



1. Application details

1.1. Permit application details

Permit application No.: 2669/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Pilbara Manganese Pty Ltd

1.3. Property details

Property: Mining Lease 45/432
Local Government Area: Shire Of East Pilbara
Colloquial name: Woodie Woodie Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
50		Mechanical Removal	Mineral Production

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>The area applied to clear has been broadly mapped at a scale of 1:250,000 as: Beard Vegetation Association 173: Hummock grasslands, shrub steppe, Kanji over soft Spinifex and <i>Triodia wiseana</i> on basalt (GIS Database; Shepherd et al., 2001).</p> <p>Mattiske Consulting (2008) undertook a flora and vegetation survey for the mining tenement (M45/432) within which the application area is located as well as for two other tenements that lie adjacent to the application area. The survey was conducted in April 2008 and consisted of surveying 17 sampling sites that were chosen to represent the different plant communities within the survey area (Mattiske Consulting, 2008).</p> <p>Nine vegetation units were recorded within the survey area with the following eight occurring within the application area:</p> <p>1) Woodland of <i>Eucalyptus victrix</i> over <i>Acacia arida</i>, <i>Petalostylis labicheoides</i>, <i>Acacia trachycarpa</i> and <i>Acacia pyrifolia</i> var. <i>morrisonii</i> over <i>Cenchrus ciliaris</i> on major watercourses.</p> <p>2) Scrub or Thicket of <i>Carissa lanceolata</i>, <i>Petalostylis labicheoides</i>, <i>Acacia bivenosa</i> and <i>Acacia ancistrocarpa</i> over <i>Triodia pungens</i>, <i>Triodia basedowii</i>, <i>Cenchrus ciliaris</i> and <i>Chrysopogon fallax</i> along minor watercourses.</p> <p>3) Scrub or Low Shrubland of <i>Acacia ancistrocarpa</i>, <i>Acacia arida</i>, <i>Acacia acradenia</i>, <i>Petalostylis labicheoides</i>, <i>Gossypium australe</i>, <i>Acacia synchronicia</i> and <i>Acacia inaequilatera</i> over <i>Triodia longiceps</i> and <i>Triodia wiseana</i> with patches of <i>Cenchrus ciliaris</i> on</p>	<p>This clearing permit application is for a purpose permit to clear up to 50ha of native vegetation within an area of approximately 243ha (GIS Database). The proposed clearing area is located on Mining Lease 45/432, approximately 100km east of Nullagine and 400km south-east of Port Hedland (GIS Database).</p> <p>The purpose of the proposed clearing is for the expansion of an existing workshop and associated facilities and development of the Area 1 mining area (Pilbara Manganese, 2008). Pilbara Manganese (2008) propose to clear approximately 15ha for the expansion of the workshop and associated facilities, and 35ha for the development of the Area 1 mining area which will consist of the Area 1 pit, waste rock stockpile and ROM pad. Existing roads and infrastructure will be used where possible to minimise the disturbance footprint (MBS Environmental, 2008).</p> <p>Vegetation clearing will be undertaken via mechanical means using a bulldozer and vegetation and topsoil will be stockpiled for rehabilitation purposes (Pilbara Manganese,</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p>	<p>The vegetation condition rating was based on the results from the flora and vegetation survey of the proposed clearing area which was conducted by Mattiske Consulting in April 2008. Apart from localised disturbances around roads and drill sites, mainly weed and fire has impacted the condition of the tenement vegetation (MBS Environmental, 2008).</p>

flats, often associated with major watercourses.

2008).

4) Open Low Shrubland of *Acacia arida* and *Acacia hilliana* over *Triodia wiseana* and *Dampiera candidans* on slopes and hilltops.

5) Hummock grassland of *Triodia longiceps* with scattered *Acacia bivenosa*, *Acacia synchronicia* and *Acacia ptychophylla* on flats and lower slopes.

6) Hummock Grassland of *Triodia longiceps* and *Triodia wiseana* with occasional *Grevillea wickhamii* subsp. *hispidula* on flats and lower slopes.

7) Hummock Grassland of *Triodia basedowii*, *Triodia pungens* and *Triodia wiseana* with *Acacia bivenosa*, *Acacia pyrifolia* var. *morrisonii*, *Acacia synchronicia*, *Hakea lorea* subsp. *lorea* and emergent *Corymbia hamersleyana* and *Corymbia aspera* on undulating plains and slopes.

8) Open Low Woodland of *Atalaya hemiglauca* with *Corymbia hamersleyana* over *Corchorus lasiocarpus* subsp. *lasiocarpus*, *Aerva javanica*, *Eriachne mucronata* and *Triodia epactia* on minor watercourses.

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Chichester subregion is characterised by undulating Archaean granite and basalt plains with significant areas of basaltic ranges (CALM, 2002). At a broad scale, vegetation can be described as shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands on plains, while *Eucalyptus leucophloia* tree steppes occur on ranges (CALM, 2002).

The geomorphology of the application area consists of rounded hills on an undulating plain with weakly incised drainage systems that flow westwards into the Oakover River, located approximately 10km from the application area (MBS Environmental, 2008). The flows within these creeks are ephemeral with no nearby permanent pools or waterholes (MBS Environmental, 2008). The vegetation within the application area is described broadly as varying from *Triodia* hummock grassland dominated plains, slopes and hills to *Acacia* shrubland over tussock grass in minor drainage lines (MBS Environmental, 2008). The proposed clearing area is close to other mining operations and has suffered disturbance from fire and weed invasion (MBS Environmental, 2008).

Several flora and vegetation surveys have been conducted over the Woodie Woodie tenements (MBS Environmental, 2008). A flora and vegetation survey conducted by Mattiske Consulting (2008) described nine vegetation units as occurring within the survey area. Approximately 270 native species have been recorded within the Woodie Woodie tenements, from 46 families and 117 genera. The most common families within the Woodie Woodie region are *Poaceae*, *Amaranthaceae*, *Mimosaceae* and *Malvaceae* (MBS Environmental, 2008). No Declared Rare Flora (DRF), Priority Flora, Threatened Ecological Communities (TEC's) or Priority Ecological Communities (PEC's) were recorded during the survey (MBS Environmental, 2008).

MBS Environmental (2008) has recorded eight weed species as occurring within the Woodie Woodie tenements: Kapok Bush (*Aerva javanica*), Buffel Grass (*Cenchrus ciliaris*), Swollen Finger-grass (*Chloris barbata*), Watermelon (*Citrullus lanatus*), Common Purslane (*Portulaca oleracea*), Spiked Malvastrum (*Malvastrum americanum*), Mimosa Bush (*Vachellia farnesiana*) and Thornapple (*Datura leichhardtii*). Of these weed species Buffel Grass and Spiked Malvastrum were recorded by Mattiske Consulting (2008) as occurring within the application area. The presence of these introduced weed species lowers the biodiversity value of the proposed clearing area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of weed management.

Western Wildlife has undertaken two fauna surveys over the application area in 2006 and 2006/2007. They have identified two broad habitat types that will be affected by the proposed clearing, however, MBS Environmental (2008) has concluded that none of the landforms or habitat types are unique at the local or regional scale. Table 1 below shows the number of vertebrate fauna species recorded during the 2006/2007

survey in comparison to the number of species with the potential to occur:

Table 1: Vertebrate fauna species in the Woodie Woodie tenements: species recorded/expected to occur

	Amphibians	Reptiles	Birds	Mammals	Total
Potential to occur	7	79	135	50	268
Recorded during survey	5	59	84	20	155

(Davis and Wilcox, 2007)

This table indicates that the application area is potentially high in bird and reptile species. However, the application area is located immediately adjacent to an established mining area and pit and therefore, it is unlikely that the application area is particularly high in biological diversity compared to other, undisturbed areas nearby.

The landforms, vegetation types and fauna habitats in the application area are well represented in the Pilbara region (MBS Environmental, 2008). In addition, the project is for the expansion of an existing workshop and development of the Area 1 mining area. Therefore, the area applied to clear surrounds a pre-existing mining area and maps provided by MBS Environmental (2008) would suggest that the tenement has numerous tracks running through it. Due to the disturbed nature of the application area it is unlikely that the area applied to clear represents a high level of biological diversity within the region.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology CALM (2002)
Davis and Wilcox (2007)
Mattiske Consulting (2008)
MBS Environmental (2008)
GIS Database
- Interim Biogeographic Regionalisation for Australia

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments Proposal is not likely to be at variance to this Principle

Western Wildlife were commissioned by Consolidated Minerals Ltd to undertake level 1 vertebrate fauna surveys in the Woodie Woodie Project Area in 2006 and 2006/2007. The surveys were conducted in accordance with the Environmental Protection Authority (EPA) Position Statement No.3 and Guidance Statement 56: 'Guidance for the Assessment for Environmental Factors - terrestrial fauna for Environmental Impact Assessment in Western Australia' (Davis and Wilcox, 2006). The 2006/2007 reconnaissance fauna survey examined ten prospective areas within the Woodie Woodie tenements while the 2006 reconnaissance fauna survey used opportunistic sampling methods to survey a further eight prospect areas, including the application area (Davis and Wilcox, 2006; 2007).

In October 2006 and April/May 2007, Western Wildlife conducted detailed Level 2 fauna surveys of the Woodie Woodie tenements (Davis and Wilcox, 2007). The methods used to sample the fauna included:

- trapping for reptiles, amphibians and small mammals;
- spotlighting;
- bat and bird surveying;
- opportunistic sightings; and
- secondary evidence (tracks, scats, burrows, diggings and nests).

Several survey limitations impacted upon the number of species recorded during the field survey. For example, survey sites were limited to areas with adequate road access and in addition were limited to sites that allowed vehicle access, therefore, avoiding areas with steep slopes (Davis and Wilcox, 2007).

The purpose of the vertebrate fauna surveys was to compile a potential fauna species list for the proposed clearing area, broadly describe the main habitat types present, and search for the presence or evidence of fauna species of conservation significance (Davis and Wilcox, 2007). Davis and Wilcox (2007) identified seven broad habitat types within the Woodie Woodie tenements:

1. *Cenchrus ciliaris* dominated plains and minor creek lines with emergent Acacia;
2. Eucalyptus and Melaleuca fringed creek lines;
3. Triodia hummock grassland dominated plains;
4. scrub / Triodia hummock grassland on low rocky hills and mesas;
5. tall shrubland of Acacia;
6. low gorges; and
7. small caves within low gorges.

Of the habitat types listed above, habitat types 1, 2, 3, and 4 are located within the application area, however, MBS Environmental (2008) report that only 4ha of habitat type 1 and 46ha of habitat type 3 will be cleared, whilst the remaining habitat types will not be directly impacted by the proposed clearing.

The creek lines of Habitat Type 1 would be expected to be dry most of the year except following significant rainfall, usually associated with tropical cyclone events. It is expected that this habitat type would be habitat for numerous species particularly following cyclonic rainfall when the creek line will contain water (Davis and Wilcox, 2007). In particular, frog species would be expected to utilise this habitat type. The fauna surveys have recorded five frog species within the Woodie Woodie tenements (Davis and Wilcox, 2007). In arid regions, the majority of these species are opportunistic breeders that emerge following cyclonic rainfall to breed in pools of standing water and in flooded creek lines (Davis and Wilcox, 2007). Therefore, it is possible that frog species would be present in the creek line within the application area.

In addition, numerous wetland bird species have been recorded during the fauna surveys (Davis and Wilcox, 2007). These species are only likely to be present in the area when water is present and have often been recorded near ephemeral ponds and creek-lines (Davis and Wilcox, 2007). Sites on or near creek-lines were found to have the highest species richness of birds (Davis and Wilcox, 2007).

Based on the above, it is likely that the creek-line within the application area supports a variety of fauna, in particular frog and bird species. The proposed clearing will result in some loss of habitat for these species. However, due to the migratory nature of many wetland birds and the small scale of clearing associated with creek-lines (4ha), the proposed clearing is not likely to have a significant impact on the habitat of any fauna species.

Habitat type 3: Triodia hummock grassland dominated plains, is likely to be habitat for a variety of fauna. This habitat type represents potential shelter and foraging ground for mammal, reptile and bird species. The following impacts to fauna would be expected as a result of the proposed clearing:

- mortality of vertebrate and invertebrate species in the clearing footprint area. Sedentary species and young animals are particularly susceptible;
- displacement of mobile species in the proposed clearing area into surrounding habitats;
- temporary loss of habitat for foraging and shelter; and
- localised disturbance from noise and dust pollution.

Within the application area numerous fauna species of conservation significance have the potential to occur, with several having been recorded within the Woodie Woodie tenements during the fauna surveys. Conservation significant fauna most likely to be impacted by the proposed clearing include:

- Rainbow Bee-eater (*Merops ornatus*) – Marine and Migratory (EPBC Act 1999 and Japan-Australia Migratory Bird Agreement);
- Australian Bustard (*Ardeotis australis*) – Priority 4 on the DEC's Threatened and Priority Fauna list.
- Star Finch (*Neochima ruficauda subclaescens*) – Priority 4 on the DEC's Threatened and Priority Fauna list.
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 on the DEC's Threatened and Priority Fauna list.

The Rainbow Bee-eater is a widespread species and common migrant to many parts of Australia, including the Pilbara bioregion (Department of Environment, Water, Heritage and the Arts, 2008). This species has been recorded and sighted on numerous occasions within the Woodie Woodie tenements and is known to breed in the area (Davis and Wilcox, 2007). The Rainbow Bee-eater is known to occur in a variety of habitats including open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats (Department of Environment, Water, Heritage and the Arts, 2008). The Rainbow Bee-eater is often recorded in disturbed habitats including roadside vegetation and in quarries, mines and gravel pits, where they often breed (Department of Environment, Water, Heritage and the Arts, 2008). The species breed from August to January and often nests on flat or sloping ground, in embankments and often in the walls of quarries or pits (Department of Environment, Water, Heritage and the Arts, 2008). If nesting in the proposed clearing area, disturbance from vegetation clearing may result in adults abandoning their chicks. Similarly, chicks face direct mortality from machinery during the clearing operations, particularly as the species often nests on the ground on slopes and embankments (Department of Environment, Water, Heritage and the Arts, 2008). Given the wide distribution and habitat range of the Rainbow Bee-eater, the vegetation within the application area is unlikely to be representative of significant habitat for this species.

The Australian Bustard is a dispersive species with widespread movements over long distances (Department of Environment and Climate Change, 2005). The Australian Bustard is known to inhabit grasslands, low shrublands, grassy woodlands as well as altered environments such as croplands and airfields (Department of Environment and Climate Change, 2005). The species usually breeds on bare ground, on low sandy ridges or stony rises (Department of Environment and Climate Change, 2005). This species is slow to take flight and is therefore vulnerable to being killed by vehicles (Davis and Wilcox, 2007). This species has been recorded on numerous occasions throughout the Woodie Woodie tenements (Davis and Wilcox, 2007) and therefore, would be likely to occur within the application area. However, given the widespread distribution of this species it is

unlikely that the vegetation within the application area would represent significant habitat for this species.

The Star Finch has a patchy distribution within the Pilbara and at low densities where it occurs (Garnett and Crowley, 2000). The Star Finch inhabits the dense vegetation around swamps, rivers and permanent waterholes in the larger watercourses of the north-west of Western Australia (Johnstone and Storr, 2004, as cited in Davis and Wilcox, 2007). The Star Finch is likely to occur seasonally in small numbers around waterholes in the area and six individuals have previously been recorded in the Woodie Woodie tenements. Based on the above, it is possible that this species may occur near the ephemeral creek-line within the application area seasonally, following rainfall, however, it is more likely that this species would be found in areas near larger, permanent watercourses. Therefore, it is unlikely that the vegetation within the application area represents significant habitat for this species.

The Western Pebble-mound Mouse generally occurs on gentler slopes of rocky ranges where the ground is covered by a stony mulch and vegetated by hard Spinifex, often with an overstorey of eucalypts and scattered shrubs (Van Dyck and Strahan, 2008). Mounds are often sited close to narrow ribbons of Acacia-dominated scrub that grow along incised drainage lines (Van Dyck and Strahan, 2008). Numerous mounds of this species have been found throughout the Woodie Woodie tenements, on low rocky hills, however, all mounds found have been old with no evidence of recently active mounds (Davis and Wilcox, 2007). Suitable habitat for this species is present within the application area, although, it is considered more likely to occur in areas with larger hills (Davis and Wilcox, 2007). Pilbara Manganese should make all contractors aware that Western Pebble-mound Mouse mounds may be present in rocky places within the application area, and that these should be avoided wherever possible.

It is acknowledged that the proposed clearing will have a number of impacts on fauna within the application area including mortality, displacement of fauna and other disruptions. Pilbara Manganese will attempt to minimise these impacts using the following management strategies:

- Utilising existing haul roads, tracks or pipeline/power corridors for access wherever possible and locating tracks to avoid large trees and shrubs and their root zones.
- Stockpiling vegetation and respreading where possible to provide habitat for fauna and to assist revegetation by providing a local seed source.
- Engineering roads to prevent drainage shadow effects.
- Removing rubbish to an approved landfill area.
- A weed management programme already exists for Ruby Dock (*Acetosa vesicaria*) on site. The programme will continue in the project area to control any infestation.
- Clearly delineating clearing area with survey pegs and flagging to ensure only the minimum required for a safe working area is cleared.
- Retaining trees (especially those with hollows) for bird, bat and reptile habitat where possible. (MBS Environmental, 2008)

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Davis and Wilcox (2006)
Davis and Wilcox (2007)
Department of Environment and Climate Change (2005)
Department of Environment, Water, Heritage and the Arts (2008)
Garnett and Crowley (2000)
MBS Environmental (2008)
Van Dyck and Strahan (2008)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments **Proposal is not likely to be at variance to this Principle**

Mattiske Consulting undertook a flora and vegetation survey of the application area in April 2008. The survey involved choosing 17 sampling sites within the representative vegetation types and then describing and systematically sampling the vegetation within each site (Mattiske Consulting, 2008). In addition MBS Environmental (2008) undertook a desktop literature review of previous flora surveys from the Woodie Woodie tenements and a search of Department of Environment and Conservation (DEC) and EPBC Act databases to compile a potential Declared Rare Flora (DRF) and Priority Flora species list for the proposed clearing area.

According to available databases, there are no known records of DRF within 100km of the application area (GIS Database). In addition no DRF has previously been recorded within the Woodie Woodie tenements during previous flora and vegetation surveys (MBS Environmental, 2008).

According to available databases, there are no known records of Priority Flora within the proposed clearing area (GIS Database). Following a search of DEC and EPBC databases, MBS Environmental (2008) have identified 16 Priority species that could potentially occur in the region based on known distributions. In addition, a search by MBS Environmental (2008) of the Western Australian Herbarium specimen database indicates that two Priority species may occur within the Woodie Woodie tenement area: *Lepidium amelum* (P1) and *Dampiera*

atriplicina (P2). Previous surveys have recorded three Priority species within the Woodie Woodie tenements: *Acacia glaucocaesia* (P3), *Goodenia* sp. East Pilbara (P1) and *Tephrosia* sp. Cathedra Gorge (P3) (MBS Environmental, 2008). However, Matiske Consulting (2008) did not locate any Priority Flora species during a flora and vegetation survey of the proposed clearing area.

The vegetation communities present within the proposed clearing area are typical of those found within the Hamersley subregion (MBS Environmental, 2008). It is not expected that the proposed clearing will result in the loss of habitat necessary for the continued existence of any DRF or Priority Flora species.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Matiske Consulting (2008)
MBS Environmental (2008)
GIS Database
- Rare and Priority Flora list

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments Proposal is not likely to be at variance to this Principle

There are no known Threatened Ecological Communities (TEC's) within the area applied to clear or within 100km of the application area (GIS Database).

MBS Environmental (2008) report that no TEC's were identified during the flora survey of the application area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MBS Environmental (2008)
GIS Database
- Threatened Ecological Communities

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments Proposal is not at variance to this Principle

The application area falls within the IBRA Pilbara Bioregion (GIS Database). Shepherd et al. (2001) report that approximately 99.9% of the pre-European vegetation still exists in this Bioregion (see table below). The vegetation in the application area is recorded as Beard Vegetation Association 173: Hummock grasslands, shrub steppe, Kanji over soft spinifex and *Triodia wiseana* on basalt (GIS Database; Shepherd et al., 2001). According to Shepherd et al., (2001) approximately 100% of this vegetation association remains within the Bioregion (see table below).

Therefore, the vegetation within the application area is not a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	Least Concern	6.3
Beard veg assoc. – State					
173	1,753,116	1,753,116	~100	Least Concern	7.5
Beard veg assoc. – Bioregion					
173	1,752,533	1,752,533	~100	Least Concern	7.5

* Shepherd et al. (2001) updated 2005

** Department of Natural Resources and Environment (2002)

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Shepherd et al. (2001)
Department of Natural Resources and Environment (2002)
GIS Database
- Interim Biogeographic Regionalisation for Australia

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

The application area contains a number of ephemeral drainage lines, including Brumby Creek which is the largest of the watercourses within the application area (GIS Database; MBS Environmental, 2008). Should a permit be granted, it is recommended that if any watercourses are to be disturbed the proponent should liaise with the Department of Water to determine whether a Bed and Banks permit is necessary for the proposed works. MBS Environmental (2008) have reported three vegetation units within the application area that are generally associated with watercourses:

- 1) Woodland of *Eucalyptus victrix* over *Acacia arida*, *Petalostylis labicheoides*, *Acacia trachycarpa* and *Acacia pyrifolia* var. *morrisonii* over *Cenchrus ciliaris* on major watercourses.
- 2) Scrub or Thicket of *Carissa lanceolata*, *Petalostylis labicheoides*, *Acacia bivenosa* and *Acacia ancistrocarpa* over *Triodia pungens*, *Triodia basedowii*, *Cenchrus ciliaris* and *Chrysopogon fallax* along minor watercourses.
- 3) Scrub or Low Shrubland of *Acacia ancistrocarpa*, *Acacia arida*, *Acacia acradenia*, *Petalostylis labicheoides*, *Gossypium australe*, *Acacia synchronicia* and *Acacia inaequilatera* over *Triodia longiceps* and *Triodia wiseana* with patches of *Cenchrus ciliaris* on flats, often associated with major watercourses.

MBS Environmental (2008) report that no vegetation will be cleared from Vegetation Unit 1, 4ha of vegetation will be cleared from Vegetation Unit 2 and 26ha of vegetation will be cleared from Vegetation Unit 3. MBS Environmental (2008) report that Vegetation Unit 3 is one of the most common vegetation units within the application area. It does not appear to be directly associated with any watercourses or wetlands but appears to often be found surrounding vegetation units 1 and 2. The vegetation maps provided by MBS Environmental (2008) indicate that this vegetation unit is well represented in surrounding areas.

Based on the above, the proposed clearing is at variance to this Principle. However, vegetation associated with watercourses is well represented throughout the Woodie Woodie region. Therefore, the 4ha of proposed clearing associated with watercourses is unlikely to have a significant impact on any watercourse or wetland.

Methodology MBS Environmental (2008)
GIS Database
- Hydrography - linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal is not likely to be at variance to this Principle

The majority of the application area has been mapped as occurring within the Coonigmah Land System (GIS Database). However, an area of approximately 69ha within the application area does not have a Land System classification due to the land being disturbed from mining activities in this area (GIS Database).

The Coonigmah Land System consists of plateau surfaces, low hills with steep slopes and undulating uplands supporting hard Spinifex grasslands (Van Vreeswyk et al., 2004). This land system is considered to have a very low erosion risk and the vegetation is not susceptible to degradation (Van Vreeswyk et al., 2004).

MBS Environmental (2008) have listed potential sources of land degradation from the proposed clearing:

- Wind erosion from topsoil stripping.
- Wind and water erosion of topsoil stockpiles.
- Wind and water erosion of rehabilitated surfaces e.g. waste rock stockpiles.
- Water erosion due to changes to the surface flow.
- Soil compaction.
- Soil contamination.
- Introduction and/or spread of weeds.

Pilbara Manganese will implement management strategies in order to minimise land degradation, these include:

- Minimising the area requiring vegetation removal.
- Implementing dust suppression measures.
- Confining vehicle movements to defined haul roads and tracks.
- Conducting topsoil-stripping activities during periods of low winds.
- Establishing vegetation on bare surfaces on completion of activities.

- Stockpiling topsoil for use in rehabilitation.
- Implementing a weed management program.
- Storing hydrocarbons and refuelling in bunded areas.
- Ensuring spill kits are available for use to contain and treat hydrocarbon spillages.
- Progressive rehabilitation of completed surfaces to minimise active areas exposed.
- Minimising travel on roads during wet conditions.
- Scarifying of compacted tracks prior to rehabilitation of the site.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MBS Environmental (2008)
Van Vreeswyk et al. (2004)
GIS Databasse
- Rangelands System Mapping

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing is not located within close proximity to any conservation areas (GIS Database). The nearest DEC managed land is the Rudall River National Park located approximately 85km south-east of the application area (GIS Database).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology GIS Database
- CALM Managed Land and Waters

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

The application area is located in an arid region with an average annual rainfall of approximately 327mm falling mainly during the summer months and an average annual evaporation rate of approximately 3,800mm (MBS Environmental, 2008), hence the presence of surface water resulting from rain events is relatively short-lived.

The application area has several ephemeral drainage lines running through it, including Brumby Creek (GIS Database). Based on the climate of the region these creeks are expected to be dry except following significant rainfall events, usually associated with tropical cyclones.

The groundwater and surface water of the Woodie Woodie region is well documented with over ten years of monitoring data (MBS Environmental, 2008). The groundwater and surface water within the Woodie Woodie region has pH ranges between 7.2 and 8.5 and is generally fresh to brackish (MBS Environmental, 2008).

The natural water table is more than 20 metres below natural ground level (MBS Environmental, 2008). Therefore, the impact of vegetation removal on groundwater levels is not likely to be significant. In addition, due to the arid climate, surface water runoff is expected to be minimal except following significant rainfall. Hence, the proposed clearing of the native vegetation is unlikely to have any significant impact on surface water flows or groundwater level or quality.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MBS Environmental (2008)
GIS Database
- Hydrography, linear

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The application area is located in an arid region where the average annual evaporation rate greatly exceeds the average annual rainfall (MBS Environmental, 2008). There are no permanent watercourses within the application area, however, several ephemeral drainage lines dissect the proposed clearing area (GIS Database). These drainage lines are expected to be dry for most of the year, only flowing briefly immediately following significant rainfall (GIS Database).

Natural flood events do occur in the Pilbara following cyclonic activity. However, the proposed clearing is not expected to increase the incidence or intensity of such events given the size of the area to be cleared (50ha) in relation to the Oakover River catchment area (2,001,756ha) (GIS Database).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology MBS Environmental (2008)
GIS Database
- Hydrographic Catchments - catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There is one native title claim (WC99/008) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases there are no Aboriginal Sites of Significance within the application area (GIS Database). The nearest known Aboriginal Site of Significance is located approximately 1km north of the application area (GIS Database).

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water, to determine whether a Works Approval, Water Licence, Bed and Banks permit, or any other licences or approvals are required for the proposed works.

There were no public submissions received during the public comments period.

Methodology GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles, and is not at variance to Principle (e), is not likely to be at variance to Principles (a), (b), (c), (d), (g), (h), (i) and (j) and is at variance to Principle (f).

Should the permit be granted it is recommended that conditions be imposed on the permit for the purposes of weed management, rehabilitation, record keeping and permit reporting.

5. References

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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1** **Priority One - Poorly Known taxa:** 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., or the plants are under threat, e.g. from disease, grazing by feral animals, 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** **Priority Two - 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 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** **Priority Three - Poorly Known taxa:** taxa which are known from several 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 need of further survey.
- P4** **Priority Four – 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. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** 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, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1 Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2 Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3 Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4 Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5 Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W) Extinct in the wild:** A native species which:
- (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
 - (b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN Endangered:** A native species which:
- (a) is not critically endangered; and
 - (b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU Vulnerable:** A native species which:
- (a) is not critically endangered or endangered; and
 - (b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.