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Cape Preston Iron Ore Development

Seasonal Biological Survey - Threatened Flora

Austeel Pty Ltd

November 2003

Cape Preston Iron Ore Development

Prepared for
Austeel Pty Ltd

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Seasonal Biological Survey - Threatened Flora

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Table of Contents

1.0	Introduction	1
1.1	The Development/Requirement for the Study	1
1.2	Existing Environment	1
1.2.1	Biological Environment	1
2.0	Methodology	5
2.1	Survey Timing	5
2.2	Survey Methodology	5
3.0	Results and Discussions	6
4.0	References	9
Appendix A	Previously Recorded Priority Flora	10



1.0 Introduction

1.1 The Development/Requirement for the Study

Austeel Pty Ltd (Austeel) is in the process of obtaining environmental approvals for the proposed Cape Preston Iron Ore development located approximately 80km south-west of Karratha. When operational the project will produce up to 4.7 million tonnes per annum of Direct Reduced Iron/Hot Briquetted Iron utilising part of the estimated 4 billion tonne ore resource over which mining rights are held by Mineralogy Pty Ltd.

The project will include the development of an open pit, waste dumps, tailings storage facility, product stockpiles and additional infrastructure including access roads, haul roads, construction camps, village, power station, power distribution network and desalinated water plant. Full details of the development and environmental studies undertaken to date are summarised in the Public Environmental Review (PER) and Supplementary Environmental Review (SER) (HGM 2000 and 2002, respectively).

This report details the findings of an additional seasonal flora study undertaken in June and July 2003 to specifically survey the mine footprint area for species of threatened flora. This study was commissioned by Austeel in response to the EPA requirement for an additional seasonal survey to be conducted.

1.2 Existing Environment

Comprehensive descriptions of the existing physical and biological environment and predicted impacts of the proposed development are detailed in previous studies (HGM 2000, 2001 and 2002). A brief description of the biological environment is provided below to provide a context for the current study.

1.2.1 Biological Environment

Land Systems and Previous Vegetation Mapping

Land System data was obtained and used as a basis for description of vegetation communities in the initial biological survey of the project area (HGM 2001). The study area includes portions of the following Land Systems:

- Littoral – bare coastal mudflats flanked by mangroves and samphire flats; minor sandy islands, narrow sandy plains, coastal dunes and beaches;
- Horseflats – extensive gilgaied clay plains with tussock grasslands;
- Newman – rugged jaspilite plateaux and ridges with hard spinifex grasslands;
- Rocklea – rugged basalt hills and plateau remnants with hard spinifex grasslands;
- Paraburdoo – stony plains derived from basalt, supporting snakewood shrublands and spinifex grasslands;
- Macroy – stony plains with hard and soft spinifex hummock grasslands;

- Boolgeeda – stony lower slopes and plains found below hill systems, supporting hard spinifex grasslands;
- River – active floodplains and terraces flanking major rivers and creeks, supporting riverine woodlands and tussock and hummock grasslands,
- Yamerina – floodplains and deltaic deposits supporting tussock grasslands with chenopod low shrubs and soft spinifex grasses.

Sixty-four terrestrial vegetation units were described from the nine Land Systems during the 2000 biological survey (HGM 2001). The most widespread Land Systems were the Rocklea, Newman, Paraburdoo and Horseflats systems with 14, 13, 10 and 5 vegetation units described for these respectively. Given the diversity of vegetation units described and the relatively good condition of vegetation, the area was considered to have conservation value. The following vegetation was identified as particularly important:

- coastal dune vegetation (small representation in area; high species richness of one vegetation unit; susceptibility to erosion and weed invasion following physical disturbance);
- riverine vegetation (high species richness; habitat specific flora, including Priority species; susceptible to weed invasion);
- rockpile vegetation (very limited representation in area; variable composition; habitat restricted flora); and
- minor creeklines (small representation in area; relatively species rich; habitat specific flora, including Priority species; susceptible to weed invasion).

Following the public comments period for the PER, the WA Department of Conservation and Land Management (CALM) identified cracking clay communities of the Horseflats Land System as of particular interest given that “these communities are poorly known and severely degraded elsewhere in the Pilbara”.

Threatened Flora

CALM categorises species of threatened flora as declared rare (Conservation Code R or X), poorly known (Conservation Codes P1, P2 or P3), or requiring monitoring (Conservation Code 4). Both State and Commonwealth legislation (*Wildlife Conservation Act (1950)* and *Environment Protection and Biodiversity Conservation Act (1999)* respectively) protect species that are classified as Declared Rare. It is an offence to “take”, that is, remove, dig up, destroy or pick species classified as declared rare flora without Ministerial Approval. It is not an offence to remove or harm priority taxa. However, it is recommended that disturbance be avoided where possible, given that such species are of high conservation value and do have the potential to be reclassified as declared rare. An explanation of conservation codes is provided in Table 1.

Table 1 Conservation Codes for Threatened Flora

Code	Definition
R	Declared Rare Flora – Extant Taxa. Taxa that 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.
X	Declared Rare Flora – Presumed Extinct. Taxa that have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all wild populations have been destroyed more recently.
P1	Priority 1 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations which are under threat.
P2	Priority 2 – Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under threat.
P3	Priority 3 – Poorly Known Taxa. Taxa which are known from several populations and the taxa are not believed to be under immediate threat.
P4	Priority 4 – Rare Taxa. Taxa which are considered to have been adequately surveyed and which whilst being rare (in Australia), are not currently threatened by any identifiable factors.

The following Priority species were recorded during the 2001 flora and vegetation survey (HGM 2002):

- *Goodenia omearana* (P1);
- *Abutilon trudgenii* (P3);
- *Eriachne tenuiculmis* (P3);
- *Hibiscus brachysiphonius* (P3);
- *Phyllanthus aridus* (P3); and
- *Sida* sp. Wittenoom (P3).

Information on the populations of these species recorded during the 2001 survey is provided in Appendix A.

In addition, a search of CALM's databases indicated that the following species have been identified as potentially occurring within the project area:

- *Goodenia pallida* (P1);
- *Gunniopsis* sp. Fortescue (P1);
- *Ischaemum albovillosum* (P2);
- *Acacia glaucocaesia* (P3);

- *Tephrosia* sp. Cathedral Gorge (P3); and
- *Themeda* sp. Hamersley Station (P3).



2.0 Methodology

2.1 Survey Timing

Poor rains in the project area over the previous 18 - 24 months resulted in the postponement of the current phase of flora surveys, originally scheduled for 2001. The project area received limited rainfall in April 2003 from the passage of a cyclonic low and as a result the first field trip was conducted over 18 – 26 June 2003. This field trip was cut short due to heavy rainfall which made parts of the survey area impassable. Therefore a second field trip was conducted a month later from 22 – 25 July 2003 to survey the remaining areas, namely the infrastructure corridor and port laydown area.

2.2 Survey Methodology

Prior to the field survey specimens of threatened flora species (see section 1.1.2) were examined at the West Australian Herbarium to familiarise field staff with the priority species. The habitats in which these species had previously been found were recorded from relevant literature. This allowed a targeted approach to the threatened flora survey.

During the field survey intensive searching for threatened flora species, via vehicle and foot traverses, was conducted in the following infrastructure areas:

- orebody/mine pit
- waste dump
- construction camp
- plant site
- tailings dam
- infrastructure corridor, and
- port laydown area

The areas surveyed are shown in Figure 1.

The Department of Conservation and Land Management (CALM) had previously identified cracking clay communities of the Horseflats Landsystem as likely habitat for threatened flora species, particularly the Priority 1 *Goodenia pallida*. Therefore particular attention was paid to searching in this habitat via numerous foot traverses.

Where field identification was not possible specimens were collected and later identified at the West Australian Herbarium. Where collections were made coordinates were recorded using a handheld GPS. Population size and condition and site characteristics such as vegetation type, topography and soil type were recorded.

3.0 Results and Discussions

No populations of threatened flora were located during the 2003 field surveys. The areas surveyed are indicated in Figure 1 with cracking clay communities highlighted (Hp – Clayey plains vegetation community shown in red).

Areas of cracking clays occurred on the plant site and in the areas designated for the tailings storage facility, waste dump and the infrastructure corridor. As stated previously, these areas were searched intensively for threatened flora. Other areas/habitats where search intensity was heightened included:

- Creeklines;
- Minor flowlines; and
- Rockpiles/rocky outcrops.

Within the infrastructure corridor the survey was restricted to an approximate 100m corridor surveyed by foot and vehicle traverses. A corridor up to 1km wide may be required to accommodate all required infrastructure (eg. haul roads, powerlines, light vehicle access and pipelines). All vegetation types that would be impacted upon by the 1km wide infrastructure corridor were represented within the area surveyed with particular focus on the communities/habitats detailed above.

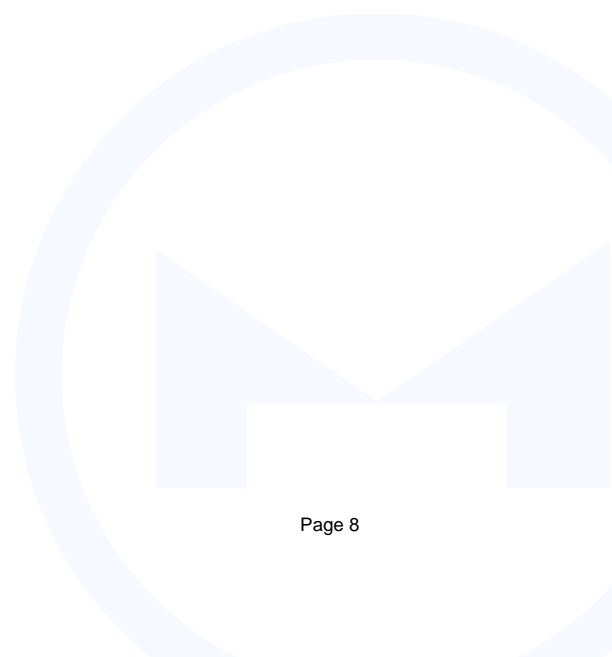
Unfortunately the vigour of vegetation and number of species flowering during the survey was generally poor due to the lack of significant rainfall in the preceding 12 – 18 months. Nearby Mardie Station Homestead received 211.4 mm during April from a cyclonic low however, Karratha received only 14.8 mm. Within the project area rainfall appears to have been patchy with certain areas in moderate to good condition and others in poor condition. The orebody and waste dump areas in particular appeared very dry with very little vegetation flowering and *Triodia* spp. apparently senescent. The condition of the construction camp site was similar.

Annual/ephemeral species such as *Stemodia kingii*, *Goodenia forrestii*, *Mimulus gracilis* and *Triumfetta clementii* were present and flowering in certain habitats/locations such as creeks and flowlines and 'crabholes' within cracking clay communities. These occurrences were greater during the July survey of the infrastructure corridor following additional rainfall in June.

A number of grasses in creeks and flowlines were flowering. These included *Eriachne mucronata* and *Cymbopogon bombycinus*. *Themeda triandra* was recorded flowering from rockpiles and outcrops in a number of locations.

Overall, the condition of the vegetation was poor which was directly attributed to lack of rainfall. The poor condition of the vegetation may have decreased the likelihood of locating threatened flora populations.

Insert Figure 1



4.0 References

Halpern Glick Maunsell (2000) Iron Ore Mine and Downstream Processing, Cape Preston, Western Australia, Public Environmental Review. Prepared for Austeel Pty Ltd.

Halpern Glick Maunsell (2001) Austeel Biological Survey Phase I. Unpublished report prepared for Austeel Pty Ltd.

Halpern Glick Maunsell (2002) Iron Ore Mine and Downstream Processing, Cape Preston, Western Australia, Supplementary Environmental Review. Prepared for Austeel Pty Ltd.

Appendix A Previously Recorded Priority Flora



***Goodenia omearana* ms. Priority 1**

This small herb was collected only once within the survey area, from tussock grassland on clay soils at Site M027. This species is more typical of calcareous soils and is known from relatively few populations in the Weeli Wolli Springs – Marillana Creek area in the eastern Pilbara.

***Abutilon trudgenii* ms. Priority 3**

This low shrub was recorded from six locations within the survey area. The typical habitat comprised minor flowlines through stony hills of the Rocklea or Newman Land Systems. Specimens of *A. trudgenii* ms. are lodged with the WA Herbarium from only four areas west of Newman, including Cane River, Hillside Station, Goldsworthy and Tom Price. However according to the *Priority Species List* this species is known from other locations including Warralong, Woodstock, Point Sampson and Pannawonica (Atkins, 1999). This species is poorly collected, rather than rare, with 23 records by Trudgen & Casson (1998).

***Eriachne tenuiculmis* Priority 3**

Scattered clumps of this grass species were recorded from two locations within creekline habitat in the Paraburdoo Land System. This species is poorly collected rather than uncommon. *E. tenuiculmis* is known from several locations in the Hamersley Ranges including Serpentine Creek, Yandi and Millstream, all within large creeklines. It has been collected in a number of creeks in the Newman area (Biota, in prep.), is common in creeklines on the Burrup Peninsula (M. Trudgen, pers. obs.), and was recorded 69 times (from 1200 sites) by Trudgen & Casson (1998).

***Hibiscus brachysiphonius* Priority 3**

This low spreading herb occurred as scattered individuals on clay soils of clayey or stony plains at five locations. Most of these sites occurred within the Horseflats or Paraburdoo Land Systems, with a single collection from the Boolgeeda Land System. Specimens of *H. brachysiphonius* are lodged with the WA Herbarium from several Pilbara locations including Minilya River, Tom Price, Karratha and Millstream. This species appears largely restricted to cracking clays.

***Phyllanthus aridus* Priority 3**

This small perennial shrub occurred as scattered individuals at a single site within creekline habitat in the Paraburdoo Land System. While known from several Kimberley populations, this species had apparently not been recorded from the Fortescue District prior to the survey of the West Angelas rail corridors (Trudgen & Casson, 1998). Twelve populations of *P. aridus* were recorded from the southern slopes of the Chichester Ranges during the West Angelas survey, and the species was described as being not uncommon along creeks in the area (Trudgen & Casson, 1998).

***Sida* sp. Wittenoom (WR Barker 1962) Priority 3**

This perennial shrub was recorded from a single location within a creek in the project area. This species is known from several Pilbara locations including Warralong Station, Nickol Bay, near Onslow, Roy Hill, east of Pannawonica and Fortescue Roadhouse (Atkins, 1999).