



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2382/2
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 (AML 70/4)
Local Government Area: Shire of Ashburton
Colloquial name: Mount Tom Price Iron Ore Mine

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
228		Mechanical Removal	Mineral production and geotechnical drilling

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 24 March 2011

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. Three Beard vegetation associations are located within the application area (GIS Database):

82 - Hummock Grasslands, low tree steppe; snappygum over *Triodia wiseana*. 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*.

162 - Shrublands; snakewood scrub. According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 162 is a shrubland dominated by *Acacia xiphophylla*, with sub-dominants of *A. aneura*, *A. victoriae*, *Senna glutinosa* ssp. *charlesiana* over *Triodia longiceps* and *Maireana melanocoma*.

567 - Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *T. basedowii*. According to the Shared Land Information Platform (SLIP, 2007), Beard vegetation association 567 is a shrubland dominated by *Acacia aneura*, with sub-dominants of *Senna* sp., *A. pruinocarpa*, *A. xiphophylla* and *Eremophila* sp.

Keith Lindbeck and Associates conducted a vegetation survey over the application area and surrounding vegetation between November 2006 and March 2007. As a result, 16 vegetation types were identified as occurring within the application areas (Keith Lindbeck and Associates, 2007). These were:

H2-1 - *Eucalyptus leucophloia* scattered low trees over *Acacia hamersleyensis* and *A. bivenosa* closed heath over *Triodia wiseana* hummock grassland. Located on very steep serrated escarpments.

H5 - *Eucalyptus leucophloia* and *Corymbia hamersleyana* low open woodland over high shrubland over *Triodia wiseana* hummock grassland with open tussock grassland. Located on smooth rocky slopes.

H6 - Scattered low trees over open shrubland over open spinifex hummock grassland and open tussock grassland. Located on steep rocky slopes.

H7-4 - *Acacia citrinoviridis*, *A. pruinocarpa*, *A. aneura* and *Corymbia hamersleyana* woodland over low shrubland over *Triodia wiseana* hummock grassland. Located on low rocky slopes.

H8-1 - *Acacia aneura* and *A. pruinocarpa* low open woodland over open shrubland over *Triodia wiseana* hummock

grassland. Located on undulating rocky hillocks.

H11 - *Acacia pruinocarpa* and *Eucalyptus leucophloia* low open woodland over shrubland over *Triodia wiseana* hummock grassland. Located in broad sub-valley with steep slopes and deeply incised valley floors.

H12 - *Eucalyptus leucophloia* scattered low trees over high open shrubland over *Triodia wiseana* hummock grassland. Located in broad sub-valleys with moderate slopes.

H13 - *Acacia aneura* and *A. pruinocarpa* low woodland (with patches of *A. aneura* low closed forest) over shrubland over *Triodia epactia* and *T. wiseana* hummock grassland or *Themeda* sp. Mt Barricade tussock grassland. Located in moderately sized sub-valleys.

H14 - *Eucalyptus leucophloia* and *Acacia pruinocarpa* low open woodland over shrubland over *Triodia wiseana* hummock grassland or *Themeda* sp. Mt Barricade tussock grassland. Located in minor sub-valleys.

H15 - *Acacia aneura* var. *pilbarana*, *A. citrinoviridis* and *A. pruinocarpa* low closed forest with open scriub and mixed spp. grassland. Located in narrow incised shallow gorges.

H16 - *Acacia bivenosa* open scrub over *Triodia wiseana* hummock grassland. Located in minor shallow sub-valleys.

H17-1 - *Acacia pruinocarpa* low open forest over *Triodia wiseana* hummock grassland. Located on colluvial upland slopes.

P1 - Scattered *Corymbia hamersleyana* low trees over low open shrubland over open *Triodia wiseana* hummock grassland. Located on stony flat plains.

P2-1 - *Eucalyptus leucophloia* and *Acacia pruinocarpa* low woodland over *Triodia wiseana* hummock grassland. Located on terraced plains.

W1 - Scattered *Eucalyptus leucophloia* low trees over *Triodia epactia* and *T. wiseana* hummock grassland and *Eriachne* aff. *mucronata* and *Themeda triandra* tussock grassland. Located in sub-valley boulder cascades.

W4-1 - *Acacia aneura* var. *pilbarana*, *A. citrinoviridis* and *A. pruinocarpa* low open forest over open herbland and open tussock grassland. Located on alluvial meadows.

Clearing Description	Hamersley Iron Pty Ltd has applied to clear 228 hectares for the purpose of creating and extending waste dumps and stockpiles, and a pit cutback. Vegetation within the application area is typical of the vegetation within the Pilbara region. There are four separate areas subject to this application. Three of these occur to the north and for the purpose of this assessment will be termed the 'north application area'. The fourth area occurs 3 kilometres to the south and for the purpose of this assessment will be termed the 'south application area'.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994); To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
Comment	Vegetation condition based on visual observation made by the assessing officer during a site visit in January 2008. Vegetation rated as 'excellent' occurs on the hill slopes and hill tops, vegetation rated as 'degraded' occurs close to existing waste dumps and other mine infrastructure. Approximately 35% of the area surveyed by Keith Lindbeck and Associates (2007) is either cleared or in a degraded state.

Clearing permit CPS 2382/1 was granted by the Department of Mines and Petroleum on 1 May 2008, and is valid from 31 May 2008 to 31 March 2013. The clearing permit authorised the clearing of 228 hectares of native vegetation. An application for an amendment to clearing permit CPS 2382/1 was submitted by Hamersley Iron Pty Ltd on 15 February 2011. The proponent has requested to change the annual reporting date from 31 March each year for the life of the permit to 31 July each year for the life of the permit. There were no additional environmental impacts as a result of this amendment.

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 the Hamersley (PIL3) Interim Biogeographic Regionalisation of Australia 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
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(CALM, 2002). The vegetation described within the application area (Keith Lindbeck and Associates, 2007) is typical of the bioregion.

Vegetation surveys of the application area and surrounding vegetation (total area surveyed - 17.2 km²) identified 295 flora species from 49 Families (Keith Lindbeck and Associates, 2007). This is considered to be biologically diverse. It is noted by the assessing officer that approximately 35% of the area surveyed was cleared. Poaceae, Malvaceae, Mimosaceae, Asteraceae, Papilionaceae, Amaranthaceae, and Myoporaceae families are particularly diverse within the application area (Keith Lindbeck and Associates, 2007). This is typical of the floristics of the Pilbara IBRA Region.

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, 2008). The database search found 63 reptile species from 9 Families as potentially occurring within the application area, or within 50 km of the application area. 53 avian fauna species from 23 Families have also been recorded within 50 km of the application area, reflecting the diverse range of habitats available.

Five alien weed species were recorded within the vegetation survey area (Keith Lindbeck and Associates, 2007). 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 through repeated fires. No major infestations were observed. It is not expected that the clearing of vegetation will lead to an infestation of weeds within the application area or surrounding vegetation.

Although the application areas are high in floral and faunal diversity, they are not likely to have greater diversity than similar areas within the region, particularly given areas within the application area that have been degraded by previous disturbance from mining activities.

Based on the above, the proposed clearing may be at variance to this Principle. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Methodology CALM (2002)
Keith Lindbeck and Associates (2007)
Western Australian Museum (2008)
GIS Database:
- IBRA WA (Regions - 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 coordinates 117.5°, 22.5° and 118.1°, 23.1°, representing a 50 kilometre radius around the application areas.

This search identified 6 Amphibian, 53 Avian, 21 Mammalian and 63 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: Striated Grasswren (*Amytornis striatus striatus*), Night Parrot (*Pezoporus occidentalis*), Long-tailed Dunnart (*Sminthopsis longicaudata*), Orange Leaf-nosed Bat (*Rhinonictis aurantius*), Lakeland Downs Mouse (*Leggadina lakedownensis*), Pebble-mound Mouse (*Pseudomys chapmani*) and Pilbara Olive Python (*Liasis olivaceus barroni*).

Keith Lindbeck and Associates conducted a desktop search of the DEC's Threatened Fauna Database and the Department of Environment and Water Resources "Protected Matters Search Tool. In addition to those species of conservation significance listed above, this search identified the following species within the search area (Keith Lindbeck and Associates, 2007): Peregrine Falcon (*Falco peregrinus*), Australian Bustard (*Ardeotis australis*), Northern Quoll (*Dasyurus hallucatus*), and Rainbow Bee-eater (*Merops ornatus*). The search also identified a range of migratory marine and wetland bird species. However, it is unlikely that the proposed clearing will impact on these migratory species due to their transitory presence within the application areas and the highly disturbed nature of the vegetation within some sections of the application areas.

The Orange Leaf-nosed Bat (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) 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 and Water Resources, 2007a). 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 and Water Resources, 2007a). There are no abandoned mine shafts of substantial caves within the application area. Therefore, the vegetation within the application areas is not significant habitat for this species.

The Northern Quoll (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) 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). Whilst a rocky areas exist within the application areas, the absence of available water suggests that the vegetation within the application area is not significant habitat for this species.

The Night Parrot (Schedule 1 - Fauna that is rare or likely to become extinct, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) is a very seldom seen bird that occupies dense, low vegetation, which provides them shelter during the day (Australian Museum Online, 2007b). Most records come from hummock grasslands with spinifex (porcupine grass, *Triodia* sp.), or from areas dominated by samphire. It has been suggested that birds move into the grasslands when *Triodia* is seeding (Australian Museum Online, 2007b). They have also been reported in low chenopod shrublands comprising saltbush and bluebush, and from areas of Mitchell grass, *Astrelba* sp. with scattered chenopods (Australian Museum Online, 2007b). Many records have come from waterholes, and almost all reports from areas of *Triodia* have noted the presence of nearby water (Australian Museum Online, 2007b). As this species is very rare, and little is known of its distribution, it is difficult for the assessing officer to determine what impact, if any, the proposed clearing will have on this species. However, given the lack of permanent water in the application areas, it is unlikely that the vegetation to be cleared represents 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, 2006*) prefers deep gorges and water holes in the ranges of the Pilbara region (Pearson, 1993 in Department of Environment and Water Resources, 2007b). 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, 2007b). The application areas do not provide habitat for this species.

The Rainbow Bee-eater (Migratory species under the *Environmental Protection and Biodiversity Conservation Act, 1996*) 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 Peregrine Falcon (Schedule 4 - Other specially protected fauna, *Wildlife Conservation (Specially Protected Fauna) Notice, 2006*) is known to inhabit most areas in Australia and utilise cliffs, tall trees and granite outcrops for nesting (Australian Museum Online, 2007c). The Peregrine Falcon is likely to occur sporadically within the application areas, but is not known to nest in the area. Given the vast amounts of available habitat within the Pilbara region that this species can utilise, it is unlikely that the vegetation within the application areas is 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). Pebble mounds were observed at several locations but not in dense colonies (Hamersley Iron, 2008). The vegetation within the application areas may be significant habitat for this species, although the species is found in many locations within the Hamersley Iron ranges, including Karijini National Park.

The Lakeland Downs Mouse (DEC - Priority 4) is known to occur on sandy soils and cracking clays that support native grasses (DEC, 2006). It is known that this species experiences great fluctuations in population size depending on seasonal factors, reaching plague proportions in good years (DEC, 2006). The soil types located within the application areas appears to be gravelly stony soils and therefore the area may not be ideal habitat for this species. Therefore, it is unlikely that the vegetation to be cleared is significant habitat for this species.

The Long-tailed Dunnart (DEC Priority 4) occur in rugged rocky landscapes that support a low open woodland or shrubland of *Acacia*'s (especially Mulga) with an understorey of spinifex hummocks, and (occasionally) also perennial grasses and Cassias from the Pilbara and upper Gascoyne region in the West (DNREA, 2007). They have also more recently been recorded from plateaus near breakaways and scree and rugged boulder strewn scree 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 Australian Bustard (DEC Priority 4) prefers tussock grassland, *Triodia* hummock grassland, grassy woodland and low shrublands (Garnett et al, 2000). This species may occur within the application area, however, given the widespread distribution of this species, the habitat within the application area is not likely to be significant habitat for this species.

Striated Grasswrens (DEC Priority 4) live on sandplains dominated by mature *Triodia* hummock grassland with an overstorey of shrubs, usually mallee eucalypts (Garnett et al, 2000). Currently the major threat throughout the subspecies' range is fire, especially extensive fires that destroy mature hummock grassland over large areas (Garnett et al, 2000). There are vast amounts of *Triodia* hummock grassland within the Pilbara IBRA region that this species can utilise. It is not likely that the vegetation within the application areas is significant habitat for this species.

The assessing officer conducted a site visit of the application areas in January 2008. During this visit the assessing officer noted that vegetation condition ranged from 'excellent' to 'degraded' depending on its distance from mining activities. Vegetation rated as excellent had been burnt in the previous 2-3 years. None of the fauna habitat present within the application areas could be considered to be unique, restricted or fauna specific.

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

Methodology Australian Museum Online (2007a)
Australian Museum Online (2007b)
Australian Museum Online (2007c)
Braithwaite et al (1994)
DEC (2006)
Department of Environment and Water Resources (2007a)
Department of Environment and Water Resources (2007b)
DNREA (2007)
Firestone (1999)
Garnett et al (2000)
Hamersley Iron (2008)
Keith Lindbeck and Associates (2007)
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 areas (GIS Database).

The application areas were subject to a flora survey by Keith Lindbeck and Associates (2007). This survey revealed four Priority flora species within the application areas. These are: *Sida* sp. Pilbara (P1), *Indigofera ixocarpa* (P2), *Triumfetta leptacantha* (P3) and *Eremophila magnifica* ssp. *magnifica* (P4).

Sida sp. Pilbara occurs as a population of five plants within the north application area (Keith Lindbeck and Associates, 2007). This species has been recorded from 16 locations (11 from Pilbara Iron database, 5 from DEC database) within the Central and Western Pilbara (Keith Lindbeck and Associates, 2007). The species has been recorded mainly from the Brockman Iron Formation on the top of hills in stony skeletal soil, although there is a record of the species occurring in well draining stony loamy sand at the base of a steep slope (Western Australian Herbarium, 1998-). This type of habitat is extensive in the Pilbara region. According to Keith Lindbeck and Associates (2007) another five populations of this species occur in the Tom Price area and will not be impacted by this clearing. Given the vast amount of vegetation within the Pilbara region that could be potential habitat for this species, the vegetation within the application area is not likely to be significant habitat for this species.

Indigofera ixocarpa was located at 26 sites within the north application area, totalling 1400 plants and one population in the south application area (Keith Lindbeck and Associates, 2007). There are 53 known populations within the Tom Price minesite and another population known from between Nullagine and Marble Bar. Records from the Western Australian Museum indicate that the species occurs after recent disturbance or fire. Keith Lindbeck and Associates (2007) suggest this species would be ideal for rehabilitation of disturbed areas. It appears to be prolific in the Tom Price area and it is unlikely that the vegetation within the application areas is significant habitat for this species.

Triumfetta leptacantha has been recorded from eight locations within the north application area (Keith Lindbeck and Associates, 2007). There are 115 known locations of this species within Pilbara Iron's database (Keith Lindbeck and Associates, 2007), ranging from one to 50 plants per site. It favours rocky shelters (eg/ gullies) in range systems. It is common in the central Pilbara region from Tom Price to Roy Hill Station (Keith Lindbeck and Associates, 2007). The vegetation within the application areas does not appear to be significant habitat for this species.

Eremophila magnifica ssp. *magnifica* was located at 11 locations within the north application area, totalling 150 plants (Keith Lindbeck and Associates, 2007). Over 3650 plants have been recorded in the Pilbara Iron and DEC threatened flora databases, with 19 locations totalling over 450 plants occurring within the Tom Price mine

site. It appears to favour rocky hillsides and hill tops (Western Australian Herbarium, 1998-) which are extensive in the Pilbara region. Given the large number of populations that will be found in the local area and regionally, 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.

Methodology Keith Lindbeck and Associates (2007)
Western Australian Herbarium (1998-)
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 nearest TEC is located approximately 40 km to the east. At this remote distance there is little likelihood of any impact to this TEC 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 (Keith Lindbeck and Associates, 2007).

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

Methodology Keith Lindbeck and Associates (2007)
GIS Database:
- Threatened Ecological Sites

(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 82, 162 and 567 occur within the application area (GIS Database). These vegetation associations remain at approximately 100% of their Pre-European extent. All three Beard vegetation associations are well represented in conservation estate.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves*
IBRA Bioregion – Pilbara	17,804,193	17,785,001	~99.89%	Least Concern	~6.32%
Beard veg assoc. – State					
82	2,565,901	2,565,901	~100%	Least Concern	~10.24%
162	547,312	547,312	~100%	Least Concern	~11.36%
567	777,507	777,507	~100%	Least Concern	~22.33%
Beard veg assoc. - Bioregion					
82	2,563,583	2,563,583	~100%	Least Concern	~10.25%
162	20,009	20,009	~100%	Least Concern	No information available
567	776,824	776,824	~100%	Least Concern	~22.35%

* Shepherd (2009)

** 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 (2009)
GIS Database:
- IBRA WA (Regions - subregions)
- 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 several minor, non-perennial drainage lines within the application area (GIS Database).

According to a vegetation survey conducted over the application area, two vegetation types are subject to water flows. **W1 - 'Sub Valley Rock Boulder Cascade'** is described as a 'drainage line along sub-valley floors consisting of a boulder cascade. Creek bed not always apparent and system can be deeply incised'. (Keith Lindbeck and Associates, 2007). **W4-1 - 'Alluvial Meadows'** is described as 'alluvial areas subject to inundation and associated with the Broad Ephemeral Creek (W1) systems. Ranging from 10 - 100 metres in width and with smaller braided channels. Neither of these vegetation types host vegetation that is consistent with vegetation that is riparian in nature. It is most likely that the vegetation occurs in areas that are a focal point for surface run-off during times of intense rainfall.

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

Methodology Kieth Lindbeck and Associates (2007)
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 areas have been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al 2004).

The north application area is composed of the following land systems (GIS Database):

- 1) Boolgeeda
- 2) Newman

The south application area is composed of the following land systems (GIS Database):

- 1) Boolgeeda
- 2) Newman
- 3) Rocklea

The Boolgeeda Land System is described as stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands. The vegetation within the system is not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk, 2004). An analysis of aerial photography for the application area reveals the application area is most likely to fall within the 'Stony Upper Plains' land unit. The soil types within these land units (shallow stony red loamy soils) are not susceptible to erosion (Van Vreeswyk et al, 2004). The vegetation described by Van Vreeswyk et al (2004) accurately reflects the vegetation types described in vegetation surveys conducted over the area (Keith Lindbeck and Associates, 2007).

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 the 'Lower slope' land units. The soil types within these land units (stony soils, red shallow loams, red loamy earths and red shallow sands) are not susceptible to erosion (Van Vreeswyk et al, 2004). The vegetation described by Van Vreeswyk et al (2004) accurately reflects the vegetation types described in vegetation surveys conducted over the area (Keith Lindbeck and Associates, 2007).

The Rocklea Land System is described as basalt hills and restricted stony plains with hard spinifex (Van Vreeswyk et al, 2004). An analysis of aerial photography suggests the application area is most likely to fall with the 'lower slopes and stony interfluves' land unit. The soil within this land unit are not susceptible due to the presence of dense pebble and gravel mantle. The vegetation described by Van Vreeswyk et al (2004) accurately reflects the vegetation types described in vegetation surveys conducted over the area (Keith

Lindbeck and Associates, 2007).

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

Methodology Van Vreeswyk et al (2004)
Keith Lindbeck and Associates (2007)
GIS Database:
- IBRA WA (Regions - subregions)
- Pre-European Vegetation

(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 14 kilometres to the west 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.

It is noted by the assessing officer that large areas of vegetation between the application area and Karijini National Park were burnt around late December 2007 to early January 2008.

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

Methodology GIS Database:
- DEC Tenure

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

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

According to available databases, the application area is not located within a Public Drinking Water Supply 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 water course (DoW, 2008). The area is located in a RIWI Act Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

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 311 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 likely 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 license (DoW, 2008). 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 (18 hectares) compared to the size of the Hamersley groundwater province (101,668 kilometres²) (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 Database:
- 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 method of clearing and the small area to be cleared are not likely to lead to an increase in flood height or duration. Flooding is not expected within the application area as it is located higher in the landscape.

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 one Native Title Claim (WC97/089) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (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 two registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

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. The proponent is required to obtain permits to extract groundwater in this area.

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.

Clearing permit CPS 2382/1 was granted by the Department of Industry and Resources (now Department of Mines and Petroleum) on 1 May 2008, and is valid from 31 May 2008 to 31 March 2013. The clearing permit authorised the clearing of 228 hectares of native vegetation. An application for an amendment to clearing permit CPS 2382/1 was submitted by Hamersley Iron Pty Ltd on 15 February 2011. The proponent has requested to change the annual reporting date from 31 March each year for the life of the permit to 31 July each year for the life of the permit. There were no additional environmental impacts as a result of this amendment.

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

4. References

Australian Museum Online (2007a) Bats in Australia, Orange Leaf-nosed Bat. <http://www.amonline.net.au/bats/records/bat22.htm> Accessed 8/6/07.

Australian Museum Online (2007b) Night Parrot. http://www.austmus.gov.au/birds/research/night_parrot.htm Accessed 9/8/07.

Australian Museum Online (2007c) Birds, Peregrine Falcon. http://www.austmus.gov.au/wild_kids/birds/perigrine_falcon.htm Accessed 9/8/07.

BoM (2008) Climate Averages - Paraburdoo. http://www.bom.gov.au/climate/averages/tables/cw_007185.shtml Accessed 28/1/08. Bureau of Meteorology.

Braithwaite RW and Griffiths AD (1994) Demographic variation and range contraction in the Northern Quoll, *Dasyurus hallucatus* (Marsupalia: *Dasyuridae*). *Wildlife Research* 21, 203-217.

DEC (2006) Lakeland Downs Short-tailed Mouse, *Leggadina lakedownensis* (Watts, 1976) http://www.naturebase.net/component/option,com_docman/task,doc_download/gid,145/Itemid,1288/mode,view/

Accessed 9/8/07.

- Department of Conservation and Land Management (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions.
- Department of Environment and Water Resources (2007a) The Action Plan for Australian Bats, Orange Leaf-nosed Bat. <http://www.environment.gov.au/biodiversity/threatened/publications/action/bats/14.html> Accessed 8/6/07.
- Department of Environment and Water Resources (2007b) Olive Python (Pilbara subspecies). http://eied.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66699 Accessed 9/8/07.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- DNREA (2007) Threatened Species Of The Northern Territory - Long-Tailed Dunnart (*Sminthopsis longicaudata*). http://nt.gov.au/nreta/wildlife/animals/threatened/pdf/mammals/longtailed_dunnart_vu.pdf Accessed 16/10/07.
- Department of Natural Resources, Environment and the Arts, Northern Territory.
- DoW (2008) Advice for land clearing application 2235/1. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR), received 21/1/08. Department of Water, Western Australia.
- Firestone KB (1999) The Application of Molecular Genetics to the Conservation Management of Quolls, *Dasyurus* Species (*Dasyuridae: Marsupialia*), December 1999. <http://www.library.unsw.edu.au/~thesis/adt-NUN/public/adt-NUN20010105.095232> Accessed 8/1/08.
- Garnett ST & Crowley GM (2000) Action Plan for Australian Birds 2000. Environment Australia, Canberra.
- Hamersley Iron (2008) Supporting documentation supplied within clearing permit application for Mt Tom Price Iron Ore Mine Henry Walker Dump Extension, Dowd LG Stockpile/Dump, North Deposit Waste Dump and Topsoil Stockpile, Mining of NTD5 Cutback. Hamersley Iron Pty Ltd.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Keith Lindbeck and Associates (2007) Vegetation Survey and Land Clearing Information for Proposed Mining Areas; East, West and Central Pits, Tom Price Minesite. Unpublished report prepared for Hamersley Iron Pty Ltd by Keith Lindbeck and Associates, Western Australia
- Luke GJ, Burke KL and O'Brien TM (1987) Evaporation Data for Western Australia. Resource Management Technical Report No. 65. Department of Agriculture, Western Australia.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- SLIP (2008) Shared Land Information Platform <http://spatial.agric.wa.gov.au/slip/home.htm> Accessed 29/3/08.
- Start AN, Anstee SD & Endersby M, (2000) A review of the biology and conservation status of the Ngadji, *Pseudomys chapmanii* Kitchener 1980 (Rodentia: *Muridae*). CALMScience, Vol 2, No 2, p 125-147.
- Van Vreeswyk AME, Payne AL, Leighton KA & Hennig P, (2004) Technical Bulletin No. 92: An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/> (Accessed 3/4/2008).
- Western Australian Museum (2008) Faunabase - Western Australian Museum, Queensland Museum and Museum & Art Gallery of NT Collections Databases. <http://www.museum.wa.gov.au/faunabase/prod/index.htm> Accessed 21/2/08. Western Australian Museum.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia

IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

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

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

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