



1. Application details

1.1. Permit application details

Permit application No.: 2461/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972
TR70/4267
TR70/4192
Local Government Area: Shire of East Pilbara
Colloquial name: Rhodes Ridge Drilling Program

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. Two Beard vegetation associations are located within the application area (GIS Database):

18: Low woodland; mulga (*Acacia aneura*) (Shepherd et al, 2001). According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 18 is a shrubland dominated by *Acacia aneura*, over *Ptilotus drummondia*, *Eremophila fraseri*, *Acacia pruinocarpa*, *Acacia sp. aff. ligulata*, *Eremophila forrestii* over *Eremophila lanceolata*, *Brachyscome sp.*, *Calocephalus francisii*, *Rhodanthe floribunda*, *Pimelea holroydii* and *Ptilotus gaudichaudii*.

29: Sparse low woodland; mulga, discontinuous in scattered groups (Shepherd et al, 2001). According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 29 is a shrubland dominated by *Acacia aneura*, over *Eremophila fraseri*, *Acacia pruinocarpa*, *Acacia sp. aff. ligulata*, *Eremophila forrestii* and *Ptilotus drummondii*, over *Eremophila lanceolata*, *Brachyscome sp.*, *Calocephalus francisii*, *Rhodanthe floribunda*, *Pimelea holroydii* and *Ptilotus gaudichaudii*.

A vegetation survey conducted over the application area and surrounding areas by Pilbara Iron staff in February 2007 identified 14 vegetation types (Hamersley Iron, 2008) of which 13 occur within the application area. These were:

A: *Acacia aneura* low open woodland to scattered low trees over *Eucalyptus gamophylla*, *Codonocarpus cotinifolius* and mixed *Acacia* tall open shrubland to scattered tall shrubs over *Acacia pachyacra* scattered shrubs over *Rhagodia sp.* Hamersley, *Ptilotus incanus*, *Gompholobium polyzygum* scattered low shrubs over *Triodia aff. basedowii* scattered hummock grass over *Themeda triandra* scattered tussock grassland *Enneapogon polyphyllus* and *E. caerulescens* scattered bunch grass.

B: *Corymbia deserticola* scattered low trees, over *Eucalyptus gamophylla*, *Acacia pruinocarpa*, *Acacia aneura* (various) scattered tall shrubs over *Acacia maitlandii*, *A. pachyacra*, *A. atkinsiana*, *Eremophila forrestii*, *Senna glutinosa ssp. glutinosa*, open shrubland over *Gompholobium karjini* scattered low shrubs over *Triodia aff. basedowii* hummock grassland over *Cymbopogon ambiguus*, *Paraneurachne muelleri* scattered tussock grassland over *Aristida contorta*, *Enneapogon polyphyllus* scattered bunch grass.

C: *Acacia aneura* (various) low woodland over mixed *Acacia* tall open shrubland over *Sida ectogama*, *Rhagodia sp.* Hamersley scattered shrubs over *Maireana sp.*, *Ptilotus incanus*, *P. obovatus* low scattered shrubs, over *Triodia aff. basedowii* scattered hummock grass, over *Enneapogon polyphyllus*, *Perotis rara* scattered bunch grass, over *Cheilanthes sieberi*, *Bidens bipinnata* very open herbs.

D: *Acacia aneura* (various) low open woodland, over mixed *Acacia*'s tall open shrubland, over *Eremophila forrestii*, *Senna glutinosa ssp. x luerssenii*, *Sida ectogama* scattered shrubs, over *Solanum lasiophyllum* low scattered shrubs, over *Triodia aff. basedowii* open hummock grassland.

E: *Acacia aneura*, *Acacia ayersiana*, *A. catenulata ssp. occidentalis* groves/intergroves scattered low trees over *Enneapogon polyphyllus*, *E. caerulescens* scattered bunch grass, over *Cymbopogon ambiguus* scattered tussock grassland.

F: *Acacia aneura* (various) *Grevillea berryana*, *Psyrax latifolia* scattered tall shrubs, *Eremophila fraseri*, *E. forrestii* scattered shrubs over *Ptilotus aervoides* scattered herbs over *Aristida contorta* scattered bunch grassland.

G: *Eucalyptus gamophylla*, *E. leucophloia* scattered low trees over *Acacia aneura* var. *aneura*, *A. pruinocarpa* scattered tall shrubs, *A. atkinsiana*, *Eremophila forrestii*, *E. fraseri*, *A. hilliana*, *Indigofera monophylla* scattered shrubs over *Triodia basedowii* and pockets of *T. pungens* hummock grassland.

H: *Eucalyptus exothermic* scattered low trees, over *Acacia aneura* (various), *A. ayersiana* low open forest, over *Sida ectogama* open shrubland, over *Maireana* sp., *Eremophila forrestii* ssp. *forrestii*, *Ptilotus obovatus* low open shrubland, over *Triodia pungens* very open hummock grassland.

I: Groves of *Acacia aneura* var. *aneura*, *A. pruinocarpa*, *A. rhodophloia* tall open shrubland, over *Psyrax latifolia*, *Eremophila forrestii* ssp. *forrestii* scattered shrubs, over *Triodia pungens*, *T. basedowii* scattered hummock grassland, over *Aristida contorta* scattered bunch grassland.

J: *Corymbia deserticola* scattered low trees, over *Eucalyptus gamophylla*, *Acacia tenuissima*, *A. pruinocarpa*, *Hakea lorea* tall shrubland, over *A. maitlandii*, *Senna glutinosa* ssp. x *luerssenii*, *Senna glutinosa* ssp. *pruinosa*, *Gompholobium karjini*, *Eremophila latrobei* scattered shrubs, over *A. adoxa*, *Indigofera monophylla*, *Keraudrenia nephrosperma* scattered low shrubs, over *Triodia* aff. *basedowii* hummock grassland.

K: *Acacia aneura* (various) low open forest, over *Eremophila forrestii*, *Psyrax latifolia*, *Rhagodia* sp. Hamersley scattered shrubs over *Ptilotus incansu* low scattered shrubs, over *Triodia* aff. *basedowii* scattered hummock grass, over *Enneapogon polyphyllus*, *Aristida contorta* scattered bunch grass over *Cheilanthes sieberi* scattered herbs.

L: *Eucalyptus leucophloia*, *Corymbia hamersleyana*, *Codonocarpus cotinifolius* scattered low trees, over *Petalostylis labicheoides*, *Acacia monticola*, *A. maitlandii* scattered tall shrubs, over *Senna glutinosa* ssp. *glutinosa*, over *Scaevola brownii* scattered low shrubs over *Triodia* aff. *basedowii* hummock grassland.

M: *Acacia pachyacra*, *A. bivenosa* scattered shrubs, over *Triodia epactia* scattered hummock grassland on calcrete soil.

Clearing Description	Hamersley Iron Pty Ltd (Hamersley Iron) have applied to clear up to 41.33 hectares of native vegetation within an application area of 741.1 hectares for the purpose of mineral exploration (evaluation drilling). This exploration program involves the clearing for drill lines, creation of drill pads and sumps. A total of 515 holes are planned. Each drill hole is located on a drill pad measuring 20 metres x 20 metres.
Vegetation Condition	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994) to Pristine: No obvious signs of disturbance (Keighery, 1994)
Comment	The condition of vegetation within the application area has been rated as good by Pilbara Iron staff (Hamersley Iron, 2008). Analysis of aerial photography suggests that the application area is in very good condition, with a few graded tracks.

3. Assessment of application against clearing principles

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

Comments	<p>Proposal may be at variance to this Principle</p> <p>The application area occurs within the Hamersley (PIL3) Interim Biogeographic Regionalisation of Australia (IBRA) sub-region (GIS Database). This sub-region is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and <i>Eucalyptus leucophloia</i> over <i>Triodia brizoides</i> on skeletal soils of the ranges (CALM, 2002). The vegetation described within the application area (Hamersley Iron, 2008) is typical of the bioregion.</p> <p>A vegetation survey of the application area and surrounding vegetation (1020 hectares) identified 197 flora species from 35 families (Hamersley Iron, 2008). This is considered to be biologically diverse. Poaceae (37), Malvaceae (15), Mimosaceae (25), Asteraceae (13) and Amaranthaceae (15) families are particularly diverse within the application area (Hamersley Iron, 2008). This is typical of the floristics of the Pilbara IBRA Region.</p> <p>An area search of the Western Australian Museum's Faunabase conducted by the assessing officer suggests that the application area is diverse in reptile species, particularly Skinks (28) and Geckos (18) (Western Australian Museum, 2008). The database search found a total of 92 reptile species from 9 families as potentially occurring within the application area, or within 50 km of the application area. 34 species of avian fauna were also recorded within the database search area, slightly lower than what could be expected from the bioregion. This may reflect a lack of survey data in this area given the range of habitat types available and the excellent condition of vegetation within the application area.</p> <p>Four alien weed species were recorded within the application area (Hamersley Iron, 2008). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. No major infestations were observed. However, <i>Urochloa</i></p>
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mosambicensis (Sabi Grass) was identified within the application area. Hamersley Iron (2008) state that this species has not previously been recorded within the Pilbara Region. It is recommended that should a permit be granted, a condition be placed on any permit granted requiring yearly inspections within the application area for this species, and if detected, it should be eradicated. A condition should also be placed on any permit granted with regards to weed hygiene.

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

Methodology CALM (2002)
Hamersley Iron (2008)
Western Australian Museum (2008)
GIS Database:
- 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

The assessing officer has conducted a search of the Western Australian Museum's online fauna database between the co-ordinates 118.94°E, 22.68°S and 119.94°E, 23.57°S, representing a 50 kilometre radius around the application areas.

This search identified 4 Amphibian, 34 Avian, 31 Mammalian and 92 Reptilian species that may occur within the application areas (Western Australian Museum, 2008). Of these, the following species of conservation significance have previously been recorded within the search area: Long-tailed Dunnart (*Sminthopsis longicaudata*), Black Flanked Rock Wallaby (*Petrogale lateralis lateralis*), Western Pebble-mound Mouse (*Pseudomys chapmani*), Pilbara Olive Python (*Liasis olivaceus barroni*) and a blind snake (*Ramphotyphlops ganei*).

Hamersley Iron (2008) conducted a desktop search of the DEC's Threatened Fauna Database and the Department of Environment and Water Resources 'Protected Matters Search Tool'. This search used similar co-ordinates to those used by the assessing officer above. In addition to those species of conservation significance listed above, this search identified the following species within the search area (Hamersley Iron, 2008): Ghost Bat (*Macroderma gigas*) and Grey Falcon (*Falco hypoleucos*).

The Long-tailed Dunnart (DEC Priority 4) occurs in rugged rocky landscapes that support low open woodland or shrubland of Acacia's (especially Mulga) with an understorey of spinifex hummocks, and occasionally perennial grasses and Cassia's from the Pilbara and upper Gascoyne region (DNREA, 2007). They have also more recently been recorded from plateaus near breakaways and screes and rugged boulder strewn screes in the Goldfields region. The habitat types found within the application area may support populations of Long-tailed Dunnart. However, it is unlikely that the vegetation to be cleared represents significant habitat for this species, given its widespread distribution.

The habitat of the Black-Flanked Rock Wallaby (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) varies in detail from colony to colony but always involves proximity to some form of cliff, rock-pile, talus or escarpment for refuge within close proximity to a source of food (DEWR, 2008a). Existing populations of this subspecies are scattered across much of western WA, with mainland populations occurring east of the Fortescue River Roadhouse, in Cape Range, Ningaloo Station, Calvert Range, Kalbarri National Park (DEWR, 2008a). There are also six populations in the wheatbelt, at Nangeen Hill, Mount Caroline, Mount Stirling, Sales Rock, Querkin Rocks and Tutakin Rock (DEWR, 2008). Two isolated populations occur on Barrow Island and on Salisbury Island (DEWR, 2008). The terrain within the application area is unlikely to contain the complexity of rocks, cliffs or escarpment necessary to sustain a population of this species. A lack of predator control is also a limiting factor in whether the species remains in the area. Therefore, the vegetation within the application area is not likely to be significant habitat for this species.

The Western Pebble-mound Mouse (DEC - Priority 4) is described as constructing pebble mounds on slopes composed of stony soils, near sharply incised drainage lines (Start et al, 2000). Mounds are built in vegetation dominated by hard spinifex (*Triodia basedowii*) or *T. wiseana*. Pebble mounds were observed at two locations within the application area (Hamersley Iron, 2008). The vegetation within the application area is not likely to be significant habitat for this species, given its extensive distribution in the Hamersley ranges.

The Pilbara Olive Python (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) prefers deep gorges and water holes in the ranges of the Pilbara region (Pearson, 1993 as cited in DEWR, 2008b). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (Pearson, 2001, in DEWR, 2008b). The application area does not provide habitat for this species.

The Blind snake *Ramphotyphlops ganei* (DEC - Priority 1) has been collected at opposite ends of the Pilbara uplands, hence the species may occur over a substantial geographic range (Aplin, 1998). Four specimens have been recorded from Newman, approximately 40 kilometres from the application area. However, the fact that it

has not previously been collected in other biological surveys implies either a general scarcity or a very discontinuous distribution. Aplin (1998) suggests that the species is associated with the moist microhabitats which exist in many of the deeper, better shaded gorges throughout the region. Based on this description, suitable habitat for this species is not likely to occur within the application area.

The Ghost Bat (DEC - Priority 4) roosts in caves, old mine shafts and deep cracks in rocks (Australian Museum Online, 2008). During a flora survey by Pilbara Iron staff, a cave was observed within the application area. Caves can represent significant habitat within the Pilbara region for bats and invertebrates. Therefore, the vegetation within the application area may be significant habitat for this species. No information was supplied as to whether any bat species inhabited the cave.

The Grey Falcon (DEC - Priority 4) is a wide ranging bird known to nest along watercourses in tall *Eucalyptus camaldulensis* (Garnett et al, 2000). Due to the non perennial nature of the local watercourses within the application area, and the lack of *E. camaldulensis*, the vegetation within the application area is not likely to be significant habitat for this species.

Based on the above, the proposed clearing is not likely to be at variance to this Principle. However, it is recommended that should a permit be granted, a condition be imposed on the permit requiring the permit holder to avoid clearing within 100 m of the cave identified above as it may be significant habitat for the Ghost Bat.

Methodology Aplin (1998)
Austrian Museum Online (2008)
DEWR (2008a)
DEWR (2008b)
DNREA (2007)
Garnett et al (2000)
Hamersley Iron (2008)
Start et al (2000)
Western Australian Museum (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 Declared Rare or Priority flora species occur within the application area (GIS Database).

A flora survey conducted by Mattiske Consulting Pty Ltd in February 2007 identified twelve separate populations of the Priority 3 species *Themeda sp.* Hamersley Station within the application area (Hamersley Iron, 2008). This survey covered the greater majority of the application area.

A flora survey was conducted over the application area and surrounding areas by Pilbara Iron staff in May 2007 (Hamersley Iron, 2008). This survey involved the area being traversed by an experienced botanist in transects spaced between 50-100 metres apart. All vascular plant species were recorded. No Declared Rare or Priority flora species were recorded during this survey (Hamersley Iron, 2008). This survey covered that area not surveyed by Mattiske in February 2007.

Themeda sp. Hamersley Station is located in red clay in clay pans/cracking clays, drainage lines or on grass plains (Western Australian Herbarium, 1998-2008). There are 11 records of this species on Florabase, located over a wide range within the Pilbara Region (Western Australian Herbarium, 1998-2008). This species has been recorded many times by Pilbara Iron staff from many different and wide ranging localities. Given that the habitat types this species have been found in are common and widespread within the Pilbara Region, the vegetation within the application area is not likely to be necessary for the continued existence of this species.

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

Methodology Hamersley Iron (2008)
Western Australian Herbarium (1998-2008)
GIS Database:
- Declared Rare and Priority Flora List - CALM 1/7/05

(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

According to available databases, no Threatened Ecological Communities (TEC) occur within the application area (GIS Database). The nearest TEC occurs approximately 43 kilometres south east of the application area (Ethel Gorge aquifer stygobiont community). It is not expected that the proposed clearing will impact the conservation of this TEC.

None of the vegetation types identified within the application area (Hamersley Iron, 2008) are representative of a TEC or an ecological community at risk.

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

Methodology Hamersley Iron (2008)
GIS Database:
- Threatened Ecological Communities

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

Comments Proposal is not at variance to this Principle

According to available databases, the application area falls within the Pilbara IBRA Bioregion (GIS Database). This bioregion's vegetation extent remains at approximately 100% of its Pre-European extent (see table). Beard vegetation associations 18 and 29 occur within the application area (GIS Database). These vegetation associations remain at approximately 100% of its Pre-European extent. Vegetation association 18 is well represented in conservation estate within the Pilbara bioregion. Whilst little of vegetation association 28 is located within conservation estate, its conservation is under no threat.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves*
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~100	Least Concern	6.3
Beard veg assoc. – State					
18	19,892,437	19,890,348	~100	Least Concern	2.1
29	7,904,064	7,904,064	~100	Least Concern	0.3
Beard veg assoc. - bioregion					
18	676,561	676,561	~100	Least Concern	16.8
29	1,133,228	1,133,228	~100	Least Concern	1.9

*Shepherd et al (2006)

**Department of Natural Resources and Environment (2002)

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

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al (2001)
GIS Databases:
- 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

According to available databases there are no wetlands or watercourses within the application area (GIS Database).

However, analysis of aerial imagery suggests that the application area occurs on a small ridge. Running off either side of the ridge are many small drainage lines that divert surface run-off to lower landscapes during times of intense rainfall. There are no defined watercourses on the lower plains within the application area.

A flora survey conducted by Pilbara Iron staff identified one vegetation type occurring within drainage lines. This vegetation type was described as *Corymbia hamersleyana*, *Eucalyptus leucophloia* scattered low trees over *Acacia citrinoviridis*, *A. coriacea* tall open shrubland over *A. pyrifolia*, *Petalostylis labicheoides* open shrubland over *Themeda triandra* scattered tussock grass (Hamersley Iron, 2008). This vegetation type is not representative of riparian vegetation.

A small clay pan or natural drainage sump is located in the south east of the application area. A flora survey by Pilbara Iron staff identified one vegetation type occurring within the sump area. This vegetation type was described as *Eucalyptus gamophylla*, *E. leucophloia* scattered low trees over *Acacia aneura* var *aneura*, *A. pruinocarpa* scattered tall shrubs, *A. atkinsiana*, *Eremophila forrestii*, *E. fraseri*, *A. hilliana*, *Indigofera monophylla* scattered shrubs over *Triodia basedowii* and pockets of *T. pungens* hummock grassland. None of these species are restricted to wetland habitats. This area is likely to receive run-off during times of intense rainfall and is likely to hold water for longer periods following rainfall events.

Based on the above, the proposed clearing is at variance to this Principle. However, the clearing of vegetation within the drainage lines and sump is not expected to significantly impact their environmental value.

Methodology Hamersley Iron (2008)
GIS Database:
- Hydrography, Linear

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

Comments Proposal may be at variance to this Principle

The application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al 2004). The application area is composed of the following land systems (GIS Database):

- Newman
- Boolgeeda
- Wannamunna

The Newman Land System is described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al, 2004). An analysis of aerial photography for the application area reveals the application area is most likely to fall within the 'Plateau, ridge mountain and hill' and 'lower slope' land units. The soil types within this land unit (stony soils, red shallow loams) are not susceptible to erosion due to the presence of a stony mantle (Van Vreeswyk et al, 2004).

The Boolgeeda Land System is described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grassland and mulga shrublands (Van Vreeswyk et al, 2004). An analysis of aerial photography for the application area reveals the application area is most likely to fall within the 'stony slope and upper plain' land unit. The soils within this land unit are not susceptible to erosion due to abundant stony mantle (Van Vreeswyk et al, 2004).

The Wannamunna Land System is described as hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (and occasionally eucalypt woodlands) (Van Vreeswyk et al, 2004). This land unit is uncommon within the Pilbara region (577 square kilometres). An analysis of aerial photography for the application area reveals the application area is most likely to fall within the 'hardpan plain', 'groves' and 'internal drainage plains' land units. A small natural drainage sump is located within the 'internal drainage plains' unit. None of these land units are susceptible to erosion, although inappropriate positioning of roads can lead to water starvation downslope (Van Vreeswyk et al, 2004).

Based on the above, the proposed clearing may be at variance to this Principle if soil moved during exploration is allowed to remain windrowed. It is recommended that a condition be placed on any permit granted to remove soil windrows post-clearing.

Methodology Hamersley Iron (2008)
Van Vreeswyk et al (2004)
GIS Database:
- Rangeland Land System Mapping - DA

(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 located approximately 80 kilometres to the east of Karijini National Park (GIS Database). At this distance it is not likely that the vegetation within the application area provides a buffer to a conservation area, or is important as an ecological link to a conservation area. The vegetation types within the application areas are well replicated in other land systems within the Pilbara region. Consequently, their conservation status is under no threat.

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

Methodology GIS Database:
- CALM Managed Lands and Waters

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

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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

The area is located within a *Rights in Water Irrigation Act, 1914* (RIWI Act) Surface Water Management Area (DoW, 2008). The proponent is required to obtain a Beds and Banks Permit in order to disturb any watercourse.

There are no permanent waterbodies or watercourses within, or in association with the application area (GIS Database). Rainfall in this area is mainly restricted to a wet summer season, where precipitation can be variable. Rain can be either intense falls associated with cyclonic events, or scattered falls associated with local thunderstorms. The application area receives average annual rainfall of approximately 310.2 millimetres (BoM, 2008), and experiences a pan evaporation rate of approximately 3400 millimetres/year (Luke et al, 1987). Therefore, during normal rainfall events, surface water within the application area is likely to evaporate or be utilised by vegetation quickly. However, substantial rainfall events create surface sheet flow which is likely to be high in sediments.

During normal rainfall events, the proposed clearing would not lead to an increase in sedimentation of waterbodies on or off site.

The application area is located within the Pilbara Groundwater Area (DoW, 2008). Any extraction of groundwater in this area will require a groundwater licence. The groundwater salinity within the application area is approximately 500 - 1000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. Given the size of the area to be cleared (41.33 hectares) compared to the size of the Hamersley groundwater province (101,668 square kilometres) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

There are no known Groundwater Dependant Ecosystems within the application area (GIS Database).

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

Methodology BoM (2008)
DoW (2008)
Luke et al (1987)
GIS Databases:
- Groundwater, Statewide
- Public Drinking Water Source Areas (PDWSA's)
- Hydrography, Linear
- Potential Groundwater Dependent Ecosystems

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

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

The application area experiences an arid, tropical climate with a wet summer season and a dry winter season (BoM, 2008). Most rainfall is received during the wet season, but falls can be variable (BOM, 2008). Rain can either be sporadic (local thunderstorms) or heavy and intense (cyclonic events). It is likely that during times of intense rainfall there may be some localised flooding in adjacent areas. However, the small area to be cleared (4 hectares) in relation to the size of the Fortescue River - Upper catchment area (2,975,192 hectares; GIS Database) is not likely to lead to an increase in flood height or duration within the application area.

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

Methodology BoM (2008)
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

There is a native title claim over the area under application: WC99/04 (GIS Database). The claim has been registered with the National Native Title Tribunal. However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act, 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act, 1993*.

The application area is located within a *Rights in Water Irrigation Act, 1914* (RIWI Act) Surface Water Management Area (GIS Database). The proponent is required to obtain a Beds and Banks Permit in order to disturb any water course (DoW, 2008). The application area is located in a RIWI Act Groundwater area (GIS Database). The proponent is required to obtain permits to extract groundwater in this area.

No public submissions were received during the advertised period.

A submission was received from a direct interest party after the close of the submission period. The assessing officer is not required to consider this submission in the assessment of this application. However, the assessing officer responds to the submission below.

The submission raised queries with regard to aboriginal sites of significance, bush tucker and medicinal plants and the cumulative impacts of all clearing permits within State Agreement Mineral Lease AML70/4 with regard to Principle (e).

A search of available databases reveals there are 5 known Aboriginal sites of significance within the application area; TX-01, TX-02, TX-03, TX-04 and Texas-1 (GIS Database). Hamersley Iron (2008) have advised that heritage surveys have yet to be conducted over the application areas and any sites identified within the application area will be avoided. 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 considered that the extent of remaining vegetation both within the local area and regionally is such that access to bush tucker and medicinal plants by native title claimants will not be significantly impacted by the proposed clearing.

It is not considered that the removal of 41.33 hectares of native vegetation will significantly impact the extent of native vegetation within the area both locally and regionally. Whilst a number of applications have been granted within the region, the extent of remaining vegetation on a regional scale is such that there is likely to be no significant impact to the extent of vegetation within the Pilbara region. It should be noted that many of these granted permits require the permit holder to rehabilitate the areas cleared such that there will be no net loss of vegetation in these areas.

Methodology DoW (2008)
Hamersley Iron (2008)
GIS Database:
- Native Title Claims
- Aboriginal Sites of Significance

4. Assessor's comments

Comment

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

It is recommended that should a permit be granted, conditions be endorsed on the permit with regard to weed management, avoiding clearing near a cave, rehabilitating areas cleared to remove windrows, recording and reporting areas cleared.

5. References

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6. Glossary

Acronyms:

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

Definitions:

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

P1	Priority One - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	Priority Three - Poorly Known taxa: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	Priority Four – Rare taxa: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable): taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in

need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

- X Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

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

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

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