



## 1. Application details

### 1.1. Permit application details

Permit application No.: 2525/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

### 1.3. Property details

Property: Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 272SA (AML70/272)  
Local Government Area: Shire Of Ashburton  
Colloquial name: Marandoo Dewatering Bore and Geotechnical Drilling

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
12		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*.

**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*.

A vegetation survey over the application area and surrounding vegetation was conducted by Biota Environmental Sciences (Biota) in 2007/2008 (Biota, 2008). This survey updated vegetation mapping of the area conducted by Matiske and Associates in 1992. As a result of this vegetation survey, six vegetation types were identified within the application area.

**AanTm** - *Acacia aneura var. pilbarana* low open woodland to low woodland over *Triodia melvillei* scattered hummocks to hummock grassland.

**ExAanpAbSAITIoTHtEUa** - *Eucalyptus xerothermica*, *Acacia aneura var. pilbarana* low open forest over *Acacia bivenosa*, *Santalum lanceolatum* open shrubland over *Triodia longiceps* hummock grassland and *Themeda triandra*, *Eulalia aurea* very open tussock grassland.

**EIAmTbrTw** - *Eucalyptus leucophloia ssp. leucophloia* scattered low trees over *Acacia maitlandii* (*A. marramamba*, *A. aneura var pilbarana*, *A. atkinsiana*, *A. bivenosa*) shrubland over *Triodia brizoides*, *T. wiseana* hummock grassland.

**EIAmAmaAaAatTsps** - *Eucalyptus leucophloia ssp. leucophloia* scattered low trees over *Acacia maitlandii*, *A. marramamba*, *A. ancistrocarpa*, *A. atkinsiana* open shrubland over *Triodia sp.* Shovellana Hill hummock grassland.

**EgAprAaTsps** - *Eucalyptus gamophylla* scattered low mallees over *Acacia pruinocarpa*, *A. ancistrocarpa* scattered tall shrubs over *Triodia sp.* Shovellana Hill (*T. wiseana*) hummock grassland.

**AatAaCapCAgTw** - *Acacia atkinsiana* scattered tall shrubs over *A. ancistrocarpa*, *Senna glutinosa ssp. pruinosa*, *Senna glutinosa ssp. glutinosa* scattered shrubs over *Triodia wiseana* hummock grassland.

##### Clearing Description

Hamersley Iron Pty Ltd (Hamersley Iron) have applied to clear up to 12 hectares within an application area of approximately 112 hectares for the purpose of drilling de-watering bores and geotechnical drilling. Dewatering pads will be approximately 60 metres x 60 metres. Drill pads will be constructed by expanding existing pads to 20 metres x 30 metres. Vegetation will be cleared using a dozer, blade down. Hamersley Iron have advised that vegetation and topsoil will be stockpiled and used in

	rehabilitation.
<b>Vegetation Condition</b>	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
	To
	Excellent: Vegetation structure intact, disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).
<b>Comment</b>	The application area occurs adjacent to an active mine site and rail infrastructure. Analysis of aerial photography reveals the vegetation to be adjacent to rail infrastructure and numerous tracks, sumps, a mine pit flood protection bund and topsoil stockpile. These raised structures appear to have had some impact on surface drainage and possibly the health of the vegetation in addition to the direct effects of clearing (Biota, 2008). Vegetation condition was derived from Biota (2008) based on vegetation condition scale described by Trudgeon. Biota state that much of the vegetation is highly disturbed and/or burnt. Vegetation in the eastern half of the application area is relatively undisturbed between historic exploration gridlines.

### 3. Assessment of application against clearing principles

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

<b>Comments</b>	<p><b>Proposal is not likely to be at variance to this Principle</b></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 (Biota, 2008) is typical of the bioregion.</p> <p>A vegetation survey of the application area and surrounding vegetation identified 177 flora species from 40 families (Biota, 2008). Given the level of disturbance that has occurred within the application area, this is still considered to be moderately biologically diverse. Biota (2008) state that a total of 348 native species have been recorded from the wider Marandoo project area. Poaceae (42), Malvaceae (16), Mimosaceae (19), and Amaranthaceae (12) families (Biota, 2008) display high levels of speciation within the application area. This is typical of the floristics of the Pilbara IBRA Region. This suggests that the application area displays less floral diversity due to the high levels of disturbance.</p> <p>An area search of the Western Australian Museum's Faunabase conducted by Biota (2008) suggests that the survey area is diverse in reptile species, particularly Skinks (27) and Geckos (16). The database search found a total of 90 reptile species from 9 families as potentially occurring within the application area, or within 70 kilometres of the application area (Biota, 2008). A total of 74 species of avian fauna were also recorded within the database search area (Biota, 2008), reflecting the diversity of habitats available within the Pilbara region. However, the level of disturbance within the application area is such that it would not be expected that the application area would be diverse in fauna species.</p> <p>Five alien weed species were recorded within the application area (Biota, 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.</p> <p>Whilst the area appears to be moderately floristically diverse, given the level of disturbance that has occurred within the application area it is certain that there are areas of higher biodiversity in better condition within the Bioregion.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this Principle.</p>
<b>Methodology</b>	<p>Biota (2008)</p> <p>CALM (2002)</p> <p>GIS Database:</p> <p>- Interim Biogeographic Regionalisation of Australia (subregions)</p>

#### (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.

<b>Comments</b>	<p><b>Proposal is not likely to be at variance to this Principle</b></p> <p>The application area and surrounding vegetation was subject to a fauna survey by Biota in March, April and November 2007 (Biota, 2008). This involved a desktop review of available databases and literature review and a field based fauna species and habitat survey. The survey and subsequent report adequately meet the requirements of EPA Guidance Statement 56 'Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2004a). As a result of this survey it was determined that a total of 16 fauna species of conservation significance could potentially occur within the application area. However, based on habitat requirements, the following species are most likely to occur within the application area:</p>
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The Northern Quoll (*Dasyurus hallucatus*) (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). This species was recorded from within the survey area in 2007 and was recorded previously in 1991 (Biota, 2008). The assessing officer notes that the trapping record occurred outside the application area in habitat that is less disturbed and occurs close to a rocky gully or ravine, which is suitable habitat for *D. hallucatus*. The species is unlikely to venture to the more disturbed and less suitable habitat that occurs within the application area, over 1 kilometre away, although it may be within its home range.

The Pilbara Olive Python (*Liasis olivaceus barroni*) (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 in Department of Environment and Water Resources, 2007). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (Pearson, 2001, in Department of Environment and Water Resources, 2007). This species was recorded from the survey area in 1991 (Biota, 2008). However, given the lack of gorges and water holes in the application area, it is unlikely that the vegetation within the application area is significant habitat for this species. It is more likely to be found in rocky gullies found approximately one kilometre south of the application area and may visit the application area following heavy seasonal rains.

The Western Pebble-mound Mouse (*Pseudomys chapmani*) (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). This species was recorded in the survey area by Biota in 2007 and previously in 1991 (Biota, 2008). Whilst suitable habitat for this species occurs within the application area, given the degraded nature of the vegetation and the presence of large populations of this species in the adjoining Karjini National Park, it is unlikely that the vegetation within the application area is significant habitat for this species.

The Ghost Bat (*Macroderma gigas*) (DEC - Priority 4) roosts in caves, old mine shafts and deep cracks in rocks (Australian Museum Online, 2008). This species was recorded by Biota within the survey area and previously in 1991 (Biota, 2008). Biota report a lack of suitable roosting habitat within the application area. It is unlikely that the vegetation within the application area is significant habitat for this species.

The Australian Bustard (*Ardeotis australis*) (DEC Priority 4) prefers tussock grassland, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett et al, 2000). This species has been recorded from the area previously in 1991 (Biota, 2008) and may occur within the application area. However, given the widespread distribution of this species and the degraded nature of the vegetation to be cleared, the vegetation within the application area is not significant habitat for this species.

The Bush Stone-curlew (*Burhinus grallarius*) (DEC - Priority 4) is known to frequent lightly timbered open woodlands. This species has previously been recorded from the area in 1991 (Biota, 2008) and may occur within the application area. However, 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.

Two species of avian fauna protected under Federal Migratory Bird Agreements have been recorded from the survey area, Rainbow Bee-eater (*Merops ornatus*) and Fork-tailed Swift (*Apus pacificus*).

The Rainbow Bee-eater was recorded by Biota during their survey in 2007 and previously in 1991 (Biota, 2008). The Rainbow Bee-eater is able to utilise a wide range of habitat types and nests in sandy soils. It is likely to utilise the application areas for feeding, but are unlikely to utilise the area for nesting due to the absence of sandy soils. Given the vast area of the Pilbara IBRA Bioregion and the species ability to utilise a wide range of habitats, it is unlikely that the vegetation within the application areas is significant habitat for this species.

The Fork-tailed Swift was recorded from the area previously in 1991 (Biota, 2008). The Fork-tailed Swift is a migratory species and may be an occasional visitor to the area. The application area represents a small fraction of the total habitat this species could potentially utilise and is not significant habitat for this species.

The fauna habitats identified in the area by Biota (2008) are common and widespread in the Pilbara region. Given the disturbance that has occurred within the application area it is not likely that the fauna habitat is significant on a local level.

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

**Methodology** Australian Museum Online (2008)  
Biota (2008)  
Braithwaite et al (1994)  
Department of Environment and Water Resources (2007)

EPA (2004a)  
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 may be at variance to this Principle**

According to available databases, there are no recorded populations of Declared Rare or Priority flora species within the application area (GIS Database).

A flora and vegetation survey was undertaken over the application area and surrounding vegetation in March, April and November 2007 (Biota, 2008). This involved a desktop review of available databases and literature to identify vegetation types and conservation significant species that may occur within the application area. A field based survey then recorded vegetation types within the survey area and attempted to locate conservation significant species based on habitat preference. The survey and subsequent report adequately meet the requirements of EPA Guidance Statement 51 'Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia' (EPA, 2004b).

As a result of the survey, the following conservation significant flora populations are recorded within the survey area (Biota, 2008): *Goodenia lyrata* (P1), *Josephinia* sp. Marandoo (P1), *Lobelia heterophylla* ssp. Pilbara (P1), *Indigofera ixocarpa* (P2), *Acacia dawsoniana* (P2), *Acacia effusa* (P2), *Dicladanthera glabra* (P2), *Euphorbia* sp. Mt Bruce flats (P2), *Scaevola* sp. Hamersley Range Basalts (P2), *Spartothamnella puberula* (P2), *Olearia fluvialis* (P2), *Goodenia nuda* (P3), *Acacia bomilowiana* (P3), *Cynanchum* sp. Hamersley (P3), *Dampiera anonyma* (P3), *Dampiera metalorum* (P3), *Geijera salicifolia* (P3), *Polymeria* sp. Hamersley (P3), *Rostellularia adscendens* var *latifolia* (P3), *Sida* sp. Marandoo (P3), *Swainsona* sp. Hamersley Station (P3), *Triumfetta leptacantha* (P3) *Eremophila magnifica* (P4) and *Ptilotus mollis* (P4). Most of these population records are historic records from previous flora surveys in the Marandoo area and occur within a 20 kilometre radius of the application area.

Of these species, only one population is located within the application area - *Goodenia lyrata*. A total of four populations have been recorded in the survey area, however, only one occurs within the application area. These populations were not identified during the most recent flora survey, but are historic records recorded by Pilbara Iron staff (Biota, 2008). However, Biota failed to locate these populations during their flora survey. There are six records of this species at the Western Australian Herbarium, widely scattered from the Eastern Pilbara, Laverton and Gibson Desert (Western Australian Herbarium, 1998-2008). Pilbara Iron have located this species from 15 locations, including Marandoo and several locations north of West Angeles (Hamersley Iron, 2008). Its preferred habitat is clay pans or internal drainage areas, although there is a record of it occurring in sandy soil between dunes (Western Australian Herbarium, 1998-2008). All records on Pilbara Iron's Threatened Flora Database are located on clay pans. Biota (2008) noted the presence of several claypan areas within the survey area, including the application area, that may support this species. Analysis of aerial photography reveals that all four populations that have been recorded in the survey area occur on the edge of sump areas that are holding water at the time the image was taken. These sump areas are located on gently sloping plains and may be man-made. It is possible therefore, that these populations have appeared since the creation of the sump areas. Given that this species has only been recorded on few occasions, the vegetation within the application area may be significant habitat for this species, although its scattered distribution suggests that the species may occur in suitable habitat throughout its distribution.

Based on the above, the proposed clearing may be at variance to this Principle. The assessing officer recommends that should a permit be granted, a condition be placed on the permit requiring the permit holder to avoid the recorded location of a population of *Goodenia lyrata* occurring within the application area.

**Methodology** Biota (2008)  
EPA (2004b)  
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, there are no Threatened Ecological Communities (TEC) or Priority Ecological Community (PEC) within the application area (GIS Database). The nearest PEC occurs approximately 2.5 kilometres north of the application area (Coolibah Lignum Flats). This community is described as woodland or forest of *Eucalyptus victrix* (coolibah) over thicket of *Muehlenbeckia florulenta* (lignum) on red clays in run-on zones. Associated species include *Eriachne benthamii*, *Themeda triandra*, *Aristida latifolia*, *Eulalia aurea* and *Acacia aneura* (DEC, 2008).

None of the vegetation types identified within the application area (Biota, 2008) are representative of this PEC or any other ecological community at risk.

It is not anticipated that the proposed clearing will significantly impact on the conservation of this PEC as the clearing occurs south of an existing rail line which effectively creates a barrier between the clearing area from the PEC. The loss of 12 hectares of native vegetation is not expected to significantly alter surface drainage or groundwater levels in the area, which could otherwise pose a threat to the PEC.

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

**Methodology** Biota (2008)  
DEC (2008)  
GIS database:  
- Declared Rare and Priority Flora List

**(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 18 and 82 occur within the application area (GIS Database). These vegetation associations remain at approximately 100% of their Pre-European extent (see table). Vegetation associations 18 and 82 are well represented in conservation estate within the Pilbara bioregion (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					
18	19,892,437	19,890,348	~100	Least Concern	2.1
82	2,565,930	2,565,930	~100	Least Concern	10.2
Beard veg assoc. - bioregion					
18	676,561	676,561	~100	Least Concern	16.8
82	2,563,610	2,563,610	~100	Least Concern	10.2

\* 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. (2006)  
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 several minor, non-perennial drainage lines occur within the application area (GIS Database).

A vegetation survey by Biota (2008) identified the following vegetation types within drainage lines:

**ExAanpAbSAITIoTHtEUa:** *Eucalyptus xerothermica*, *Acacia aneura var pilbarana*, low open forest over

*Acacia bivenosa*, *Santalum lanceolatum* open shrubland over *Triodia longiceps* hummock grassland and *Themeda triandra*, *Eulalia aurea* very open tussock grassland. Located in relatively broad but minor flowlines.

**EIAmTbrTw:** *Eucalyptus leucophloia* ssp. *leucophloia* scattered low trees over *Acacia maitlandii* (*A. marramamba*, *A. aneura* var. *pilbarana*, *A. atkinsiana*, *A. bivenosa*) shrubland over *Triodia brizoides*, *T. wiseana* hummock grassland. Located in a minor creek.

Neither of these vegetation types could be considered riparian vegetation. Water flow within these drainage lines would be restricted to cyclonic or thunderstorm activity.

Biota (2008) noted the presence of several claypan areas within the survey area (including the application area) that may support this species. Analysis of aerial photography reveals that all four populations recorded in the survey area occur on the edge of sump areas that were holding water at the time the image was taken. These sump areas are located on gently sloping plains and may be man-made.

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

**Methodology** Biota (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 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):

- Boolgeeda
- Wannamunna

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 lower plains' and 'narrow drainage floors and channels' land units. The soils within these land unit are not susceptible to erosion (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). Only a very small proportion of the application area (2.6 hectares of approximately 112 hectares) occurs within this land system. It is likely that those areas that fall within the Wannamunna Land System are likely to exhibit characteristics of the Boolgeeda Land System.

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

**Methodology** 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 Marandoo minesite is located on a 48 square kilometre reserve held under a State Agreement Act that is surrounded by Karijini National Park (CALM, 1999). Karijini National Park is a Redbook area that is listed by the Australian Heritage Commission on the Register of the National Estate (GIS Database; CALM, 1999). Karijini National Park contains a representative sample of many of the geological types, plant and animal communities and landscape forms of the central portion of the Hamersley Range (CALM, 1999). It is managed by the Department of Environment and Conservation.

Many flora and fauna species of special significance occur within Karijini National Park. The area contains populations of eight species of flora considered as rare, poorly known or of restricted distribution at either the National or State level (Australian Heritage Database, 2008). Karijini National Park is home to many conservation significant fauna species, including the Bilby, Western Pebble-mound mouse, Northern Quoll and Pilbara Olive Python. The area is scenically outstanding (Australian Heritage Database, 2008).

The area and its Aboriginal sites of significance are highly valued by the Punjima, Innawonga and Wurruthundi Aboriginal people (Australian Heritage Database, 2008).

The Marandoo tenement and the associated transport corridors have been excised from the Park, dividing it in two and resulting in extensive common boundaries (CALM, 1999). Considering the application area is located adjacent to existing mining operations and on previously disturbed land, it is not likely that the proposal will cause any appreciable additional impact on the conservation values of Karijini National Park.

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

**Methodology** Australian Heritage Database (2008)  
CALM (1999)

**(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.

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 315.1 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 (12 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 (12 hectares) in relation to the size of the Ashburton River catchment area (787,774,321 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: WC97/089 (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 (DoW, 2008). 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.

Two submission were received from direct interest parties.

One submission raised no objections to the proposed clearing.

The other 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 AML70/272 with regard to Principle (e).

A search of available databases reveals there are 3 known Aboriginal sites of significance within the application area; P00880, P04689 and P07352 (GIS Database). It is the proponent's responsibility to comply with the Aboriginal Heritage Act, 1972 and ensure that no sites of Aboriginal significance are damaged though the clearing process. The assessing officer is aware that Hamersley Iron conduct heritage surveys prior to any ground disturbance and avoids sites of significance where possible.

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 12 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 in the longer term.

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

## 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 (c), is not likely to be at variance to Principles (a), (b), (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 regard to weed management, avoiding priority flora species, recording and reporting areas cleared.

## 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.