Department of Industry and Resources

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2980/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Pilbara Manganese Pty Ltd**

1.3. Property details

Property: Mining Lease 45/430
Local Government Area: Shire of East Pilbara
Colloquial name: Whodowe 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
The area applied to clear has been broadly mapped at a scale of 1:250,000 as (GIS Database; Shepherd et al., 2001): - Beard Vegetation Associations 173: Hummock grasslands, shrub steppe; kanji over soft Spinifex & *T. wiseana* on basalt and - Beard Vegetation association 177: Hummock grasslands, sparse shrub steppe: hard Spinifex *Triodia basedowii* (GIS Database). Mattiske Consulting (2007) undertook a flora and vegetation survey of the whole of Mining Lease 45/430, including the application area during May and June 2007. The following five vegetation units were found within the application area: 1. 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. 2. 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. 3. Low Shrubland of *Acacia arid* and *Acacia hilliana* over *Triodia wiseana* and *Dampiera candicans* on slopes and hilltops. 4. Hummock Grassland of *Triodia longiceps* with scattered *Acacia*	Pilbara Manganese Pty Ltd has applied to clear 50 hectares within an application area of 341.4 hectares for the purpose of developing the Whodowe Project which comprises three pits and associated infrastructure. Vegetation will be cleared by mechanical means.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994). to Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).	The vegetation condition rating is based on information reported by Mattiske Consulting (2007). Whilst vegetation within the application area is generally of a 'very good' condition rating there are areas recorded that have been previously cleared and are classed as 'degraded'.

bivenosa, Acacia synchronicia and *Acacia ptychophylla* on flats and lower slopes.

5. Hummock Grassland of *Triodia longiceps* and *Triodia wiseana* with occasional *Grevillea wickhamii subsp. hisidula* on flats and lower slopes.

There was also areas mapped as 'CL' which is areas of land that have been previously cleared (MBS Environmental, 2008). Aerial photography shows mining activity in the southeast of the application area.

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, while *Eucalyptus leucophloia* tree steppes occur on ranges (CALM, 2002).

A number of flora and vegetation surveys have been conducted over the Woodie Woodie tenemants (MBS Environmental, 2008). A flora and vegetation survey of Mining Lease 45/430 was conducted by Mattiske Consulting in 2007 which identified a total of 123 taxa from 31 families and 66 genera. None of these were Declared Rare Flora or Priority Flora (MBS Environmental, 2008). The most common families within the application area were the Grass family (Poaceae), Amaranth family (Amaranthaceae), Acacia family (Mimosaceae) and the Legume family (Papilionaceae) (MBS Environmental, 2008).

Mattiske Consulting (2007) have identified 16 plant communities across the Woodie Woodie tenements, five of which are found in the application area. None of these plant communities are listed as Threatened Ecological Communities or Priority Ecological Communities (MBS Environmental, 2008). The condition of the vegetation is described as very good throughout the area excluding areas of localised disturbance from previous mining and exploration activities (MBS Environmental, 2008).

Mattiske Consulting (2007) identified two weed species within the application area. These were Kapok Bush (*Aerva javanica*) and Buffel Grass (*Cenchrus ciliaris*). These species are likely to have originated from pastoral land use in the region. Neither of these species is listed as a Declared Plant for the Shire of East Pilbara by the Department of Agriculture and Food. However, both species can be invasive and have the capacity to spread rapidly in disturbed areas (Mattiske Consulting, 2007). The presence of these introduced weed species lowers the biodiversity value of the proposed cleared 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 purpose of weed management.

Western Wildlife has undertaken a Level 2 fauna survey of the Woodie Woodie area in 2006/2007 that did not include trapping sites within the application area, and a Level 1 survey in 2008, including the application area. They have identified three broad habitat types that will be affected by the clearing. However, MBS Environmental (2008) has concluded that none of the landforms or habitat types are unique at the local scale and are well represented throughout the region.

The flora and fauna surveys found a similar representation of species throughout the whole Woodie Woodie area, hence the application area is unlikely to have greater biological diversity than other undisturbed areas nearby.

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

Methodology

CALM (2002)
Mattiske Consulting (2007)
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 may be at variance to this Principle

Western Wildlife was commissioned by Consolidated Minerals Ltd to undertake vertebrate fauna surveys in the Woodie Woodie Project area, including the application area in 2006/2007, 2008. These 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' (EPA 2002; 2004). The 2006/2007 survey was a Level 2 fauna survey that sampled twelve sites within the Woodie Woodie tenements, however no trapping sites were located within the application area. The 2008 survey was a Level 1 survey that surveyed eleven sites across the Woodie Woodie Project including the application area (Davis and Wilcox 2007; 2008).

From these surveys, Davis & Wilcox (2007) identified three broad habitat types within the application area:

1. *Cenchrus ciliaris* dominated plains and minor creek lines with emergent *Acacia*;
2. *Triodia* hummock grassland dominated plains; and
3. Scrub/*Triodia* hummock grassland on low rocky hills and mesas.

All of these habitats are well represented on a regional scale and local areas of similar habitat will be retained (MBS Environmental, 2008).

The proposed clearing of these habitats has the potential to result in the following impacts to fauna:

- 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 and permanent loss of habitat for foraging and shelter; and
- localised disturbances from noise and dust pollution.

There is potential for a number of fauna species of conservation significance to occur within the application area. Searches of the Department of Environment and Conservation (DEC) Database and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC) database for species that may occur in the region listed nine mammals, twelve birds, and one reptile (MBS Environmental, 2008).

Based on known habitat requirements and the results of fauna habitat assessment of the area, the following species are most likely to occur in the habitat area:

The Pilbara Olive Python (*Liasis olivaceus barroni*) is listed as Schedule 1 - fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008* and Vulnerable under the *EPBC Act 1999*. The Pilbara Olive Python is known from relatively few localities in the Pilbara and islands in the Dampier Archipelago (Davis & Wilcox, 2008). This species usually inhabits deep gorges and waterholes, where it hunts it prey (DEWHA, 2009). In 2007, a road killed python was recorded on the Nifty Road, just outside the Woodie Woodie area (Davis & Wilcox, 2008). The Pilbara Olive Python has been recorded nearby, however the application area has no suitable habitat to support this species.

The Peregrine Falcon (*Falco peregrinus*) is listed as Schedule 4 - other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*. It is a widespread bird of prey that mainly nests on ledges on cliffs, rocky outcrops and quarries, and often takes advantage of man made structures such as abandoned open pits (Davis & Wilcox, 2008). It was not recorded during any surveys of the area but may occur in potentially nest in rocky areas within the proposed clearing area (Davis & Wilcox, 2008).

The Australian Bustard (*Ardeotis australis*) (DEC - Priority 4) 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 & Wilcox, 2007). This species has been recorded on numerous occasions throughout the Woodie Woodie tenements (Davis & Wilcox, 2007) and therefore, would be likely to occur within the application area. However, given the widespread distribution of this species across the state, it is unlikely that the vegetation within the application area would represent significant habitat for this species.

The Bush Stone-Curlew (*Burhinus grallarius*) (DEC - Priority 4) is a mainly nocturnal ground dwelling bird that inhabits lightly wooded plains, sheltering during the day in thickets of grass. The Bush Stone-Curlew was not recorded during any surveys but may occur in the application area (Davis & Wilcox, 2008). Given the availability of similar habitat types throughout the region, the vegetation within the application area is unlikely to be considered significant habitat.

The Grey Falcon (*Falco hypoleucos*) (DEC - Priority 4) is scarcely found across the northern half of Western Australia, inhabiting lightly wooded coastal and riverine plains (Johnstone & Storr, 2004). This species nests in eucalypts along rivers, so the application area is unlikely to support breeding habitat for this species (Davis & Wilcox, 2008).

The Star Finch (western) (*Neochmia ruficauda subclarescens*) (DEC Priority 4) was recorded in the Woodie Woodie area during the baseline survey (Davis & Wilcox, 2008). This species is common in the Pilbara and is likely to occur seasonally around creeks (MBS Environmental, 2008). It usually inhabits dense vegetation around swamps, rivers and permanent waterholes (Johnstone & Storr 2004). The Star Finch may occur near the ephemeral drainage lines within the application area following rainfall, however, it is more likely that this species could be found in areas where permanent sources of water occur. Therefore, it is unlikely that the vegetation within the application area represents significant habitat for this species.

Seven of the bird species: Oriental Plover (*Charadrius veredus*); Wood Sandpiper (*Tringa glareola*); Common Sandpiper (*Tringa hypoleucos*); Fork-tailed Swift (*Apus pacificus*); White-bellied Sea-eagle (*Haliaeetus leucogaster*); Rainbow Bee-eater (*Merops ornatus*) and Great Egret (*Ardea alba*) are listed as migratory under the EPBC Act and are likely to overfly and be occasional visitors, rather than using the habitats of the project area regularly (Davis & Wilcox, 2008). The proposed clearing is not likely to impact critical feeding or breeding habitat for any migratory species.

Of the nine mammals species of conservation significance with the potential to occur in the area, four are considered unlikely to occur in the application area due to lack of suitable habitat (Davis & Wilcox, 2008). These are: The Bilby (*Macrotis lagotis*), Mulgara (*Dasycercus cristicauda*), Orange Leaf Nosed Bat (Pilbara form) (*Rhinonicteris aurantius*) and the Ghost Bat (*Macroderma gigas*)

The Spectacled Hare-Wallaby (*Lagorchestes conspicillatus)* (DEC - Priority 3) is very uncommon on the Pilbara mainland and inhabits areas of tall, unburnt Spinifex (Davis & Wilcox, 2008). This species was not recorded during the baseline survey and is considered very unlikely to be present in the application area (Davis & Wilcox, 2008).

The Northern Quoll (*Dasyurus hallucatus*) is listed as Schedule 1 - fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008* and Vulnerable under the *EPBC Act 1999*. It is associated with rocky areas and open forest woodland (Davis & Wilcox, 2008). It may be at the eastern limit of its Pilbara distribution in the project area and was not recorded during the survey, but may be present in rocky areas of the application area (Davis & Wilcox, 2008). Given the availability of similar habitat types throughout the region, the vegetation within the application area is not likely to be considered significant habitat.

Both the Long-tailed Dunnart (*Sminthopsis longicaudata*) (DEC - Priority 4) and the Lakeland Downs Mouse (*Leggadina lakedownesis*) (DEC - Priority 4) were not recorded during the survey but may potentially occur in the application area. The Lakeland Downs Mouse may be present particularly on flats with clay-based soils (Davis & Wilcox, 2008). The proposed clearing may result in the loss of some habitat for these species. However, similar habitat is present throughout the Woodie Woodie area and these species are not likely to be significantly impacted.

The Western Pebble-mound mouse (*Pseudomys chapmani*) (DEC - Priority 4) generally occurs on stony slopes where it constructs its pebble mounds (Davis & Wilcox, 2008). Inactive mounds have been recorded on low stony hills in the application area and in several other locations in the Woodie Woodie area. No active mounds have been found within Woodie Woodie tenements but suitable habitat for this species is present throughout the Woodie Woodie tenements. Pilbara Manganese should make contractors aware that Western Pebble-mound Mouse mounds may be present in rocky places within the application area, and that these should be avoided where possible.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology

Davis & Wilcox (2007)
Davis & Wilcox (2008)
Department of Environment and Climate Change (2005)
EPA (2002)
EPA (2004)
Johnstone & Storr (2004)
MBS Environmental (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 (2007) undertook a flora and vegetation survey of Mining Lease 45/430 in May and June 2007, which includes the application area. In addition MBS Environmental (2008) undertook a search of the DEC and Environmental Protection and Biodiversity Conservation (EPBC) databases to compile a list of 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 100 kilometres of the application area (GIS Database). In addition, no species of DRF were recorded during the survey of Mining Lease 45/430 (Mattiske Consulting, 2007).

According to available databases, there are no known records of Priority Flora within the application 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 Woodie Woodie 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 in the Woodie Woodie area: *Lepidium amelum* (P1) and *Dampiera atriplicina* (P2). These species were not found within the application area during the flora and vegetation survey by Mattiske Consulting (2007).

The survey conducted by Mattiske Consulting (2007) identified one Priority species within Mining Lease 45/430; *Acacia glaucocaesia* (P3). This species is located approximately 1.8 kilometres from the application area and therefore is unlikely to be impacted by the proposed clearing.

The vegetation communities present within the application area are well represented throughout the region (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
Mattiske Consulting (2007)
MBS Environmental (2008)
GIS Database
- Declared 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 application area, or within 100 kilometres 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

According to available databases the application area falls within the Pilbara IBRA bioregion (GIS Database). This bioregion's vegetation extent remains at approximately 99.9% of its Pre-European extent (see table).

The vegetation in the application area has been mapped as (GIS Database; Shepherd et al., 2001):

- Beard Vegetation Association 173: Hummock grasslands, shrub steppe, Kanji over soft Spinifex and *Triodia wiseana* on basalt; and

- Beard Vegetation Association 177: Hummock grasslands, sparse shrub steppe; *Acacia bivenosa*over hard Spinifex *Triodia brizoides*.

According to Shepherd et al (2001) approximately 100% of both these vegetation associations remain 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**	Pre-european % in IUCN Class I-IV Reserves (and post clearing %)*
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
177	169,446	169,446	~100	Least Concern	0
Beard veg assoc. – Bioregion					
173	1,752,533	1,752,533	~100	Least Concern	7.5
177	169,,446	169,446	~100	Least Concern	0

* Shepherd et al. (2001)
** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)

Presumed extinct	Probably no longer present in the bioregion
Endangered+	<10% of pre-European extent remains
Vulnerable+	10-30% of pre-European extent exists
Depleted+	>30% and up to 50% of pre-European extent exists
Least concern+	>50% pre-European extent exists and subject to little or no degradation over a majority of this area

+ or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

Based on the above the proposal is not at variance to this Principle.

Methodology

Department of Natural Resources and Environment (2002)
Shepherd et al (2001)
GIS Database
- Pre-European Vegetation
- 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 several ephemeral drainage lines (GIS Database). MBS Environmental (2008) have reported two vegetation units within the application area that are generally associated with watercourses:

1) 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; and

2) 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.

Given the application area includes vegetation growing in association with a watercourse, the proposed clearing is at variance to this Principle.

There is 52.86 hectares of vegetation type 1 and 123 hectares of vegetation type 2 present respectively within the application area (MBS Environmental, 2008). MBS Environmental (2008) reports that both vegetation units are common outside the application area and are also well represented in the surrounding areas.

MBS Environmental (2008) report that based on preliminary designs approximately 10.3 hectares of vegetation unit 1 will be impacted for the proposed project. Vegetation unit 1 is well represented throughout the Woodie Woodie tenements (MBS Environmental, 2008), and therefore the proposed clearing of 10.3 hectares of this vegetation type is unlikely to have a significant impact on the overall representation of the vegetation unit within the local area. Vegetation type 2 is also reported as being common throughout the local area, therefore clearing is also not likely to have a significant impact on its overall representation in the local area.

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.

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 Connigmah Land System (GIS Database). The application area also falls partly within the McKay and Patterson Land Systems. The proposed clearing is predominately within the Coongimah and McKay Land Systems, with clearing within the Patterson Land System only being required for haul roads (MBS Environmental, 2008).

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).

The McKay Land System consists of Hills, ridges, plateaux remnants and breakaways of metasedimentary and sedimentary rocks supporting hard Spinifex grasslands. This land system is not prone to degradation or soil erosion (Van Vreeswyk et al, 2004).

MBS Environmental (2008) have listed the 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.

MBS Environmental (2008) report that Pilbara Manganese will implement management strategies in order to minimise land degradation, which include:

- Minimising the area requiring vegetation removal;
- 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 mining activities;
- Stockpiling topsoil for use in rehabilitation;
- Storing hydrocarbons and refuelling in bunded areas;
- Progressive rehabilitation of completed surfaces to minimise the active area exposed at any time;
- Minimising travel on roads during wet conditions;
- Scarifying of compacted tracks prior to rehabilitation of the site.

Provided these control measures are implemented, the proposed clearing is not likely to cause appreciable land degradation.

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

Methodology MBS Environmental (2008)
Mattiske Consulting (2007)
Van Vreeswyk et al (2004)
GIS Database
- 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 application area 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 90 kilometres southeast 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 Lands 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 327

millimetres falling mainly during December to March (MBS Environmental, 2008). Based on an average annual evaporation rate of approximately 3,800 millimetres (MBS Environmental, 2008), any surface water resulting from rain events is likely to be relatively short lived.

The application area is dissected by several ephemeral drainage lines (GIS Database). Based on the climate of the region, these creeks are expected to be dry except following significant rainfall events which are typically 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 a pH ranging between 7.2 and 8.5 and is generally fresh to brackish with approximately 190 to 1,250 milligrams/total dissolved solids (MBS Environmental, 2008).

The natural water table is more than 20 metres below natural ground level (MBS Environmnetal, 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. Given this, the proposed clearing in 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 of the Pilbara where the average 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, and would likely only flow briefly following significant rainfall.

The application area is within the Oakover River catchment area which covers 2,001,756 hectares (GIS Database). Natural flood events do occur in the Pilbara following cyclonic activity, and there may be a localised increase in surface runoff in proposed clearing areas following such events. However, the proposed clearing is not expected to increase the incidence and intensity of flooding given the size of the area to be cleared (50 hectares) in relation to the size of the catchment area (2,001,756 hectares).

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 over the area under application; WC99/008 (GIS Database). This claim has been registered with the National Native Title Tribunal. However, the mining 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 two Aboriginal Sites of Significance (Site ID: 6330 and 6331) within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

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.

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), (c), (d), (g), (h), (i) and (j), may be at variance to Principle (b) 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, 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.