Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4030/1
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 Area: Town of Port Hedland
Colloquial name: Stage 1 Poondano Southwest Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 3 March 2011

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
Beard Vegetation Associations have been mapped at a 250,000 scale for the whole of Western Australia. One Beard Vegetation Association has been mapped within the application area (Shepherd 2009; GIS Database): 93: Hummock grasslands, shrub steppe, kanji over soft spinifex. Astron Environmental Services (2009) undertook a flora and vegetation survey between late March 2008 and mid May 2008 over the Poondano Project area which included the Stage 1 Poondano Southwest Project The following seven vegetation communities were recorded within the 'Stage 1 Poondana Southwest Project' application area (Astron Environmental Services, 2009): Sand or Stony Plains **AiAaTe** - *Acacia inaequilatera*, *Acacia ancistrocarpa* (and other mixed *Acacia spp.*) high open shrubland 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;	Process Minerals International Pty Ltd has applied to clear up to 103.6 hectares within an application area of approximately 445 hectares for the purpose of mining development of the Stage 1 Poondano Southwest Project. The proposed programme will comprise of a processing plant, workshop, stockpiles, landfill and roads (Process Minerals International Pty Ltd, 2010a). Clearing will be undertaken by mechanical means.	Pristine: No obvious signs of disturbance (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 vegetation descriptions were derived from descriptions by Astron Environmental Services (2009). The vegetation condition was described using a scale based on Trudgen (1988) and has been converted to the corresponding condition from the Keighery (1994) scale. A total of seven weed species were identified during the flora survey: *Aerva javanica* (Kapok); *Cenchrus ciliaris* (Buffel Grass); *Cenchrus setiger* (Birdwood Grass); *Digitaria ciliaris* (Summer Grass); *Indigofera oblongifolia* (no common name); *Passiflora foetida* (Stinking Passionflower) and; *Stylosanthes hamata* (Verano Stylo). None of these species identified within the flora survey are listed as declared weeds by the Western Australian Department of Agriculture and Food (WA) (Astron Environmental

Services, 2009).

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

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

CcAa - Scattered *Corymbia candida* over scattered to open shrubland of *Acacia ancistrocarpa*, *Acacia inaequilatera* and *Acacia bivenosa* over *Triodia epactia* and *Triodia lanigera* hummock grassland.

Drainage Associations

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.

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 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, Sporobolusand mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite (Kendrick and Stanley, 2001).

The vegetation within the application area consists of Beard vegetation association 93 and is described as: Hummock grasslands, shrub steppe, kanji over soft spinifex. This is considered common and widespread through the Pilbara region, with approximately 100% of the pre-European vegetation remaining (GIS Database).

For the purposes of this assessment, the 'Poondano Project' in it's entirety comprises of areas known as 'Poondano East', 'Poondano Central', 'Poondano Southwest' and 'Poondano West' (Process Minerals International Pty Ltd, 2010a). The clearing application area is for mining and processing ore at 'Poondano Southwest' (Process Minerals International Pty Ltd, 2010a; Rapallo, 2010c).

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. Seven are contained within the application area (Process Minerals International Pty Ltd, 2010a). The condition of these vegetation communities was classed 'good' to 'pristine' (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 Declared Rare Flora or Priority flora species were recorded within the application area (Process Minerals International Pty Ltd, 2010a). One Priority 3 species, *Gymnanthera cunninghamii* was identified outside of the application area and is known from several populations (Astron Environmental Services, 2009). As this is located within the Petermarer Creek area (approximately 5.5 kilometres east of the application area) the proposed clearing is unlikely to impact on the conservation of this species (Process Minerals International Pty Ltd, 2010a).

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 control condition.

The vegetation types described within the 'Poondano Southwest' application area are considered relatively widespread (Process Minerals International Pty Ltd, 2010a). It is not likely that the application area comprises a higher level of floral diversity than undisturbed areas within the surrounding areas.

A troglofauna survey of the Poondano Project area recorded 11 trogophilic specimens. Given that no specimens were recorded for the Poondano Southwest application area there appears to be no troglofaunal community present (Rapallo, 2010b).

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).

Areas east of the application area (Poondano Central and Poondano West) have been found to support core denning and roosting habitat for three conservation significant fauna species (Outback Ecology, 2010; Rapallo, 2010a). These being the Northern Quoll (*Dasyurus hallucatus*), Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) and the Ghost Bat (*Macroderma gigas*). While these core habitat areas are outside of the application area, the application area is likely to provide habitat for foraging and/or fly-over of these species (Process Minerals International Pty Ltd, 2010a; Rapallo, 2010a). Subsequent to the original application Process Minerals International Pty Ltd have proposed a two kilometre foraging habitat buffer zone in order to minimise the potential impacts to biological diversity within the application area. As a result the original application area of 124.6 hectares within an area of approximately 445 hectares has now been reduced to 103.6 hectares to accommodate the buffer zone (Rapallo, 2010c). The buffer zone is now outside of the application area. Advice has been provided from the Department of Environment and Conservation (DEC), Environmental Management Branch on the 4 February 2011 regarding the clearing application and the amended application area, specifically in relation to the above three conservation significant species. The DEC advice states that 'the proposal associated with this permit application does not appear to have a significant impact on biodiversity conservation values' (Department of Environment and Conservation, 2011).

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

Methodology

Astron Environmental Services (2009)
Department of Environment and Conservation (2011)
Kendrick and Stanley (2001)
Outback Ecology (2009)
Outback Ecology (2010)
Process Minerals International Pty Ltd (2010a)
Rapallo (2010a)
Rapallo (2010b)
Rapallo (2010c)
GIS Database
- IBRA Australia
- 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 not likely to be at variance to this Principle

A 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 (Process Minerals International Pty Ltd, 2010a). The application area consists of sand plains and stony sand plains with open emergent woodlands over Acacia shrublands over Triodia hummock grasslands which is considered common and widespread in the Pilbara region (Process Minerals International Limited, 2010a).

For areas that surround the application area the survey identified a number of vegetation communities associated with landforms that are considered to be unique or poorly represented in the region (Astron Environmental Services, 2009). These being granite outcrops, broad creeks and associated floodplains and mesas (Astron Environmental Services, 2009). While these significant habitat features are outside of the application area, the conservation significant fauna that have been identified as using these areas as core habitat, are likely to be utilise the Poondano Southwest application area as foraging habitat and/or fly-over (Outback Ecology, 2009; 2010; Rapallo, 2010a).

The Poondano Project area (which includes the application area) has been subject to the following fauna surveys:

- Outback Ecology (2009) - Reconnaissance and targeted fauna survey (15-16 September 2009, 28 September 2009 - 2 October 2009).
- Outback Ecology (2010) - Regional survey of conservation significant bat species (15 - 16 February 2010).
- Rapallo (2010a) - Targeted survey for the Northern Quoll (6 June - 21 July 2010).

The following fauna species of conservation significance were recorded during the above surveys: Northern Quoll (*Dasyurus hallucatus*) - listed as Endangered under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* and Schedule 1 under the *Wildlife Conservation Act 1950*; Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) - listed as Vulnerable under the *EPBC Act 1999* and Schedule 1 under the *Wildlife Conservation Act 1950*; Ghost Bat (*Macroderma gigas*) - listed as a Priority 4 species by the Department of Environment and Conservation (DEC) and the; Western Pebble-mound Mouse (*Macroderma hallucatus*) - listed as a Priority 4 species by the DEC (Outback Ecology, 2009).

Northern Quoll (*Dasyurus hallucatus*)

The Northern Quoll can utilise a wide variety of habitats such as savannah, boulder fields, rocky gorges, woodlands and riparian areas (Rapallo, 2010a). Habitat degradation (lower percentage of ground cover and lower plant diversity) has resulted in the decline of Northern Quoll populations through increased predation and reduced food availability (Van Dyke and Strahan, 2008).

A targeted Northern Quoll survey was undertaken by Rapallo (2010a) between 10 and 19 June 2010 which covered the entire Poondano Project comprising of Poondano Central, Poondano East, Poondano Southwest, Poondano West and Poondano Granite - a small granite monolith located approximately one kilometre north of Poondano Central. Survey methods included targeted trapping (Poondano Project only), the use of motion detection cameras and searching for evidence of day forage activity (Rapallo, 2010a)

Rapallo (2010a) found that two healthy populations of Northern Quoll within the Poondano Project Area have a preference for the mesas of Poondano Central and rocky hills of Poondano West. No captures were recorded in Poondano Southwest (Rapallo, 2010a) which was expected given this area is on a gently sloping plain and has no major rocky features present (Rapallo, 2010a). While Poondano Southwest lacked core denning habitat such as hollow-bearing trees, rocky hills or creek lines (Rapallo, 2010a), the area is likely to provide for foraging and/or dispersal habitat (Rapallo, 2010a).

Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*)

The Pilbara Leaf-nosed Bat inhabits deep caves with warm humid micro-climates that enable it to limit energy expenditure and water loss (Van and Strahan, 2008). Caves with such conditions to support the Pilbara Leaf-nosed Bat are uncommon in the Pilbara, this species occurs in relatively few known roosts and is considered to have a small overall population size (Van and Strahan, 2008).

One roost cave at Poondano Central supports the Pilbara Leaf-nosed Bat (Outback Ecology, 2009; 2010). 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 (Outback Ecology, 2010). While Poondano West lacks roosting cave habitat this species may utilise the Poondano Southwest application area for foraging or overfly (Process Minerals International Pty Ltd, 2010a). However, it is highly unlikely that clearing will have a significant impact on this species (Process Minerals International Pty Ltd, 2010a).

Ghost Bat (*Macroderma gigas*)

Roosts can be found in caves, deep rock crevices, and old mines (Australian Museum Online, 2009). Ghost bats' utilise several day and night roost caves within an area for feeding, resting, breeding and maternity caves (Outback Ecology, 2009). This species is known to disperse widely outside of breeding times (Department of Sustainability, Environment, Water, Population and Communities, 2011) and is likely to be dependent on relatively few maternity roost sites that contain large aggregations (Worthington Wilmer et.al, 1999, cited in: Van Dyck and Strahan, 2008).

Thirteen caves within 'Poondano Central' support a Ghost Bat population of between 30 and 40 individuals (Outback Ecology, 2010). Other regionally significant roost caves have been identified (Outback Ecology, 2010), however the closest is located approximately sixteen kilometres north-east of the application area (GIS Database). Core roosting cave habitats are not located within the application area, however it is likely the Ghost Bat would utilise the application area for foraging or overfly (Process Minerals International Ltd, 2010a).

Western Pebble-mound Mouse (*Pseudomys chapmani*)

The Western Pebble-mound Mouse (DEC - Priority 4) is relatively widespread in the extensive ranges of the central and southern Pilbara (Van Dyck and Strahan, 2008). The species occurs on gentler slopes of rocky ranges where ground is covered by stony mulch and vegetated by hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs (Van Dyck and Strahan, 2008). One active mound and two inactive mounds were identified at 'Poondano Central' and 'Poondano East' respectively (Outback Ecology, 2009). No mounds were identified within the application area. The sand plains of the 'Poondano Southwest' are not considered ideal habitat (Outback Ecology, 2009) and therefore clearing is unlikely to impact on any significant habitat for this species.

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). Conservation significant species such as the Peregrine Falcon (*Falco peregrinus*) and Long tailed Dunnart (*Sminthopsis longicaudata*) could potentially utilise the rocky habitats and mesas at Poondano Central, however, these species are unlikely to be impacted upon given the distance from the application area (Outback Ecology, 2009).

A troglofauna survey of the Poondano Project area was undertaken between 6 June and 9 June 2010, whereby eleven trogophilic specimens were recorded (Rapallo, 2010b). Given no specimens were detected within the Poondano Southwest area, there appears to be no troglofaunal community present (Rapallo, 2010b).

The fauna surveys of the Poondano Project have identified that rocky cave habitats which occur within Poondano West and Poondano Central are significant for the Northern Quoll, Ghost Bat, and Pilbara Leaf-nosed Bat (Outback Ecology, 2009, 2010; Rapallo, 2010a). These habitats are in reasonably close proximity to the proposed application area given the potential foraging and/or fly-over range for these species. PMI have amended the original application area and a two kilometre core foraging habitat buffer zone (Rapallo, 2010c) will be managed for the protection of denning, roosting and foraging habitats (Process Minerals International Ltd, 2010a). This two kilometre foraging buffer zone starts from the closest 'core denning habitat' to the application area identified within the Poondano West area known as 'Rocky Hill 4' (Rapallo, 2010c). This has resulted in a reduced application area from 124.6 hectares to 103.6 hectares within an area of approximately 445 hectares. The buffer zone is now outside of the application area.

Advice has been requested and obtained from the Department of Environment and Conservation's (DEC), Environmental Management Branch in relation to the foraging habitat buffer zone (approximately 2 kilometres) and the potential impacts that clearing native vegetation will have on the foraging and/or fly over habitat for the above conservation significant species. The advice provided by the DEC on 4 February 2011 regarding the clearing application and the amended application area, states that 'the proposal associated with this permit application does not appear to have a significant impact on biodiversity conservation values' (Department of Environment and Conservation, 2011).

The proposed clearing is unlikely to impact significantly on habitats of high significance such as granite outcrops and mesas given the minimum distance of approximately two kilometres from the application area. The sand plains and stony sand plains which cover the majority of the application area are considered common and widespread in the Pilbara region (Process Minerals International Limited, 2010a) and therefore the area to be cleared is not likely to provide significant habitat for fauna.

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

Methodology

Astron Environmental Services (2009)
Australian Museum Online (2009)
Department of Environment and Conservation (2011)
Department of Sustainability, Environment, Water, Population and Communities (2011)
Outback Ecology (2009)
Outback Ecology (2010)
Process Minerals International Pty Ltd (2010a)
Rapallo (2010a)
Rapallo (2010b)
Rapallo (2010c)
Rapallo (2010d)
Van Van Dyck and Strahan (2008)
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 Declared Rare Flora (DRF) 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 DRF 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, 2010a). 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 (2010a)
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) report 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 Association 93: Hummock grasslands, shrub steppe, kanji over soft spinifex. (Shepherd 2009; GIS Database);

According to Shepherd (2009) approximately 100% of Beard Vegetation Association 93 remains at the state level and 100% at the bioregional level (see table) (Shepherd 2009; GIS Database). This vegetation association is considered common and widespread through the Pilbara region, with approximately 100% of the pre-European vegetation remaining (GIS Database).Therefore, the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

While a small percentage of the vegetation types within the bioregion are adequately protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of vegetation associations within the bioregion is not likely to be impacted by this proposal.

	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
Beard veg assoc. – Bioregion					
93	3,042,113	3,042,063	~100	Least Concern	0.42

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**

Petermarer Creek is the closest locally significant watercourse, this passes directly through Mining Lease 45/1189 and is approximately 5.5 kilometres west of the application area (Process Minerals International Pty Ltd, 2010a). Beebingara Creek is another locally significant water course (Process Minerals International Pty Ltd, 2010a) that is located approximately 2.8 kilometres to the east of the application area. No wetlands of International significance (RAMSAR Sites) occur within a 10 kilometre radius of the application area (Process Minerals International Pty Ltd, 2010a; GIS Database).

Astron Environmental Services (2009) have identified one vegetation community associated with drainage lines within the application area, this being: 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. The vegetation in these drainage lines is considered to be locally significant and generally in excellent condition (Astron Environmental Services, 2009). This drainage line may be impacted upon by vegetation clearing. Astron Environmental Services (2009) note that species richness is generally quite high and these vegetation types within drainage areas support tall trees which provide habitat for a number of fauna species. Alteration to drainage in these areas can impact surrounding vegetation by affecting water flow patterns (Astron Environmental Services, 2009), however, this vegetation type is very small in relation to the application area (Process Minerals International Pty Ltd, 2010a). This vegetation does not contain any Declared Rare Flora or Priority flora (Process Minerals International Pty Ltd, 2010a) nor is this area in close proximity to significant watercourses or wetlands.

Exploration drilling has been undertaken at the Poondano Southwest area with no groundwater encountered (Process Minerals International Pty Ltd, 2010a), however, groundwater was encountered during drilling operations south of the application area at an approximate depth of 60 metres (Process Minerals International Pty Ltd, 2010b). Given the depth to groundwater, there are no wetlands within the survey area that are dependent on groundwater, or groundwater dependent vegetation (Process Minerals International Pty Ltd, 2010a).

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

Methodology Astron Environmental Services (2009)
Process Minerals International Pty Ltd (2010a)
Process Minerals International Pty Ltd (2010b)
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 and Macroy land systems (Process Minerals International Pty Ltd, 2010a; GIS Database). Of the 103.6 hectare application area, most falls within the Uaroo Land system (Process Minerals International Pty Ltd, 2010a). These land systems are generally not prone to erosion (Van Vreeswyk et.al, 2004). However, some erosion may occur within the drainage tracts within the Uaroo Land System (Van Vreeswyk et.al, 2004). Potential impacts to erosion may be minimised by perimeter bunds and diversion channels to manage surface water which are to be constructed as part of the mine infrastructure (Process Minerals International Pty Ltd, 2010a).

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). The application area has an average annual evaporation rate of 3400 millimetres (GIS Database), approximately ten times the annual average rainfall (GIS Database), therefore any surface water resulting from normal rainfall events is likely to be relatively short lived. Groundwater within the application area of is currently 'brackish' with average salinity ranging from 1000-3000 milligrams per Litre Total Dissolved Solids (GIS Database). Based on this information, recharge to groundwater would be minimal, thereby reducing the likelihood of salinity increasing as a result of the proposed clearing.

One small drainage line located in the south western end of the application area may be impacted upon by the clearing of native vegetation, however this is a small area within the clearing application area of 103.6 hectares

(Process Minerals International Pty Ltd, 2010a).

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 (2010a)
Van Vreeswyk
GIS Database
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- 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 Department of Environment and Conservation managed 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 Broome. 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 (Category)

(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 15 kilometres north 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 was not intercepted during exploration drilling at the Poondano Southwest project (Process Minerals International Pty Ltd, 2010a), although three prospective water bores drilled 2 kilometres north of the application area encountered groundwater at 60 metres (Process Minerals International Pty, 2010a). Groundwater is unlikely to be intercepted during mining as the proposed pit depth is 10 metres. Given the above information the proposed clearing is not likely to cause an alteration to existing salinity levels within the application area.

There are no water courses or drainage channels located within the application area (GIS Database. The closest locally significant waterbodies are the Petermarer Creek located approximately 5.5 kilometres west of the application area and the Beebingara Creek located approximately 2.8 kilometres to the east of the application area (Process Minerals International Pty Ltd, 2010a).

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 or be used by vegetation quickly.

Perimeter bunds are to be constructed around the Poondano Southwest pit areas to divert surface water away from the pits during storm events. Bunds will also be place upstream to divert water around the processing area and landfill (Process Minerals International Pty Ltd, 2010a).

Given there is a low average annual rainfall and there are no watercourses within the application area, the proposed clearing is not likely to cause sedimentation or deteriorate the quality of surface water in nearby areas.

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 (2010a)
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.

There are no significant watercourses or wetlands within the application area (GIS Database). The application area is subject to low relief (less than 10 metres) and most the area is relatively undisturbed and surrounded by large tracts of intact vegetation (Process Minerals International Pty Ltd, 2010a).

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 (103.6 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)
Process Minerals International Pty Ltd (2010a)
Van Vreeswyk et.al (2004)
GIS Database
- Evaporation Isopleths
- Hydrographic Catchments - catchments
- Hydrography, linear

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

Comments

The clearing permit application was advertised on 1 November 2010 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application.

There are no native title claims over the area under application (GIS Database).

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 proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. The applicant referred the 'Poondano' project on 24 November 2010 to the Department of Sustainability, Environment, Water, Population and Communities for environmental impact assessment under the *EPBC Act 1999*.

Methodology

GIS Database
- Aboriginal Sites of Significance
-Native Title Determined
-Native Title Federal
- Native Title NNTT

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water

EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.