



## 1. Application details

### 1.1. Permit application details

Permit application No.: 2708/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

### 1.3. Property details

Property: Iron Ore (Mount Bruce) Agreement Act 1972, Mineral Lease 252SA (AML 70/252)  
Local Government Area: Shire Of Ashburton & Shire Of East Pilbara  
Colloquial name: Koodaideri Exploration Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
35		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):

**82:** Hummock Grasslands, low tree steppe; snappygum over *Triodia wiseana* (Shepherd et al, 2001). According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 82 is a grassland dominated by *Triodia wiseana*, with emergent trees of *Eucalyptus leucophloia* and *E. gamophylla*, with various emergent shrubs including *Senna artemisioides ssp. sturtii*, *Dodonaea viscosa*, *Grevillea wickhamii*, *Hakea lorea* and *Senna pleurocarpa var. pleurocarpa*.

**111:** Hummock grasslands, shrub steppe; *Eucalyptus gamophylla* over hard spinifex (Shepherd et al, 2001). According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 111 is a grassland dominated by *Hakea lorea*, *Eucalyptus gamophylla*, *E. setosa*, *E. oleosa*, over shrub layer of *Acacia pachycarpa*, *A. pyrifolia*, *Senna sp.*, *Dicrastylis sp.*, *Dodonaea viscosa*, *Grevillea juncea*, *Newcastlelia hexarrhena*, *Petalostylis cassioides*, over a lower shrub layer of *Leptosema chambersii*, *Diplopeltis sturtii*, *Kennedia prorepens*, *Maireana appressa*, *Ptilotus calostachyus*, *Scaevola parvifolia* over a hummock grass layer of *Triodia basedowii*, *T. pungens*.

A flora survey conducted over the application area in 2007, identified 11 vegetation types (Biota, 2008). These are:

**Crests (V1):** *Eucalyptus leucophloia* scattered trees over *Grevillea wickhamii* tall open shrubland over *Acacia spondylophylla* scattered low shrubs over *Triodia sp.* Shovelanna Hill hummock grassland.

**Crests (V2):** *Eucalyptus leucophloia*, *E. gamophylla*, *Hakea chordophylla* low open woodland over *Acacia maitlandii* tall open shrubland over *Acacia hilliana* scattered low shrubs over *Triodia wiseana* hummock grassland.

**Steep upper slopes (V3):** *Eucalyptus leucophloia*, *Corymbia deserticola* low open woodland over *Hakea chordophylla* scattered tall shrubs over *Acacia spondylophylla* scattered low shrubs over *Triodia wiseana*, *T. sp.* Shovelanna Hill hummock grassland.

**Upper slopes (V4):** *Eucalyptus leucophloia*, *E. gamophylla*, *E. kingsmillii* low open mallee woodland over *Acacia hamersleyensis* tall open scrub over *Triodia sp.* Shovelanna Hill hummock grassland.

**Gentle lower slopes/foot slopes (V5):** *Eucalyptus leucophloia*, *Hakea chordophylla* scattered low trees over *Solanum phlomoides*, *Goodenia stobbsiana* low shrubland over *Triodia sp.* Shovelanna Hill hummock grassland.

**Undulating plains (V6):** *Eucalyptus leucophloia*, *Hakea chordophylla* scattered low trees over *Acacia bivenosa* open shrubland over *Goodenia stobbsiana*, *Ptilotus astrolasius* scattered low shrubs over *Triodia wiseana* hummock grassland.

**Undulating Plains (V7):** *Grevillea wickhamii*, *Acacia inaequilatera* tall shrubland over *Acacia ancistrocarpa*, *Cassia glutinosa* open shrubland over *Cassia helmsii*, *C. oligophylla* scattered low shrubs over *Triodia pungens* hummock grassland.

**Undulating plains (V8):** *Eucalyptus leucophloia* scattered low trees over *Acacia rhodophloia*, *A.*

*pruinocarpa* tall shrubland over *Eremophila latrobei* scattered shrubs over *Triodia wiseana*, *T. sp.* Shovelanna Hill open hummock grassland.

**Floodplains near creeks (V9):** *Acacia pyrifolia*, *A. tumida*, *Gossypium robinsonii* tall open scrub over *Tephrosia rosea* low open shrubland over *Cenchrus ciliaris* closed tussock grassland.

**Narrow Drainage Lines:** *Eucalyptus gamophylla* scattered low mallees over *Acacia tumida*, *Petalostylis labicheoides*, *Gossypium robinsonii* tall closed scrub.

**Burnt vegetation (V11):** *Acacia pruinocarpa*, *A. aneura* low woodland over *Acacia inaequilatera* tall open shrubland over *Cenchrus ciliaris* very open tussock grassland and *Triodia pungens* hummock grassland. Recreated from remnant species present.

**Clearing Description**

Hamersley Iron Pty Ltd have applied to clear up to 35 hectares of native vegetation within an application area of approximately 226 hectares for the purpose of constructing a camp, communications repeater tower and access tracks associated with the Koodaideri exploration project. It is expected vegetation will be removed using machinery.

**Vegetation Condition**

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994)

To

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

**Comment**

Vegetation condition was rated by Biota (2008) as good to very good in hilly areas and stoney plains to poor (degraded) in creeklines and low lying areas, with extensive grazing and infestations of buffel grass (*Cenchrus ciliaris*). Many areas within the application area have been recently burnt between less than one year to more than three years prior to the flora survey. This burn history can be seen from aerial photography. A site visit conducted by the assessing officer noted that vegetation for the most part within the application area has previously been disturbed for vehicle tracks and has been allowed to revegetate, or remain accessible by vehicle.

**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 may be at variance to this Principle**

The application area occurs within both the Hamersley and Fortescue Interim Biogeographic Regionalisation of Australia (IBRA) sub-bioregions.

The Hamersley sub-bioregion is characterised by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002). The vegetation described within the application area (Biota, 2008) is typical of the bioregion.

The Fortescue sub-bioregion is characterised by alluvial plains and river frontage (CALM, 2002). Extensive salt marsh, mulga-bunch grass, and short grass communities occur on alluvial plains in the east, deeply incised gorge systems occur in the western (lower) part of the drainage system (CALM, 2002). River gum woodlands fringe the drainage lines (CALM, 2002). An extensive calcrete aquifer (originating within a palaeo-drainage valley) feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and cadjeput *Melaleuca* woodlands (CALM, 2002). Only a very small fraction of the application area occurs within the Fortescue sub-bioregion and the vegetation types present are more likely to represent those found within the Hamersley sub-bioregion.

A vegetation survey of the application area and surrounding vegetation identified 169 flora species from 38 families (Biota, 2008). This suggests that the area is one of high biodiversity, given the size of the survey area (approximately 226 hectares). Poaceae (24), Mimosaceae (22), Papilionaceae (13) Caesalpiniaceae (11) and Malvaceae (11) families (Biota, 2008) display high levels of speciation within the application area. This is typical of the floristics of the Pilbara IBRA Region.

Two priority flora species were identified within the application area (Biota, 2008). The vegetation within the application area has a high diversity of vegetation habitat types such as hill crests and ridges, deep gullies and gorges, drainage lines, sloping plains and breakaways. The presence of diverse habitat types is a precursor to high biological diversity, leading to the presence of unique or endemic flora species.

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 and Geckos (Western Australian Museum, 2009). The search found 111 species from 8 Families as potentially occurring within the application area, or within approximately 50 kilometres of the application area. 53 avian fauna species from 23 Families have also been recorded within 50 kilometres of the application area, reflecting the diverse range of habitats available.

A site visit by the assessing officer confirmed that the area has a variety of landforms and vegetation habitat types. Vegetation was in very good condition for most of the application area, although weeds (Buffel Grass and Beggartick) were present in some areas. Buffel grass in particular is a serious environmental weed, out-competing native grasses and other species, reducing species richness and impacting on habitats for fauna.

Based on the above, the proposed clearing may be at variance to this Principle. The assessing officer recommends that should a permit be granted, conditions be imposed on the permit for the purpose of weed management.

**Methodology** Biota (2008)  
CALM (2002)  
Western Australian Museum (2009)  
GIS Database:  
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00

**(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**

Biota Environmental Sciences (Biota, 2008) conducted a desktop fauna assessment of the application area and surrounding vegetation. This involved an area search of the Department of Environment and Conservation's (DEC) threatened fauna database, and an area search of the Protected Matters search tool maintained by the Department of Environment, Water, Heritage and the Arts. Fauna habitats were assessed during a site visit by Biota in 2007 (Biota, 2008).

As a result of this desktop survey, the following fauna species of conservation significance have previously been recorded within the survey area (Biota, 2008):

Northern Quoll (*Dasyurus hallucatus*), Bilby (*Macrotis lagotis*), Mulgara (*Dasyercus cristicauda*), Pilbara Orange Leaf-nosed Bat (*Rhinonictis aurantius*), Night Parrot (*Pezoporus occidentalis*), Pilbara Olive Python (*Liasis olivaceus barroni*), Peregrine Falcon (*Falco peregrinus*), a blind snake (*Ramphotyphlops ganeii*), a skink (*Ctenotus uber johnstonei*), Fortescue Grunter (*Leiopotherapon aheneus*), Lake Downs Mouse (*Leggadina lakedownensis*), Western Pebble-mound Mouse (*Pseudomys chapmani*), Ghost Bat (*Macroderma gigas*), Long-tailed Dunnart (*Sminthopsis longicaudata*), Star Finch (*Neochima ruficauda subclarescens*), Grey Falcon (*Falco hypoleucos*), Australian Bustard (*Ardeotis australis*) and the Bush Stone-curlew (*Burhinus grallarius*).

Of these species, based on preferred habitat type, the following are likely to occur within the application area:

The Northern Quoll (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is known to occur in a range of habitats, including Eucalyptus open forest, monsoon rainforest and savannah woodland, but is most abundant (and apparently with less fluctuation) in rocky environments close to free water in creekline areas (Braithwaite et al, 1994). It has undergone substantial decline in the Pilbara and is now known to occur in geographically isolated populations (Firestone, 1999). Rocky outcrops and gorges exist within the application area, and permanent water is found in a gorge located near the application area. However, the rocky outcrops and gorges found within the application area are present throughout most of the Hamersley Ranges and it is unlikely that the vegetation within the application area is significant habitat for this species.

The Orange Leaf-nosed Bat (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is described as preferring warm humid caves for roosting, although some have been found in tree hollows (Australian Museum Online, 2007a). They are known to hunt flying prey close to roosts, and glean from foliage and the ground in riparian vegetation in gorges, and in open hummock grasslands and sparse tree and shrub savannah (Department of Environment, Water, Heritage and the Arts, 2008a). Known colonies in the Pilbara occupy abandoned, deep and partially flooded mines that trap pockets of warm, humid air in the mine's constant temperature zone. For at least part of the year, the species is thought to also occupy smaller, less complex mines nearby. There are no known natural roosting sites in the Pilbara (Department of Environment, Water Heritage and the Arts, 2008a). There are no abandoned mine shafts or substantial caves within the application area, although shallow caves and overhangs within the breakaway areas may provide short term roosting sites for this species. Therefore, the vegetation within the application area is not significant habitat for this species.

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 Department of Environment, Water Heritage and the Arts, 2008b). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (Pearson, 2001, in Department of Environment, Water, Heritage and the Arts, 2008b). This species was observed by Biota staff during a site visit in 2007 within the application area (Biota, 2008). This species is common throughout the Hamersley Ranges in suitable habitat. The vegetation within the application area is not likely to be significant habitat for this species.

The Peregrine Falcon (Schedule 4 - Other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2008*) is known to inhabit most areas in Australia and utilise cliffs, tall trees and granite outcrops for nesting (Australian Museum Online, 2007b). The Peregrine Falcon was observed during the flora survey as a pair of birds within high cliff habitat. It is likely that this pair use the large hills, cliffs and rocky outcrops as potential nesting sites. However, the clearing of vegetation within the application area is not likely to remove significant 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 100 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 may occur within the application area. However, these deep gorges are usually not accessible for exploration drilling. Given the extensive amount of gorge type habitat within the Hamersley Ranges, 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*) (Start et al, 2000). Biota identified at least 146 active mounds during a flora survey over the application area (Biota, 2007). This species is widespread throughout the Hamersley Ranges. The vegetation within the application area is not likely to be significant habitat for the Western Pebble-mound Mouse. Pebble-mounds are easily avoided during exploration activities.

The Ghost Bat (DEC Priority 4) has been recorded from a number of sites across the Pilbara Region, mainly from abandoned mine shafts close to permanent water. Shallow caves and overhangs found within the application area may provide temporary roosting habitat for this species. However, it is not likely to constitute significant habitat for this species.

The Star Finch (DEC - Priority 4) has a patchy distribution within the Pilbara and at low densities where it occurs (Garnett et al, 2000). There are occasional concentrations at Exmouth and Millstream (Garnett et al, 2000). The Star Finch inhabits grasslands and eucalypt woodland close to water, where they feed on seeds (Hall, 1974, Immelmann, 1982, M. Todd as cited in Garnett et al, 2000). Birds tend to be resident in large flocks during the dry season, and disperse to breed during the wet season (Garnett et al, 2000). The Star Finch is likely to be present within the application area following heavy rain when water is likely to pool within creeks. However, this vegetation type is widespread throughout the Pilbara region and it is unlikely that the vegetation to be cleared represents significant habitat for this species.

The Australian Bustard (DEC Priority 4) prefers tussock grassland, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett et al, 2000). This species was observed during the flora survey (Biota, 2008). Given the widespread distribution of this species and the abundant amount of suitable habitat within the Hamersley Ranges, the vegetation within the application area is not significant habitat for this species.

The Bush Stone-curlew (DEC - Priority 4) is known to frequent lightly timbered open woodlands. Given the widespread distribution of this species, and the degraded nature of vegetation to be cleared, the vegetation within the application area is not significant habitat for this species.

The Koodaideri Hills are characteristic of the Hamersley Ranges, with fauna habitats including hilltops, slopes, stony plains and small to moderate watercourses. Biota notes that there are no caves within the application area (Biota, 2008).

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

**Methodology** Aplin (1998)  
Australian Museum Online (2007a)  
Australian Museum Online (2007b)  
Biota (2008)  
Braithwaite et al (1994)  
Department of Environment, Water, Heritage and the Arts (2008a)  
Department of Environment, Water, Heritage and the Arts (2008b)  
Firestone (1999)  
Garnett et al (2000)  
Start et al (2000)

**(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 flora species occur within the application area (GIS Database; DEC, 2007-2009). Two Priority flora species have previously been recorded within close proximity to the application area; *Rhynchosia bungarensis* (P3) and *Sida sp.* Barlee Range (P3) (DEC, 2007-2009).

A vegetation and rare flora survey was conducted over the application area and surrounding vegetation by Biota Environmental Sciences (Biota, 2008) between April and September 2007. As a result of this survey, two Priority flora species were identified within the application area (Biota, 2008). They are:

*Eremophila magnifica* spp. *magnifica* (P4)  
*Rhynchosia bungarensis* (P3)

*Eremophila magnifica* spp. *magnifica* occurs in skeletal soils over ironstone (Western Australian Herbarium, 1998-2009). A total of 45 individual plants were found in a single population within the application area (Biota, 2008). This species has been found from rocky outcrops and hills throughout the Hamersley Ranges (Western Australian Herbarium, 1998-2009). Rocky outcrops and hills are very common within the Hamersley Ranges and it is likely that the species is common throughout its range. A Priority rank of 4 suggests that significant populations of species are found within secure conservation estate. The vegetation within the application area is not likely to be significant habitat for this Priority species.

*Rhynchosia bungarensis* occurs on pebbly, shingly coarse sand amongst boulders in creek lines and on floodplains, and has also been collected on ironstone slopes in skeletal soil (Western Australian Herbarium, 1998-2009). It has been found across much of the Pilbara region. Within the application area *R. bungarensis* was found in two separate populations, both within ephemeral watercourses (Biota, 2008).

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

**Methodology** Biota (2008)  
DEC (2007-2009)  
Western Australian Herbarium (1998-2009)  
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**

There are no known Threatened Ecological Communities (TEC) located within the application area (GIS Database). The West Angeles cracking clay Priority Ecological Communities (PEC) are located approximately 50 km to the south west. At this remote distance there is little likelihood of any impact to this PEC from the proposed clearing.

None of the vegetation communities identified during a flora survey over the application area are considered to be threatened ecological communities, or ecological communities at risk (Biota, 2008).

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

**Methodology** Biota (2008)  
GIS Database:  
- Threatened Ecological Communities - CALM

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

**Comments Proposal is not at variance to this Principle**

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 Association's 111 and 82 occur within the application area (GIS Database). According to Shepherd et al (2001), these vegetation associations remain at approximately 100% of their Pre-European extent (see table). Both Beard vegetation associations are represented in conservation estate (see table).

	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					
82	2,565,929	2,565,929	~100	Least Concern	10.2
111	762,966	762,966	~100	Least Concern	5.5
Beard veg assoc. - bioregion					
82	2,563,609	2,563,609	~100	Least Concern	10.2
111	550,289	550,289	~100	Least Concern	1.3

\* Shepherd et al. (2001)

\*\* Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)	
Presumed extinct+	Probably no longer present in the bioregion
Endangered+	<10% of pre-European extent remains
Vulnerable+	10-30% of pre-European extent exists
Depleted+	>30% and up to 50% of pre-European extent exists
Least concern+	>50% pre-European extent exists and subject to little or no degradation over a majority of this area
+ or a combination of depletion, loss of quality, current threats and rarity gives a comparable status	

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 Database:  
- Interim Biogeographical Regionalisation of Australia

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

**Comments Proposal is at variance to this Principle**

According to available databases there are several minor, non-perennial watercourses within the application area (GIS Database). A site inspection conducted by the assessing officer confirmed that most of these watercourses are seasonally dry ephemeral watercourses with no riparian vegetation fringing their banks. These watercourses would experience high, rapid flows during intense rainfall associated with the wet season, but would be dry for the rest of the year.

Based on the above, the proposed clearing is at variance to this Principle. However, clearing associated with minor, ephemeral watercourses is not likely to significantly impact the conservation values of these watercourses.

**Methodology** 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 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**

The Newman Land System is described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al, 2004). The system is not prone to erosion and has evolved to cope with vegetation loss following frequent fires. As a result of a site inspection by the assessing officer and analysis of aerial photography for the area, the application area is most likely to consist of the "Plateau, ridge, mountain and hill", "Lower slope", "Stony plain" and "Narrow drainage floor with channel" land units within this land system. None of these land units are susceptible to erosion due to abundant pebble or cobble 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 grasslands and mulga shrublands (Van Vreeswyk et al, 2004). The vegetation within the system is not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al, 2004). As a result of a site inspection by the assessing officer and analysis of aerial photography for the area, the application area is most likely to consist of the "stony lower plain" and "narrow drainage floor and channel" land unit within this land system. The soil types within these land units have a low susceptibility to erosion (Van Vreeswyk et al, 2004).

The application area experiences low rainfall (~311 mm/year) (BoM, 2009), and very high pan evaporation rates (~3400 mm/year) (Luke et al, 1987). Most rainfall will be either utilised by vegetation or lost through evaporation. Subsequently, there is little recharge of groundwater as a result of rainfall. As a result, the removal of 43 hectares of vegetation is not likely to lead to a rise in water table, which can lead to water logging

or salinisation.

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

**Methodology** BoM (2009)  
Luke et al (1987)  
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 22.6 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. Subsequently, 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 - CALM 1/7/05

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

**Comments Proposal 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 application area is located within a *Rights in Water and 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 (DoW, 2008). Given the size of the clearing (35 hectares) compared with the size of the Fortescue River - Upper Catchment (2,975,192 hectares), the proposed clearing is not likely to reduce the quality of surface water in the catchment.

The application area is located within the Pilbara Groundwater Area (DoW, 2008). Any extraction of groundwater in this area will require a groundwater licence (DoW, 2008). The groundwater salinity within the application area is approximately 500 - 1000 mg/L Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. Given the size of the area to be cleared 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** DoW (2008)  
GIS Database:  
- Groundwater Provinces  
- Groundwater, Statewide - DoW  
- Hydrographic Catchments - Catchments  
- Public Drinking Water Source Areas (PDWSA's) - DoW  
- Potential Groundwater Dependent Ecosystems - DoE 2004

**(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, 2009). Most rainfall is received during the wet season, but falls can be variable (BoM, 2009). 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 method of clearing and the moderate amount of vegetation to be cleared are not likely to lead to an increase in flood height or duration. Flooding is not expected within the application areas as they are located higher in the landscape.

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

**Methodology** BoM (2009)

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

### Comments

There is one native title claim over the area under application (WC98\_062 - 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*.

There are no Aboriginal sites of significance within the application area. It is the proponent's responsibility to comply with the *Aboriginal Heritage Act, 1972* and ensure that no sites of aboriginal significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The application area is located within a *Rights in Water and 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. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

One submission was received during the advertised public comments period, raising no objections to the proposed clearing.

**Methodology** DoW (2008)  
GIS Database:  
- Native Title Claims - DLI  
- Aboriginal Sites of Significance - DIA  
- Groundwater, Statewide - DoW

## 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 Principle (a), is not likely to be at variance to Principle (b), (c), (d), (g), (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 regards to weed management, record keeping and permit reporting.

## 5. References

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## 6. Glossary

### Acronyms:

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

