIMATE .....	4
3.2	IBRA BIOREGION .....	4
3.3	CONSERVATION AREAS IN THE REGION .....	5
<b>4.0</b>	<b>MATERIALS &amp; METHODS.....</b>	<b>5</b>
4.1	DESKTOP STUDY .....	5
4.2	FIELD SURVEY .....	5
4.3	RARE AND PRIORITY FLORA DATABASE SEARCH.....	8
4.4	THREATENED ECOLOGICAL COMMUNITIES .....	8
4.5	LIMITATION OF SURVEY.....	9
<b>5.0</b>	<b>RESULTS &amp; DISCUSSION .....</b>	<b>10</b>
5.1	REVIEW OF PREVIOUS SURVEYS .....	10
5.2	DECLARED RARE AND PRIORITY FLORA.....	11
5.3	FLORA .....	13
5.4	VEGETATION ASSOCIATIONS AND VEGETATION CONDITION ASSESSMENT.....	13
5.4.1	Salmon Gums (M16/220) .....	13
5.4.2	Two Gums (M16/266).....	15
5.4.3	Federal Flag (M30/63) .....	17
5.4.4	Walhalla (M30/63) .....	19
5.4.5	Golden Eagle (M30/005) .....	21
5.4.6	Makai (M30/044, M30/132, M30/073 and M30/042) .....	23
5.4.7	Sand King (M24/352 and M24/039) .....	27
5.4.8	Missouri (M24/290).....	29
5.4.9	SM (M24/352).....	32
5.4.10	Lady Bountiful (M24/862) .....	34
5.5	THREATENED OR 'AT RISK' ECOLOGICAL COMMUNITIES .....	34
<b>6.0</b>	<b>REFERENCES.....</b>	<b>35</b>

**List of Figures**

Figure 1	Location map of Davyhurst Gold Mine relative to Menzies.....	3
Figure 2	Climate data for Menzies (BOM, 2007).....	4
Figure 3	Map showing tenements surveyed at Davyhurst in March 2007. ....	7
Figure 4	Area surveyed at Salmon Gums (outline at base, Macedon) during March 2007. ....	14
Figure 5	Area surveyed at Two Gums in March 2007.....	16
Figure 6	Area surveyed at Federal Flag during March 2007. ....	17
Figure 7	Area of Walhalla surveyed during March 2007.....	19
Figure 8	Area surveyed and vegetation association recorded at Golden Eagle during March 2007.....	22
Figure 9	Area surveyed and vegetation associations described at Makai, March 2007.....	24
Figure 10	Area surveyed and distribution of vegetation associations described at Sand King during March 2007. ....	28
Figure 11	Area surveyed and distribution of vegetation associations described at Missouri during March 2007. ....	30
Figure 12	Area surveyed and distribution of vegetation association described at SM during March 2007. ....	33

**List of Tables**

Table 1	Tenements surveyed during March 2007.....	6
Table 2	Definition of Declared Rare and Priority Flora Species.....	8
Table 3	Summary of historical flora and vegetation surveys of Davyhurst.....	10
Table 4	Priority flora known to occur within 50 km of Davyhurst.....	12

**List of Plates**

Plate 1	Example of vegetation observed at Salmon Gums in March 2007.....	14
Plate 2	Example of vegetation observed at Two Gums in March 2007. ....	16
Plate 3	Remnant native vegetation at Federal Flag, March 2007.....	18
Plate 4	Rehabilitation vegetation at Federal Flag, March 2007. ....	18
Plate 5	Pristine vegetation at Walhalla, March 2007.....	20
Plate 6	Degraded vegetation at Walhalla, March 2007.....	20
Plate 7	Open <i>Eucalyptus</i> Woodland over Open Low Scrub, Golden Eagle, March 2007. ....	22
Plate 8	MF – Open <i>Eucalyptus salmonophloia</i> Woodland (Floodplain) Over Open Low Scrub B at Makai, March 2007.....	25
Plate 9	ME – Low <i>Eucalyptus salmonophloia</i> and <i>Allocasuarina eriochlamys</i> subsp. <i>eriochlamys</i> Woodland over <i>Acacia</i> Thicket at Makai, March 2007.....	25
Plate 10	MA – Open Low <i>Eucalyptus salubris</i> Woodland A Over <i>Acacia</i> Thicket at Makai, March 2007. ....	26
Plate 11	MR – Rehabilitation and remnant vegetation at Makai, March 2007. ....	26
Plate 12	SC – Low <i>Eucalyptus griffithsii</i> and <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> Woodland over Open Low Scrub A over Dwarf Scrub C at Sand King, March 2007.....	28
Plate 13	SE – Low <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> Woodland over Open Low Scrub A over Open Low Scrub B.....	29



Plate 14 MiE – Open <i>Eucalyptus salmonophloia</i> and <i>Allocasuarina eriochlamys</i> subsp. <i>eriochlamys</i> Woodland A Over Low Scrub A Over Dwarf Scrub C at Missouri, March 2007 .....	31
Plate 15 MiA – <i>Acacia</i> spp. Thicket at Missouri, March 2007 .....	31
Plate 16 Low <i>Grevillea nematophylla</i> subsp. <i>nematophylla</i> and <i>Allocasuarina eriochlamys</i> subsp. <i>eriochlamys</i> Forest B with an emergent canopy of <i>Eucalyptus salmonophloia</i> Over Dwarf Scrub C Over Open <i>Triodia</i> Hummock Grass at SM, March 2007. ....	33

### **Appendices (A – E)**

Appendix A - Plant Species List

Appendix B – Classification of Vegetation Structural Formation and Height Classes (Muir, 1977)

Appendix C - Vegetation Condition Scale (Keighery, 1994)

Appendix D – DEC Declared Rare Flora and Priority Flora database search

Appendix E – EPBC database search

Appendix F – *Environment Reporting Tool* database search

## 1.0 INTRODUCTION

### 1.1 Purpose and Scope

Outback Ecology Services (OES) was commissioned by Monarch Gold Mining Company Ltd in March 2007 to conduct a flora survey and vegetation assessment of the following Davyhurst Gold Mine (Davyhurst) tenements;

- Salmon Gums (M16/220)
- Two Gums (M16/268)
- Federal Flag (M30/63)
- Walhalla (M30/63)
- Golden Eagle (M30/005)
- Makai (M30/044, M30/132, M30/073 and M30/042)
- Sand King (M24/352 and M24/039)
- Missouri (M24/290)
- An area adjacent to Sand King (for the purposes of this report, hereafter referred to as SM) (M24/352)
- Lady Bountiful (M24/862)

The results of the survey are presented in this report, which will be appended to the Mining Proposal. This report contains the following information:

- A brief overview of the existing environment;
- A summary of the key findings of flora surveys previously conducted over Davyhurst tenements;
- A summary of flora taxa present and their conservation status; and
- A summary of the area surveyed in regard to vegetation associations and their condition.

## 2.0 SITE INFORMATION

### 2.1 Ownership

Monarch Gold Mining Company Limited (Monarch) own 100% of the Davyhurst Gold Project (Davyhurst).

### 2.2 Location

Davyhurst is located within the Shire of Menzies; approximately 130 km northwest of Kalgoorlie and 60 km southwest of Menzies (**Figure 1**).

### 2.3 Land Tenure and Use

Davyhurst Gold Mine is located on mining leases M16/220, M16/268, M24/039, M24/290, M24/352, M30/005, M30/042, M30/044, M30/063, M30/072, M30/073, M30/074, M30/108, M30/131, M30/132 and M30/137 (**Figure 2**), all of which occur on vacant crown land.

Gold was first discovered at Davyhurst in 1897 and townships were established at Davyhurst, Mulwarrie, Mulline and Callion. Mining in the Sand King area commenced in 1898. Historical mining at Lady Bountiful commenced in 1909 with 190,000 ounces of gold removed up to 2005. Between 1897 and 1956 total recorded gold production in the project area was 330,000 ounces of gold, with the main contributors being Golden Pole (77,000 oz) and Callion (74,000 oz).

Modern exploration commenced at Davyhurst in the 1980s. Three companies, Jones Mining, Western Mining Corporation (WMC) and Hill Minerals pegged claims surrounding the historic Davyhurst sites, whilst WMC, Pancontinental Mining Ltd and Riverina Gold pegged claims in the Riverina tenements in the north of the Project area. Open pit mining by WMC commenced in the area in the 1980's. In 1986, WMC established a 300,000 tonne per annum carbon-in-pulp (CIP) treatment plant at Davyhurst and commenced open pit mining at Golden Eagle and Wahai.

In 1988 WMC's and Jones Mining's Davyhurst assets were acquired by Consolidated Exploration Ltd. Consolidated Exploration then developed open cut mines at Great Ophir, Lady Eileen, Lady Eileen South and Homeward Bound. At about the same time Aberfoyle Resources/Hill Minerals commenced open-pit mining at the Lights of Israel Deposit. Consolidated Exploration ceased mining operations at Davyhurst in 1991.

During 1995/96 Consolidated Exploration Ltd. restructured as Consolidated Gold N.L (CGNL) and commenced tenement acquisition and exploration activities in the area. This resulted in the consolidated ground holdings in the district. In December 1996 the assets of Aberfoyle Resources in the area, including the Bardoc Processing plant, were acquired by CGNL in an equity transaction. The Bardoc plant was relocated to Davyhurst and upgraded to 1.2Mtpa, at a cost in excess of \$20M. The upgraded plant was commissioned in June 1997.

In 1998 the board of CGNL appointed an administrator to run the company on behalf of the creditors after the company experienced financial difficulties. Gold production was maintained whilst the administrators attempted to sell the project and restructure the company. In October 1998 Davyhurst Project Pty. Ltd. (DPPL), a subsidiary of NM Rothschild's and Sons (Australia), acquired the project. In April 1999, the mill was placed on care and maintenance following the completion of mining of Waihi and processing of the low grade stockpiles.

Croesus Mining NL ("Croesus") acquired the Davyhurst Project in 2000. Croesus ceased operations at Davyhurst in October 2005. All sites have remained in a Care and Maintenance status since this time. Monarch acquired the Davyhurst Gold Mine in January 2006.

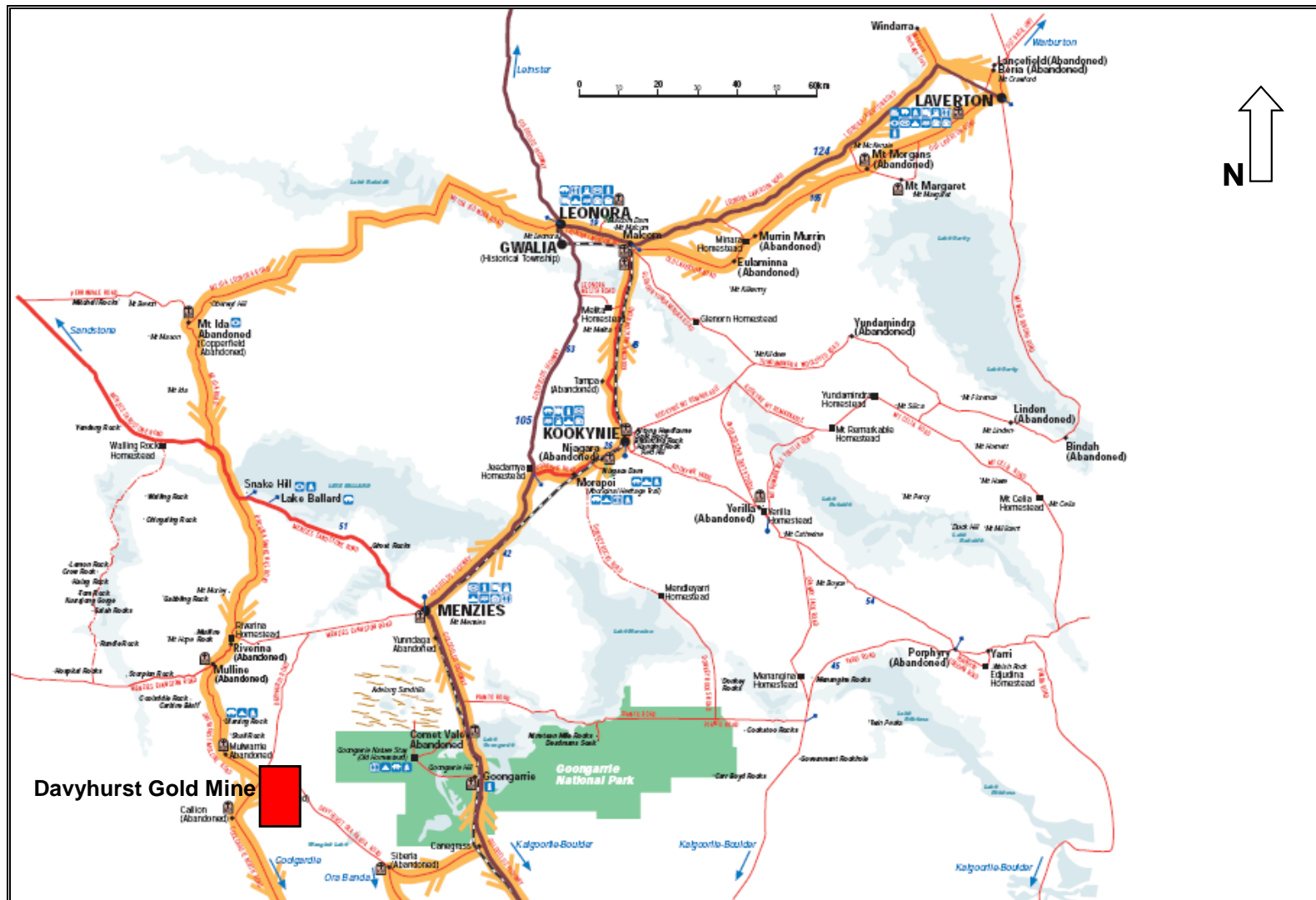
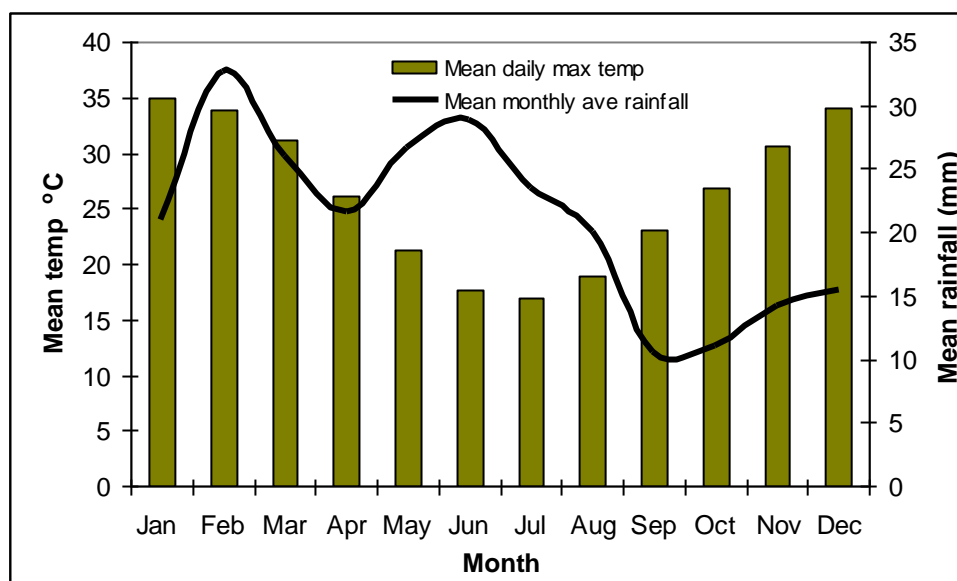


Figure 1 Location map of Davyhurst Gold Mine relative to Menzies

### 3.0 EXISTING ENVIRONMENT

#### 3.1 Climate

Davyhurst is located in a climatic area defined as desert with bimodal (summer and winter) rainfall (Beard, 1990). This region has a wet winter with a low summer rainfall (BOM, 2007). Data collected at the Menzies Station (active from 1896 to 2004) conforms to this class, with a clear pattern characterised by low annual rainfall, with peak rain events occurring between May and August with potentially heavy falls during summer (**Figure 2**). Peak temperatures are recorded between December to March (**Figure 2**). Average annual rainfall is in the range of 250mm with an average of 47 rain days per annum. Mean daily maximum temperatures range from 17°C in July to 35°C in January (Menzies station, last recording 2004; BOM, 2007) (**Figure 2**).



**Figure 2** Climate data for Menzies (BOM, 2007).

#### 3.2 IBRA Bioregion

Davyhurst is within the Murchison 1 (MUR1 – Eastern Murchison subregion) zone of the Interim Biogeographical Regionalisation of Australia (IBRA, version 5.1). This subregion is 7,847,996 ha in size and comprises the “Southern Cross” and “Eastern Goldfields” Terranes of the Yilgarn Craton (Cowan, 2001; NLWRA, 2002). Vegetation is dominated by Mulga Woodlands that are frequently rich in ephemerals, hummock grasslands, saltbush shrublands and *Halosarcia* shrublands (Cowan, 2001). There are 41 vegetation associations within the Murchison Bioregion with at least 85% of their total area within the bioregion (NLWRA, 2002). The Murchison Bioregion is comparatively biodiverse; however, many species are wide ranging and occur in adjoining regions (NLWRA, 2002).

Land uses of the region include (NLWRA, 2002; Desmond *et al.*, 2001):

- Grazing - approximately 85.47% of the subregion is used for grazing.
- Mining – extensive mining of nickel and gold, however, most mining leases are located on pastoral lands which come under section 97 of the *Land Administration Act 1997* and are therefore still required to be stocked.

- Unallocated Crown Land (UCL) and Crown reserves – 11.34%.
- Conservation – 1.4% of the subregion is classified as conservation estate, with most of this having no World Conservation Union (IUCN) conservation value.

### 3.3 Conservation Areas in the Region

Within the Murchison region, the DEC's conservation estate is comprised of six Nature Reserves, one National Park, one Timber Reserve and five areas of UCL (NLWRA, 2002). Existing conservation lands cover a wide array of surfaces at all levels in the landscape (NLWRA, 2002). There are 60 ecosystems or vegetation associations that are high priority to reserve but are not currently represented in DEC estates (of any kind) (NLWRA, 2002). The level of conservation is lower than recommended, with the bioregion ranked as a Reservation Class 2, whereas it should be ranked as a Class 1 (NLWRA, 2002). The nearest conservation area to Davyhurst is Goongarrie National Park, which is located approximately 20 km west.

Within the conservation estates, there are no feral predator programs in place, wildfire management facilities are limited by resources, mining exploration is supervised (with the exception of old exploration drill holes which often remain open), and feral herbivore grazing activities still pose a conservation risk in some areas (NLWRA, 2002). The most important issue relating to reserve management is that of control of feral animals (NLWRA, 2002).

## 4.0 MATERIALS & METHODS

### 4.1 Desktop study

The desktop study involved:

- A search of Department of Environment and Conservation's (DEC) *Threatened (Declared Rare) Flora* database, *Western Australian Herbarium (WAHERB) Specimen* database and *Declared Rare and Priority Flora* database for rare and priority species known or potentially occurring in the Project Area
- A search of the *Environment Protection and Biodiversity Conservation (EPBC) Protected Matters Search Tool* and the *National Land and Water Resources Audit (NLWRA)* databases for Threatened Ecological Community (TEC) and at risk ecological community information for the Shire of Menzies
- Collation of relevant aerial photography, survey and proposed works maps and a review of past surveys over the area.

### 4.2 Field survey

A flora survey of Davyhurst was undertaken on the 21<sup>st</sup> and 22<sup>nd</sup> of March 2007 by OES. Seven sites were surveyed during the site visit, as listed in (**Figure 3; Table 1**). A Level 1 survey as described by the EPA (2004) was conducted, which consisted of a desktop study followed by a reconnaissance survey. The general requirements of a Level 1 were attained during this survey, in the form of; a

census of all species present, with specimens collected of all species which could be identified, a search for Declared Rare Flora and Priority Flora, a vegetation association description (based on Muir (1977) (**Appendix B**) and delineation, a vegetation condition assessment, using the scale of Keighery (1994) (**Appendix C**). Further data was recorded for slope, percentage litter, soil type, exposed rock, and vegetation disturbance. A photographic record of each vegetation community was also taken.

**Table 1 Tenements surveyed during March 2007**

<b>Tenement/s</b>	<b>Site/Project Name</b>	<b>Site Status</b>
M16/220	Salmon Gums	Greenfield
M16/266	Two Gums	Greenfield
M30/63	Federal Flag	Decommissioned pit and waste landforms
M30/63	Walhalla	Greenfield
M30/005	Golden Eagle	Decommissioned pit and waste landforms
M30/044, M30/132, M30/073 and M30/042	Makai	Decommissioned pit and waste landforms
M24/352 and M24/039	Sand King	Decommissioned pit and waste landforms
M24/290	Missouri	Decommissioned pit and waste landforms
M24/352	SM (adjacent to Sand King)	Adjacent to waste landform
M24/862	Lady Bountiful	Decommissioned pit and waste landforms

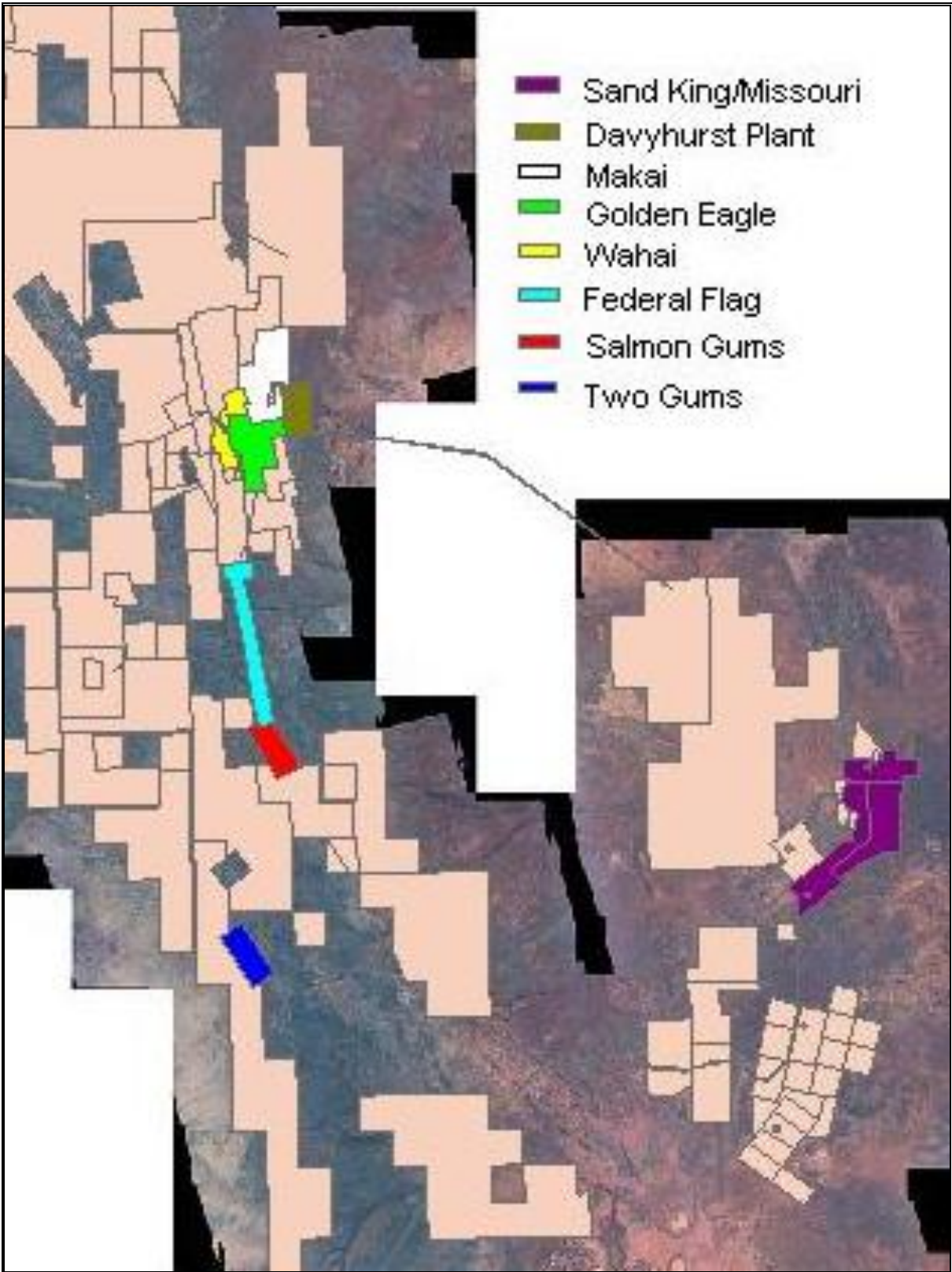


Figure 3 Map showing tenements surveyed at Davyhurst in March 2007.



### 4.3 Rare and Priority Flora Database Search

Rare Flora are gazetted under subsection 2 of section 23F of the Western Australian Wildlife Conservation Act (1950) and as such it is an offence to damage rare flora. The Priority Flora list does not have the same legal status as the DRF Schedule; however, Priority Flora are considered under the Environmental Protection Act 1986 as enforced by the Environmental Protection (Clearing of Native Vegetation) Regulations 2004, when determining biodiversity value of an area (DoIR, 2006). Definitions of Declared Rare and Priority Flora species are provided in **Table 2**.

A targeted search of the DEC's *Threatened (Declared Rare) Flora, Western Australian Herbarium (WAHERB) Specimen* and *Declared Rare and Priority Flora* databases for any Declared Rare Flora and Priority Flora collected in the area based on a polygon search with corner locations of 29° 30' S, 120° 13' E to 30° 24' S, 121° 09' E, which represents an area of approximately 50 km around the survey area.

**Table 2 Definition of Declared Rare and Priority Flora Species**

Conservation Code	Category Description
R	<u>Declared Rare Flora – Extant Taxa</u> “Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.”
P1	<u>Priority One – Poorly Known Taxa</u> “Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as ‘rare flora’, but are in urgent need of further survey.”
P2	<u>Priority Two – Poorly Known Taxa</u> “Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as ‘rare flora’ but are in urgent need of further survey.”
P3	<u>Priority Three – Poorly Known Taxa</u> “Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as ‘rare flora’ but are in need of further survey.”
P4	<u>Priority Four – Poorly Known Taxa</u> “Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia) are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years.”

Adapted from Western Australian Herbarium (2007)

### 4.4 Threatened Ecological Communities

Threatened Ecological Communities (TECs) are recognized on a national and state level. Commonwealth legislation protects native vegetation communities classified as threatened under Schedule 2 of the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. Approval from the Minister for the Environment and Water Resources must be sought to undertake any action that is likely to have a significant impact on a listed threatened ecological community. There are three categories of TECs under the *EPBC Act 1999* – ‘Critically Endangered’, ‘Endangered’ and ‘Vulnerable’. A search of the Department of Environment and Water Resources *Environment Protection and Biodiversity Conservation (EPBC) Protected Matters* and the *National Land and Water*

*Resources Audit* (NLWRA) databases was undertaken for the Shire of Menzies to determine whether any TECs or at risk vegetation associations were located near the survey area.

In Western Australia, the Department of Environment and Conservation (DEC) recognizes four categories of Threatened Ecological Communities (TECs) within WA, as developed by English and Blyth (1997). These include – ‘Presumed Totally Destroyed’, ‘Critically Endangered’, ‘Endangered’ and ‘Vulnerable’.

Other ecological communities that are considered to possibly be under threat but do not meet the survey criteria associated with TECs, are listed under the Department’s Priority Ecological Community List under Priorities 1, 2 and 3. Those ecological communities that are considered to be adequately known and are rare but not threatened, or that have been recently removed from the threatened list, are classified as Priority 4 and require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5 (Naturebase, 2007).

A search of the Department of Environment and Water Resources *Environmental Protection and Biodiversity and Conservation (EPBC)* Protected Matters and the *National Land and Water Resources Audit* (NLWRA) databases was undertaken for the Shire of Menzies and the Murchison region to determine whether any TECs or at risk vegetation associations were located near the survey area.

#### 4.5 Limitation of Survey

It is recognised that flora surveys should be conducted at a time that is considered to be ecologically optimum. For this region, optimum survey time is after any significant rainfall event. Due to timing constraints, the March 2007 survey was not conducted after a significant rainfall. Based on the relatively small scale of the areas surveyed, the availability of previous surveys for the majority of the areas, proximity to currently inactive minesites (where relevant), it is proposed that this limitation would not impact on the overall accuracy of the assessment.

The accuracy and completeness of surveys conducted during the March 2007 site visit will have been affected by time available for the surveys. Due to the number of sites and the distance between sites, only a limited time was spent at each site. This may have affected the completeness of the census of floral taxa at the sites.

## 5.0 RESULTS & DISCUSSION

### 5.1 Review of Previous Surveys

Reports of surveys conducted across the entire Davyhurst tenements between 1997 and 2005 were reviewed, with key points summarised in **Table 3**. Key surveys that relate to areas surveyed during March 2007 are Mattiske (2002; 2005) and Shepherdson (2000). The other surveys were either too broad in scope to be considered as a reliable source of information or referred to areas that were not covered in this survey.

**Table 3 Summary of historical flora and vegetation surveys of Davyhurst**

Author and Date	Tenement surveyed	Taxa identified	Vegetation associations described	DRF and Priority Flora observed
BSD Consultants, 1997	Davyhurst Area	No record provided	Three - variations on <i>Eucalyptus salmonophloia</i> woodlands	None
Shepherdson Environment Services, 2000	Giles Pit (M30/75 & E30/116) and Golden Eagle (M30/5)	Giles Pit – 70 taxa from 23 families, Myrtaceae dominant and Golden Eagle – 78 taxa from 27 families, Chenopodiaceae dominant	Giles Pit – Eucalypt woodland [sic] (dominant association) and <i>Acacia</i> Shrubland Golden Eagle – Eucalypt woodland	Giles pit – None Golden Eagle – <i>Eremophila pustulata</i> (P3)
Mattiske Consulting Pty Ltd, 2002	Tuatara, Chameleon, Two Gums and Salmon Gums	83 taxa from 25 families, Myrtaceae, Mimosaceae and Proteaceae dominant	Eight – Seven variations of <i>Eucalyptus</i> Woodlands and <i>Allocasuarina</i> Shrubland	<i>Eremophila</i> sp. Mt Jackson (P1) – single plant at Two Gums <i>Grevillea georgeana</i> (P3) – widespread and dominant within specific associations at Tuatara and Chameleon
Rally Revegetation and Environmental Services, 2004	Callion (M30/103)	Summary with vegetation descriptions – no indication of completeness of record	Six – variations of <i>Eucalyptus</i> Woodland, Mixed and Open	None
Rally Revegetation and Environmental Services, 2005	Davyhurst – multiple tenements	Database search only	Database search only	DEC reference only
Mattiske Consulting Pty Ltd, 2005	Federal Flag, Mt Banjo and Macedon (M30/63)	78 taxa from 26 families, Chenopodiaceae dominant	Five – variations of <i>Eucalyptus</i> Woodland	None

## 5.2 Declared Rare and Priority Flora

Two Declared Rare Flora (DRF) were recorded within the targeted database search for DRF and Priority flora (**Appendix D**). Twenty two Priority Flora were recorded as having been sampled within 50 km of Davyhurst (**Table 4**). None of the species listed were observed during the field survey.

No DRF were identified in surveys of the area reviewed for this report (**Table 3**). Three records of Priority Flora have been made in reviewed surveys. A record of *Eremophila pustulata* (P3) was made at Golden Eagle (M30/5) (Shepherdson, 2000), a record of *Eremophila* sp. Mt Jackson (P1) was made at Two Gums and extensive records of *Grevillea georgeana* (P3) were made at Tuatara and Chameleon (Mattiske Consulting Pty Ltd, 2000)

**Table 4 Priority flora known to occur within 50 km of Davyhurst**

Species	Code	Habitat*
<i>Acacia eremophila</i> var. <i>variabilis</i>	P3	Occurs on sand or sandy loam.
<i>Alyxia tetanifolia</i>	P3	Occurs on sandy clay, loam, concretionary gravel. Found near drainage lines or near lakes.
<i>Elatine macrocalyx</i>	P3	Occurs on shallow sands over clay. Associated with margins of playa lakes and clay pans.
<i>Eremophila mirabilis</i> ms	P2	Occurs on clay sand and stony clayey loam. Found in granite country.
<i>Eremophila parvifolia</i> subsp. <i>parvifolia</i> ms	P4	Occurs on loam, yellow sand, clay and limestone. Found on plains, claypans.
<i>Eremophila</i> sp. Mt Jackson	P1	Occurs on occasionally saline, red loam, red clay, greenstone and gravel. Found on slopes of ridges, undulating stony alluvial plains.
<i>Eucalyptus crucis</i> subsp. <i>crucis</i>	DRF	Occurs on sand and loam. Associated with granite outcrops.
<i>Eucalyptus jutsonii</i>	P2	Occurs on red sand. Found on sandplains & sandhills.
<i>Euryomyrtus leptospermoides</i>	P3	Occurs on yellow or white sand, clayey sand and gravel. Found on undulating plains.
<i>Grevillea erectiloba</i>	P4	Occurs on gravelly loam. Associated with lateritic ridges.
<i>Grevillea secunda</i>	P2	Occurs on yellow or red sand. Found on sand dunes, sandplains.
<i>Grevillea subterlineata</i>	P3	No habitat data available
<i>Gunniopsis propinqua</i>	P3	Occurs on stony sandy loam. Found on lateritic outcrops and winter-wet sites.
<i>Homalocalyx grandiflorus</i>	P1	Occurs on yellow sand. Associated with sandplains.
<i>Lepidobolus deserti</i>	P4	Occurs on yellow or orange sand. Found on sand dunes.
<i>Malleostemon</i> sp. <i>adelong</i>	P2	Occurs on red sand.
<i>Myriophyllum lapidicola</i>	DRF	Associated with waterholes on granite outcrops.
<i>Newcastelia insignis</i>	P2	Occurs on red or yellow sandy soils.
<i>Persoonia leucopogon</i>	P1	Occurs on yellow sand or sandy clay.
<i>Philothea coateana</i>	P3	Occurs on red sand.
<i>Philothea deserti</i> subsp. <i>brevifolia</i>	P1	Occurs on red sandy clay.
<i>Sowerbaea multicaulis</i>	P4	Occurs on yellow-brown sand.
<i>Thryptomene eremaea</i>	P2	Occurs on red or yellow sand. Found on sandplains.
<i>Thysanotus brachyantherus</i>	P2	Occurs on clay over limestone and loam.

\*Adapted from Western Australian Herbarium (2007)

### 5.3 Flora

During the March 2007 survey conducted by OES, a total of 66 taxa (including subspecies and variants) from 22 families and 31 genera were recorded (**Appendix A**). The dominant families were Mimosaceae, with 15 species from one genus, Chenopodiaceae with 10 species from four genera, Myoporaceae with seven species from one genus and Myrtaceae with six species from one genus. No DRF or Priority Flora were observed during the survey. Two alien taxon were recorded, *Cucumis myriocarpus* (Prickly Paddy Melon, Cucurbitaceae) and *Nicotiana glauca* (Tree Tobacco, Solanaceae).

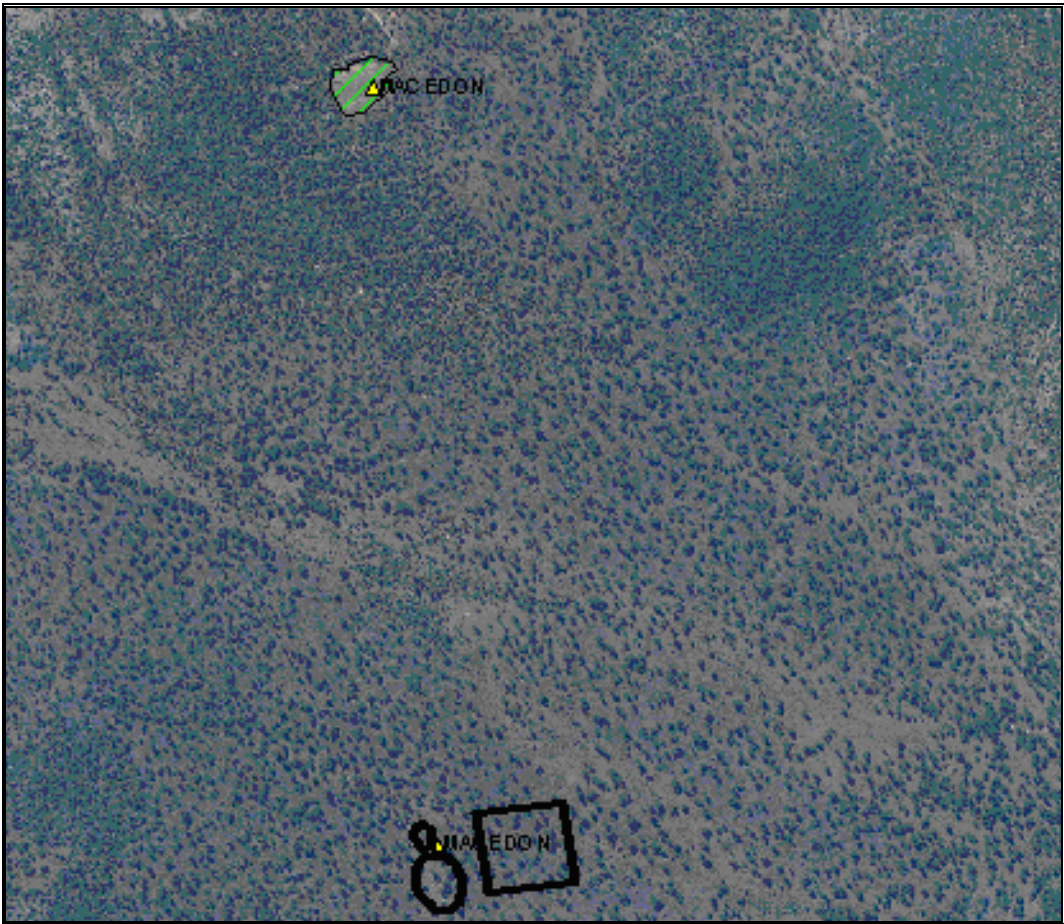
The diversity recorded in this survey is reasonably consistent with that of previous surveys conducted at the Davyhurst Gold Mine. Diversity recorded in previous surveys ranges from 70 taxa at Giles Pit (M30/75 & E30/116) (Shepherdson, 2000) to 83 taxa at Tuatara, Chameleon, Two Gums and Salmon Gums (Mattiske Consulting Pty Ltd, 2002). Variance may be explained by timing of surveys, condition of vegetation surveyed, sampling intensity and the area surveyed. Species recorded are consistent across all surveys of the Davyhurst area, with widespread dominance by families such as Myrtaceae, Mimosaceae, Chenopodiaceae and Myoporaceae.

### 5.4 Vegetation Associations and Vegetation Condition Assessment

#### 5.4.1 Salmon Gums (M16/220)

Salmon Gums is presently an undisturbed site that was previously surveyed by Mattiske Consulting Pty Ltd in 2002. Mattiske (2002) identified two communities within the Salmon Gums area, both of which were Low Open Woodlands with *Eucalyptus* species as dominants. Records of the Priority 3 species, *Grevillea georgeana* were made within the area of Salmon Gums surveyed by Mattiske (2002). During this survey, the area of Salmon Gums OES visited (**Figure 4**) was condition assessed as being pristine (**Plate 1**), according to the scale of Keighery (1994). No observations of the previously identified Priority species were made.





**Figure 4** Area surveyed at Salmon Gums (outline at base, Macedon) during March 2007.

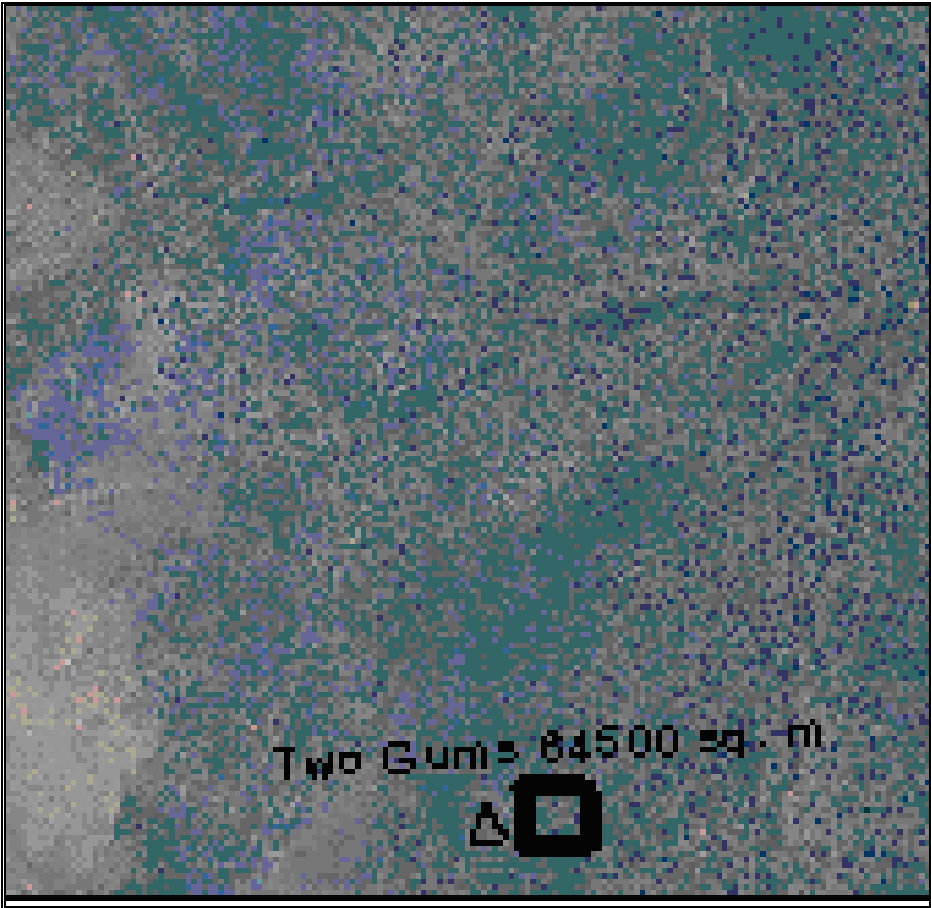


**Plate 1** Example of vegetation observed at Salmon Gums in March 2007.

#### 5.4.2 Two Gums (M16/266)

Two Gums is a presently undisturbed site that was previously surveyed by Mattiske Consulting Pty Ltd in 2002. Mattiske (2002) identified five vegetation communities within the Two Gums area, all of which were *Eucalyptus* Woodlands of differing levels of cover and with different dominant species. One record of the Priority One species *Eremophila* sp. Mt Jackson was made by Mattiske (2002) within this area. During this survey, the site OES visited (**Figure 5**) was condition assessed as being pristine (**Plate 2**), according to the scale of Keighery (1994). No observations of the previously identified Priority species were made.





**Figure 5** Area surveyed at Two Gums in March 2007.



**Plate 2** Example of vegetation observed at Two Gums in March 2007.

### 5.4.3 Federal Flag (M30/63)

Federal Flag consists of two currently decommissioned pits. The area was previously surveyed by Matiske Consulting Pty Ltd in 2005. The area surveyed during the OES site visit was located within or immediately adjacent to the existing mine footprint and was within the abandonment bund (**Figure 6**). There was a limited amount of remnant native vegetation within the area defined by the abandonment bund, which was assessed as being degraded (**Plate 3**), according to the scale of Keighery (1994). The remaining vegetation was rehabilitation vegetation (**Plate 4**).



Figure 6 Area surveyed at Federal Flag during March 2007.





**Plate 3      Remnant native vegetation at Federal Flag, March 2007.**



**Plate 4      Rehabilitation vegetation at Federal Flag, March 2007.**

#### 5.4.4 Walhalla (M30/63)

Walhalla is a largely undisturbed site that was previously surveyed by Mattiske Consulting Pty Ltd in 2005. Mattiske (2005) identified five vegetation communities within the tenement (M30/63), all of which were *Eucalyptus* Woodland with different levels of cover and different dominant species. No DRF or Priority Flora were identified in M30/63 by Mattiske (2005). The area surveyed (**Figure 7**) by OES in March 2007 consisted of a section of vegetation assessed as pristine (**Plate 5**) and a section that was assessed as degraded (**Plate 6**), according to the scale of Keighery (1994). The cause of the degradation was deemed to be related to exploration activities.



**Figure 7** Area of Walhalla surveyed during March 2007





**Plate 5      Pristine vegetation at Walhalla, March 2007.**



**Plate 6      Degraded vegetation at Walhalla, March 2007.**

#### 5.4.5 Golden Eagle (M30/005)

Golden Eagle is a currently decommissioned pit. The area surveyed in March 2007 was located adjacent to the existing pit and a waste landform (**Figure 8**). Golden Eagle was previously surveyed by Shepherdson Environment Services in 2000. A total of 78 taxa from 27 families were recorded by Shepherdson (2000). The dominant family was Chenopodiaceae, with Mimosaceae, Myrtaceae and Myoporaceae well represented (Shepherdson, 2000). Ten introduced species were also identified by Shepherdson (2000). One vegetation association was described by Shepherdson (2000), a Eucalypt Open Woodland. The vegetation was considered to be highly degraded and not reflective of a natural state of the vegetation association (Shepherdson, 2000).

In March 2007, OES conducted a Level 1 assessment as described in the EPA Guidelines No 51 (EPA, 2004) at Golden Eagle (**Figure 8**).

A total of 24 taxa (including subspecies and variants) from 14 families and 18 genera were identified within the area (**Appendix A**). Whilst the Priority 3 species *Eremophila pustulata* was previously recorded at Golden Eagle (Shepherdson, 2000), no observations of this species were made during the March 2007 survey. One alien taxon, *Nicotiana glauca* (Tree Tobacco) was recorded at the site.

One vegetation association was described, an Open *Eucalyptus* Woodland over Low Scrub B. The vegetation association was described as being degraded (**Plate 7**), according to the scale of Keighery (1994). Causes of degradation were deemed to be related to proximity to an existing mine and the presence of a road dissecting the vegetation.





Figure 8 Area surveyed and vegetation association recorded at Golden Eagle during March 2007



Plate 7 Open *Eucalyptus* Woodland over Open Low Scrub, Golden Eagle, March 2007.

#### 5.4.6 Makai (M30/044, M30/132, M30/073 and M30/042)

The area of Makai surveyed by OES was adjacent to a decommissioned pit and a rehabilitated waste landform (**Figure 9**). No detailed surveys appear to have been conducted in the area. A Level 1 assessment, as described in the EPA Guidelines No 51 (EPA, 2004), was undertaken, which involved a walkover survey of the area to enable a census of species to be undertaken and to facilitate mapping of vegetation associations.

A total of 22 taxa (including subspecies and variants) from 11 families and 15 genera were recorded across Makai (**Appendix A**). The dominant family was Mimosaceae, with 7 taxa. No DRF or Priority Flora were recorded at Makai. One alien taxon, *Cucumis myriocarpus* (Prickly Paddy Melon), was recorded in rehabilitation vegetation.

Four vegetation associations were recorded at Makai:

MF – Open *Eucalyptus salmonophloia* Woodland (Floodplain) Over Open Low Scrub B.

ME – Low *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland over *Acacia* Thicket.

MA – Open Low *Eucalyptus salubris* Woodland A Over *Acacia* Thicket.

MR – Rehabilitation and remnant vegetation.

The distribution of the vegetation associations within the survey area has been mapped (**Figure 9**). It was noted that vegetation association MF and MA are widespread in the local area whilst ME was restricted in its distribution. Detailed descriptions of the vegetation associations present and assessments of condition follow.

##### **MF – Open *Eucalyptus salmonophloia* Woodland (Floodplain) Over Open Low Scrub B**

Open Woodland A of *Eucalyptus salmonophloia* over Open Low Scrub B of *Atriplex nummularia*, *Atriplex vesicaria*, *Maireana pyramidata*, *Maireana triptera*, *Ptilotus obovatus* and *Sclerolaena* sp. on red clay (**Plate 8**). This vegetation association was widespread in the area adjacent to the Makai pit. The area surveyed represents a small section of the association (**Figure 9**). The vegetation association was assessed as being in a degraded condition, according to the scale of Keighery (1994) (**Appendix C**), due to loss of structure. Degradation was attributed to vehicular movement and proximity to mining activity.

##### **ME – Low *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland over *Acacia* Thicket**

Low Woodland A of *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* over Thicket of *Acacia acuminata*, *Acacia burkittii* and *Acacia craspedocarpa*, *Dodonaea lobulata* and *Eremophila scoparia* over Open Dwarf Scrub of *Scaevola spinescens*, *Ptilotus obovatus*, *Olearia muelleri* and *Solanum lasiophyllum* (**Plate 9**). This vegetation association was restricted to a narrow band located between the floodplain Woodland and the *Acacia* Thicket (**Figure 9**). This vegetation association was assessed as being in very good condition, according to the scale of Keighery (1994)



(Appendix C). The structure of the vegetation was generally intact, with limited evidence of disturbance.

#### **MA – Open Low *Eucalyptus salubris* Woodland A Over *Acacia* Thicket**

Open Low Woodland A of *Eucalyptus salubris* over Thicket of *Acacia acuminata*, *Acacia aneura* var *aneura*, *Acacia aneura* var *fuliginosa* and *Acacia aneura* var. *argentea* on red clay loam (Plate 10). This vegetation association was widespread in the area surrounding Makai. The section assessed was located immediately adjacent to vegetation associations MR and ME (Figure 9). This vegetation association was assessed as being in very good condition. The structure of the vegetation was generally intact, with limited signs of disturbance.

#### **MR – Rehabilitation and remnant vegetation**

Very sparse Open Dwarf Scrub C of *Solanum lasiophyllum*, *Maireana pyramidata*, *Maireana triptera*, *Ptilotus obovatus* and *Sclerolaena* species with small stands of remnant vegetation of *Eucalyptus salubris*, *Acacia burkittii* and *Acacia craspedocarpa* (Plate 11) - The majority of the vegetation within this association was consistent with the representation shown in Plate 11. This vegetation was assessed as being in a degraded condition as the vegetation was lacking in structure, with extensive areas cleared of vegetation.

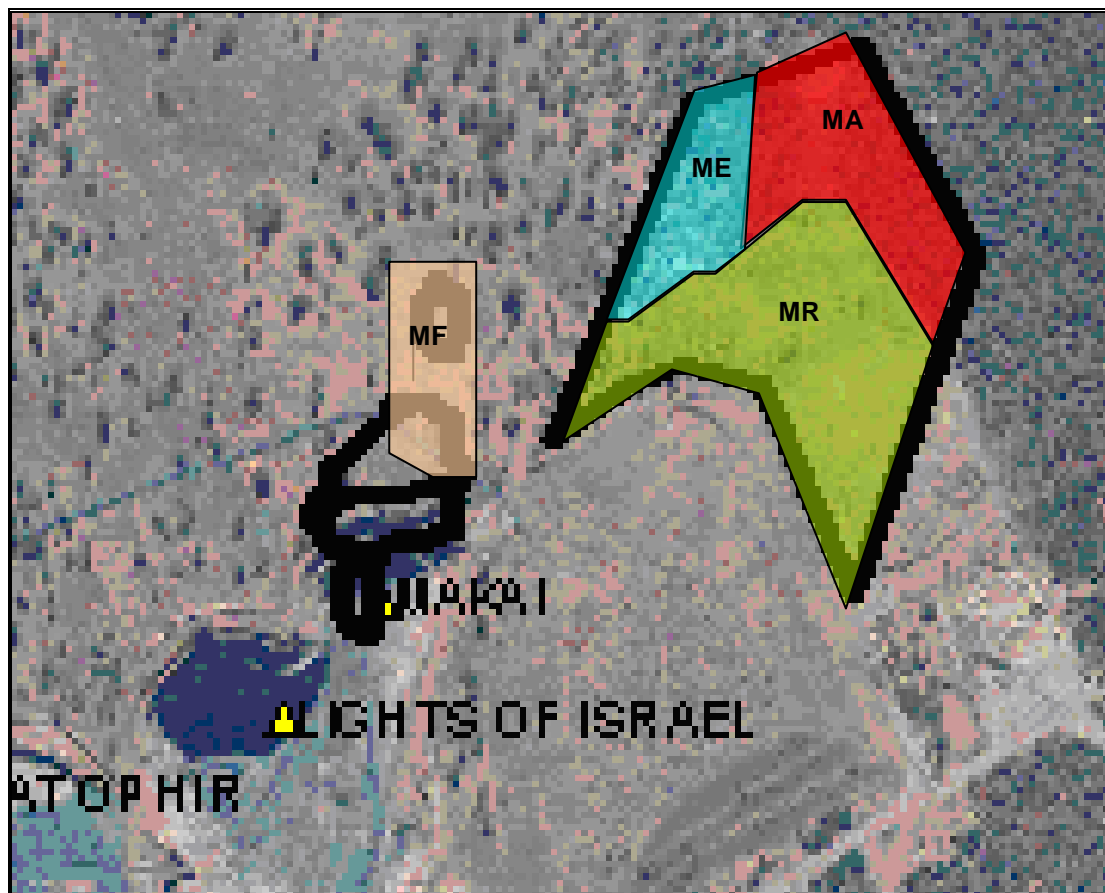


Figure 9 Area surveyed and vegetation associations described at Makai, March 2007.



**Plate 8 MF – Open *Eucalyptus salmonophloia* Woodland (Floodplain) Over Open Low Scrub B at Makai, March 2007.**



**Plate 9 ME – Low *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland over *Acacia* Thicket at Makai, March 2007.**





**Plate 10 MA – Open Low *Eucalyptus salubris* Woodland A Over *Acacia* Thicket at Makai, March 2007.**



**Plate 11 MR – Rehabilitation and remnant vegetation at Makai, March 2007.**

#### 5.4.7 Sand King (M24/352 and M24/039)

The area of Sand King surveyed consisted of a section of remnant native vegetation located between a decommissioned pit and waste landform and a section of vegetation located immediately adjacent to the abandonment bund (**Figure 10**). OES conducted a Level 1 assessment, as described in the EPA Guidelines No 51 (EPA, 2004), which involved a walkover survey of the area to enable a census of species to be undertaken and to facilitate mapping of vegetation associations.

A total of 20 taxa (including subspecies and variants) from 13 families and 15 genera were recorded across Sand King. No DRF or Priority Flora were recorded at Sand King. Two alien taxon, *Cucumis myriocarpus* (Prickly Paddy Melon) and *Nicotiana glauca* (Tree Tobacco) were recorded in vegetation located between the decommissioned pit and the waste landform.

Two vegetation associations were recorded at Sand King:

SC – Low *Eucalyptus griffithsii* and *Eucalyptus oleosa* subsp. *oleosa* Woodland over Open Low Scrub A over Dwarf Scrub C.

SE – Low *Eucalyptus oleosa* subsp. *oleosa* Woodland over Open Low Scrub A over Open Low Scrub B.

The distribution of the vegetation associations within the survey area has been mapped (**Figure 10**). It was noted that vegetation association SE was widespread in the local area whilst SC was restricted to within the existing mine footprint. Detailed descriptions of the vegetation associations present and assessments of condition follow.

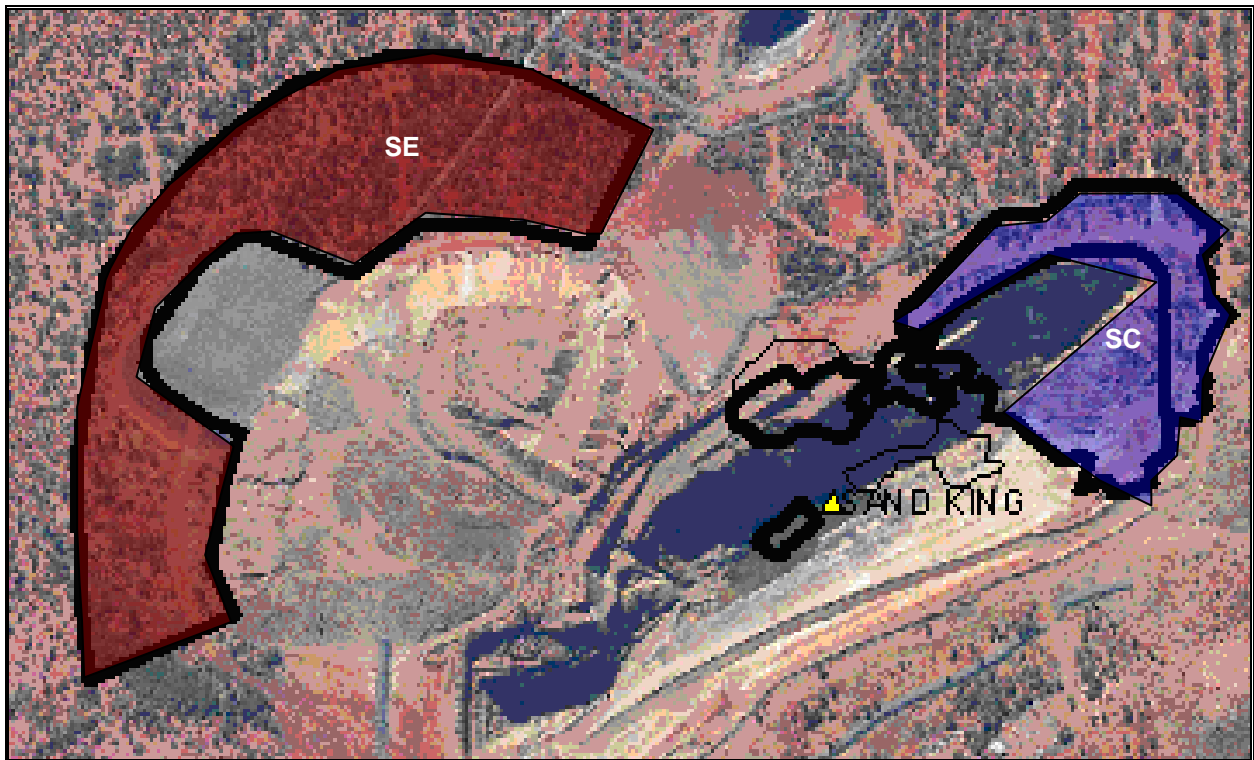
##### **SC – Low *Eucalyptus griffithsii* and *Eucalyptus oleosa* subsp. *oleosa* Woodland over Open Low Scrub A over Dwarf Scrub C**

Low Woodland of *Eucalyptus griffithsii* and *Eucalyptus oleosa* subsp. *oleosa* over Open Low Scrub A of *Eremophila oldfieldii* and *Dodonaea lobulata* over Open Dwarf Scrub C of *Grevillea species* over Dwarf Scrub D of *Atriplex bunburyana*, *Acacia colletioides*, *Maireana triptera*, *Senna artemisioides* subsp. *filifolia*, *Olearia muelleri* and *Solanum lasiophyllum* (**Plate 12**). This vegetation community was assessed as being degraded, according to the scale of Keighery (1994). Degradation was deemed to have been the product of mining activity.

##### **SE – Low *Eucalyptus oleosa* subsp. *oleosa* Woodland over Open Low Scrub A over Open Low Scrub B**

Low Woodland of *Eucalyptus oleosa* subsp. *oleosa* over Open Low Scrub A of *Acacia hemiteles*, *Dodonaea viscosa* subsp. *angustissima* and *Eremophila scoparia* over Open Low Scrub B of *Senna artemisioides* subsp. *filifolia* and *Acacia* sp. (**Plate 13**) – This vegetation association was assessed as being in good to very good condition. Some evidence of grazing and trampling was noted in the association. The impact of the damage was limited in both scale and intensity. There was also the potential that proximity to the existing mine may have contributed to some of the degradation. This impact was restricted to close to the bund.





**Figure 10 Area surveyed and distribution of vegetation associations described at Sand King during March 2007.**



**Plate 12 SC – Low *Eucalyptus griffithsii* and *Eucalyptus oleosa* subsp. *oleosa* Woodland over Open Low Scrub A over Dwarf Scrub C at Sand King, March 2007.**



**Plate 13 SE – Low *Eucalyptus oleosa* subsp. *oleosa* Woodland over Open Low Scrub A over Open Low Scrub B**

#### 5.4.8 Missouri (M24/290)

The area of Missouri surveyed was adjacent to a currently decommissioned pit and a waste landform (**Figure 11**). OES conducted a Level 1 assessment, as described in the EPA Guidelines No 51, which involved a walkover survey of the area to enable a census of species to be undertaken and to facilitate mapping of vegetation associations.

A total of 16 taxa (including subspecies and variants) from 10 families and 10 genera were recorded across Missouri. The dominant family was Mimosaceae, with 7 taxa. No DRF or Priority Flora were recorded at Missouri.

Two vegetation associations were recorded at Missouri:

MiE – Open *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland A Over Low Scrub A Over Dwarf Scrub C.

MiA – *Acacia* spp. Thicket.

The distribution of the vegetation associations within the survey area has been mapped (**Figure 11**). Detailed descriptions of the vegetation associations present and assessments of condition follow.

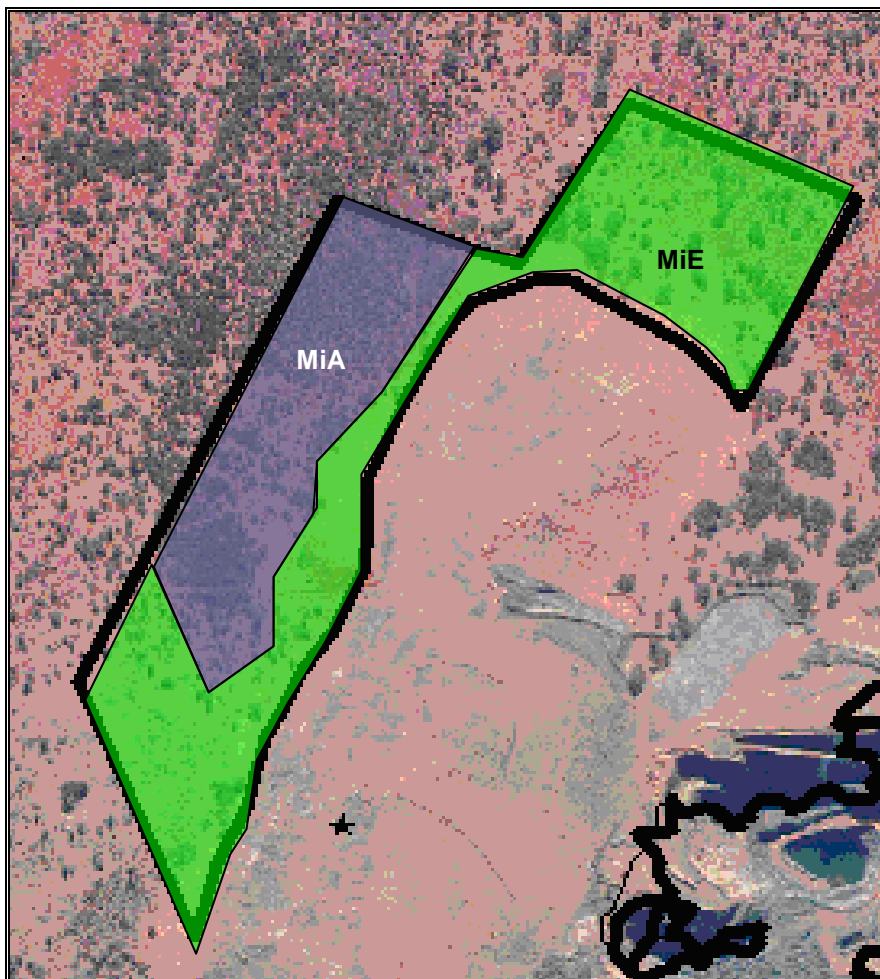


**MiE – Open *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland A Over Low Scrub A Over Dwarf Scrub C**

Open Woodland A of *Eucalyptus salmonophloia* Over Low Woodland B of *Allocasuarina eriochlamys* subsp. *eriochlamys* Over Low Scrub A of *Acacia hemiteles* Over Low Scrub B of *Acacia* sp., *Eremophila scoparia* and *Senna artemisioides* subsp. *filifolia* Over Open Dwarf Scrub D of *Maireana georgei*, *Maireana tomentosa*, *Maireana triptera* and *Ptilotus obovatus* (**Plate 14**). This vegetation community was assessed as very good, due to limited modification of the vegetation structure and limited signs of disturbance. Causes of modification of the vegetation structure were thought to be associated with mining activities.

**MiA – *Acacia* spp. Thicket**

Thicket of *Acacia acuminata*, *Acacia aneura* var. *aneura* and *Acacia aneura* var. *fuliginea* (**Plate 15**). This vegetation association was assessed as being in very good condition, according to the scale of Keighery (1994). Some degradation had been caused as a consequence of vehicle movement, but this was limited to areas immediately adjacent to a waste landform and a fenceline.



**Figure 11 Area surveyed and distribution of vegetation associations described at Missouri during March 2007.**



**Plate 14 MiE – Open *Eucalyptus salmonophloia* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Woodland A Over Low Scrub A Over Dwarf Scrub C at Missouri, March 2007**



**Plate 15 MiA – *Acacia* spp. Thicket at Missouri, March 2007**



#### 5.4.9 SM (M24/352)

An area of vegetation located in close proximity to the Sand King waste landform (SM) (**Figure 12**) was surveyed by OES during March 2007. A Level 1 assessment, as described in the EPA Guidelines No 51, was undertaken, which involved a walkover survey of the area to enable a census of species to be undertaken and to facilitate mapping of vegetation associations.

A total of 11 taxa (including subspecies and variants) from 6 families and 7 genera were recorded across SM. The dominant families were Proteaceae, with 3 taxa from two genera and Myoporaceae, with 3 taxa from one genus. No DRF or Priority Flora were recorded at SM.

One vegetation association was recorded at SM:

SM – Low *Grevillea nematophylla* subsp. *nematophylla* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Forest B with an emergent canopy of *Eucalyptus salmonophloia* Over Dwarf Scrub C Over Open *Triodia* Hummock Grass

A detailed description of the vegetation association present and assessment of condition follows.

**SM – Low *Grevillea nematophylla* subsp. *nematophylla* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Forest B with an emergent canopy of *Eucalyptus salmonophloia* Over Dwarf Scrub C Over Open *Triodia* Hummock Grass**

Low *Grevillea nematophylla* subsp. *nematophylla* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Forest B with an emergent canopy of *Eucalyptus salmonophloia* Over Low Scrub B *Acacia burkittii* and *Eremophila ionantha* Over Open Hummock Grass of *Triodia* sp. (**Plate 16**) – This vegetation community was assessed as being in very good condition, according to the scale of Keighery (1994). There was evidence of some degradation of the vegetation as a consequence of vehicular movement; however, the effects of this were restricted to a limited number of infrequently used tracks.

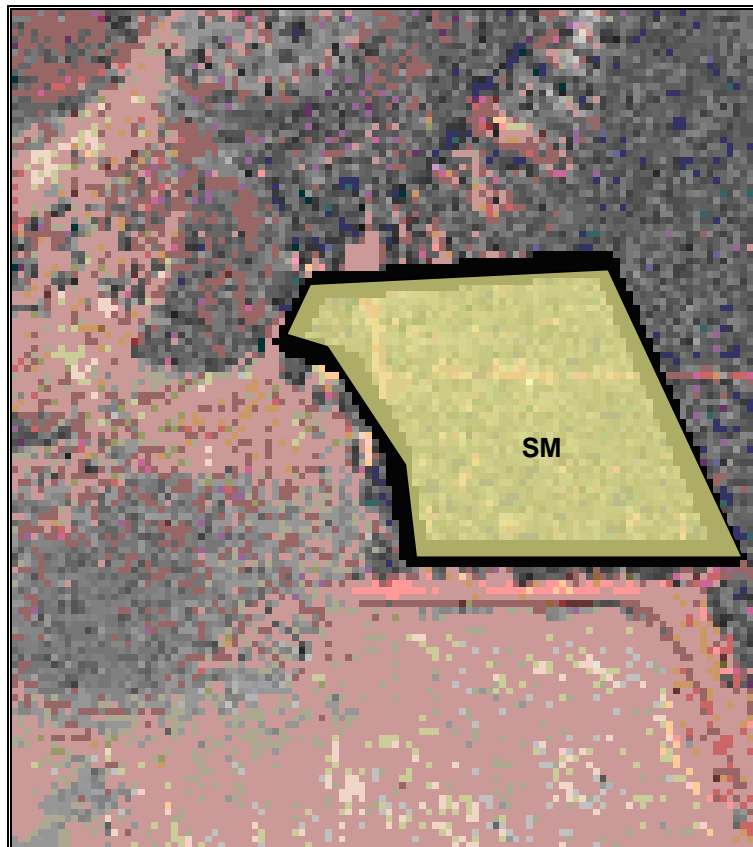


Figure 12 Area surveyed and distribution of vegetation association described at SM during March 2007.



Plate 16 Low *Grevillea nematophylla* subsp. *nematophylla* and *Allocasuarina eriochlamys* subsp. *eriochlamys* Forest B with an emergent canopy of *Eucalyptus salmonophloia* Over Dwarf Scrub C Over Open *Triodia* Hummock Grass at SM, March 2007.

#### 5.4.10 Lady Bountiful (M24/862)

Access to Lady Bountiful was not possible, due to safety issues. Therefore, there are no results for this site.

### 5.5 Threatened or 'at risk' ecological communities

No threatened ecological communities (TEC's) have been identified within the Murchison bioregion (NLWRA, 2002) (**Appendix E**). However, there are 27 vegetation assemblages that have been identified as being 'at risk' within the Murchison bioregion (NLWRA, 2002). None of these assemblages were observed within the Davyhurst survey area. One area of National Heritage, Goongarrie National park, is located within 20 km of the Davyhurst Gold Mine.

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**Appendix A**  
**Plant Species List**



No	Family	Genus	Species	Variety	Makai	GoldenEagle	Sand King	Missouri	SM
31	Poaceae	<i>Austrostipa</i>	<i>platychaeta</i>						
		<i>Triodia</i>	sp.				x		x
70	Casuarinaceae	<i>Allocasuarina</i>	<i>eriochlamys</i>	subsp. <i>eriochlamys</i>	x			x	x
		<i>Casuarina</i>	<i>obesa</i>			x			
90	Proteaceae	<i>Grevillea</i>	sp. 1				x		
		<i>Grevillea</i>	<i>nematophylla</i>	subsp. <i>nematophylla</i>					x
		<i>Grevillea</i>	<i>oligomera</i>						x
		<i>Hakea</i>	<i>recurva</i>	subsp. <i>recurva</i>					x
92	Santalaceae	<i>Exocarpus</i>	<i>aphyllus</i>						
		<i>Santalum</i>	<i>spicatum</i>			x		x	
105	Chenopodiaceae	? <i>Enchylaena</i>	? <i>tomentosa</i>			x			
		<i>Atriplex</i>	<i>nummularia</i>		x	x			
		<i>Atriplex</i>	<i>vesicaria</i>		x	x			
		<i>Atriplex</i>	<i>bunburyana</i>				x		
		<i>Maireana</i>	<i>pyramidata</i>		x				
		<i>Maireana</i>	<i>triptera</i>		x		x		
		<i>Maireana</i>	<i>georgei</i>			x		x	
		<i>Maireana</i>	<i>tomentosa</i>			x		x	
		<i>Maireana</i>	sp.			x			
		<i>Sclerolaena</i>	<i>diacantha</i>		x	x			
106	Amaranthaceae	<i>Ptilotus</i>	<i>obovatus</i>		x			x	
		<i>Ptilotus</i>	<i>exaltatus</i>			x			
163	Mimosaceae	<i>Acacia</i>	sp. 1		x				
		<i>Acacia</i>	<i>craspedocarpa</i>		x				x
		<i>Acacia</i>	<i>burkittii</i>		x				
		<i>Acacia</i>	<i>acumiata</i>		x			x	
		<i>Acacia</i>	<i>aneura</i>	var. <i>fuliginea</i>	x			x	
		<i>Acacia</i>	<i>aneura</i>	var. <i>aneura</i>	x			x	
		<i>Acacia</i>	<i>aneura</i>	var. <i>argentea</i>	x				
		<i>Acacia</i>	<i>colletioides</i>			x	x	x	x
		<i>Acacia</i>	<i>erinaceae</i>			x		x	
		<i>Acacia</i>	sp. 2				x		

No	Family	Genus	species	variety	Makai	GoldenEagle	Sand King	Missouri	SM
163	Mimosaceae	<i>Acacia</i>	<i>hemiteles</i>				x	x	
		<i>Acacia</i>	sp. 3					x	
		<i>Acacia</i>	<i>ligulata</i>						
		<i>Acacia</i>	<i>ramulosa</i>	var. <i>ramulosa</i>					
		<i>Acacia</i>	<i>siberica</i>						
164	Caesalpiniaceae	<i>Senna</i>	<i>artemisioides</i>	subsp. <i>filifolia</i>			x	x	
165	Papilionaceae	<i>Swainsona</i>	<i>canescens</i>					x	
173	Zygophyllaceae	<i>Zygophyllum</i>	sp.			x			
207	Sapindaceae	<i>Dodonaea</i>	<i>lobulata</i>		x	x	x		
		<i>Dodonaea</i>	<i>viscosa</i>	subsp. <i>angustissima</i>			x		
215	Rhamnaceae	<i>Cryptandra</i>	<i>apetala</i>	var. <i>apetala</i>					
221	Malvaceae	<i>Sida</i>	sp.			x			
223	Sterculiaceae	<i>Brachychiton</i>	<i>gregorii</i>					x	
273	Myrtaceae	<i>Eucalyptus</i>	<i>salmonophloia</i>		x			x	x
		<i>Eucalyptus</i>	<i>salubris</i>		x	x			
		<i>Eucalyptus</i>	<i>griffithsii</i>				x		x
		<i>Eucalyptus</i>	<i>oleosa</i>	subsp. <i>oleosa</i>			x		x
		<i>Eucalyptus</i>	<i>campaspe</i>						
		<i>Eucalyptus</i>	<i>celastroides</i>	subsp. <i>celastroides</i>					
305	Asclepiadaceae	<i>Marsdenia</i>	<i>australis</i>				x		
313	Lamiaceae	<i>Prostanthera</i>	<i>grylloana</i>						
315	Solanaceae	<i>Nicotinia</i>	<i>glauca</i> *			x	x		
		<i>Solanum</i>	<i>lasiophyllum</i>		x	x	x		
326	Myoporaceae	<i>Eremophila</i>	<i>scoparia</i>		x	x	x	x	
		<i>Eremophila</i>	sp.		x				
		<i>Eremophila</i>	<i>oppositifolia</i>	subsp. <i>angustifolia</i>		x			
		<i>Eremophila</i>	<i>interstans</i>	subsp. <i>virgata</i>		x			
		<i>Eremophila</i>	<i>oldfieldii</i>				x		
		<i>Eremophila</i>	<i>ionantha</i>						x
		<i>Eremophila</i>	<i>latrobei</i>						



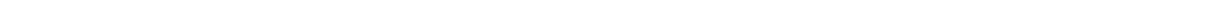
No	Family	Genus	species	variety	Makai	GoldenEagle	Sand King	Missouri	SM
337	Cucurbitaceae	<i>Cucumis</i>	<i>myriocarpus*</i>		x		x		
341	Goodeniaceae	<i>Scaveola</i>	<i>spinescens</i>		x	x	x		
345	Asteraceae	<i>Brachyscome</i>	<i>ciliocarpa</i>				x		
		<i>Olearia</i>	<i>muelleri</i>		x	x	x		

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## Appendix B

### Classification of Vegetation Structural Formation and Height Classes



**Vegetation Classification (Muir, 1977)**

LIFE FORM/HEIGHT CLASS	CANOPY COVER			
	DENSE 70% - 100%	MID DENSE 30% - 70%	SPARSE 10% - 30%	VERY SPARSE 2% - 10%
Trees > 30m Trees 15 – 30m Trees 5 – 15m Trees < 5m	Dense Tall Forest Dense Forest Dense Low Forest A Dense Low Forest B	Tall Forest Forest Low Forest A Low Forest B	Tall Woodland Woodland Low woodland A Low Woodland B	Open Tall Woodland Open Woodland Open Low Woodland A Open Low Woodland B
Mallee Tree Form Mallee Shrub Form	Dense Tree Mallee Dense Shrub Mallee	Tree Mallee Shrub Mallee	Open Tree Mallee Open Shrub Mallee	Very Open Tree Mallee Very Open Shrub Mallee
Shrubs > 2m Shrubs 1.5 – 2m Shrubs 1 – 1.5m Shrubs 0.5 – 1m Shrubs 0 – 0.5m	Dense Thicket Dense Heath A Dense Heath B Dense Low Heath C Dense Low Heath D	Thicket Heath A Heath B Low Heath C Low Heath D	Scrub Low Scrub A Low Scrub B Dwarf Scrub C Dwarf Scrub D	Open Scrub Open Low Scrub A Open Low Scrub B Open Dwarf Scrub C Open Dwarf Scrub D
Mat Plants Hummock Grass Bunch grass >0.5m Bunch grass < 0.5m Herbaceous spp.	Dense Mat Plants Dense Hummock Grass Dense Tall Grass Dense Low Grass Dense Herbs	Mat Plants Mid-dense Hummock Grass Tall Grass Low Gras Herbs	Open Mat Plants Hummock Grass Open Tall Grass Open Low Grass Open Herbs	Very Open Mat Plants Open Hummock Grass Very Open Tall Grass Very Open Low Grass Very Open Herbs
Sedges > 0.5m Sedges < 0.5m	Dense Tall Sedges Dense Low Sedges	Tall Sedges Low Sedges	Open Tall Sedges Open Low Sedges	Very Open Tall Sedges Very Open Low Sedges
Ferns Mosses, liverworts	Dense ferns Dense Mosses	Ferns Mosses	Open Ferns Open Mosses	Very Open Ferns Very Open Mosses

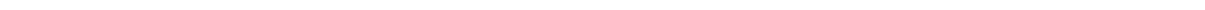
**Appendix C**  
**Vegetation Condition Scale**



**Vegetation Condition Scale (Keighery, 1994).**

<b>Code</b>	<b>Description</b>
<b>Pristine</b>	<i>Pristine or nearly so. No obvious signs of disturbance.</i>
<b>Excellent</b>	<i>Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.</i>
<b>Very Good</b>	<i>Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.</i>
<b>Good</b>	<i>Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.</i>
<b>Degraded</b>	<i>Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.</i>
<b>Completely Degraded</b>	<i>The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.</i>

**Declared Rare and Priority Flora Database searches**



**DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT  
DECLARED RARE AND PRIORITY FLORA LIST  
21 December 2006**

SPECIES / TAXON FLOWER	CONS	CALM	DISTRIBUTION
	CODE PERIOD	REGION	
Acacia speckii	3	MW	Nannine, Yalgoo, Norie Stn, Coodardy Stn, Meekatharra, Madoonga Stn
Dicrastylis linearifolia Nov-Jan	3	MW	Nerren Nerren, Meka, Iona, Binnu, Billabong, Mt Magnet, Burnerbinmah
Dicrastylis sp. Cue (AA Mitchell 764) Sep-Oct	1	MW	Coodardy Stn
Lepidium scandens Aug, Sep	3	MW	Sanford River, Murgoo Stn, Jingemarra Stn, Bush Bay, Wooramel
Ptilotus beardii Oct	3	MW	Muggon Station, Meka Stn, Wooleen Stn, Mt Narryer Stn

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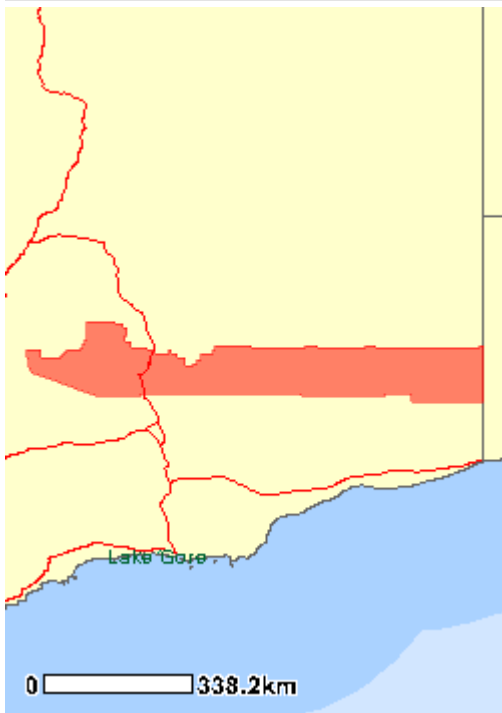
**Appendix E**  
**Environment Protection and Biodiversity Conservation Protected Matters**  
**Database Search**

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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.

The Australian Natural Resources Atlas at <http://www.environment.gov.au/atlas> may provide further environmental information relevant to your selected area. 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>



This map may contain data of which are Australia (Australia)  
© Commonwealth  
(Geoscience  
© 2007 MapData Sciences Pty Ltd, PSMA  
Search Region: Shire Of Menzies, WA



- Report Contents: [Summary](#)  
[Details](#)  
 [Matters of NES](#)  
 [Other matters protected by the EPBC Act](#)  
 [Extra Information](#)  
[Caveat](#)  
[Acknowledgments](#)

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>.

World Heritage Properties: None

National Heritage Places: None

Wetlands of International Significance: None  
(Ramsar Sites)

Commonwealth Marine Areas: None

Threatened Ecological Communities: None

[Threatened Species:](#) 12

[Migratory Species:](#) 3

#### 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>.

[Commonwealth Lands:](#) 1

Commonwealth Heritage Places: None

[Places on the RNE:](#) 6

[Listed Marine Species:](#) 5

Whales and Other Cetaceans: None

Critical Habitats: None

Commonwealth Reserves: None

#### Extra Information

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

[State and Territory Reserves:](#) 6

Other Commonwealth Reserves: None

Regional Forest Agreements: None

## Matters of National Environmental Significance

Threatened Species [ <a href="#">Dataset Information</a> ]	Status	Type of Presence
Birds		
<a href="#">Acanthiza iredalei iredalei</a> * Slender-billed Thornbill (western)	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Leipoa ocellata</a> * Malleefowl	Vulnerable	Species or species habitat likely to occur within area
Mammals		
<a href="#">Dasycercus cristicauda</a> * Mulgara	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Myrmecobius fasciatus</a> * Numbat	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Notoryctes typhlops</a> * Yitjarritjarri, Southern Marsupial Mole	Endangered	Species or species habitat likely to occur within area
<a href="#">Sminthopsis psammophila</a> * Sandhill Dunnart	Endangered	Species or species habitat may occur within area
Reptiles		
<a href="#">Egernia kintorei</a> * Great Desert Skink, Tjakura, Warrarna, Mulyamiji	Vulnerable	Species or species habitat may occur within area
Plants		
<a href="#">Conospermum toddii</a> * Victoria Desert Smokebush	Endangered	Species or species habitat likely to occur within area
<a href="#">Eucalyptus articulata</a> * Ponton Creek Mallee	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Gastrolobium graniticum</a> * Granite Poison	Endangered	Species or species habitat likely to occur within area
<a href="#">Myriophyllum lapidicola</a> * Chiddarcooping mMRIophyllum	Endangered	Species or species habitat known to occur within area
<a href="#">Stipa nullanulla</a> * Club Spear-grass	Vulnerable	Species or species habitat likely to occur within area
Migratory Species [ <a href="#">Dataset Information</a> ]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
<a href="#">Leipoa ocellata</a> Malleefowl	Migratory	Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		
Birds		
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel	Migratory	Species or species habitat may occur within area
Other Matters Protected by the EPBC Act		
Listed Marine Species [ <a href="#">Dataset Information</a> ]	Status	Type of Presence
Birds		
<a href="#">Apus pacificus</a> Fork-tailed Swift	Listed overfly	Species or species habitat may occur within area

		marine area	
<a href="#">Ardea</a>	<a href="#">alba</a>	Listed overfly marine area	- Species or species habitat may occur within area
Great Egret, White Egret			
<a href="#">Ardea</a>	<a href="#">ibis</a>	Listed overfly marine area	- Species or species habitat may occur within area
Cattle Egret			
<a href="#">Charadrius</a>	<a href="#">veredus</a>	Listed overfly marine area	- Species or species habitat may occur within area
Oriental Plover, Oriental Dotterel			
<a href="#">Merops</a>	<a href="#">ornatus</a>	Listed overfly marine area	- Species or species habitat may occur within area
Rainbow Bee-eater			

#### Commonwealth Lands [ [Dataset Information](#) ]

Unknown

Places on the RNE [ [Dataset Information](#) ]  
 Note that not all Indigenous sites may be listed.

Natural

[Goongarrie Area WA](#)

[Great Victoria Desert Nature Reserve WA](#)

[Lake Moore Area WA](#)

[Mount Manning Nature Reserve WA](#)

[Plumridge Lakes Nature Reserve WA](#)

[Unnamed Conservation Park SA](#)

Extra Information

#### State and Territory Reserves [ [Dataset Information](#) ]

Goongarrie National Park, WA

Great Victoria Desert Nature Reserve, WA

Mount Manning Range Nature Reserve, WA

Niagara Dam Nature Reserve, WA

Plumridge Lakes Nature Reserve, WA

Unnamed Conservation Park, SA

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#### 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

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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 [migratory](#) and [marine](#) provisions of the Act have been mapped.

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:

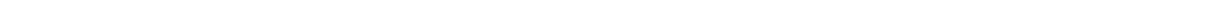
non-threatened seabirds which have only been mapped for recorded breeding sites;

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.

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**Appendix F**  
**Environment Reporting Tool Database Search**



Database Report

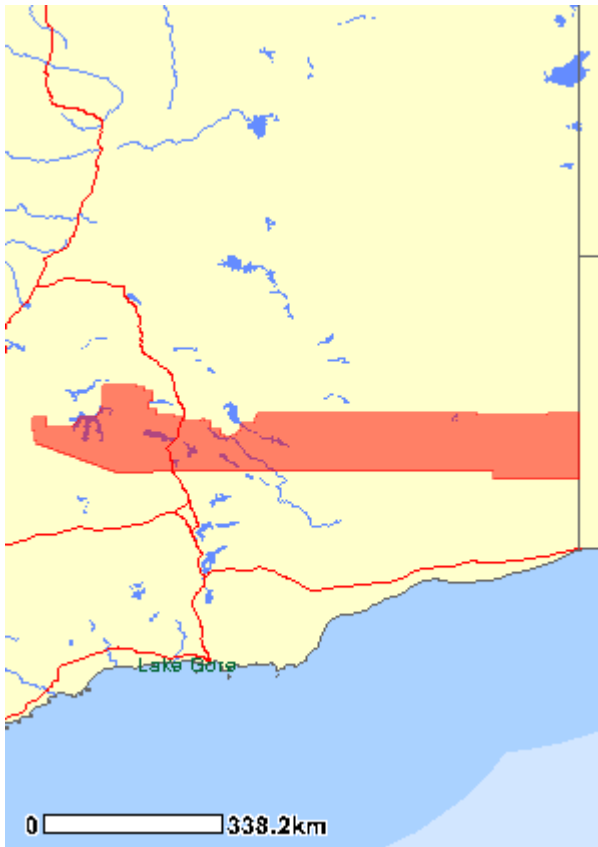
1 March 2007 11:30

This report includes places of national environmental significance that are registered in the Department of the Environment and Heritage's databases, for the selected area. The information presented here has been provided by a range of groups across Australia, and the accuracy and resolution varies.

Search Region: Shire Of Menzies, WA



Report Contents: [Summary](#) >> [Details](#) >> [Caveat](#) >> [Acknowledgment](#)



Biodiversity

[Threatened Species:](#) 12

[Migratory Species:](#) 3

[Listed Marine Species:](#) 5

[Invasive Species:](#) 7

Whales and Other Cetaceans: None

Threatened Ecological Communities: None

Heritage

World Heritage Properties: None

[Australian Heritage Sites:](#) 6

Wetlands

Ramsar (Internationally important) sites: None

[Nationally Important Wetlands:](#) 3

National Pollutant Inventory



<a href="#">Reporting Facilities:</a>	6
Airsheds:	None
<a href="#">Catchments:</a>	1
Protected Areas	
<a href="#">Reserves and Conservation Areas:</a>	6
Regional Forest Agreements:	None

## Biodiversity

Threatened Species [ <a href="#">Dataset Information</a> ]	Status	Comments
Birds		
<a href="#">Acanthiza iredalei iredalei</a> Slender-billed Thornbill (western)	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl	Vulnerable	Species or species habitat likely to occur within area
Mammals		
<a href="#">Dasycercus cristicauda</a> Mulgara	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Myrmecobius fasciatus</a> Numbat	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Notoryctes typhlops</a> Yitjarritjarri, Southern Marsupial Mole	Endangered	Species or species habitat likely to occur within area
<a href="#">Sminthopsis psammophila</a> Sandhill Dunnart	Endangered	Species or species habitat may occur within area
Reptiles		
<a href="#">Egernia kintorei</a> Great Desert Skink, Tjakura, Warrarna, Mulyamiji	Vulnerable	Species or species habitat may occur within area
Plants		
<a href="#">Conospermum toddii</a> Victoria Desert Smokebush	Endangered	Species or species habitat likely to occur within area
<a href="#">Eucalyptus articulata</a> Ponton Creek Mallee	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Gastrolobium graniticum</a> Granite Poison	Endangered	Species or species habitat likely to occur within area
<a href="#">Myriophyllum lapidicola</a> Chiddarcooping mMRIophyllum	Endangered	Species or species habitat known to occur within area
<a href="#">Stipa nullanulla</a> Club Spear-grass	Vulnerable	Species or species habitat likely to occur within area

Migratory Species [ <a href="#">Dataset Information</a> ]	Status	Comments
Migratory Terrestrial Species		
Birds		
<a href="#">Leipoa ocellata</a> Malleefowl	Migratory	Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		

## Birds

[Charadrius](#) [veredus](#) Migratory Species or species habitat may occur within area  
Oriental Plover, Oriental Dotterel

Listed Marine Species [ [Dataset Information](#) ] Status Comments

## Birds

[Apus](#) [pacificus](#) Listed - overfly marine area Species or species habitat may occur within area  
Fork-tailed Swift

[Ardea](#) [alba](#) Listed - overfly marine area Species or species habitat may occur within area  
Great Egret, White Egret

[Ardea](#) [ibis](#) Listed - overfly marine area Species or species habitat may occur within area  
Cattle Egret

[Charadrius](#) [veredus](#) Listed - overfly marine area Species or species habitat may occur within area  
Oriental Plover, Oriental Dotterel

[Merops](#) [ornatus](#) Listed - overfly marine area Species or species habitat may occur within area  
Rainbow Bee-eater

Invasive Species [ [Dataset Information](#) ] Status Comments

Selected Invasive Species: 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.

## Mammals

[Capra](#) [hircus](#) Feral Species or species habitat likely to occur within area  
Goat

[Felis](#) [catus](#) Feral Species or species habitat likely to occur within area  
Cat, House Cat, Domestic Cat

[Oryctolagus](#) [cuniculus](#) Feral Species or species habitat likely to occur within area  
Rabbit, European Rabbit

[Vulpes](#) [vulpes](#) Feral Species or species habitat likely to occur within area  
Red Fox, Fox

## Plants

[Carrichtera](#) [annua](#) Invasive Species or species habitat likely to occur within area  
Ward's Weed

[Cenchrus](#) [ciliaris](#) Invasive Species or species habitat may occur within area  
Buffel-grass, Black Buffel-grass

[Lycium](#) [ferocissimum](#) Invasive Species or species habitat may occur within area  
African Boxthorn, Boxthorn

## Heritage

Australian Heritage Sites [ [Dataset Information](#) ]  
Note that not all Indigenous sites may be listed.

## Natural

[Goongarrie Area WA](#)

[Great Victoria Desert Nature Reserve WA](#)

[Lake Moore Area WA](#)

[Mount Manning Nature Reserve WA](#)

[Plumridge Lakes Nature Reserve WA](#)

[Unnamed Conservation Park SA](#)

#### Wetlands

Nationally Important Wetland Sites [ [Dataset Information](#) ]

[Lake Ballard, WA](#)

[Lake Barlee, WA](#)





[Lake Marmion, WA](#)

National Pollutant Inventory [ [Dataset Information](#) ]


[NPI Location Report](#)

Reporting Facility

Top Substance Source


Substance emissions are ranked on a scale of 1-100: 1=lowest; 100=highest. Rankings are shown as:  =0-25;  =26-50;  =51-75;  =76-100.

[ANGLOGOLD AUSTRAL LTD \( SUNRISE DAM OPERATIONS, LAVERTON WA \)](#)

Particulate Matter 10.0 um  
 [ Low ]


Gold mining and processing

[Barmingo Pty Ltd \( First Hit, Menzies WA \)](#)

Oxides of Nitrogen  
 [ Low ]


of Underground Mining of Gold Ore

[Croesus Mining NL \( DAVYHURST, Menzies WA \)](#)

Arsenic compounds  
 [ Low ]


& MINE DEWATERING, PUTRESCIBLE LANDFILL, PROCESSING OF METALLIC ORE

[ORICA AUST P/L \( Orica Explosives Detonation Range, SANDSTONE WA \)](#)

Particulate Matter 10.0 um  
 [ Low ]


Explosives detonation range at remote site

[Paddington Gold Pty Ltd \( Menzies Operations, via Kalgoorlie WA \)](#)

Particulate Matter 10.0 um  
 [ Low ]

Open pit gold mining for three months of reporting period

[SONS OF GWALIA LTD \( Ulysses Operations, Leonora WA \)](#)

Particulate Matter 10.0 um  
 [ Low ]

Gold mining

Catchment

Substances

Sources

[Avon, WA](#)

2

6

#### Other

Reserves and Conservation Areas [ [Dataset Information](#) ]

Goongarrie National Park, WA

Great Victoria Desert Nature Reserve, WA

Mount Manning Range Nature Reserve, WA

Niagara Dam Nature Reserve, WA

Plumridge Lakes Nature Reserve, WA

Unnamed Conservation Park, SA

Caveat

The information presented here has been drawn from a range of sources, compiled for a variety of purposes. Details of the coverage of each dataset are included in the metadata [[Dataset Information](#)] links above.