



1. Application details

1.1. Permit application details

Permit application No.: 2443/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Pilbara Manganese Pty Ltd

1.3. Property details

Property: Mining Lease 45/431
Local Government Area: Shire of East Pilbara
Colloquial name: Austin Pit Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
17.5		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>Beard vegetation associations have been mapped at 1:250,000 scale for the whole of Western Australia, and are a useful tool to examine the vegetation extent in a regional context. One Beard vegetation association is located within the area proposed to be cleared (GIS Database, 2007). This vegetation association is:</p> <p>Beard vegetation association 173 - Hummock grasslands, shrub steppe; kanji over soft spinifex & <i>Triodia wiseana</i> on basalt</p> <p>A flora and vegetation survey of the entire tenement (M47/431) was completed by Mattiske Consulting in May 2007. As a result of the flora and vegetation survey, 12 vegetation associations were identified within the Eat tenement. The following 5 were found in the application area (Mattiske Consulting, 2007):</p> <p>Vegetation association 3: Tall shrubland of <i>Acacia arida</i>, <i>Acacia bivenosa</i>, <i>Acacia synchronica</i> over patches of <i>Triodia basedowii</i> and <i>Triodia pungens</i> with <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> and emergent <i>Corymbia hamersleyana</i> on flats and lower slopes.</p> <p>Vegetation association 4: 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 synchronica</i> and <i>Acacia inaequilatera</i> over <i>Triodia longiceps</i> and <i>Triodia wiseana</i> with patches of *<i>Cenchrus ciliaris</i> on flats, often associated with major watercourses.</p> <p>Vegetation association 7: Hummock Grassland of <i>Triodia longiceps</i> and <i>Triodia wiseana</i> with occasional <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> on flats and lower slopes.</p> <p>Vegetation association 8: Hummock Grassland of <i>Triodia pungens</i> with patches of <i>Cymbopogon ambiguus</i> and <i>Acacia synchronica</i> and emergent <i>Corymbia hamersleyana</i> on flats and lower</p>	<p>Pilbara Manganese proposes to clear up to 17.5 hectares of native vegetation within a purpose permit boundary of 56 hectares, for the Austin Project. The application area contains existing mining infrastructure, including an open pit, waste rock stock piles, drill pads and haul roads (MBS Environmental, 2008). It is estimated that approximately 5.7 hectares of native vegetation is already cleared from previous mining (MBS Environmental, 2008).</p> <p>Vegetation clearing in the application area is proposed for the expansion of the existing Austin pit (6.4 hectares) and construction of associated infrastructure, including waste rock stockpile (8.7 hectares), ROM pad (0.3 hectares) dewatering pond and drains (0.8 hectares), access roads (0.1 hectares) and topsoil stockpiles (1.2 hectares) (MBS Environmental, 2008).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)</p> <p>To</p> <p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)</p>	<p>The majority of the northern and central portion of the application area has been degraded from previous mining, however, there are areas in the south of the application area which remain in 'very good' condition.</p> <p>Four weed species were identified in the application area, including: <i>Aerva javanica</i> (Kapok Bush), <i>Cenchrus ciliaris</i> (Buffel Grass), <i>Portulaca oleracea</i> (Pursland) and <i>Datura leichhardtii</i> (Native Thornapple) (Mattiske Consulting, 2007).</p>

slopes.

Vegetation association 10: Open scrub of *Senna artemisioides* subsp. *oligophylla*, *Hakea lorea* subsp. *lorea* and *Atalaya hemiglauca* over mixed shrubs, herbs and grasses on rocky slopes.

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 clearing permit area is located within the Chichester Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS database). The main vegetation and landform features of the region are plains composed of shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges (Kendrick & McKenzie, 2001). High reptile and mammal species diversity within hummock grasslands are a feature of the Chichester subregion (Kendrick & McKenzie, 2001). The main land uses of the subregion are pastoral activity, Aboriginal lands and Reserves, Unallocated Crown Land and Crown Reserves, conservation, and mining.

A flora and vegetation survey of the application area was undertaken by Mattiske Consulting (2007) in May 2007. This involved a desktop review of the application area and the flora species and vegetation it may support, as well as a field survey to verify the findings of the desktop review.

As a result of the survey there were 127 taxa from 33 families and 71 genera recorded in the Eat tenement survey area (Mattiske Consulting, 2007). The most prevalent families were Poaceae, Amaranthaceae, Caesalpiniaceae and Mimosaceae. There were no Declared Rare Flora (DRF) or Priority flora species identified within the application area (Mattiske Consulting, 2007). Mattiske Consulting (2007) have stated that the vegetation of the application area is well represented locally and regionally.

A desktop fauna review of the Austin Project area was undertaken in May 2008 by Western Wildlife (2008). The fauna with the potential to occur in the application area were identified using a previous baseline fauna survey of the larger Woodie Woodie Project area and vegetation and habitat mapping provided by MBS Environmental (Western Wildlife, 2008).

As a result of the desktop fauna review, it was shown that 268 fauna species potentially occur in the application area, including 7 amphibians, 79 reptiles, 132 birds and 50 mammals (Western Wildlife, 2008). This is indicative of a high level of fauna species richness. However, Western Wildlife (2008) have stated that a large portion of the application area is highly degraded from previous mining with little vegetation remaining. As a result, the majority of habitats within the application area are in a 'poor' to 'degraded' condition, and are likely to support a reduced level of fauna species (Western Wildlife, 2008).

According to MBS Environmental (2008) the application area has been disturbed from previous mining, including a waste dump, open pits, haul roads and drill pads, totalling 5.7 hectares in area. Mattiske Consulting (2007) have stated that apart from disturbance from previous mining, the vegetation of the application area had been impacted by fire and weeds. During the flora and vegetation survey there were four weed species identified in the application area, including: *Aerva javanica* (Kapok Bush), *Cenchrus ciliaris* (Buffel Grass), *Portulaca oleracea* (Pursland) and *Datura leichhardtii* (Native Thornapple) (Mattiske Consulting, 2007). The presence of weeds 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 on the permit for the purposes of weed management.

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

Methodology Kendrick & McKenzie (2001).
Mattiske Consulting (2007).
MBS Environmental (2008).
Western Wildlife (2008).
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- Interim Biogeographic Regionalisation of Australia (subregions)

(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**

A desktop review of the fauna of the application area was undertaken in May 2008 by Western Wildlife (2008). As a result of the review fauna with the potential to occur in the application area were identified using a previous baseline fauna survey of the larger Woodie Woodie Project area, and vegetation and habitat mapping provided

by MBS Environmental (Western Wildlife, 2008).

Based on the findings of the desktop fauna review, it is possible that 268 fauna species potentially occur in the general Woodie Woodie Project area including 7 amphibians, 79 reptile, 132 birds and 50 mammals (Western Wildlife, 2008). The application area is a much smaller area, and will support a much smaller subset of these species. According to Western Wildlife (2008), 6 species of conservation significance may occur in the application area, including: Peregrine Falcon (*Falco peregrinus*), Fork-tailed Swift (*Apus Pacificus*), Rainbow Bee-eater (*Merops ornatus*), Orange Leaf-nosed Bat (*Rhinonictus aurantius*), Australian Bustard (*Ardeotis australis*) and the Western Pebble-mound Mouse (*Pseudomys chapmani*).

The Peregrine Falcon (Schedule 4 - Other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is widespread across Australia including some continental islands but absent from most deserts and the Nullarbor Plain (Johnstone & Storr, 1998). Its habitat consists of areas such as cliffs along coasts, rivers and ranges, and about wooded watercourses and lakes (Johnstone & Storr, 1998). The Peregrine Falcon may potentially utilise the application area for feeding, however, the habitats present are well replicated in the local area (Western Wildlife, 2008). Therefore, the vegetation within the application area is not likely to be significant habitat for this species.

The Fork-tailed Swift (Migratory and Marine species - *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*) is found throughout Australia and its movements are influenced by weather patterns (Knight & Pizzey, 1997). It is found in a variety of habitats in open country from semi-deserts to the coast. Western Wildlife (2008) have stated that this species could potentially be found in the application area. However, the Fork-tailed Swift is an aerial species and rarely comes to the ground unless nesting. The Fork-tailed Swift breeds and nests in Japan and Siberia (Knight & Pizzey, 1997), and therefore is unlikely to be reliant on the project area for habitat.

The Rainbow Bee-eater (Migratory and Marine species - *EPBC Act 1999*) is a medium sized bird, and the only species of bee-eater in Australia (Department of Environment and Water Resources (DEWR), 2008). The Rainbow Bee-eater is distributed across much of mainland Australia and on several near shore islands. It occurs in a range of habitats including open forests and woodlands, shrubland areas, grasslands, inland and coastal sand dune systems, mangroves and cleared or semi-cleared habitats (DEWR, 2008). It is possible that the Rainbow bee-eater may forage within the application area, however, it is unlikely to rely on the application area for habitat (Western Wildlife, 2008). Based on this, it is unlikely the vegetation within the application area is significant habitat for the Rainbow Bee-eater.

The Orange Leaf nosed Bat (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is described as preferring warm humid caves for roosting, although some have been found in tree hollows of the eastern Pilbara (Department of Environment, Water, Heritage and Arts (DEWHA), 2008). However, in the Pilbara, colonies are known to occupy abandoned, deep and partially flooded mines that trap pockets of warm, humid air in the mine's constant temperature zone (DEWHA, 2008). Although the application area has been previously mined, there are no abandoned mine shafts that would provide suitable nesting sites for the Orange Leaf nosed Bat (MBS Environmental, 2008). Based on this, it is unlikely that the application area is significant habitat for this species.

The Western Pebble-mound Mouse (Department of Environment & Conservation (DEC) - Priority 4) is found in rocky hummock grasslands and is endemic to the Pilbara (Western Wildlife, 2008). Active pebble mounds have been recorded within the general Woodie Woodie project area (Western Wildlife, 2008). Therefore, it is possible that the Western Pebble-mound Mouse exists within the application area. However, this species is common throughout the eastern Pilbara and is abundant in at least five large conservation reserves found in the Pilbara (Start et al., 2000). As a result, it is unlikely that the vegetation within the application area is significant habitat for the Western Pebble-mound Mouse.

The Australian Bustard (DEC - Priority 4) is limited to the arid areas of Northern and Central Australia (Caughley et al., 1986). It is found in tussock grasslands, Triodia hummock grassland, grassy woodland and low shrublands (Garnett & Crowley, 2000). MBS Environmental (2008) have stated that the Australian Bustard was recorded during the baseline ground survey of the Woodie Woodie project area. Based on this, it is possible that the Australian Bustard may frequent the application area. However, it is unlikely that this species would be reliant on the application area for habitat, as the habitat types within the application area are well represented in the local area (Western Wildlife, 2008). The vegetation within the application area is therefore unlikely to represent significant habitat for this species.

The application area is approximately 17.5 hectares in size, with a significant proportion of this area disturbed from previous mining, including drill pads, roads, waste rock stockpile and an open pit (MBS Environmental, 2008). Western Wildlife (2008) have stated that there are limited patches of native vegetation remaining within the application area, however, the vegetation present is likely to comprise the following habitats:

- Acacia dominated drainage lines;
- Triodia hummock grasslands dominated plains; and
- Tall shrubland of Acacia.

Western Wildlife (2008) have stated that the condition of most habitats within the application area is 'poor' to

'degraded'. Based on this, and the fact that these habitats are well represented locally and regionally (Western Wildlife, 2008), it is unlikely that the application area constitutes significant habitat for any conservation significant species.

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

Methodology Caughley et al., (1986).
DEWHA (2008).
DEWR (2008).
Garnett & Crowley (2000).
Johnstone & Storr (1998).
Knight & Pizzey (1997).
MBS Environmental (2008).
Start et al., (2000).
Western Wildlife (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

According to available databases, no known DRF or Priority flora species are found within the application area (GIS Database).

Mattiske Consulting (2007) conducted a flora and vegetation survey of the entire Eat tenement (M45/431), which included the application area in May 2007. This involved:

- a desktop review of the Eat tenement project area and the flora species and vegetation associations it may support; and
- a field survey of the Eat tenement project area to verify the findings of the desktop review.

As a result of the flora and vegetation survey, no DRF or Priority flora species were recorded within the application area, however, there were two Priority flora species recorded in the broader Eat tenement area, including: *Goodenia* sp. *East Pilbara* (AA Mitchell PRP 727) (Priority 1) and *Tephrosia* sp. *Cathedral Gorge* (F.H. Mollmans 2420) (Priority 3). Both of these species were recorded at a survey site approximately 365 metres from the border of the application area (Mattiske Consulting, 2007). Given the close proximity of these species, it is possible that the application area may provide suitable habitat for these Priority flora species.

However, it should be noted that parts of the application area are in a 'degraded' condition from previous mining, including an open pit, waste rock stockpile, drill pads and haul roads (MBS Environmental, 2008). Additionally it should be noted that the vegetation of the application area is well represented on a local and regional scale (Mattiske Consulting, 2007). Given the above, it is unlikely that application area is significant habitat for the Priority flora species identified during the flora and vegetation survey.

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 - CALM 01/07/05

(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 (TECs) within the application area (GIS Database). There are no known TECs found within the Chichester IBRA Subregion (Kendrick & McKenzie, 2001). The flora and vegetation survey of the application area did not identify any significant ecological communities within the area proposed to be cleared (Mattiske Consulting, 2007).

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

Methodology Kendrick & McKenzie (2001).
Mattiske Consulting (2007).
GIS Database:
- Threatened Ecological Communities - CALM

(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 is located within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (Shepherd et al., 2001). According to Shepherd et al., (2001) there is approximately 99.9% of pre-European vegetation remaining within this bioregion (see table).

The vegetation of the application area is classified as Beard vegetation association 173 - Hummock grasslands, shrub steppe; kanji over soft spinifex & *Triodia wiseana* on basalt (GIS Database). There is approximately 100% of Beard vegetation association 173 remaining at both the state and Bioregional level (Shepherd et al., 2001). The area proposed to clear does not represent a significant remnant of vegetation in 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	17,804,163	17,794,650	~ 99.9	Least Concern	6.3 (6.3)
Beard veg assoc. – State					
173	1,753,116	1,753,116	~ 100	Least Concern	7.5 (7.5)
Beard veg assoc. – Bioregion					
173	1,752,533	1,752,533	~ 100	Least Concern	7.5 (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 Department of Natural Resources and Environment (2002).
Shepherd (2001) updated 2005.
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- Pre-European Vegetation

(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

There are two minor non-perennial watercourses located in the application area (GIS Database). One of the watercourses is located in the very north of the application area, while the other begins in the southern section of the application area and flows downstream into Brumby Creek, and then into Warri Warri Creek, which eventually drains into the Oakover River (GIS Database).

Mattiske Consulting (2007) conducted a flora and vegetation survey of the application area during May 2007. The following vegetation association was found in the north of the application area and was identified as being associated with a watercourse.

Vegetation Association 3: Scrub or Thicket of *Carissa lanceolata*, *Petalostylis labicheoides*, *Acacia trachycarpa*, *Acacia ancistrocarpa* over *Triodia pungens*, *Triodia basedowii*, **Cenchrus ciliaris* and *Chrysopogon fallax* along minor watercourses.

It is estimated approximately 0.3 hectares of vegetation association 3 will be cleared during the project for the pit, abandonment bund and settling pond (Pilbara Manganese, 2008). According to Mattiske Consulting (2007) the vegetation along this watercourse was 'undisturbed'.

There is one vegetation association found along the watercourse located in the south of the application area:

Vegetation association 7: Hummock Grassland of *Triodia longiceps* and *Triodia wiseana* with occasional *Grevillea wickhamii* subsp. *hispidula* on flats and lower slopes.

It is estimated approximately 450 metres of this drainage line or 0.5 hectares of vegetation will be cleared for the waste rock stockpile (Pilbara Manganese, 2008). During the flora and vegetation survey it was noted that

the vegetation within this area was 'undisturbed' (Mattiske Consulting, 2007).

It is the proponent's responsibility to liaise with the Department of Water to determine whether Bed and Banks Permit is required for the proposed works.

Based on the information above, the proposed clearing is at variance to this Principle.

Methodology Mattiske Consulting (2007).
Pilbara Manganese (2008).
GIS Database:
- Hydrography, linear (medium scale, 250k GA)
- Geodata, Lakes

(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 geomorphology of the Austin Project area includes rounded hills on an undulating plain with weakly incised drainage systems that form part of the De Grey River catchment (MBS Environmental, 2008).

The majority of land within the central and northern sections of the application area is already disturbed from previous mining, including an open pit, waste rock stockpile, drill pads and haul road (GIS Database).

The application area is located within the Coongimah land system which is described as plateau surfaces, low hills with steep slopes and undulating uplands supporting hard spinifex grasslands (GIS Database). The landforms of the Coongimah land system that are proposed to be cleared include the plateaux and hill crests, and drainage lines. The Coongimah land system has shallow loams and clay soils that sometimes have stony mantles and supports spinifex grassland with isolated Acacia shrubs (Van Vreeswyk et al., 2004). The Coongimah land system is not particularly prone to land degradation as it has a very low erosion risk (Van Vreeswyk et al., 2004).

Aerial photos of the application area, submitted by MBS Environmental (2008) showed that there is a protective stony mantle present, and no evidence of soil erosion in disturbed areas.

The drainage lines of the application area are likely to be more susceptible to soil erosion if disturbed (Van Vreeswyk et al., 2004). It is therefore possible that the clearing within the southern drainage line for the waste dump, and the northern drainage line for the pit and settling pond, may initiate some soil erosion.

In regards to this, Pilbara Manganese (2008) have stated that the project has been scheduled so that progressive clearing will occur. This means areas will only be cleared when infrastructure is ready to be implemented (such as the waste rock stockpile), and therefore these areas will not be left open to erosional forces for long periods of time. Additionally, it should be noted that progressive rehabilitation during the life of the project will occur, which will reduce the areas that are open to erosional forces at any given time (Pilbara Manganese, 2008).

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

Methodology MBS Environmental (2008).
Pilbara Manganese (2008).
Van Vreeswyk et al., (2004).
GIS Databases:
- Hydrography, linear (medium scale, 250k GA)
- Rangeland Land System Mapping
- Topographic Contours, Statewide

(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 closest conservation area to the application area is Rudall River National Park, which is situated approximately 90 kilometres to the south-east of the area applied to clear (GIS Database). Based on the large distance between these two areas, it is unlikely there would be any detrimental effects to the environmental values of the Rudall River National Park from the proposed clearing.

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

Methodology GIS Database:
- CALM Managed Lands and Waters - CALM 1/07/05

(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 may be at variance to this Principle

The area proposed to clear is not located within a Public Drinking Water Supply Area (GIS Database).

The groundwater and surface water of the Woodie Woodie region is well documented, with over ten years of monitoring data from bores, discharge water and upstream and downstream surface water flow in creeks and rivers (MBS Environmental, 2008). The pH of the groundwater ranges between 7.2 and 8.5 and is generally fresh to brackish, around 190 to 1,250 milligrams per litre Total Dissolved Solids. The natural water table is more than 20 metres below ground level (MBS Environmental, 2008).

Groundwater recharge in the application area is by rainwater infiltration through the overlying unsaturated rocks and sediments (MBS Environmental, 2008). Recharge has been estimated using a combination of methods to be about 15% of annual rainfall. The quality of groundwater (fresh to brackish) is indicative of the basin receiving rapid recharge from infiltrating rainwater (MBS Environmental, 2008).

Based on the depth of groundwater (20 metres) and the sparse vegetation present, it is unlikely that the groundwater levels of the application area will be greatly affected from the proposed clearing (MBS Environmental, 2008).

The geomorphology of the application area includes rounded hills on an undulating plain with weakly incised drainage systems (located in the north and south of the application area) that form part of the De Grey River catchment (MBS Environmental, 2008). Flow in the creeks is ephemeral and there are no nearby permanent pools or water holes. It is possible that clearing within the drainage lines in the north and the south of the application area, may initiate sedimentation in downstream areas. However, MBS Environmental (2008) have stated that the following measures will be implemented to ensure surface water quality within the application area is not reduced:

- Monitoring of water quality parameters in line with existing Environmental Licence requirements;
- Constructing diversion bunds where necessary to ensure clean surface runoff is directed away from pits.
- Clean water will be kept separate from potentially contaminated areas and be directed into natural flow areas;
- Directing runoff from potentially contaminated areas to specific collection ponds where contaminants will be removed. Water will be re-used where practicable;
- The open pit will be designed to capture and retain all incident rainfall;
- The waste rock stockpile top surface will be constructed to retain runoff; and
- The waste rock stockpile area will be surrounded by a one metre toe bund to reduce transport of sediments from the stockpile area.

Additionally, it should be noted that during the project a settling pond will be constructed near the pit to treat dewatering discharge (MBS Environmental, 2008). This pond will also be effective in treating runoff from the western half of the application area. The pond system will be designed to provide time for any solids to settle so that only clean water is discharged into the creek system in the north of the application area. Therefore impacts to surface water as a result of the project are likely to be minimal.

Based on the above, the proposed clearing may be at variance to this Principle, however, the implementation of the management measures stated above will reduce impacts to surface and groundwater from the proposed clearing.

Methodology MBS Environmental (2008).
GIS Database:
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

(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

In a typical year, average rainfall throughout the application area is low, variable and often falls within a small time frame. Average annual rainfall ranges from 250 - 450 millimetres, and years without significant rainfall can occur (Bureau of Meteorology, 2008). The majority of rainfall comes in summer as a result of scattered thunderstorms and the occasional tropical cyclone. A secondary rainfall period occurs in May as a result of rainfall from tropical cloud bands (Bureau of Meteorology, 2008). Flooding is possible during rainfall periods as a result of cyclonic activities where large amounts of water fall within a short time frame.

The application area experiences high evaporation rates of approximately 3,000 millimetres annually (GIS Database). This is more than 7 times the annual rainfall recorded on average. Although the potential of flooding within the application area exists during extreme rainfall events, there is little likelihood that the potential for

flooding will be increased as a result of the proposed clearing.

Additionally, it should be noted that the application area is very small (17.5 hectares) in comparison to the size of the Oakover River catchment, which is approximately 20017 square kilometres. As a result, the cleared area is unlikely to significantly increase the amount of surface water flow in this catchment.

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

Methodology Bureau of Meteorology (2008).
MBS Environmental (2008a).
GIS Databases:
- Hydrography, linear (medium scale, 250k GA)

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

Comments

The clearing permit application was advertised on the 21 April 2008, inviting submissions from the public. One public submission was received on the 28 May 2008, raising concerns regarding the potential impacts of the proposed vegetation clearing on flora and fauna, sites of aboriginal significance and cultural heritage issues. The concerns of the direct interest party have since been addressed in this assessment.

There is one native title claim in the area under application (WC99_008) (GIS Database, 2007). 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*.

There is one known registered Site of Aboriginal Significance located 0.7 kilometres to the north of the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal 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 Databases:
- Aboriginal Sites of Significance - DIA
- Native Title Claims - DLI

4. Assessor's comments

Comment

The Clearing Principles have been addressed and the proposed clearing is at variance to Principle (f), may be at variance to Principle (i), is not likely to be at variance to Principles (a), (b), (c), (d), (g),(h) and (j), and is not at variance to Principle (e).

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

5. References

- Bureau of Meteorology (2008) Climate of Port Hedland. URL: http://www.bom.gov.au/weather/wa/port_hedland/climate.shtml
- Caughley G, Grice D, and Short J (1986) Density and Distribution of the Australian Bustard *Ardeotis australis*. *Biological Conservation* 35: 259-267.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- DEWHA (2008) Recovery Outlines and Taxon Summaries - Pilbara Leaf-nosed Bat. URL: <http://www.environment.gov.au/biodiversity/threatened/publications/action/bats/14.html>
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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.