C O B U R N M I N E R A L S A N D P R O J E C T

E N V I R O N M E N T A L M A N A G E M E N T P L A N

Declared Rare Flora Management Plan *Eucalyptus beardiana*

Prepared for

Gunson Resources Limited

Level 2, 33 Richardson Street
WEST PERTH

20 March 2007

42906323/JL/627-F7963.1

URS

Environmental Management Plan Checklist: EAS Form 1b

General Information

Ministerial Statement No	723	**Project Title**	Coburn Mineral Sand Project
		Proponent	Gunson Resources Limited
EMP Title (including date and version number)	**Declared Rare Flora Management Plan** Date: Revision:		

EMP Content	**Yes**	**No**	**Comments**
Is the document structured according to the EMP guideline?	☑	☐	
Element - Is the aspect appropriately described?	☑	☐	SECTION 1.
Current Status – Are the project description and receiving environment details adequate?	☑	☐	SECTION 2.
Potential Impacts – Are the potential impacts described adequately?	☑	☐	SECTION 3.
Environmental Objectives – Are the objectives consistent with the Ministerial Statement and the EPA bulletin?	☑	☐	SECTION 4.
Performance Indicators/Criteria – Are the indicators and criteria used meaningful, sufficient and appropriate?	☑	☐	
Are the criteria verifiable and reproducible?	☑	☐	SECTION 5.
Implementation strategy – Are the strategies, tasks and the action program adequate for the environmental objectives?	☑	☐	
Have roles and responsibilities been identified?	☑	☐	
Have adequate timeframes and priorities been identified?	☑	☐	SECTION 6.
Monitoring – Is the program to monitor performance against objectives and criteria adequate?	☑	☐	
Are details provided on how/when monitoring will be undertaken and reported?	☑	☐	SECTION 7.
Contingencies – Are the mechanisms to identify actual and apparent non-conformance adequate?	☑	☐	
Are the actions to address non-conformances adequate?	☑	☐	SECTION 8.
Stakeholder consultation – Is a list of major stakeholders and details of how and when they were and will be consulted, provided?	☑	☐	SECTION 9.
Auditing – Are details of an audit process to demonstrate implementation and compliance provided?	☑	☐	SECTION 10.
Review and Revision – Is a suitable process to assess the adequacy of the plan detailed?	☑	☐	SECTION 11.
Reporting – are the reporting details provided adequate?	☑	☐	SECTION 12.
Key Management Actions Table - Has adequate information been provided in the Table?	☑	☐	
Does the table list the key actions, how implementation will be reported and the evidence that will be provided to DoE?	☑	☐	SECTION 13.
Figures and Tables – Have relevant figures and tables been provided?	☑	☐	
Advisory bodies – Has advice been sought from all relevant advisory bodies and incorporated into the EMP?	☑	☐	ADVICE HAS BEEN SOUGHT FROM DEC AND SBWHP CCC AND SAC.
Has evidence of this advice been provided with the document?	☑	☐	REFER TO ATTACHED COVER LETTER.

Additional Comments	-	
The EMP has been developed in accord with the DEC EMP guideline.	Harley. ..... **Environmental Manager**	20/3/2007 **Date**

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1.1 Background

Gunson Resources Limited (Gunson) is developing the Coburn Mineral Sand Project (the Project) in the Shark Bay district of Western Australia (WA), approximately 250 km north of Geraldton and 84 km southeast of Denham. The Project Area is located immediately east of the Shark Bay World Heritage Property (SBWHP). The Project will comprise the mining and processing of a major low grade heavy mineral sand deposit known as the Amy Zone, approximately 18 km long, up to 3 km wide and between 10 m and 40 m thick.

The Project was assessed as a Public Environmental Review (PER) under Part IV of the Western Australian *Environmental Protection Act 1986*. In addition, the Project is considered to be a "controlled action" under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*. The environmental assessment was conducted in accordance with the bilateral agreement between the Commonwealth of Australia and WA, meaning that the Commonwealth accredited the WA environmental impact assessment process.

The PER (URS, 2005) was issued in July 2005 for an eight-week public review period and the Report and Recommendations of the WA Environmental Protection Authority (EPA) was published as EPA Bulletin 1211 in December 2005. Environmental approval for the Project was granted by the State Minister for the Environment in May 2006 in Ministerial Statement No. 723 and the Commonwealth Environment Minister in July 2006.

1.2 Aspect

This Declared Rare Flora (DRF) Management Plan is part of a series of management plans (MPs) for the Project, that are known collectively as the Environmental Management Plan (EMP). The purpose of the EMP is to provide measures to prevent or mitigate potential impacts to the environment and heritage values during construction and operation of the Project. The MPs were developed based upon the impacts identified during the environmental risk assessment process undertaken during preparation of the PER, with consideration given to stakeholder comment and issues addressed during the EPA's and Department of Environment and Heritage's (DEH) assessment of the Project.

This DRF Management Plan has been prepared in accordance with Conditions 8-5 to 8-8 of Ministerial Statement No. 723 (see Section 1.4), and Condition 5 of the DEH Approval Decision – Coburn Mineral Sand Project (EPBC 2003/1221). These Conditions require that a Management Plan be prepared and implemented should a DRF species be located during flora and vegetation surveys of the Project and surrounding area. During October and November 2006, surveys of the Miscellaneous Licence L09/21 and surrounding area for the access road route, by Mattiske Consulting Pty (Mattiske), located two populations (167 plants) of the DRF species *Eucalyptus beardiana* (Figure 1.1).

Species of flora defined as DRF (Extant Taxa) are "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." The Department of Environment and Conservation (DEC) recognises these threats of extinction and consequently applies regulations towards population and species protection.

The richness and high degree of endemism in Western Australia's flora and the localised distribution of many taxa have resulted in a situation where many flora taxa are naturally rare or have been made rare through habitat loss due to land clearing or other causes. Threats from land clearing, disease infection, weed invasion, drought and other local disturbances are major causes of endangerment of Western Australia's many naturally rare and localised plants (CALM, 2005).

Photography by A.P. Brown and S.D. Hopper. Image used with the permission of the Western Australian Herbarium, Department of Environment and Conservation (http://florabase.calm.wa.gov.au/help/copyright). Accessed on 5 December 2006. (Western Australian Herbarium, 2006).

Figure 1.1: *Eucalyptus beardiana*

1.3 Relevant Legislation and Policies

Legislation and policies applicable to this management plan include:

- *Wildlife Conservation Act 1950*;
- *Environmental Protection Act 1986*;

- EPBC Act*;*
- DEC Policy Statement No. 9 (Conservation of Threatened Flora in the Wild, 1992);
- DEC Policy Statement No. 29 (Translocation of Threatened Flora and Fauna, Revised July 1995);
- EPA Position Statement No. 2 (Environmental Protection of Native Vegetation in Western Australia, 2000);
- EPA Position Statement No. 3 (Terrestrial Biological Surveys as an Element of Biodiversity Protection in Western Australia, 2002); and
- EPA Guidance Statement No. 51 (Terrestrial Flora Surveys for Environmental Impact Assessment in Western Australia, 2004).

DRF species are gazetted under Subsection 2 of Section 23F of the *Wildlife Conservation Act 1950* and therefore it is an offence to "take" or damage rare flora without Ministerial approval. Section 23F of the *Wildlife Conservation Act 1950* defines "to take" as "… to gather, pick, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means".

Under DEC's Policy Statement No. 9 (Conservation of Threatened Flora in the Wild), protected flora taxa may be recommended for gazettal as DRF if they satisfy each of the following criteria.

a) The taxon (species, subspecies, variety) is well defined, readily identified and represented by a voucher specimen in a State or National Herbarium. It need not necessarily be formally described under conventions in the International 21 Code of Botanical Nomenclature, but such a description is preferred and should be undertaken as soon as possible after listing on the schedule;

b) The taxon has been searched for thoroughly in the wild by competent botanists during the past five years in most likely habitats, according to guidelines approved by the Executive Director;

c) Searches have established that the plant in the wild is either:

   - rare; or
   - in danger of extinction; or
   - deemed to be threatened and in need of special protection; or
   - presumed extinct (i.e. the taxon has not been collected from the wild, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently).

d) In the case of hybrids, or suspected hybrids, the following criteria must also be satisfied:

   - they must be a distinct entity, that is, the progeny are consistent within the agreed taxonomic limits for that taxon group;

- they must be self perpetuating, that is, not reliant on the parent stock for replacement; and
- they are the product of a natural event, that is, both parents are naturally occurring and cross fertilisation was by natural means. The status of a threatened plant in cultivation has no bearing on this matter. The legislation refers only to the status of plants in the wild. Plants may be deleted from the schedule of DRF (as flora which is likely to become extinct or is rare) where:
  - recent botanical survey as defined above has shown that the taxon is not rare, in danger of extinction or otherwise in need of special protection;
  - the taxon is shown to be a hybrid that does not comply with the inclusion criteria; or
  - the taxon is no longer threatened because it has been adequately protected by reservation of land where it occurs, or because its population numbers have increased beyond the danger point.

The DRF list is reviewed annually. There are currently 379 extant taxa and 14 taxa that are presumed extinct, gazetted as DRF.

Commercial harvesting of DRF is not generally permitted. An exception may be made in special circumstances, such as where the Minister approves the taking of seed, cuttings or tissue culture material for commercial propagation, where the conservation status of the taxa in the wild would be assisted, or would not be adversely affected. For example, the establishment of cultivated populations of a rare taxon that is attractive to the flora trade could reduce the likelihood of illegal picking in the wild (CALM, 2005).

Under the EPBC Act, an action requires the approval of the Minister if the action has, will have, or is likely to have a significant impact on any of the matters of National Environmental Significance (MNES). *E. beardiana* is listed as Endangered pursuant to Schedule 1 of the EPBC Act.

1.4 State Ministerial Conditions

The conditions relevant to DRF management for the Project from State Ministerial Statement No. 723 are provided below:

8 Flora and Vegetation

8-5 In the event that Declared Rare Flora and/or species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*, are identified in the project area, the proponent shall prepare a Declared Rare Flora Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

8-6 The Declared Rare Flora Management Plan required by condition 8-5 shall include:

1. the recorded location of Declared Rare Flora species;

2. a description of the habitat in which the Declared Rare Flora was found, and the extent of the contiguous area of the same habitat in the local area;

3. offsite surveys to determine the extent of rare flora species;

4. the degree of impact of the proposed works on the Declared Rare Flora or its identified contiguous habitat;

5. a management strategy for the protection of Declared Rare Flora species, in the event that approval to impact the declared rare or priority flora has not been provided pursuant to the *Wildlife Conservation Act 1950* , including:

   a) identification of a protected buffer area around the Declared Rare Flora;

   b) delineation of the location of the Declared Rare Flora buffer area to prevent accidental damage to the protected area;

   c) consideration of relocating Declared Rare Flora species;

   d) education of workers as to the protection of the Declared Rare Flora location;

   e) specific management measures for topsoil stripping within areas of the contiguous Declared Rare Flora habitat; and

   f) specific management measures for site rehabilitation and topsoil replacement within areas previously included as contiguous Declared Rare Flora habitat.

6. post-activity monitoring plan for Declared Rare Flora and regeneration of vegetation within areas previously included as contiguous Declared Rare Flora habitat, including monitoring for Declared Rare Flora plants.

8-7 The proponent shall implement the Declared Rare Flora Management Plan required by condition 8-5.

8-8 The proponent shall make the Declared Rare Flora Management Plan required by condition 8-5 publicly available.

8-10 The proponent shall report within the Annual Environmental Reports required by condition 5-4 the outcomes of any monitoring programs and performance reviews associated with the implementation of the Flora and Vegetation Management Plan required by condition 8-1 and the Declared Rare Flora Management Plan required by condition 8-5.

The requirements of the DRF MP are outlined in Condition 8-6. Table 1.1 identifies where in this document these requirements have been addressed.

Table 1.1

Management Plan Requirements

Ministerial Condition	Requirement	Where Addressed in this EMP
8-6 (1)	The recorded location of Declared Rare Flora species.	On advice from DEC this Condition has not been addressed within this MP. On request, the location of DRF species will be provided to government regulators as a confidential document.
8-6 (2)	A description of the habitat in which the Declared Rare Flora was found, and the extent of the contiguous area of the same habitat in the local area.	Section 2.2
8-6 (3)	Offsite surveys to determine the extent of rare flora species.	Sections 2 and 6
8-6 (4)	The degree of impact of the proposed works on the Declared Rare Flora or its identified contiguous habitat.	Section 3
8-6 (5)	A management strategy for the protection of Declared Rare Flora species, in the event that approval to impact the declared rare or priority flora has not been provided pursuant to the *Wildlife Conservation Act 1950*, including:	NA
8-6 (5) a)	Identification of a protected buffer area around the Declared Rare Flora.	Section 6
8-6 (5) b)	Delineation of the location of the Declared Rare Flora buffer area to prevent accidental damage to the protected area.	Section 6
8-6 (5) c)	Consideration of relocating Declared Rare Flora species.	Section 8
8-6 (5) d)	Education of workers as to the protection of the Declared Rare Flora location.	Section 6
8-6 (5) e)	Specific management measures for topsoil stripping within areas of the contiguous Declared Rare Flora habitat.	Section 6
8-6 (5) f)	Specific management measures for site rehabilitation and topsoil replacement within areas previously included as contiguous Declared Rare Flora habitat.	Section 6
8-6 (6)	Post-activity monitoring plan for Declared Rare Flora and regeneration of vegetation within areas previously included as contiguous Declared Rare Flora habitat, including monitoring for Declared Rare Flora plants.	Section 7

1.5 DEH Conditions

The Condition relevant to DRF management for the Project from the DEH Approvals Decision – Coburn Mineral Sands Project (EPBC 2003/1221) is provided below:

> 5. In the event that a flora species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* is found, in accordance with Conditions 8-5 to 8-8 of the above Statement, the proponent must prepare a Declared Rare Flora Management Plan to the requirements of the (Australian Government) Minister for the Environment and heritage as well as to those of the WA Minister.

This DRF Management Plan has been prepared to comply with Condition 5.

2.1 Project Overview

The Project proposed in the PER included mining and processing of ore from ten open cut pits. However, during the environmental assessment process, Gunson decided to seek approval to develop only nine pits until operational data became available to validate and refine the prediction of environmental impacts associated with Pit 10. Consequently, the main components of the Project comprise:

- Nine open-cut mine pits;
- Up to two processing plants that will be relocated as mining progresses;
- A borefield;
- Haul roads and access corridors;
- Offices, workshops and other supporting infrastructure; and
- An accommodation camp.

The key characteristics of the approved Project are summarised in Table 2.1.

Table 2.1

Key Characteristics of the Coburn Mineral Sand Project

Element	Description
Project Life	Approximately 12 Years.
Number of Pits	Nine pits.
Rate of Mining	Approximately 2,300 tonnes per hour (tph) for the first two years, increasing to 4,600 tph in Year 3 (~15 million tonnes per annum [tpa] for Years 1 and 2, and 30 million tpa for Years 3 to 12).
Mining Method	Dozers and in-pit screening modules.
Estimated Footprint of Disturbance	Approximately 3,695 hectares.
Rate of Processing	Approximately 2,200 tph for the first two years increasing to 4,400 tph in Year 3 (~140,000 tpa of Heavy Mineral Concentrate from Year 1 increasing to 280,000 tpa from Year 3).
Estimated Volume of Tailings	2,180 tph for each 2,200 tph concentrator.
Volume of Process Water	Up to 18 GL/annum at full production.
Estimated Total Volume of Refined Product	Ilmenite – 1,400 kilotonnes (kt) HiTi – 380 kt Zircon – 660 kt

Source: Schedule 1 of Ministerial Statement No. 723

2.2 Existing Environment

2.2.1 Regional Environment

The Project Area is located within the transition zone between the South-West Botanical Province and the Eremaean Botanical Province (Beard, 1990). The northern extent of the Irwin Botanical District (a part of the Southwest Botanical Province) is described by Beard (1990) as 'tree heath' comprising herbs and grasses, small and large shrubs, and small trees up to 6 m. The southern portion of the Amy Zone is a part of the Carnarvon Botanical District (a part of the Eremaean Botanical Province) and is characterised by *Acacia* shrublands and low woodlands. This boundary represents the transition from the complex and species-rich heathlands and woodlands of south-western Australia to the less diverse *Acacia* shrublands of the Carnarvon Basin and is thought to relate to the increasing quantity and reliability of rainfall to the south-west (Beard, 1976).

The region is thought to be a major transition zone for the vascular flora of Western Australia, with 229 taxa ending their northern-most range within the SBWHP (Trudgen and Keighery, 1995).

2.2.2 Survey Area

Mattiske was commissioned by Gunson to undertake flora and vegetation surveys of the Project and surrounding area. The surveys extended beyond the specific Project Area to enable the botanical studies to be placed in a local and regional context. Therefore, reference to the survey area in the following text includes both the Project Area and the adjacent surveyed areas, whilst the Project Area refers specifically to the proposed mining and infrastructure areas. Based on the current mine plan, the Project Area has an estimated footprint of approximately 1,500 ha, whereas the survey area covers a total area of 24,384 ha. Surveys were conducted in August 2003, April 2004, September 2004, November 2004, August 2005, August 2006, October 2006 and November 2006. The information below has been sourced largely from these reports.

A total of 324 flora taxa (including subspecies and varieties) have been recorded within the survey area. One species of *E. beardiana*, gazetted as DRF pursuant to subsection (2) of section 23F under the *Wildlife Conservation Act 1950*, and as Endangered under the EPBC Act, has been recorded within the survey area in two populations, comprising 167 plants at 80 sites. This DRF MP has been prepared in accordance with Condition 8-5 of Ministerial Statement No. 723.

E. beardiana is a spreading mallee to 5 m tall, with smooth, pinkish-grey to cream bark. The leaves are narrow-lanceolate, up to 12.5 cm long and up to 1.5 cm wide, light grey-green in colour. The inflorescences are on down-curved stalks and have up to 11 flowers in each group. The buds are pendulous, with a cup-shaped hypanthium and a beaked operculum. They are up to 2.1 cm long and 0.6 cm wide. The flowers are creamy white in colour, with the filaments of the stamens united in the lower half. The fruits are pendulous, urn-shaped, with a thick rim and the disc level to descending. There are four or five valves which are exserted (DEC, undated).

This species is closely related to *Eucalyptus leptopoda*, which also has joined filaments, but has narrower leaves, smaller buds, 7-9 in each inflorescence and smaller fruit with a level to raised disc. It is also related to *Eucalyptus synandra*, which has smaller buds, up to seven in each inflorescence, and fruits with a steeply ascending disc (DEC, undated). The flowering period for *Eucalyptus beardiana* is between August and September.

The *E. beardiana* populations within the survey area are predominately restricted to the ridges and upper slopes of yellow sand dunes within the S12 plant community. The S12 plant community as defined by Mattiske (2006a) is a tall shrubland of *Banksia ashbyi*, *Banksia sceptrum*, *Physopsis chrysophylla* with emergent *E. beardiana* (DRF), *Eucalyptus roycei* and *Eucalyptus selachiana* over mixed low shrubs and *Triodia danthonioides*. Regionally, *E. beardiana* has been recorded in yellow sands from Shark Bay south to near Kalbarri, with one isolated population recorded near Mullewa.

Of the 24,384 ha of vegetation surveyed by Mattiske, the S12 plant community makes up approximately 26 ha. It is anticipated that approximately 1.5 %, or 0.4 ha, of this S12 plant community will be disturbed though clearing activities associated with the construction of the access road, but no *E. beardiana* are expected to be disturbed.

The locations of the *E. beardiana* populations throughout the survey area have been provided to the DEC and are available to other regulators upon request.

No clearing of *E. beardiana* is proposed. Potential indirect impacts of the Project on *E. beardiana* and its contiguous habitat (the S12 plant community) may include:

- Edge effects. Buffers at least 40 m wide from *E. beardiana* plants will be installed to keep Project activities at a distance. However, there may be loss of *E. beardiana* plants on the edge of the buffers from impacts including the following, if these are not managed effectively:
  - saline spray from dust suppression activities during the construction phase;
  - saline run off from roads during the construction phase;
  - dust deposition;
  - potential leakage or spillage of environmentally hazardous materials or hydrocarbons; and
  - overspray from roadside weed spraying.
- Introduction to and spread of weed species through the S12 plant community.
- Loss of *E. beardiana* plants and disturbance of the S12 plant community through the introduction and spread of disease (in particular *Phytophthora cinnamomi*).
- Changes to the fire regime caused by human activities.

Figure 3.1 illustrates where the access road route will be located and the locations of *E. beardiana* plants and the S12 plant communities in respect to the access road.

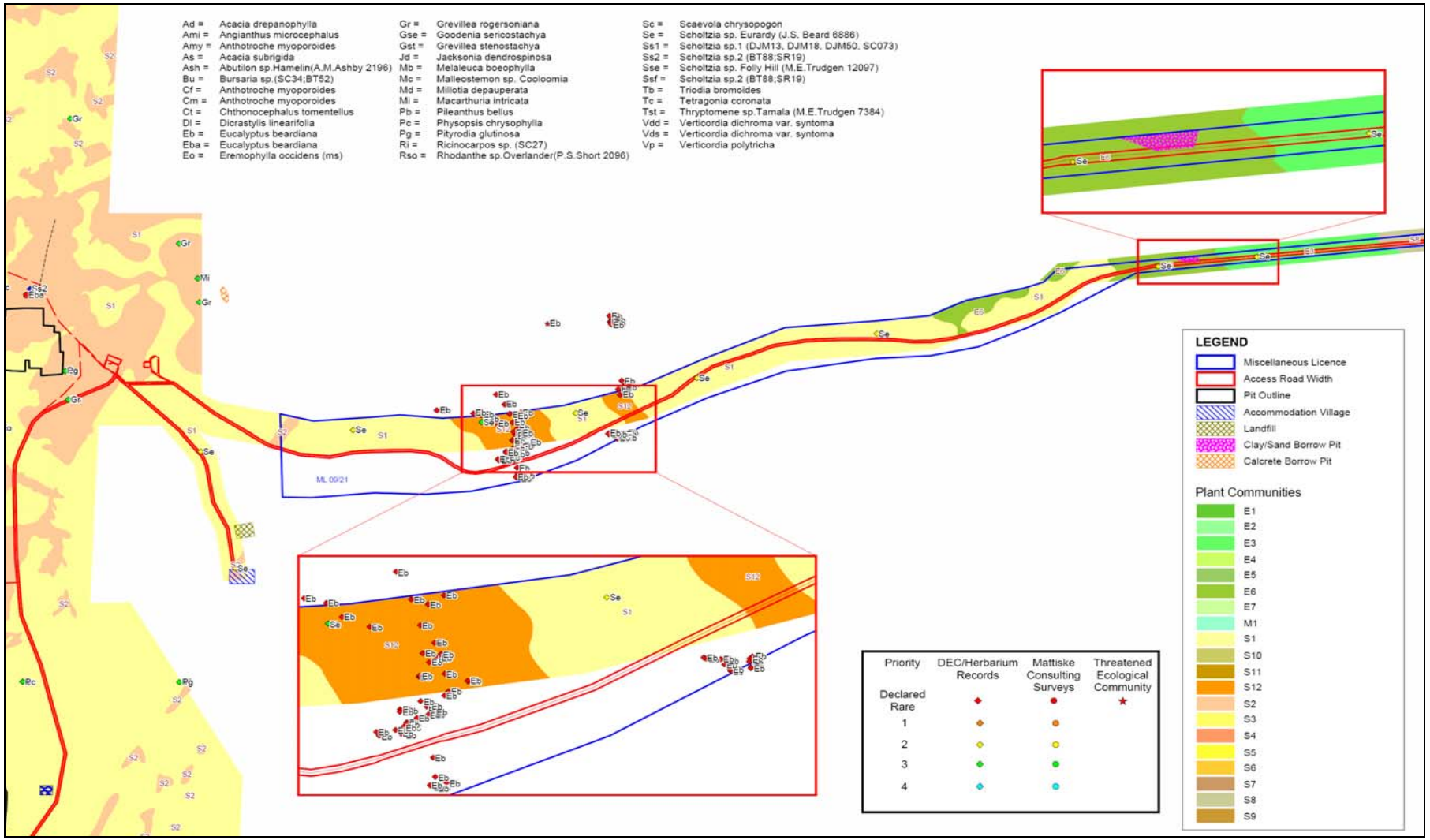

Figure: 3.1 Impacts to the S12 Plant Community

The objective of this MP is to conserve *E. beardiana* plants and populations which occur in the vicinity of and within the Project Area, through the avoidance or management of adverse impacts and the improvement in knowledge.

The effectiveness of conserving and managing *E. beardiana* in the Project and surrounding area will be determined through performance indicators associated with a regular monitoring programme. The programme has been developed to monitor the stability and condition of these populations and is discussed in detail in Section 7. The associated performance indicators are:

- The total number of individuals within the identified populations and the distribution of these populations will remain stable over the life of the mine, taking into account natural fluctuations.
- No significant decrease in the condition of the populations as a result of mining activities over the life of the mine, taking into account natural fluctuations.

Note: A significant decrease is defined as a statistically significant decrease in the condition parameters monitored as described in Section 7.2.1.

Gunson has outlined a range of measures designed to minimise the impact of mining operations on the conservation of *E. beardiana* (Table 6.1). Specific systems-focussed management measures that will be conducted on site by Gunson employees will be integrated into an Environmental Management System.

Gunson has developed a preliminary site organisational structure (Figure 6.1), with both a Mine Manager and an Environmental, Health and Safety (EH&S) Officer directly employed by Gunson and based on-site. Responsibility for management actions has therefore largely been allocated to one of these two roles. However, it is expected that Gunson's contractors will implement these actions with supervision, review and audit conducted by Gunson's EH&S Officer and Mine Manager.

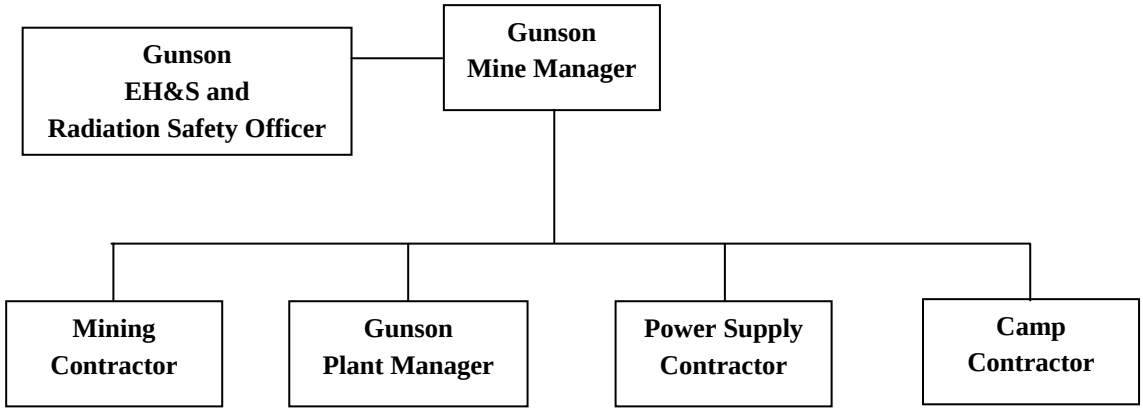

Figure 6.1: Schematic Organisational Chart

The DEC has advised that the key issues to be managed for the conservation of *E. beardiana* include:

- Dust during the construction phase;
- Disease; and
- Drainage.

Mattiske (2006b) states that disease should be a minimal risk as there are no significant diseases currently influencing *E. beardiana* on-site. Nevertheless a high standard of vehicle hygiene will be maintained at all critical entry points to ensure minimisation of any risks. Dust will need to be managed during the initial establishment and construction phases of the access road as the winds may shift the sands and damage the foliage of plants. Following construction of the access road, these indirect impacts should be minimal as the road will be sealed. As *E. beardiana* occurs on the top of ridges within the S12 plant community, drainage is not thought to pose a significant risk. These issues have been addressed in Table 6.1.

Patrick (2001) indicates that the three most important management factors for the conservation of *E. beardiana* in the Geraldton region are:

- Survey populations. Further surveys of suitable habitat for new populations is a requirement for many DRF;
- Germ plasm collection. The collection and long term storage of germ-plasm (seed or tissues) from wild populations of DRF to provide a source of propagation material for future re-establishment, in addition to ensuring protection of populations, or more importantly, taxa, from extinction; and
- Liaison. DEC liaison with landowners whose property contains DRF to arrange their operations so that the area will not be destroyed or damaged in any way.

Patrick (2001) indicated through a ranking system that none of these management actions were critical for the conservation of *E. beardiana*. Where appropriate, Gunson has addressed these factors in Table 6.1.

Table 6.1

Management Actions, Timing and Responsibility for Compliance with Objectives

Activity/Source	Priority	Management Action	Responsible Personnel	Timing
All	1	The disturbance of *E. beardiana* plants will be strictly prohibited.	Mine Manager	Construction/operation/ rehabilitation
Population protection	1	Flora and vegetation surveys to be conducted prior to ground disturbing activities, as specified in State Ministerial Statement No. 723 Condition 8-2 (1), will specifically search for *E. beardiana* and the S12 plant community. If further populations of *E. beardiana* are located, their size and condition will be noted and Gunson will inform the relevant regulatory bodies (DEC and DEH).	EH&S Officer	Construction/operation/ rehabilitation
Population protection	3	An information sheet which describes and illustrates *E. beardiana*, the S12 plant community, threats, legal obligations and the necessity for staff to protect *E. beardiana* locations will be prepared and printed for use by all staff and contractors.	EH&S Officer	Prior to ground disturbing activities
Revegetation	4	After approval from the necessary regulators has been granted through a "Permit to Take Seed", seed may be collected for possible rehabilitation purposes, if necessary. Any left-over seed store may be used for research and preservation of the species. Seed will be collected from multiple sites to maintain adequate representation of the genetic diversity of the species, utilising the appropriate techniques for collecting seed from threatened flora.	EH&S Officer	Construction/operation/ rehabilitation

Table 6.1 (cont.'d)

Activity/Source	Priority	Management Action	Responsible Personnel	Timing
Revegetation	4	Should seed be collected, a seed inventory will be maintained, with information collected including, but not limited to: • When seed was collected; • Where seed was collected; • Expected seed viability rates; • Applicable germination/propagation techniques; • Expected use of seed (e.g. area); and • When seed should be used by.	EH&S Officer	Construction/operation/ rehabilitation
Revegetation	4	Gunson will liaise with the Kings Park Botanical Gardens to arrange storage, if necessary, of a genetically representative seed bank from the Project Area.	EH&S Officer	Construction/operation/ rehabilitation
Revegetation	4	Gunson will liaise with DEC's Threatened Flora Seed Centre to arrange storage, if necessary, of a genetically representative seed bank from the Project Area.	EH&S Officer	Construction/operation/ rehabilitation
Population protection	1	*E. beardiana* sites will have a protected buffer area of at least 40 m in width. This will act as an exclusion zone and will be appropriately signed to delineate and explain the buffer area. Where mine infrastructure or roads are directly adjacent this buffer area, a semi-permanent visual "barrier" will be constructed around the extreme edge of the buffer with markers every 10 - 15 m.	EH&S Officer	Construction/operation/ rehabilitation

Table 6.1 (cont.'d)

Activity/Source	Priority	Management Action	Responsible Personnel	Timing
Population protection/Dust management	2	Major roads adjacent to buffers of *E. beardiana* populations will be fenced and signed at that section, to delineate the *E. beardiana* location and to prevent accidental damage to the protected area. Tracks near buffer areas not in use will be closed off or access restricted by signage where tracks are not currently needed. Particular attention will be paid to dust management during the construction of roads in the vicinity of *E. beardiana* populations. Refer to the Dust Management Plan.	EH&S Officer	Construction/operation/ rehabilitation
Population protection	1	A comprehensive and confidential up-to-date map will be produced to show locations of all *E. beardiana* populations, buffers, fenced buffers, semi-permanent visual "barriers" and S12 plant communities within the survey area. Maintaining the confidentiality of this map and the ability to grant access to it will be the responsibility of the EH&S Officer.	EH&S Officer	Construction/operation/ rehabilitation
Population protection	1	Off-road activities will be prohibited, with signs in the area of *E. beardiana* and S12 plant communities that state that this practice is strictly prohibited.	EH&S Officer	Construction/operation/ rehabilitation
Saline runoff/Drainage/ Disease management	1	All roads adjacent to S12 plant communities will have appropriately designed culverts and drains such that potentially saline run-off from roads is not directed to the plant community. Appropriate road design will include conditions that discourage disease.	Road Construction Contractor	Construction
Disease management	2	Hygiene measures will be implemented at critical entry points, where necessary, to prevent the introduction of plant diseases. A vehicle washdown certificate must be presented before vehicles are allowed entry on-site. Refer to the Progressive Rehabilitation Programme.	Mine Manager	Construction/operation/ rehabilitation

Table 6.1 (cont.'d)

Activity/Source	Priority	Management Action	Responsible Personnel	Timing
Soil management	2	Rehabilitation, topsoil stripping and replacement measures will be implemented where areas of the S12 plant community are required to be cleared, as described below. As previously stated, *E. beardiana* plants will not be disturbed directly. Cleared vegetation will not be burnt but stored in separate piles to topsoil, subsoil and other plant communities for return to rehabilitation areas within this contiguous S12 habitat. The stripping of the top 100 mm of soil, which contains the majority of the viable seed store and also a large amount of vegetation, will then occur. Topsoil will be stored in separate stockpiles of less than 2 m in height and seeded to allow it to retain a seedbank and micro-organisms, and decrease wind erosion potential. The topsoil will be returned to the contiguous S12 habitat once use of that area has finished. Return of topsoil will increase the potential success of the revegetation programme as it will prevent or reduce the amount of biological deterioration in the soil, and return the habitat most favourable for conservation of *E. beardiana*. For further site rehabilitation management strategies, refer to the Progressive Rehabilitation Programme.	Mine Manager	Construction/operation/ rehabilitation
Dust management	1	Site specific dust minimisation and mitigation training for all contractors and site personnel. This will be conducted by the EH&S Officer throughout the construction and operational phases of the Project and every employee shall review training on an annual basis.	EH&S Officer	Construction/operation/ rehabilitation

7.1 Overview

Gunson will implement a monitoring programme to assess the management of *E. beardiana* within the Project Area. This non-invasive monitoring programme will be conducted to assess the stability and condition of these populations, and will comprise:

- The condition of *E. beardiana* populations;
- Population stability (expansion or decline); and
- Post-activity monitoring of the regenerated S12 plant community at the access road site.

7.2 Condition

7.2.1 Photographic Monitoring

On advice from DEC, a non-invasive monitoring programme will be conducted to monitor the condition of *E. beardiana* populations. Non-invasive photographic monitoring points will be established to monitor the condition of *E. beardiana.* Monitoring will comprise taking photographs of targeted trees near the access road and surrounding area. Individual trees will be tagged and measured assessments of the condition of the tree will be made through assessments of the percentage of foliage:

- On each stem intact;
- On the crowns of the trees which is healthy (green and glossy compared with brown foliage);
- Which is coated with dust; and
- That is damaged by insects.

Photographic monitoring will occur on an annual basis. Due to the longevity of *E. beardiana*, the post-activity monitoring of the condition of *E. beardiana* populations will continue for at least five years following the completion of mining, and in consultation with the relevant regulatory authorities.

7.2.2 Rare Flora Report Forms

DEC has advised that, to complement the annual photographic monitoring of the condition of *E. beardiana* populations, the DEC's Rare Flora Report Forms (RFRFs) should be used during annual monitoring.

The RFRFs will be completed annually as suggested, and will provide a comprehensive checklist of the condition of the vegetation within each population and any potential threats to the populations. Upon completion, the RFRFs will also be provided to the DEC for information.

7.3 Stability

Baseline surveys have determined the size and boundary of these *E. beardiana* populations. The populations' area, plant abundance and distribution will be monitored on a two yearly basis.

7.4 Post-Activity

The monitoring of revegetation procedures is an essential part of the overall success of the revegetation strategy, especially when considering *E. beardiana* and its contiguous habitat, the S12 plant community. This will occur through the establishment of permanent vegetation monitoring plots within the rehabilitated areas of the S12 plant community.

The abundance and diversity of *E. beardiana* occurrences will be monitored using these permanent vegetation plots, and these will be subject to the same performance indicators determined within the Progressive Rehabilitation Programme. Annual site assessments (including photographic point monitoring) will be conducted to ascertain the survival and growth of the rehabilitated vegetation. The data collected will be analysed to provide possible recommendations for improved rehabilitation techniques. The establishment of permanent revegetation monitoring plots will assist in determining the success of the rehabilitation. In addition to the monitoring plots, Gunson will undertake routine visual site inspections to check for erosion, weed outbreaks and herbivory.

Gunson will initiate contingency plans if the monitoring programme indicates that the performance indicators for the condition and stability of *E. beardiana* populations, due to Project activities, are not being met.

A range of contingency actions are available to Gunson, these include:

- Translocation. At this stage the translocation of *E. beardiana* plants will not be necessary as Gunson aims to implement management strategies which do not require the disturbance of *E. beardiana* plants. Translocation of plants may, however, be considered as a contingency action if required, if disturbance to plants is unavoidable or if other propagation techniques are unsuccessful. Translocation of flora, if necessary, will be conducted in accordance with DEC's Policy Statement No. 29 *Translocation of Threatened Flora and Fauna*, and only after approval has been sought from the Minister for the Environment. Translocation into the nearby SBWHP or Nature Reserves may be a possibility if approval from regulatory bodies has been granted and suitable habitat can be found. Gunson will liaise with DEC and DEH if this contingency action is required.

- Implementation of a fire management strategy. Mallee eucalypt adults typically resprout from lignotubers after fire, producing multiple stems that usually flower more quickly then a juvenile growing from seed. Fire also often stimulates germination in eucalypts. It may therefore be beneficial to conduct prescribed burns of the S12 plant community if the condition or size of *E. beardiana* populations have declined. Gunson will liaise with the regional DEC office and the DEC Species and Community Branch for advice, before seeking approval through a Licence to Take Flora, to conduct this contingency action.

- Further monitoring. It may be necessary to implement further monitoring programmes. The implementation of additional monitoring programmes will be assessed on as needs basis after Gunson has sought advice from the regional DEC office and the Species and Community Branch.

- Fungicides. Should *Phytophthora cinnamomi* or other deleterious fungi become established within the area, fungicidal treatments may need to be applied to roads or habitats surrounding *E. beardiana* populations.

- Research. Gunson may include *E. beardiana* in the Research and Development Programmes (see Progressive Rehabilitation Programme) or implement further research programmes with facilities such as the Kings Park Botanical Gardens into potential aspects of *E. beardiana* ecology and biology such as:

  – Pollinator activity within populations;

  – Investigation of factors determining level of flower and fruit abortion;

  – Quantification of level of invertebrate grazing of seed;

  – The size and viability of the soil seed bank;

  – Seed germination requirements;

- The role of disturbance in regeneration;
- The response of *E. beardiana* and its habitat to fire;
- The longevity of plants, and time taken to reach maturity; and
- The extent of genetic variation within and between populations.

9.1 During the EIA Process

Gunson undertook stakeholder consultation with the DEC (formerly the Department of Conservation and Land Management and the Department of Environment), Department of Agriculture and surrounding pastoralists prior to submission of the PER in relation to the management of flora and vegetation. Issues raised during this consultation and Gunson's responses are documented in Section 5 of the PER (URS, 2005). Public comment was also received during the eight-week public review period for the PER, with issues raised and Gunson's responses documented in the Proponent's Response to Submissions (URS, 2006a).

The key stakeholder issue raised in regards to DRF included the need for further surveys to identify any DRF in the Project Area.

9.2 During Preparation of this MP

Ministerial Condition 8-5 requires that this DRF MP be prepared to meet the requirements of the Minister for the Environment on advice of the EPA and DEC (formerly the Department of Conservation and Land Management). In addition, the DEC's guidelines on the preparation of EMPs state that the relevant advisory agencies and other stakeholders should be given the opportunity to provide input to the draft MP. The relevant stakeholders for this MP are:

- EPA; and
- DEC Conservation Branch.

To obtain advice from the DEC Conservation Branch, a draft MP was submitted to the DEC (Midwest Region and Environmental Management Branch) for review. A draft was also submitted to the SBWHP Community Consultative Committee (CCC) and SBWHP Scientific Advisory Committee (SAC) to obtain their comments. Feedback from the DEC Conservation Branch, SBWHP CCC and SAC was addressed during the preparation of this version of the MP, prior to submission to the DEC Statement Management Section.

Documentation on the comments received from the DEC Conservation Branch, SBWHP CCC and SAC, and the way in which these comments have been addressed in the MP, has been submitted to the DEC Statement Management Section under separate cover. It is understood that the DEC Statement Management Section will consult with the EPA to obtain its input on the MP.

The final MP will be prepared following receipt of comments from the EPA and will be submitted to the EPA through the DEC Statement Management Section and the DEC Audit Branch for approval.

9.3 Consultation during Construction and Operation

Stakeholder consultation will continue throughout the life of the Project and will address any issues raised by these parties.

Gunson will establish and maintain a programme and procedures for periodic audits of the EMP, including this MP. The current audit programme is outlined in URS (2006b). Maintenance and implementation of the audit programme will be the responsibility of Gunson's EH&S Officer.

Environmental audits can occur in many forms, but have a common objective: to assess the environmental performance of a facility in order to identify risks and potential liabilities. For this Project, the audits will also be required to provide information and evidence for the reports required under the Ministerial Statement, which are listed in Section 12 of this MP.

The format of the audit will depend on the issue or area being reviewed but could include the following phases:

- Development of the audit protocol.
- Completion of a questionnaire by site personnel prior to a site visit by the auditor.
- Site visit, comprising interviews, site inspections and/or direct measurement.
- Review of relevant documentation and records.
- Preparation and submission of the audit report.

This MP will be audited on an annual basis and the outcomes included in the relevant reports required under Ministerial Condition 5 (see Section 12). Information on the results of the audits will also be provided to Gunson management for review.

In addition to formal audits by internal or external auditors to meet the reporting requirements for Ministerial Condition 5, internal area or facility inspections will be conducted to assess the effectiveness of day-to-day environmental management. This will allow opportunities for improvements in environmental performance to be identified and acted upon as soon as possible. The inspections will occur on a weekly, monthly or less frequent basis, depending on the area or facility being reviewed.

This MP will be reviewed on an annual basis or more frequently if required, to address the following:

- Any changes in Project design or operation that require modifications to the environmental management procedures outlined in this MP;
- Any issues identified as a result of internal and external audits, and Gunson management review of the audit outcomes, in relation to the suitability, adequacy and effectiveness of this MP in meeting the agreed objectives; and
- Corrective or preventative actions developed in response to environmental incidents and nonconformances.

Revision of this MP may also be triggered by Conditions 10 and 11 of the Commonwealth environmental approval. These conditions are as follows:

10. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, programs or measures referred to in paragraphs 1 to 8, the person taking the action may submit for the Minister's approval a revised version of any such plan, program or measure. If the Minister approves a revised plan, program or measure so submitted, the person taking the action must implement that plan, program or measure instead of the plan, program or measure as originally approved.

11. If the Minister believes it is necessary or desirable for the better protection of the environment relevant to the species or World Heritage values mentioned in this Approval to do so, the Minister may request the person taking the action to make specified revisions to a plan, program or measure approved pursuant to paragraphs 1 to 8, and to submit the revised plan, program or measure for the Minister's approval. The person taking the action must comply with any such request. If the Minister approves a revised plan, program or measure pursuant to this condition, the person taking the action must implement that plan, program or measure instead of the plan, program or measure as originally approved.

The revised MP will be submitted to the relevant stakeholders (see Section 9) for review and approval.

The revision number for the MP will be recorded on the document's signature page.

12.1 Internal Reporting

Environmental records are evidence of the ongoing environmental performance of the Project and demonstrate conformance with legal and other requirements. Environmental records to be maintained by Gunson and/or its contractors will include:

- A register of legal and other regulatory requirements including licences and permits;
- A register of environmental aspects and impacts
- Incident reports;
- Training records;
- Inspection, calibration and maintenance records;
- Monitoring data;
- A register of non-conformances;
- Public complaints and responses to these; and
- Internal and external audits and reviews.

12.2 External Reporting under the State Ministerial Approval

The reporting requirements defined under Ministerial Statement No. 723 are as described below. There is a degree of overlap for these reports, and it is expected that some of these reports will be combined to simplify the review process.

12.2.1 Compliance Reports

Compliance reports are required under Ministerial Condition 5-1 to address:

- The status of implementation of the proposal, as defined in Schedule 1 of the Ministerial Statement;
- Evidence of compliance with the conditions and commitments; and
- The performance of the environmental management plans and programs.

These reports are to be submitted to on an annual basis, or more frequently if sign-off of a condition or commitment is required more rapidly than annually.

12.2.2 Performance Review Reports

Performance review reports are required every five years after the start of operations. These are required to address:

1. The major environmental issues associated with implementing the project; the environmental objectives for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those objectives;

2. The level of progress in the achievement of sound environmental performance, including Australian industry benchmarking, and the use of best available technology where practicable;

3. Significant improvements gained in environmental management, including the use of external peer reviews;

4. Stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and

5. The proposed environmental objectives over the next five years, including improvements in technology and management processes.

12.2.3 Independent Audit Report

Ministerial Condition 5-3 requires that an independent auditor prepare a report on each condition/commitment included in the Ministerial Statement which requires preparation of a management plan, programme, strategy or system. The objective of the report is to determine whether the requirements of these conditions and commitments have been fulfilled within the stated timeframe.

It is expected that this report could be included in the Compliance Reports submitted in accordance with Ministerial Condition 5-1.

12.2.4 Annual Environmental Report

An Annual Environmental Report (AER) is required under Ministerial Condition 5-4. The purpose of the AER is to report on:

- Implementation of Gunson's environmental commitments (but not the Ministerial Conditions); and
- Outcomes of any monitoring programs and performance reviews associated with the implementation of the MPs.

Unlike the other reports required under Ministerial Condition 5, this report is to be made available to the public.

This report is not to be confused with the AER required by the DoIR as part of mining lease conditions (Section 12.4), or by the DEC in relation to licensing under Part V of the *Environmental Protection Act 1986* (Section 12.5).

12.3 External Reporting under the Commonwealth Ministerial Approval

Condition 9 of the Commonwealth environmental approval issued under the EPBC Act requires that:

> On 1 September of each year after the date of commencement of operations, the Project Director for the person taking the action must provide to the (Australian Government) Minister for the Environment and Heritage (the Minister) a certificate stating that the person taking the action has complied with the conditions of this Approval. This certificate must state, to the satisfaction of the Minister, the manner in which the approval conditions have been complied with. Should the Minister so direct, the person taking the action must appoint an independent auditor to audit compliance under this condition and make the results of that audit available to the Minister.

12.4 External Reporting under Mining Lease Conditions

As part of the mining lease conditions set by the DoIR, Gunson will be required to submit an AER. The objectives of the AER are defined by the DoIR (Department of Minerals and Energy, 1996) as to:

- To concisely document the major mining activities for the reporting year and proposed activities for the following year;
- To concisely document environmental management and rehabilitation activities for the reporting year and proposed activities and developments in the following year;
- To assist operators in monitoring their own performance;
- To assist in the preparation of a completion report and audit for the DoIR on cessation of operations; and
- To provide basic information to DoIR about the extent of mining operations in the State and the standard of environmental management being achieved.

12.5 External Reporting under the Pollution Prevention Licence

A pollution prevention licence will be required for the Project under Part V of the *Environmental Protection Act 1986*. This licence is not yet required. Once the licence has been issued, the need for reporting data relevant to this MP will be reviewed, and the MP amended if required.

Table 13.1

Key Management Actions Table

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
To ensure the conservation of *E. beardiana* plants and populations which occur in the vicinity of and within the Project Area, through the avoidance or management of adverse impacts and the improvement in knowledge.	DRF Eb 1.1	Flora and vegetation surveys to be conducted prior to ground disturbing activities, as specified in State Ministerial Statement No. 723 Condition 8-2 (1), will specifically search for *E. beardiana* and the S12 plant community. If further populations of *E. beardiana* are located, the size and condition will be noted and Gunson will inform the relevant regulatory bodies (DEC and DEH).	Results of surveys will be summarised within the AER.	
	DRF Eb 1.2	A comprehensive and confidential up-to-date map will be produced to show locations of all *E. beardiana* populations, buffers, fenced buffers, semi-permanent visual "barriers" and S12 plant communities within the survey area. Maintaining the confidentiality of this map and the ability to grant access to this map will be the responsibility of the EH&S Officer.	This map will be kept on-site within the Environmental Department and produced to regulators/auditors on request.	

Table 13.1 (cont.'d)

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
To ensure the conservation of *E. beardiana* plants and populations which occur in the vicinity of and within the Project Area, through the avoidance or management of adverse impacts and the improvement in knowledge (cont.'d).	DRF Eb 1.3	Site specific dust minimisation and mitigation training for all contractors and site personnel. This will be conducted by the EH&S Officer throughout the construction and operational phases of the Project and every employee shall review training on an annual basis.	Up-to-date staff training records will be kept on-site and produced for regulators/auditors on request.	
	DRF Eb 1.4	Hygiene measures will be implemented at critical entry points, where necessary, to prevent the introduction of plant diseases. A vehicle washdown certificate must be presented before vehicles are allowed entry on-site. Refer to the Progressive Rehabilitation Programme.	Copies of the vehicle washdown certificates will be kept on-site and produced for regulators/auditors on request.	
	DRF Eb 1.5	Annual monitoring of the condition and two yearly monitoring of the stability of *E. beardiana* populations.	Summaries of these monitoring programmes will be included within the AER, detailing whether performance indicators have been met and whether any contingency actions had been undertaken.	

Table 13.1 (cont.'d)

Target/Objective	Ref	Key Management Action	DEC Reporting/Evidence	Status (to be updated in annual compliance reports)
To ensure the conservation of *E. beardiana* plants and populations which occur in the vicinity of and within the Project Area, through the avoidance or management of adverse impacts and the improvement in knowledge (cont.'d).	DRF Eb 1.6	The Rare Flora Report Forms (RFRFs) will be completed annually as suggested by the DEC, and will provide a comprehensive checklist of the condition of the vegetation within each population and any potential threats to the populations.	Upon completion, the RFRFs will be provided to the DEC for information.	

Beard, J.S. (1976) *Vegetation Survey of Western Australia - Murchison.* University of Western Australia.

Beard, J.S. (1990) *Plant Life of Western Australia*. Kangaroo Press.

Department of Conservation and Land Management (2005) *Management of Commercial Harvesting of Protected Flora in Western Australia 1 July 2003 – 30 June 2008.* Amended September 2005.

Department of Environment and Conservation (undated) *Part Two: Declared Rare Flora in the Geraldton District.*

Mattiske Consulting Pty Ltd (2006a) *Flora and Vegetation in the Proposed Central Haul Road Coburn Mineral Sand Mine – Shark Bay.* Unpublished report for URS Australia Pty Ltd. November 2006.

Mattiske Consulting Pty Ltd (2006b) *Beard's Mallee Populations on the Coburn Station Haul Road.* Unpublished report for URS Australia Pty Ltd. December 2006.

Patrick, S.J. (2001) *Declared Rare and Poorly Known Flora in the Geraldton District. Western Australian Wildlife Management Program No. 26.* Department of Conservation and Land Management, Western Australia.

Trudgen, M.E. and Keighery, G.J. (1995) *Flora of the Shark Bay World Heritage Area and Environs.* A report prepared for the Australian Heritage Commission by the Western Australian Department of Conservation and Land Management, Western Australia.

URS Australia Pty Ltd (2005) *Public Environmental Review for the Coburn Mineral Sand Project.* Prepared for Gunson Resources Ltd.

URS Australia Pty Ltd (2006a) *Proponent's Response to Submissions. Public Environmental Review for the Coburn Mineral Sand Project*. Prepared for Gunson Resources Ltd.

URS Australia Pty Ltd (2006b) *Audit Programme. Coburn Mineral Sand Project Compliance Audit and Performance Review Programme*. Prepared for Gunson Resources Limited, July 2006.

Western Australian Herbarium (2006). *FloraBase — The Western Australian Flora*. Department of Environment and Conservation. Available online: http://florabase.calm.wa.gov.au/. Accessed 5 December 2006.

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Gunson Resources Limited and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 10 November 2006.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between December 2006 and March 2007 and is based on the information provided at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

RARE FLORA REPORT FORM

TAXON: _____ **POPULATION No.:** _____

DRF ☐ Priority Species ☐ _____ Partial Survey ☐ Full Survey ☐ New Population ☐

FROM: _____ **TITLE**: _____ **SURVEY DATE:** _____

REGION: _____ **DISTRICT:** _____ **SHIRE:** _____

File Ref.: _____ Map/Site Ref.: _____ Reserve No.: _____

LAND STATUS:
Nature Reserve ☐ Private ☐ Gravel Res. MRD ☐ Gravel Res. Shire ☐
National Park ☐ Pastoral Lease ☐ Rd. Verge MRD ☐ Rd. Verge Shire ☐
State Forest ☐ VCL ☐ Rail Reserve ☐ Other Shire Res. ☐
Water Reserve ☐ Other ☐ Specify: _____

LOCATION: _____

_____

_____

LATITUDE: ____° ____′ ____″S **LONGITUDE:** ____° ____′ ____″E **G.P.S. USED:** ☐ **ASPECT:** _____

LANDFORM:
Hilltop ☐ Cliff ☐ Slope ☐ Valley ☐ Swamp ☐
Outcrop ☐ Breakaway ☐ Low Plain ☐ Gully ☐ Riverbank ☐
Ridge ☐ Sand Dune ☐ Flat ☐ Drainageline ☐ Lake Edge ☐
Firebreak ☐ Other ☐ ____

ROCK TYPE: Laterite ☐ Granite ☐ Dolerite ☐ Limestone ☐ Other:_____

ROCK FORM: Sheet ☐ Boulder ☐ Fluviatile Gravel ☐ Concretionary Gravel ☐

SOIL TYPE: Sand ☐ Loam ☐ Clay ☐ Peat ☐ Gravel ☐

SOIL COLOUR: Red ☐ Brown ☐ Yellow ☐ White ☐ Grey ☐

SOIL CONDITION: Inundated ☐ Moist ☐ Dry ☐ Saline ☐ Other: _____

VEGETATION CLASSIFICATION (Muir's): _____

ASSOCIATED SPECIES:_____

_____

No. of PLANTS: Mature: _____ Seedlings: _____ Dead**:** _____ Actual ☐ Estimate ☐ Area Occupied: _____

REPRODUCTIVE STATE: Flower bud ☐ Flower ☐ Immat. fruit ☐ Fruit ☐ Fruit Dehisced ☐ Vegetative ☐

POLLINATORS: Native bees ☐ Honey bees ☐ Other insects ☐ Birds ☐ Mammals ☐

Other observations: _____

CONDITION OF POPULATION: Healthy ☐ Moderate ☐ Poor ☐ Disturbed ☐ Comment:

_____

POTENTIAL THREATS: Firebreaks ☐ Mining ☐ Recreational activities ☐ Roadworks ☐ Grazing ☐

Weeds ☐ Disease ☐ Prescribed Burning ☐ Other ☐ Comment:_____

FIRE HISTORY: Not known ☐ Burnt in 19____ Summer ☐ Autumn ☐ Winter ☐ Spring ☐

VOUCHER SPECIMEN: District Herb. ☐ WA Herb. ☐ Other ☐ _____

ATTACHED: Map ☐ Mudmap ☐ Illustration ☐ Photo ☐ Field Notes ☐

FENCING: Not Required ☐ Fenced ☐ Required ☐ Replace/Repair ☐

ROADSIDE MARKERS: Not Required ☐ Present ☐ Required ☐ Replace ☐ Reposition ☐

OTHER COMMENTS (include action taken/required):_____

_____

_____

COPY SENT TO: Regional Office ☐ District Office ☐ Other ☐ Specify: _____

Signed: _____ Date: _____

NOTE: More than one box, in any section may be ticked. Map or further information may be given on the back of this form.

Please return completed form to Executive Director, CALM, PO Box 104, COMO WA 6152

RECORDS: PLEASE FORWARD TO ADMINISTRATIVE OFFICER, FLORA, WILDLIFE BRANCH