Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4870/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Process Minerals International Pty Ltd

1.3. Property details

Property: Mining Lease 45/1189
Local Government Authority: Town of Port Hedland
Colloquial name: Stage 2 Poondano Central Operation

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
35		Mechanical Removal	Mineral Production and Associated Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 12 April 2011

2. Background

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard vegetation associations have been mapped for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (Shepherd, 2009; GIS Database): 93: Hummock grasslands, shrub steppe, kanji over soft spinifex; and 619: Abydos Plain, medium woodland; river gum (*Eucalyptus camaldulensis*). Astron Environmental Services (2009) undertook a flora and vegetation survey between late March 2008 and mid May 2008 over the Poondano Project area. The following 22 vegetation communities were recorded (Astron Environmental Services, 2009): <u>Mesas and Outcrops</u> **AiTe** - Scattered *Acacia inaequilatera* and *Acacia bivenosa* over *Triodia epactia* hummock grassland; **AoAaS** - *Acacia orthocarpa* and *Acacia ancistrocarpa* Shrubland (with scattered *Corymbia hamersleyana* and *Acacia bivenosa*) over low open shrubland of *Acacia stellaticeps* over *Triodia epactia* hummock grassland; **AoCh** - *Acacia orthocarpa open shrubland with scattered Corymbia hamersleyana over Triodia epactia hummock grassland*; **GwAb** - *Grevillea wickhamii, Acacia bivenosa and Acacia ancistrocarpa, (Acacia inaequilatera) open shrubland over low scattered Acacia stellaticeps over Triodia*	Process Minerals International Pty Ltd has applied to clear up to 35 hectares within an application area of approximately 330 hectares for the Poondano Iron Ore Project (Poondano Central). The proposed programme will comprise of conventional drill and blast methods of open cut mining to remove ore from the top three to eight metres of nine mesas. The Poondano Central operation will involve the mining of mesa tops, development of mine roads and interim stockpiling areas at Poondano Central and a haul road to link Poondano Central to Poondano Southwest.	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994); To Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).	The clearing application area is situated approximately 30 kilometres southeast of Port Hedland (GIS Database). The application involves the development of a satellite mining operation at Poondano Central. The vegetation condition and descriptions were derived from a survey conducted by Astron Environmental Services (2009). This project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' and required assessment under Section 95A of the EPBC Act with the level of assessment being set at Preliminary

epactia hummock grassland;

Sandy or Stony Plains

AHOS - High open shrubland of *Acacia bivenosa/ Acacia ancistrocarpa/ Acacia inaequilatera* over *Triodia epactia* hummock grassland;

AiAaTe - *Acacia inaequilatera, Acacia ancistrocarpa* (and other mixed *Acacia* spp.) high open shrubland over *Triodia epactia* hummock grassland;

CAtAs - Scattered *Corymbia flavescens* over scattered *Acacia tumida* over low open shrubland of *Acacia stellaticeps* over *Triodia epactia* hummock grassland;

ChAsTg - Scattered *Corymbia hamerslyana* over *Acacia stellaticeps* low open shrubland over *Triodia epactia* (*Triodia lanigera*) hummock grassland;

ChcAb - Scattered *Corymbia flavescens* over scattered *Hakea chordophylla* and *Acacia bivenosa* over *Acacia stellaticeps* over *Triodia epactia* hummock grassland;

CHSA - Scattered *Corymbia hamersleyana* over scattered *Acacia ancistrocarpa, Acacia bivenosa* and *Acacia inaequilatera* over scattered *Acacia stellaticeps* over *Triodia epactia* hummock grassland;

SATec - Scattered *Corymbia hamersleyana* over scattered *Acacia ancistrocarpa/ Acacia inaequilatera/ Acacia bivenosa/Acacia tumida* over scattered *Acacia orthocarpa* and *Acacia stellaticeps* over *Triodia epactia* hummock grassland;

TeGSA - Scattered *Acacia inaequilatera / Acacia orthocarpa / Acacia ancistrocarpa* over scattered to low open shrubland of *Acacia stellaticeps* over *Triodia epactia* hummock grassland;

TeTs - *Triodia epactia* and *Triodia lanigera* closed hummock grassland (with scattered *Acacia bivenosa* and *Acacia ancistrocarpa*);

Drainage Associations

AaT - *Acacia ampliceps* high shrubland over *Triodia secunda* hummock grassland;

CAtr - *Scattered Corymbia flavescens* over scattered *Acacia trachycarpa* over scattered to low open shrubland of *Waltheria indica* and *Corchorus incanus ssp. Incanus* over *Cenchrus ciliaris* and *Cenchrus setiger* tussock grassland;

ChAa - Scattered *Corymbia hamersleyana* over scattered to open shrubland of *Acacia ancistrocarpa* over *Triodia epactia* hummock grassland;

EvAa - Scattered to low open woodland of *Eucalyptus victrix* over open shrubland of *Acacia ampliceps* over scattered to low shrubland of *Acacia stellaticeps* over *Triodia epactia* hummock grassland;

EvAt - Scattered to low open woodland of *Eucalyptus victrix* and *Corymbia candida ssp. latifolia* over *Acacia tumida* and *Acacia colei* high open shrubland over *Triodia epactia* hummock grassland;

Documentation. Final approval for the project was given on 16 August 2011 and was subject to 13 conditions.

ChAt - Scattered *Corymbia hamersleyana* over scattered to open shrubland of *Acacia ancistrocarpa* over *Triodia epactia* hummock grassland;

MCW - Low woodland of *Corymbia hamersleyana, Eucalyptus victrix* and *Corymbia flavescens* over *Triodia epactia* and *Cenchrus ciliaris* grassland; and

SMg - Scattered to low open woodland of *Melaleuca glomerata* over scattered to open shrubland of *Crotalaria cunninghamii* over *Cenchrus ciliaris* tussock grassland and mixed sedgeland.

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 at variance to this Principle

The application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion is characterised by alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by Triodia hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, Sporobolus and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite (CALM, 2002).

The vegetation within the application area consists of Beard vegetation associations 93 and 619 which are considered common and widespread through the Pilbara region, with approximately 100% of the pre-European vegetation remaining (GIS Database; Shepherd, 2009).

For the purposes of this assessment, the 'Poondano Project' comprises of areas known as 'Poondano East', 'Poondano Central', 'Poondano Southwest' and 'Poondano West' (Process Minerals International Pty Ltd, 2012). The clearing application area is for mining of mesa tops, development of mine roads and interim stockpiling areas at Poondano Central and a haul road to link Poondano Central to Poondano Southwest. Processing of ore is currently undertaken at 'Poondano Southwest' (Process Minerals International Pty Ltd, 2012).

A Level 2 flora and vegetation survey was undertaken between late March and mid May 2008 (Astron Environmental Services, 2009). The field survey was conducted over project areas: Poondano Central; Poondano East; Poondano West; most of Poondano Southwest and three potential haul road areas linking the overall project to the Great Eastern Highway (Astron Environmental Services, 2009). The survey area was conducted over a total of 3728 hectares and identified forty one vegetation communities of which 22 are contained within the application area (Process Minerals International Pty Ltd, 2012). The condition of these vegetation communities was 'good' to 'excellent' (Astron Environmental Services, 2009).

The Level 2 survey identified 263 vascular taxa from 45 families, the dominant genus being Acacia with 18 taxa recorded (Astron Environmental Services, 2009). Astron Environmental Services (2009) note that seasonal summer rains were considered poor in 2007/2008, therefore species richness is likely to have been reduced, with some annual/ephemeral species likely to have been under-represented. The application area has been subject to disturbance by fire over the past five years (Astron Environmental Services, 2009).

No rare flora or priority flora species were recorded within the application area (Process Minerals International Pty Ltd, 2012). One Priority 3 species, *Gymnanthera cunninghamii* was identified outside of the application area and is known from several populations (Astron Environmental Services, 2009). The proposed clearing is unlikely to impact upon the conservation status of this species (Process Minerals International Pty Ltd, 2012).

Seven introduced flora species have been identified within the survey area of which none are listed as declared weeds by the Western Australian Department of Agriculture and Food (Astron Environmental Services, 2009). Care must be taken to ensure that the proposed clearing activities do not spread or introduce any weed species to non infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Astron Environmental Services (2009) have identified a number of vegetation communities associated with landforms that are considered to be unique or poorly represented in the region. These being granite outcrops, broad creeks and associated floodplains and mesas (Astron Environmental Services, 2009). However, no threatened or priority ecological communities were identified within the application area (Astron Environmental Services, 2009).

A reconnaissance fauna survey (Poondano Project) and a subsequent targeted fauna survey (Poondano West, Central and East, and Granite Hill which is located to the north of Poondano Central) was undertaken by Outback Ecology between 15-16 September 2009, and 28 September- 2 October 2009 respectively. The

targeted fauna survey recorded 27 vertebrate species comprising ten avifauna, seven reptiles and ten mammals (Outback Ecology, 2009).

The application area has been found to support core denning and roosting habitat for three conservation significant fauna species (Outback Ecology, 2009; Outback Ecology, 2010; Rapallo, 2010 and Process Minerals International Pty Ltd, 2012). These being the Northern Quoll (*Dasyurus hallucatus* - EPBC, Endangered), Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* - EPBC, Vulnerable) and the Ghost Bat (*Macroderma gigas* - DEC Priority 4). One inactive Western Pebble-mound Mouse mound (*Pseudomys chapmani* - DEC Priority 4) has also been identified within the application area at the base of mesa 9, however, this species occurs extensively throughout the Pilbara region. Process Minerals International Pty Ltd has committed to avoid clearing at the location of the inactive Pebble-mound Mouse mound (Process Minerals International Pty Ltd, 2012).

This project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of the Northern Quoll and Pilbara Leaf-nosed Bat within the project area. The project was deemed a 'controlled action' and required assessment under Section 95A of the EPBC Act with the level of assessment being set at Preliminary Documentation. Final approval for the project was given on 16 August 2011 and was subject to 13 conditions.

This approval is subject to the implementation of a condition which requires the development and implementation of a Significant Flora and Fauna Management Plan (EMP). The EMP describes management actions to minimise the environmental impacts of the project on significant flora and fauna. A further condition of the approval requires a $160,000 per annum contribution for research over three years, which will contribute to the better protection and long term conservation of EPBC Act listed threatened fauna species in the Pilbara. The implementation of these conditions will minimise and mitigate the impact of the clearing on EPBC Act listed threatened fauna species and the landforms and vegetation communities with which these are associated.

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

Methodology

Astron Environmental Services (2009)
CALM (2002)
Outback Ecology (2009)
Outback Ecology (2010)
Process Minerals International Pty Ltd (2012)
Rapallo (2010)
Shepherd (2009)
GIS Database
- IBRA WA (Regions - Sub Regions)

(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 at variance to this Principle

A reconnaissance fauna survey (Poondano Project) and a subsequent targeted fauna survey (Poondano West, Central and East, and Granite Hill which is located to the north of Poondano Central) was undertaken by Outback Ecology between 15-16 September 2009, and 28 September- 2 October 2009 respectively. The targeted fauna survey recorded 27 vertebrate species comprising ten avifauna, seven reptiles and ten mammals (Outback Ecology, 2009).

Astron Environmental Services (2009) have identified a number of vegetation communities associated with landforms within the application area that are considered to be unique or poorly represented in the region. These being granite outcrops, broad creeks and associated floodplains and mesas (Astron Environmental Services, 2009). In particular the mesas of Poondana Central represent significant core habitat features for conservation significant fauna (GIS Database).

The application area has been found to support core denning and roosting habitat for three conservation significant fauna species (Outback Ecology, 2009; Outback Ecology, 2010; Rapallo, 2010 and Process Minerals International Pty Ltd, 2012). These being the Northern Quoll (*Dasyurus hallucatus* - EPBC, Endangered), Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* - EPBC, Vulnerable) and the Ghost Bat (*Macroderma gigas* - DEC Priority 4). One inactive Western Pebble-mound Mouse mound (*Pseudomys chapmani* - DEC Priority 4) has also been identified within the application area at the base of mesa 9, however, this species occurs extensively throughout the Pilbara region. Process Minerals International Pty Ltd has committed to avoid clearing at the location of the inactive Pebble-mound Mouse mound (Process Minerals International Pty Ltd, 2012).

Northern Quoll

A targeted Northern Quoll survey was undertaken by Rapallo (2010) between 10 and 19 June 2010 which covered the entire Poondano Project. Survey methods included targeted trapping (Poondano Project only), the use of motion detection cameras and searching for evidence of day forage activity (Rapallo, 2010).

The population of Northern Quolls across the application area exists as two metapopulations, one focused on Poondano Central and the other on Poondano West. The Northern Quoll population at Poondano showed a strong preference for rocky habitats, especially mesas and rocky hills. No quolls were trapped in riparian habitats and no quolls were trapped on the hummock grassland plains (Rapallo, 2010).

Pilbara Leaf-nosed Bat
One roost cave at Poondano Central (Cave 26) supports the Pilbara Leaf-nosed Bat (Outback Ecology, 2009; 2010; Process Minerals International Pty Ltd, 2012). One individual was also recorded in a cave approximately nine kilometres east of Poondano Central which may suggest that the Pilbara Leaf-nosed Bat has a large habitat range surrounding the application area. The Pilbara Leaf-nosed Bat was also associated with Petermarer Pool, within the application area, approximately 100 metres west of mesa 9 (Outback Ecology, 2010).

To ensure minimal impacts upon bat species, PMI has imposed a 50 metre exclusion zone around Cave 26 and Petermarer Pool. The exclusion zone is intended to reduce impacts associated with noise and vibration (Process Minerals International Pty Ltd, 2012).

Ghost Bat
Thirteen caves within 'Poondano Central' support a Ghost Bat (*Macroderma gigas*) population of between 30 and 40 individuals (Outback Ecology, 2010). The regional areas surrounding Poondano Central have suitable habitat to support Ghost Bat populations (Outback Ecology 2010). One regional roost cave occurs approximately 2 kilometres to the north-east of Poondano Central and appears to support at least 20 Ghost Bats (Outback Ecology, 2009).

Other Conservation Significant Fauna
A reconnaissance survey and subsequent targeted fauna survey identified several other conservation significant fauna which have the potential to occur in the survey area, however, the majority are unlikely to occur within the application area due to lack of suitable habitat (Outback Ecology, 2009). Several conservation significant species are also highly mobile and transitory and therefore unlikely to rely solely on habitat within the application area (Outback Ecology, 2009).

The Petermarer Creek which passes through the application area may provide habitat for the Pilbara Olive Python (*Liasis olivaceus barroni* - Vulnerable, Schedule 1), Bush Stone-curlew (*Burhinus grallarius* - DEC Priority 4), Star Finch (western race) (*Neochmia ruficauda* - DEC Priority 4) and the Rainbow Bee-eater (*Merops ornatus* - EPBC Migratory). However, there are no proposed mining activities for Petermarer Creek apart from a haul road crossing and the proposed clearing is considered unlikely to have any impact on the conservation status of these species (Process Minerals International Pty Ltd, 2012).

This project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of the Northern Quoll and Pilbara Leaf-nosed Bat within the project area. The project was deemed a 'controlled action' and required assessment under Section 95A of the EPBC Act with the level of assessment being set at Preliminary Documentation. Final approval for the project was given on 16 August 2011 and was subject to 13 conditions.

The above approval is subject to the implementation of a condition which requires the development and implementation of a Significant Flora and Fauna Management Plan (EMP). The EMP describes management actions to minimise the environmental impacts of the project on fauna within the application area. The EMP contains the following management action categories:

- Education;
- Locating non-essential works away from key habitat;
- Mine planning to retain integrity of key habitat;
- Clearing Control;
- Drill and Blast Control;
- Load and Haul Control;
- Progressive mining, backfilling and rehabilitation;
- Feral Animal Control;
- Sick and Injured Wildlife Procedures;
- Conservation Significant Species Register;
- Operational Monitoring;
- Fauna Monitoring and Research; and
- Reporting.

Specifically with regard to key habitat features, the potential for adverse impacts on caves within the granitic rock formation underlying the mineralised target zone will be minimised by the proposed mining methodology (Process Minerals International Pty Ltd, 2011). The iron bearing mineralisation zone of the Poondano Central mesas is confined to the upper layer comprising approximately 10% of the outcropping formation. The majority of cave formations providing potential denning habitat for the Northern Quoll and roosting habitat for the Pilbara Leaf-nosed Bat occur within the granitic formation underlying the iron mineralisation zone (Process Minerals International Pty Ltd, 2011). Typically, the potential habitat caves are located between 12 to 21 metres below the crest of the Poondano Central mesas and the mining operation will not extend into the cave bearing formation. Accordingly, the majority of the underlying caves will remain post mining (Process Minerals

International Pty Ltd, 2011).

A further condition of the approval requires a $160,000 per annum contribution for research over three years, which will contribute to the better protection and long term conservation of EPBC Act listed threatened fauna species in the Pilbara. The implementation of these conditions will minimise and mitigate the impact of the clearing on conservation significant fauna species and the landforms and vegetation communities with which these are associated.

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

Methodology
Astron Environmental Services (2009)
Outback Ecology (2009)
Outback Ecology (2010)
Process Minerals International Pty Ltd (2011)
Process Minerals International Pty Ltd (2012)
Rapallo (2010)
GIS Database
- Port Hedland 50cm Orthomosaic Landgate 2004

(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, there is no recorded threatened flora within the application area (GIS Database). Astron Environmental Services (2009) conducted a flora survey over the application area between late March and mid May 2008 during which no threatened flora species were recorded within the application area.

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

Methodology
Astron Environmental Services (2009)
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

According to available databases, there are no known Threatened Ecological Communities (TEC's) within the application area (GIS Database). No vegetation communities described as a TEC were recorded during the botanical survey of the application area (Astron Environmental Services, 2009; Process Minerals International Pty Ltd, 2012). The nearest known TEC is located approximately 201 kilometres south-west of the application area (GIS Database).

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

Methodology
Astron Environmental Services (2009)
Process Minerals International Pty Ltd (2012)
GIS Database
- Threatened Ecological Sites Buffered

(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 for Australia (IBRA) bioregion (GIS Database). Shepherd (2009) reports that approximately 99.89% of the pre-European vegetation remains in this bioregion.

The vegetation of the application area has been mapped as Beard vegetation associations 93: Hummock grasslands, shrub steppe, kanji over soft spinifex and 619: Abydos Plain, medium woodland; river gum (*Eucalyptus camaldulensis*) (Shepherd 2009; GIS Database).

According to Shepherd (2009) approximately 100% of these Beard vegetation associations remain at the state and bioregional level (see table) (Shepherd 2009; GIS Database). These vegetation associations are considered common and widespread through the Pilbara region. Therefore, the area proposed to be cleared does not represent 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
IBRA Bioregion – Pilbara	17,804,193	17,785,000	~99.89	Least Concern	6.32
Beard veg assoc. – State					
93	3,044,308	3,044,249	~100	Least Concern	0.42
619	119,158	119,088	~99.94	Least Concern	0.20
Beard veg assoc. – Bioregion					
93	3,042,113	3,042,063	~100	Least Concern	0.42
619	118,705	118,705	~100	Least Concern	0.20

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database
- IBRA WA (Regions - Sub Regions)
- 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

Astron Environmental Services (2009) have identified eight vegetation types which are associated with drainage lines within the application area. The vegetation in these drainage lines is considered to be locally significant and generally in good condition (Astron Environmental Services, 2009).

Petermarer Creek is a locally significant watercourse which passes directly through the application area immediately west of mesa 9 at Poondano Central (GIS Database; Process Minerals International Pty Ltd, 2012). Species richness is generally quite high within vegetation communities associated with drainage lines which provide habitat for a number of fauna species (Astron Environmental Services, 2009). However, these vegetation types only represent a small portion of the application area (Process Minerals International Pty Ltd, 2012). There are no proposed mining activities for Petermarer Creek apart from a haul road crossing (Process Minerals International Pty Ltd, 2012) and it is therefore unlikely that the proposed clearing will have any significant impacts on watercourses and wetlands. Potential impacts to riparian vegetation may be minimised through the implementation of a vegetation management condition.

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

Methodology Astron Environmental Services (2009)
Process Minerals International Pty Ltd (2012)
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 application area comprises of the Robe, Uaroo, Macroy and River land systems (Process Minerals International Pty Ltd, 2012; GIS Database). These land systems are generally not prone to erosion (Van Vreeswyk et.al, 2004) although some erosion may occur within the drainage tracts of the Uaroo Land System and the River Land System is susceptible to erosion once vegetative cover is removed (Van Vreeswyk et.al, 2004). The majority of proposed clearing is located outside of drainage areas and the River Land System is only to be impacted at the site of a haul road crossing. Infrastructure associated with the construction of the road at this location will minimise any long term erosion risks associated with the removal of vegetation from drainage lines.

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

Methodology Astron Environmental Services (2009)
Process Minerals International Pty Ltd (2012)
Van Vreeswyk et.al (2004)

GIS Database
- Rangeland Land 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 situated within a conservation area (GIS Database). The nearest conservation area is the Northern Island Turtle Reserve which is located approximately 65 kilometres north-east of the application area (GIS Database) and 43 kilometres from the coastline of Port Hedland. Given the distance between the application area and the nearest conservation area, the proposed clearing is not likely to impact on the conservation values of the Northern Island Turtle Reserve.

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

Methodology

GIS Database
- DEC Tenure

(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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Turner River Water Reserve which is located approximately 20 kilometres west of the application area (GIS Database).

Groundwater within the application area is 'brackish' with average salinity ranging from 1000-3000 milligrams per Litre Total Dissolved Solids (GIS Database). Groundwater has been encountered in the western extension of Poondano Southwest, outside of the application area, on average at a vertical depth of between 11 and 13 metres. At Poondano Central, the narrow mesas stand at least 30 to 40 metres above the surrounding plain and there is unlikely to be any impact from the clearing on groundwater in the mining area (Process Minerals International Pty Ltd, 2012).

Average annual rainfall is low at 313 millimetres (Astron Environmental Services, 2009), therefore surface water flow is likely to be low during normal seasonal rains. Furthermore, as the application area experiences an average annual evaporation rate of 3400 millimetres (GIS Database), during normal rainfall events, surface water within the application area is likely to evaporate quickly.

Petermarer Creek is a locally significant watercourse which passes directly through the application area immediately west of mesa 9 at Poondano Central (GIS Database; Process Minerals International Pty Ltd, 2012). There are no proposed mining activities for Petermarer Creek apart from a haul road crossing (Process Minerals International Pty Ltd, 2012). Potential long term erosion risks and surface water quality impacts associated with the construction of the road at this location may be minimised through the implementation of a a vegetation management condition.

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

Methodology

Astron Environmental Services (2009)
Process Minerals International Pty Ltd (2012)
GIS Database
- Evaporation Isopleths
- Groundwater Salinity
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSA's)

(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 project area occurs within the arid climatic zone, with predominantly hot and persistent dry conditions (Astron Environmental Services, 2009).

The average annual rainfall is low at 313 millimetres in Port Hedland of which approximately 65% falls during the summer months of January, February and March (Astron Environmental Services, 2009). Much of this precipitation comes from local thunderstorms and cyclonic activity (Van Vreeswyk, et.al. 2004). Based on an average annual evaporation rate of 3400 millimetres (GIS Database), any surface water resulting from normal rainfall events is likely to be relatively short lived.

The application area is within the Port Hedland Coast catchment area which covers approximately 7,443,017 hectares (GIS Database). Given the size of the area to be cleared (35 hectares) in relation to the size of the

catchment area, the proposed clearing is not likely to increase the incidence or intensity of flooding.

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

Methodology Astron Environmental Services (2009)
Van Vreeswyk et.al (2004)
GIS Database
- Evaporation Isopleths
- Hydrographic Catchments - catchments
- Hydrography, linear

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

Comments

There are no native title claims over the application area (GIS Database). However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (ie. 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 are no registered Aboriginal Sites of Significance 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 proponents' 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.

The clearing permit application was advertised on 27 February 2012 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application.

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

4. References

Astron Environmental Services (2009) Poondano Flora and Vegetation Survey March - May 2008, Prepared for Polaris Metals Ltd. Unpublished report for Polaris Metals Ltd. Astron Environmental Services, August 2009.

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5. 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.