



Clearing Permit Assessment Report

1. Application details

1.1. Permit application details

Permit application No.: 4039/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**
Postal address: GPO Box A42 Perth WA 6837
Contacts: Phone: 9366 5467
Fax: 9366 6298
Email: julie.neilson@riotinto.com

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 4SA (AML70/4)*
Colloquial name: Dowd Low Grade and Marra Mamba Extension

1.4. Application

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

1.5. Decision on application

Decision on Permit Application:
Decision Date:

2. Background

2.1. History (including previous clearing permits, compensation paid, caveats on title deeds etc.)

Date	Comments
02 November 2010	Application checks completed, allocated to Mandy Cross for assessment.
02 November 2010	To be advertised 08 November 2010

2.2. Existing environment and information

2.2.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>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 in a regional context.</p> <p>The following Beard vegetation associations have been mapped within the application area (GIS Database):</p> <p>162: Shrublands; snakewood scrub; and 567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and <i>Triodia basedowii</i>.</p> <p>Numerous flora and vegetation surveys of areas in and around the application area have been commissioned by Hamersley Iron Pty Ltd since 2003. Keith Lindbeck and Associates undertook a flora and vegetation survey of 1727 hectares between November 2006 and March 2007, with an opportunistic site visit conducted in June 2007. This included the application area. The purpose of this survey was to consolidate the information obtained by Hamersley Iron Pty Ltd to date, and also complete the areas not surveyed.</p> <p>Twenty seven landscape units in the following three broad groupings were defined during the survey:</p> <ol style="list-style-type: none"> 1. Ranges and Hills; 2. Plains; and 3. Watercourses. 	<p>Hamersley Iron Pty Ltd has applied to clear up to 27.8 ha of rehabilitated vegetation. The application area is located approximately 9 kilometres south west of Tom Price at the Tom Price minesite (GIS Database).</p> <p>The purpose of the clearing permit application is to increase mineral production by extending the Marra Mamba pit. Clearing will be carried out using a dozer (Keith Lindbeck and Associates, 2010).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994); To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).</p>	<p>The vegetation condition is based on the flora and vegetation surveys carried out by KLA between November 2006, and June 2007.</p>

The surveyed areas consist of typical Central Pilbara rocky ranges and rolling spinifex covered plains, with six dominant species across all sites. These six dominant species were: *Acacia aneura* var. *pilbarana*, *A. Bivenosa*, *A. Pruinocarpa*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Triodia wiseana*.

The application area falls within the surveyed area, and covers 27.8 hectares. From the vegetation maps provided by Keith Lindbeck and Associates (2007), the assessor has identified that the application area was not included in the vegetation mapping. Keith Lindbeck and Associates (2007) stated that vegetation mapping was not conducted on disturbed vegetation. Correspondence with Rio Tinto Iron Ore (pers comm. Rio Tinto Iron Ore, 2010) highlighted that the application area was previously cleared and now consists of rehabilitated species.

2.2.2. Items of interest

Theme	Value	Within meters
Declared Rare and Priority Flora List	16597	10000
Declared Rare and Priority Flora List	16600	10000
Declared Rare and Priority Flora List	22423	10000
Declared Rare and Priority Flora List	22424	10000
Declared Rare and Priority Flora List	22435	10000
Declared Rare and Priority Flora List	22436	10000
Declared Rare and Priority Flora List	27350	10000
Declared Rare and Priority Flora List	27353	10000
Declared Rare and Priority Flora List	27354	10000
Declared Rare and Priority Flora List	27355	10000
Declared Rare and Priority Flora List	27356	10000
Declared Rare and Priority Flora List	27357	10000
Declared Rare and Priority Flora List	27358	10000
Declared Rare and Priority Flora List	27359	10000
Declared Rare and Priority Flora List	27360	10000
Declared Rare and Priority Flora List	27361	10000
Declared Rare and Priority Flora List	27362	10000
Declared Rare and Priority Flora List	27363	10000
Declared Rare and Priority Flora List	27364	10000
Declared Rare and Priority Flora List	27365	10000
Declared Rare and Priority Flora List	28174	10000
Declared Rare and Priority Flora List	28180	10000
Declared Rare and Priority Flora List	28181	10000
Declared Rare and Priority Flora List	28186	10000
Declared Rare and Priority Flora List	28188	10000
Declared Rare and Priority Flora List	29306	10000
Declared Rare and Priority Flora List	29307	10000
Declared Rare and Priority Flora List	29308	10000
Declared Rare and Priority Flora List	29310	10000
Declared Rare and Priority Flora List	29311	10000
Declared Rare and Priority Flora List	30401	10000
Declared Rare and Priority Flora List	30542	10000
Declared Rare and Priority Flora List	30544	10000
Declared Rare and Priority Flora List	30547	10000
Declared Rare and Priority Flora List	31043	10000

3. Permit assessment activities

Date	Activity	Comment	Trim Ref.
22 October 2010	Department has received application		
05 November 2010	Application under assessment		
05 November 2010	Direct Interest Letter Sent	to Shire of Ashburton	
05 November 2010	Direct Interest Letter Sent	to Pilbara Native Title Service	
12 November 2010	Contacted Applicant	Emailed applicant requesting vegetation mapping for the application area.	
12 November 2010	Contacted Applicant	Applicant provided further information on the application area.	

4. 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 falls within the Hamersley sub-region of the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara bioregion (GIS Database). The vegetation within this sub-region is characterised as 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). Shepherd (2007) reported that approximately 100% of the Hamersley sub-region pre-European vegetation still exists in this bioregion.

The flora and vegetation survey conducted by Keith Lindbeck and Associates in 2006 and 2007 involved both a desktop study and a site survey of approximately 1727 hectares which included the clearing permit application area. The application area was assessed as part of the survey, however vegetation associations were not mapped due to the fact that the vegetation was highly disturbed (Keith Lindbeck and Associates, 2007). The application area currently consists of rehabilitated native vegetation (Hamersley Iron, 2010). Prior to it being cleared, a Declared Rare Flora and Priority Flora species search was conducted of the application area by Pilbara Iron in February, October and November 2003 and 17 November 2005 (Pilbara Iron, 2005).

Keith Lindbeck and Associates (2007) described 50 vegetation types from the flora and vegetation survey. There were no vegetation associations, natural features or landforms observed during the vegetation survey that were considered to be unique or of high conservation value in the context of the Pilbara bioregion (Keith Lindbeck and Associates, 2007). There are no areas of conservation estate, Threatened Ecological Communities (TECs) or Priority Ecological Communities (PEC's) occurring at, or within the immediate vicinity of, the survey area (GIS Database).

A total of 295 flora taxa were recorded within the survey area, from 112 genera and 49 families. The surveyed areas consisted of typical Central Pilbara rocky ranges and rolling spinifex covered plains, with six dominant species across all sites. These six dominant species were: *Acacia aneura* var. *pilbarana*, *A. bivenosa*, *A. pruinocarpa*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Triodia wiseana* (Keith Lindbeck and Associates, 2007).

The Department of Environment and Conservation (DEC) and Hamersley Iron database searches determined that two Declared Rare Flora (DRF) and 25 priority flora species have been recorded within the Tom Price Mine Lease area (Keith Lindbeck and Associates, 2007).

No DRF were recorded during the surveys of the application area (Keith Lindbeck and Associates, 2007; Hamersley Iron, 2010). The following seven priority flora species were recorded: (Keith Lindbeck and Associates, 2007).

- *Dampiera anonyma* P3;
- *Eremophila magnifica* subsp. *magnifica* ms P4;
- *Eremophila magnifica* subsp. *velutina* ms P3;
- *Indigofera ixocarpa* P2;
- *Olearia mucronata* P3;
- *Sida* sp. Barlee Range (S.Van Leeuwen 1642) (P3); and
- *Sida* sp. Hamersley Range (K Newbey) (P1).

All of these Priority Flora species were recorded at various locations outside of the proposed mining areas (Keith Lindbeck and Associates, 2007). The closest Priority Flora species to the application area was *Olearia mucronata* (Priority 3) which was recorded along drainage lines near the south western edge of the application area (Pilbara Iron, 2005).

As the seven Priority Flora species are not confined to the vegetation survey area or immediate vicinity, and have populations at other locations, it is considered unlikely that the proposed mining operations will impact on the conservation values of any of these species (Keith Lindbeck and Associates, 2007). Some species may respond favourably to disturbances such as the observed response of *Indigofera ixocarpa* (Priority 2) to fire. Hamersley Iron stated that it will investigate the use of Priority Flora species for mine site rehabilitation (Keith Lindbeck and Associates, 2007).

According to Keith Lindbeck and Associates (2007) five introduced flora species have been recorded as occurring within the vegetation survey area; *Cenchrus ciliaris* (Buffel Grass), *Acetosa vesicaria* (Ruby Dock), *Bidens bipinnata* (Bipinnate Beggartick), *Malvastrum americanum* (Spiked Malvastrum), *Datura leichhardtii* (Native Thornapple). The presence of introduced flora species may decrease the biodiversity of the survey area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Keith Lindbeck and Associates (2007) conducted a Threatened and Priority Fauna search of DEC databases which identified four conservation significant fauna with the potential to occur within the application area. In addition the assessing officer performed a desktop fauna search of a 40 kilometre radius around the application area using the NatureMap database. The database search recorded a total of 78 reptile species, 173 bird species, 22 mammal species and 7 amphibian species that may potentially occur within the survey area (NatureMap 2010). The results from this search indicate that the area is diverse in bird and reptile species, particularly skinks (24) and snakes (11) and parrots (10) (NatureMap 2010).

The vegetation of the application area has been previously cleared and consists of rehabilitated native vegetation (Hamersley Iron, 2010). The landforms, vegetation types and fauna habitats within the application area are well represented locally and within the Pilbara region (GIS Database and Shepherd, 2007). In addition the application area is located immediately adjacent to an established minesite and therefore, the application area is not expected to represent a higher level of diversity than other, undisturbed areas nearby. It is

considered that the proposed clearing will not reduce the biological diversity of the bioregion.

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

Methodology	CALM (2002) Hamersley Iron (2010) Keith Lindbeck and Associates (2007) NatureMap (2010) Pilbara Iron (2005) Shepherd (2007) GIS Database: <ul style="list-style-type: none">- IBRA WA (Regions - Sub-Regions)- DEC tenure- Pre-European vegetation- Threatened Ecological Sites buffered
Officer	Mandy Cross

(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 assessor conducted a search of the NatureMap database. This identified that 281 fauna species could potentially occur within a 40 kilometre radius of the application area (117°46'37"E and 22° 33'03"S) (NatureMap, 2010).

Of the 281 fauna species, nine had conservation status as listed below (NatureMap, 2010). Four of these species were also identified by Keith Lindbeck and Associates (2007) during the desktop study generated in 2006.

- *Amytornis striatus* subsp. *striatus* (Striated Grasswren) (P4);
- *Ardeotis australis* (Australian Bustard) (P4);
- *Burhinus grallarius* (Bush Stone-curlew) (P4);
- *Falco peregrines* (Peregrine Falcon) (Schedule 4 as listed by DEC);
- *Falco peregrinus* subsp. *macropus* (Schedule 4 as listed by DEC);
- *Lagorchestes conspicillatus* subsp. *leichardtii* (Spectacled Hare-wallaby) (P3);
- *Leggadina lakedownensis* (Lakeland Downs Mouse) (P4);
- *Liasis olivaceus* subsp. *barroni* (Olive Python) (Vulnerable);
- *Pseudomys chapmani* (Western Pebble-mound Mouse) (P4); and
- *Sminthopsis longicaudata* (Long-tailed Dunnart) (P4).

There were no field observations of fauna recorded during the flora and vegetation survey; however potential fauna habitats were recorded during the survey. Three broad habitat types were defined during the survey (Keith Lindbeck and Associates, 2007). These were ranges and hills, plains, and watercourses. Within these habitat units, Keith Lindbeck and Associates (2007) reported that 50 vegetation types were identified, none of which were considered as being restricted to the survey area (Keith Lindbeck and Associates, 2007).

During the flora and vegetation survey, scattered colonies of Western Pebble-mound Mouse mounds were observed at several locations within the survey area (Keith Lindbeck and Associates, 2007). Keith Lindbeck and Associates (2007) reported that both the Pebble-mound Mouse and the Lakeland Downs Mouse could occur in areas proposed for mining but are more likely to occur on lowland flats or rolling plains (Keith Lindbeck and Associates, 2007). Both species occur widely throughout the Pilbara and surrounding regions. The proposed clearing is likely to have some impact on local populations, but minimal impact on a regional scale. The five avifauna species are highly mobile and can avoid mining areas. The hilly habitat types observed throughout the survey area are not considered to be preferred or favoured by these species (Keith Lindbeck and Associates, 2007).

The three species (Spectacled Hare-wallaby, Olive Python and the Long-tailed Dunnart) which were not identified within the 2006 desktop study were also shown to have potential to occur in the area (NatureMap, 2010). An analysis of the habitats favoured by these species was conducted by assessor.

The Olive Python prefers deep gorges and water holes in the ranges of the Pilbara region (Department of Sustainability, Environment, Water, Population and Communities, 2008). This fauna habitat was not recorded within the application area.

The Long-tailed Dunnart is found in rugged, rocky areas of central Western Australia and is restricted to the granite outcrop areas (Withers and Edward, 1997). This fauna habitat was not recorded within the application area.

The Spectacled Hare-wallaby is considered rare and scattered in Western Australia, but is more common in the Northern Territory and Queensland (Department of Sustainability, Environment, Water, Population and

Communities, 2008), where it inhabits open forests, woodlands, shrublands, and hummock grasslands, preferring areas where there is a mosaic of vegetation due to differences in fire history (Department of Sustainability, Environment, Water, Population and Communities, 2008).

The fauna habitats recorded within the survey area are well represented within the broader region (GIS Database) and the Pilbara bioregion remains largely uncleared (Shepherd, 2007). In addition the application area occurs adjacent to existing mining operations and has already been previously disturbed and now contains rehabilitated species. Therefore it is not expected that the application area represents significant fauna habitat compared to surrounding undisturbed areas.

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

Methodology Keith Lindbeck and Associates (2007)
NatureMap (2010)
Shepherd (2007)
Withers and Edward (1997)
GIS Database:
- Pre-European Vegetation

Officer Mandy Cross

(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

A desktop review was conducted by Keith Lindbeck and Associates (2007) to determine if any Declared Rare Flora (DRF) and Priority Flora occur within the Tom Price Mine Lease area. This review consisted of assessing both the DEC's and Pilbara Iron's Declared Rare and Priority Flora databases (Keith Lindbeck and Associates, 2007).

The search of the databases revealed that two DRF species, *Lepidium catapycnon* and *Thryptomene wittweri* occur within the Tom Price Mine Lease area (Keith Lindbeck and Associates, 2007).

Lepidium catapycnon was recorded from one location on a steep hillside near the Tom Price Mine Operations Centre, approximately 2 kilometres from the survey area. A second population of *Lepidium catapycnon* occurs north of the tailings dam, approximately 7 kilometres from the survey area (Keith Lindbeck and Associates, 2007). No further occurrences of *Lepidium catapycnon* have been recorded near the vegetation survey area despite extensive surveys undertaken by Pilbara Iron botanists and Keith Lindbeck and Associates over a four year period (Keith Lindbeck and Associates, 2007). *Thryptomene wittweri* is known to occur within the Pilbara on isolated hilltops, however none were recorded within the survey area (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)
Officer Mandy Cross

(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's) within the application area (GIS Database). In addition, Keith Lindbeck and Associates (2007) reported that no vegetation communities recorded during the flora and vegetation survey were representative of TEC's (Keith Lindbeck and Associates, 2007).

The closest TEC, Themeda Grasslands is located 23 kilometres north to north east from the application area (GIS Database). At such distance from the application area, this TEC is unlikely to be affected by the proposed clearing.

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 Buffered

Officer Mandy Cross

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

Comments Proposal is not at variance to this Principle

The application area falls within the Hamersley sub-region of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) reported that approximately 99.95% of the Pre-European vegetation remains within the Pilbara bioregion (see table).

The vegetation of the application area has been broadly mapped as Beard vegetation associations:

162: Shrublands; snakewood scrub; and

567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and *Triodia basedowii* (GIS Database).

According to Shepherd (2007) approximately 100% of these Beard vegetation associations remain at both a state and bioregional level. In addition both Beard vegetation associations are well represented in conservation estate (see table below).

Therefore the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,187	17,794,646	~99.95	Least Concern	6.32
Beard vegetation associations - State					
162	547,312	547,312	~100	Least Concern	11.4
567	777,507	777,507	~100	Least Concern	22.3
Beard vegetation associations - Bioregion					
162	20,009	20,009	~100	Least Concern	0
567	776,824	776,824	~100	Least Concern	22.4

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)

Presumed extinct Probably no longer present in the bioregion

Endangered* <10% of pre-European extent remains

Vulnerable* 10-30% of pre-European extent exists

Depleted* >30% and up to 50% of pre-European extent exists

Least concern >50% pre-European extent exists and subject to little or no degradation over a majority of this area

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

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

Methodology Department of Natural Resources and Environment (2002)

Shepherd (2007)

GIS Database:

- IBRA WA (Regions - Sub Regions)

- Pre-European Vegetation

Officer Mandy Cross

(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 may be at variance to this Principle

There are no permanent watercourses or wetlands within or in close proximity to the application area (GIS Database). Six minor ephemeral creeks pass through the application area (GIS Database).

Two riparian vegetation habitats were described adjacent to the application area during the flora and vegetation

survey (Keith Lindbeck and Associates, 2007). This region has an average annual rainfall of approximately 308 millimetres (BoM, 2010) falling mainly during the summer months, and an average annual evaporation rate of approximately 3,400 millimetres (GIS Database). It is expected that the creeks will only flow during significant rainfall.

Based on the above, the proposed clearing may be at variance to this Principle. However, the proposed clearing is unlikely to result in any significant impact to any watercourse or wetland.

Methodology BoM (2010)
Keith Lindbeck and Associates (2007)
GIS Database:
- Evaporation Isopleths
- Hydrography, linear
- Ramsar Wetlands
- Rivers

Officer Mandy Cross

(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 falls within the Newman land system (GIS Database). The Newman Land System occupies approximately 8% of the Pilbara Bioregion (Payne et al., 1988).

The Newman Land System consists of rugged jaspilite plateaux, ridges and mountains supporting hard Spinifex grasslands (Payne et al., 1988). This land system has a very low soil erosion risk due to surface coverage of either massive ironstone chert outcropping or pebble to cobblestone scree material (Keith Lindbeck and Associates, 2007; Payne et al., 1988).

The landscapes in the vegetation survey area are the end point of millions of years of erosion (Keith Lindbeck and Associates, 2007). Given that vegetation is removed on a regular basis through fire without any apparent increase in erosion, it is unlikely that removal of vegetation will by itself exacerbate land degradation (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)
Payne et al. (1988)
GIS Database:
- Rangeland Land System Mapping

Officer Mandy Cross

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

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

The application area is not located within any conservation areas or DEC managed lands (GIS Database). The Karijini National Park is the second largest national park in Western Australia (627,400 ha) and occurs approximately 12 kilometres east of the application area. (GIS Database). At this distance, it is not likely the vegetation within the application area would be required to act as a buffer to the conservation area, or be important as an ecological linkage to the conservation area. The area between the vegetation survey area and Karijini National Park is uncleared pastoral rangeland that acts as a buffer (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:
- DEC Tenure

Officer Mandy Cross

(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

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The groundwater salinity within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database).

Several ephemeral watercourses cross through the application area (GIS Database). The proposed mining operations are elevated within the landscape at head water locations and may act to reduce the flow of surface water (Keith Lindbeck and Associates, 2007).

Surface and groundwaters within the Tom Price operations are controlled to prevent both operational and environmental impacts from occurring (Keith Lindbeck and Associates, 2007). Surface flows are managed through engineered drainage systems with sediment traps installed prior to outflow points. Groundwater is regulated through dewatering (Keith Lindbeck and Associates, 2007).

Under the DEC licence to operate, surface and groundwaters are monitored with results reported to DEC and Department of Water on an annual basis (Keith Lindbeck and Associates, 2007).

The clearing of 27.8 hectares of vegetation within the application area is not likely to have a significant impact on the quality of the groundwater or surface water in the local area.

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:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSA)

Officer Mandy Cross

(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 is located within the upper Ashburton River Catchment Area which covers an area of 7,877,740 hectares (GIS Database).

This region has an average annual rainfall of approximately 308 millimetres (BoM, 2010) falling mainly during the summer months, and an average annual evaporation rate of approximately 3,400 millimetres (GIS Database). It is expected that the minor ephemeral creeks occurring within the application area will only flow during significant rainfall. It is considered unlikely that the proposed clearing will lead to an increase in flood height or duration.

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

Methodology BoM (2010)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments-Catchments

Officer Mandy Cross

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, 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 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 no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

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

The clearing permit application was advertised on 8 November 2010 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the clearing permit application.

Methodology	GIS Database: <ul style="list-style-type: none"> - Native Title Determined - Native Title Federal - Native Title NNTT - Sites of Aboriginal Significance
Officer	Mandy Cross

5. Assessor's recommendations

Comment / recommendation

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the Environmental Protection Act 1986, and the proposed clearing may be at variance to Principle (a) and (f), is not likely to be at variance to Principles (b), (c), (d), (g), (h), (i) and (j), and is not at variance to Principle (e).

6. References

- BoM (2010) Climate Statistics for Australian Locations, Summary Statistics for Paraburdoo Aero, Western Australia. Commonwealth Government of Australia. Available online: http://www.bom.gov.au/climate/averages/tables/cw_007185.shtml.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. Pilbara Bioregion: Hamersley Sub-region (PIL3). Department of Conservation and Land Management, Perth.
- 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.
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- Department of Sustainability, Environment, Water, Population and Communities (2008). Approved Conservation Advice for *Liasis olivaceus barroni* (Olive Python - Pilbara subspecies).
- Hamersley Iron (2010) Application for a clearing permit (Purpose Permit) Dowd Low Grade/Marra Mamba extension - Tenement ML4SA. Hamersley Iron Pty Ltd, Western Australia.
- 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) Flora and Vegetation Survey of the Proposed Mining Areas: East, West and Central Pits, Tom Price Mine site. October 2007.
- NatureMap (2010) website: <http://naturemap.dec.wa.gov.au/default.aspx>
- Payne A L, Mitchell A. A, and Holman W F (1988) An inventory and condition survey of the rangelands in the Ashburton River catchment, Western Australia. Technical Bulletin 62, Revised Edition. Department of Agriculture, South Perth, Western Australia.
- Pilbara Iron (2005) Tom Price, Botanical Survey Advice. Document number 114510, BAF number 2005/128.
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Clearing Permit Assessment Report

1. Application details

1.1. Permit application details

Permit application No.: 4039/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**
Postal address: GPO Box A42 Perth WA 6837
Contacts: Phone: 9366 5467
Fax: 9366 6298
Email: julie.neilson@riotinto.com

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 4SA (AML70/4)*
Colloquial name: Dowd Low Grade and Marra Mamba Extension

1.4. Application

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

1.5. Decision on application

Decision on Permit Application:
Decision Date:

2. Background

2.1. History (including previous clearing permits, compensation paid, caveats on title deeds etc.)

Date	Comments
02 November 2010	Application checks completed, allocated to Mandy Cross for assessment.
02 November 2010	To be advertised 08 November 2010

2.2. Existing environment and information

2.2.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>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 in a regional context.</p> <p>The following Beard vegetation associations have been mapped within the application area (GIS Database):</p> <p>162: Shrublands; snakewood scrub; and 567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and <i>Triodia basedowii</i>.</p> <p>Numerous flora and vegetation surveys of areas in and around the application area have been commissioned by Hamersley Iron Pty Ltd since 2003. Keith Lindbeck and Associates undertook a flora and vegetation survey of 1727 hectares between November 2006 and March 2007, with an opportunistic site visit conducted in June 2007. This included the application area. The purpose of this survey was to consolidate the information obtained by Hamersley Iron Pty Ltd to date, and also complete the areas not surveyed.</p> <p>Twenty seven landscape units in the following three broad groupings were defined during the survey:</p> <ol style="list-style-type: none"> 1. Ranges and Hills; 2. Plains; and 3. Watercourses. 	<p>Hamersley Iron Pty Ltd has applied to clear up to 27.8 ha of rehabilitated vegetation. The application area is located approximately 9 kilometres south west of Tom Price at the Tom Price minesite (GIS Database).</p> <p>The purpose of the clearing permit application is to increase mineral production by extending the Marra Mamba pit. Clearing will be carried out using a dozer (Keith Lindbeck and Associates, 2010).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994); To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).</p>	<p>The vegetation condition is based on the flora and vegetation surveys carried out by KLA between November 2006, and June 2007.</p>

The surveyed areas consist of typical Central Pilbara rocky ranges and rolling spinifex covered plains, with six dominant species across all sites. These six dominant species were: *Acacia aneura* var. *pilbarana*, *A. Bivenosa*, *A. Pruinocarpa*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Triodia wiseana*.

The application area falls within the surveyed area, and covers 27.8 hectares. From the vegetation maps provided by Keith Lindbeck and Associates (2007), the assessor has identified that the application area was not included in the vegetation mapping. Keith Lindbeck and Associates (2007) stated that vegetation mapping was not conducted on disturbed vegetation. Correspondence with Rio Tinto Iron Ore (pers comm. Rio Tinto Iron Ore, 2010) highlighted that the application area was previously cleared and now consists of rehabilitated species.

2.2.2. Items of interest

Theme	Value	Within meters
Declared Rare and Priority Flora List	16597	10000
Declared Rare and Priority Flora List	16600	10000
Declared Rare and Priority Flora List	22423	10000
Declared Rare and Priority Flora List	22424	10000
Declared Rare and Priority Flora List	22435	10000
Declared Rare and Priority Flora List	22436	10000
Declared Rare and Priority Flora List	27350	10000
Declared Rare and Priority Flora List	27353	10000
Declared Rare and Priority Flora List	27354	10000
Declared Rare and Priority Flora List	27355	10000
Declared Rare and Priority Flora List	27356	10000
Declared Rare and Priority Flora List	27357	10000
Declared Rare and Priority Flora List	27358	10000
Declared Rare and Priority Flora List	27359	10000
Declared Rare and Priority Flora List	27360	10000
Declared Rare and Priority Flora List	27361	10000
Declared Rare and Priority Flora List	27362	10000
Declared Rare and Priority Flora List	27363	10000
Declared Rare and Priority Flora List	27364	10000
Declared Rare and Priority Flora List	27365	10000
Declared Rare and Priority Flora List	28174	10000
Declared Rare and Priority Flora List	28180	10000
Declared Rare and Priority Flora List	28181	10000
Declared Rare and Priority Flora List	28186	10000
Declared Rare and Priority Flora List	28188	10000
Declared Rare and Priority Flora List	29306	10000
Declared Rare and Priority Flora List	29307	10000
Declared Rare and Priority Flora List	29308	10000
Declared Rare and Priority Flora List	29310	10000
Declared Rare and Priority Flora List	29311	10000
Declared Rare and Priority Flora List	30401	10000
Declared Rare and Priority Flora List	30542	10000
Declared Rare and Priority Flora List	30544	10000
Declared Rare and Priority Flora List	30547	10000
Declared Rare and Priority Flora List	31043	10000

3. Permit assessment activities

Date	Activity	Comment	Trim Ref.
22 October 2010	Department has received application		
05 November 2010	Application under assessment		
05 November 2010	Direct Interest Letter Sent	to Shire of Ashburton	
05 November 2010	Direct Interest Letter Sent	to Pilbara Native Title Service	
12 November 2010	Contacted Applicant	Emailed applicant requesting vegetation mapping for the application area.	
12 November 2010	Contacted Applicant	Applicant provided further information on the application area.	

4. 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 falls within the Hamersley sub-region of the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara bioregion (GIS Database). The vegetation within this sub-region is characterised as 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). Shepherd (2007) reported that approximately 100% of the Hamersley sub-region pre-European vegetation still exists in this bioregion.

The flora and vegetation survey conducted by Keith Lindbeck and Associates in 2006 and 2007 involved both a desktop study and a site survey of approximately 1727 hectares which included the clearing permit application area. The application area was assessed as part of the survey, however vegetation associations were not mapped due to the fact that the vegetation was highly disturbed (Keith Lindbeck and Associates, 2007). The application area currently consists of rehabilitated native vegetation (Hamersley Iron, 2010). Prior to it being cleared, a Declared Rare Flora and Priority Flora species search was conducted of the application area by Pilbara Iron in February, October and November 2003 and 17 November 2005 (Pilbara Iron, 2005).

Keith Lindbeck and Associates (2007) described 50 vegetation types from the flora and vegetation survey. There were no vegetation associations, natural features or landforms observed during the vegetation survey that were considered to be unique or of high conservation value in the context of the Pilbara bioregion (Keith Lindbeck and Associates, 2007). There are no areas of conservation estate, Threatened Ecological Communities (TECs) or Priority Ecological Communities (PEC's) occurring at, or within the immediate vicinity of, the survey area (GIS Database).

A total of 295 flora taxa were recorded within the survey area, from 112 genera and 49 families. The surveyed areas consisted of typical Central Pilbara rocky ranges and rolling spinifex covered plains, with six dominant species across all sites. These six dominant species were: *Acacia aneura* var. *pilbarana*, *A. bivenosa*, *A. pruinocarpa*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Triodia wiseana* (Keith Lindbeck and Associates, 2007).

The Department of Environment and Conservation (DEC) and Hamersley Iron database searches determined that two Declared Rare Flora (DRF) and 25 priority flora species have been recorded within the Tom Price Mine Lease area (Keith Lindbeck and Associates, 2007).

No DRF were recorded during the surveys of the application area (Keith Lindbeck and Associates, 2007; Hamersley Iron, 2010). The following seven priority flora species were recorded: (Keith Lindbeck and Associates, 2007).

- *Dampiera anonyma* P3;
- *Eremophila magnifica* subsp. *magnifica* ms P4;
- *Eremophila magnifica* subsp. *velutina* ms P3;
- *Indigofera ixocarpa* P2;
- *Olearia mucronata* P3;
- *Sida* sp. Barlee Range (S.Van Leeuwen 1642) (P3); and
- *Sida* sp. Hamersley Range (K Newbey) (P1).

All of these Priority Flora species were recorded at various locations outside of the proposed mining areas (Keith Lindbeck and Associates, 2007). The closest Priority Flora species to the application area was *Olearia mucronata* (Priority 3) which was recorded along drainage lines near the south western edge of the application area (Pilbara Iron, 2005).

As the seven Priority Flora species are not confined to the vegetation survey area or immediate vicinity, and have populations at other locations, it is considered unlikely that the proposed mining operations will impact on the conservation values of any of these species (Keith Lindbeck and Associates, 2007). Some species may respond favourably to disturbances such as the observed response of *Indigofera ixocarpa* (Priority 2) to fire. Hamersley Iron stated that it will investigate the use of Priority Flora species for mine site rehabilitation (Keith Lindbeck and Associates, 2007).

According to Keith Lindbeck and Associates (2007) five introduced flora species have been recorded as occurring within the vegetation survey area; *Cenchrus ciliaris* (Buffel Grass), *Acetosa vesicaria* (Ruby Dock), *Bidens bipinnata* (Bipinnate Beggartick), *Malvastrum americanum* (Spiked Malvastrum), *Datura leichhardtii* (Native Thornapple). The presence of introduced flora species may decrease the biodiversity of the survey area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Keith Lindbeck and Associates (2007) conducted a Threatened and Priority Fauna search of DEC databases which identified four conservation significant fauna with the potential to occur within the application area. In addition the assessing officer performed a desktop fauna search of a 40 kilometre radius around the application area using the NatureMap database. The database search recorded a total of 78 reptile species, 173 bird species, 22 mammal species and 7 amphibian species that may potentially occur within the survey area (NatureMap 2010). The results from this search indicate that the area is diverse in bird and reptile species, particularly skinks (24) and snakes (11) and parrots (10) (NatureMap 2010).

The vegetation of the application area has been previously cleared and consists of rehabilitated native vegetation (Hamersley Iron, 2010). The landforms, vegetation types and fauna habitats within the application area are well represented locally and within the Pilbara region (GIS Database and Shepherd, 2007). In addition the application area is located immediately adjacent to an established minesite and therefore, the application area is not expected to represent a higher level of diversity than other, undisturbed areas nearby. It is

considered that the proposed clearing will not reduce the biological diversity of the bioregion.

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

Methodology	CALM (2002) Hamersley Iron (2010) Keith Lindbeck and Associates (2007) NatureMap (2010) Pilbara Iron (2005) Shepherd (2007) GIS Database: <ul style="list-style-type: none">- IBRA WA (Regions - Sub-Regions)- DEC tenure- Pre-European vegetation- Threatened Ecological Sites buffered
Officer	Mandy Cross

(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 assessor conducted a search of the NatureMap database. This identified that 281 fauna species could potentially occur within a 40 kilometre radius of the application area (117°46'37"E and 22° 33'03"S) (NatureMap, 2010).

Of the 281 fauna species, nine had conservation status as listed below (NatureMap, 2010). Four of these species were also identified by Keith Lindbeck and Associates (2007) during the desktop study generated in 2006.

- *Amytornis striatus* subsp. *striatus* (Striated Grasswren) (P4);
- *Ardeotis australis* (Australian Bustard) (P4);
- *Burhinus grallarius* (Bush Stone-curlew) (P4);
- *Falco peregrines* (Peregrine Falcon) (Schedule 4 as listed by DEC);
- *Falco peregrinus* subsp. *macropus* (Schedule 4 as listed by DEC);
- *Lagorchestes conspicillatus* subsp. *leichardti* (Spectacled Hare-wallaby) (P3);
- *Leggadina lakedownensis* (Lakeland Downs Mouse) (P4);
- *Liasis olivaceus* subsp. *barroni* (Olive Python) (Vulnerable);
- *Pseudomys chapmani* (Western Pebble-mound Mouse) (P4); and
- *Sminthopsis longicaudata* (Long-tailed Dunnart) (P4).

There were no field observations of fauna recorded during the flora and vegetation survey; however potential fauna habitats were recorded during the survey. Three broad habitat types were defined during the survey (Keith Lindbeck and Associates, 2007). These were ranges and hills, plains, and watercourses. Within these habitat units, Keith Lindbeck and Associates (2007) reported that 50 vegetation types were identified, none of which were considered as being restricted to the survey area (Keith Lindbeck and Associates, 2007).

During the flora and vegetation survey, scattered colonies of Western Pebble-mound Mouse mounds were observed at several locations within the survey area (Keith Lindbeck and Associates, 2007). Keith Lindbeck and Associates (2007) reported that both the Pebble-mound Mouse and the Lakeland Downs Mouse could occur in areas proposed for mining but are more likely to occur on lowland flats or rolling plains (Keith Lindbeck and Associates, 2007). Both species occur widely throughout the Pilbara and surrounding regions. The proposed clearing is likely to have some impact on local populations, but minimal impact on a regional scale. The five avifauna species are highly mobile and can avoid mining areas. The hilly habitat types observed throughout the survey area are not considered to be preferred or favoured by these species (Keith Lindbeck and Associates, 2007).

The three species (Spectacled Hare-wallaby, Olive Python and the Long-tailed Dunnart) which were not identified within the 2006 desktop study were also shown to have potential to occur in the area (NatureMap, 2010). An analysis of the habitats favoured by these species was conducted by assessor.

The Olive Python prefers deep gorges and water holes in the ranges of the Pilbara region (Department of Sustainability, Environment, Water, Population and Communities, 2008). This fauna habitat was not recorded within the application area.

The Long-tailed Dunnart is found in rugged, rocky areas of central Western Australia and is restricted to the granite outcrop areas (Withers and Edward, 1997). This fauna habitat was not recorded within the application area.

The Spectacled Hare-wallaby is considered rare and scattered in Western Australia, but is more common in the Northern Territory and Queensland (Department of Sustainability, Environment, Water, Population and

Communities, 2008), where it inhabits open forests, woodlands, shrublands, and hummock grasslands, preferring areas where there is a mosaic of vegetation due to differences in fire history (Department of Sustainability, Environment, Water, Population and Communities, 2008).

The fauna habitats recorded within the survey area are well represented within the broader region (GIS Database) and the Pilbara bioregion remains largely uncleared (Shepherd, 2007). In addition the application area occurs adjacent to existing mining operations and has already been previously disturbed and now contains rehabilitated species. Therefore it is not expected that the application area represents significant fauna habitat compared to surrounding undisturbed areas.

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

Methodology Keith Lindbeck and Associates (2007)
NatureMap (2010)
Shepherd (2007)
Withers and Edward (1997)
GIS Database:
- Pre-European Vegetation

Officer Mandy Cross

(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

A desktop review was conducted by Keith Lindbeck and Associates (2007) to determine if any Declared Rare Flora (DRF) and Priority Flora occur within the Tom Price Mine Lease area. This review consisted of assessing both the DEC's and Pilbara Iron's Declared Rare and Priority Flora databases (Keith Lindbeck and Associates, 2007).

The search of the databases revealed that two DRF species, *Lepidium catapycnon* and *Thryptomene wittweri* occur within the Tom Price Mine Lease area (Keith Lindbeck and Associates, 2007).

Lepidium catapycnon was recorded from one location on a steep hillside near the Tom Price Mine Operations Centre, approximately 2 kilometres from the survey area. A second population of *Lepidium catapycnon* occurs north of the tailings dam, approximately 7 kilometres from the survey area (Keith Lindbeck and Associates, 2007). No further occurrences of *Lepidium catapycnon* have been recorded near the vegetation survey area despite extensive surveys undertaken by Pilbara Iron botanists and Keith Lindbeck and Associates over a four year period (Keith Lindbeck and Associates, 2007). *Thryptomene wittweri* is known to occur within the Pilbara on isolated hilltops, however none were recorded within the survey area (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)
Officer Mandy Cross

(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's) within the application area (GIS Database). In addition, Keith Lindbeck and Associates (2007) reported that no vegetation communities recorded during the flora and vegetation survey were representative of TEC's (Keith Lindbeck and Associates, 2007).

The closest TEC, Themeda Grasslands is located 23 kilometres north to north east from the application area (GIS Database). At such distance from the application area, this TEC is unlikely to be affected by the proposed clearing.

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 Buffered

Officer Mandy Cross

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

Comments Proposal is not at variance to this Principle

The application area falls within the Hamersley sub-region of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) reported that approximately 99.95% of the Pre-European vegetation remains within the Pilbara bioregion (see table).

The vegetation of the application area has been broadly mapped as Beard vegetation associations:

162: Shrublands; snakewood scrub; and

567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and *Triodia basedowii* (GIS Database).

According to Shepherd (2007) approximately 100% of these Beard vegetation associations remain at both a state and bioregional level. In addition both Beard vegetation associations are well represented in conservation estate (see table below).

Therefore the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,187	17,794,646	~99.95	Least Concern	6.32
Beard vegetation associations - State					
162	547,312	547,312	~100	Least Concern	11.4
567	777,507	777,507	~100	Least Concern	22.3
Beard vegetation associations - Bioregion					
162	20,009	20,009	~100	Least Concern	0
567	776,824	776,824	~100	Least Concern	22.4

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)

Presumed extinct Probably no longer present in the bioregion

Endangered* <10% of pre-European extent remains

Vulnerable* 10-30% of pre-European extent exists

Depleted* >30% and up to 50% of pre-European extent exists

Least concern >50% pre-European extent exists and subject to little or no degradation over a majority of this area

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

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

Methodology Department of Natural Resources and Environment (2002)

Shepherd (2007)

GIS Database:

- IBRA WA (Regions - Sub Regions)

- Pre-European Vegetation

Officer Mandy Cross

(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 may be at variance to this Principle

There are no permanent watercourses or wetlands within or in close proximity to the application area (GIS Database). Six minor ephemeral creeks pass through the application area (GIS Database).

Two riparian vegetation habitats were described adjacent to the application area during the flora and vegetation

survey (Keith Lindbeck and Associates, 2007). This region has an average annual rainfall of approximately 308 millimetres (BoM, 2010) falling mainly during the summer months, and an average annual evaporation rate of approximately 3,400 millimetres (GIS Database). It is expected that the creeks will only flow during significant rainfall.

Based on the above, the proposed clearing may be at variance to this Principle. However, the proposed clearing is unlikely to result in any significant impact to any watercourse or wetland.

Methodology BoM (2010)
Keith Lindbeck and Associates (2007)
GIS Database:
- Evaporation Isopleths
- Hydrography, linear
- Ramsar Wetlands
- Rivers

Officer Mandy Cross

(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 falls within the Newman land system (GIS Database). The Newman Land System occupies approximately 8% of the Pilbara Bioregion (Payne et al., 1988).

The Newman Land System consists of rugged jaspilite plateaux, ridges and mountains supporting hard Spinifex grasslands (Payne et al., 1988). This land system has a very low soil erosion risk due to surface coverage of either massive ironstone chert outcropping or pebble to cobblestone scree material (Keith Lindbeck and Associates, 2007; Payne et al., 1988).

The landscapes in the vegetation survey area are the end point of millions of years of erosion (Keith Lindbeck and Associates, 2007). Given that vegetation is removed on a regular basis through fire without any apparent increase in erosion, it is unlikely that removal of vegetation will by itself exacerbate land degradation (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)
Payne et al. (1988)
GIS Database:
- Rangeland Land System Mapping

Officer Mandy Cross

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

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

The application area is not located within any conservation areas or DEC managed lands (GIS Database). The Karijini National Park is the second largest national park in Western Australia (627,400 ha) and occurs approximately 12 kilometres east of the application area. (GIS Database). At this distance, it is not likely the vegetation within the application area would be required to act as a buffer to the conservation area, or be important as an ecological linkage to the conservation area. The area between the vegetation survey area and Karijini National Park is uncleared pastoral rangeland that acts as a buffer (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:
- DEC Tenure

Officer Mandy Cross

(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

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The groundwater salinity within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database).

Several ephemeral watercourses cross through the application area (GIS Database). The proposed mining operations are elevated within the landscape at head water locations and may act to reduce the flow of surface water (Keith Lindbeck and Associates, 2007).

Surface and groundwaters within the Tom Price operations are controlled to prevent both operational and environmental impacts from occurring (Keith Lindbeck and Associates, 2007). Surface flows are managed through engineered drainage systems with sediment traps installed prior to outflow points. Groundwater is regulated through dewatering (Keith Lindbeck and Associates, 2007).

Under the DEC licence to operate, surface and groundwaters are monitored with results reported to DEC and Department of Water on an annual basis (Keith Lindbeck and Associates, 2007).

The clearing of 27.8 hectares of vegetation within the application area is not likely to have a significant impact on the quality of the groundwater or surface water in the local area.

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:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSA)

Officer Mandy Cross

(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 is located within the upper Ashburton River Catchment Area which covers an area of 7,877,740 hectares (GIS Database).

This region has an average annual rainfall of approximately 308 millimetres (BoM, 2010) falling mainly during the summer months, and an average annual evaporation rate of approximately 3,400 millimetres (GIS Database). It is expected that the minor ephemeral creeks occurring within the application area will only flow during significant rainfall. It is considered unlikely that the proposed clearing will lead to an increase in flood height or duration.

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

Methodology BoM (2010)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments-Catchments

Officer Mandy Cross

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, 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 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 no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

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

The clearing permit application was advertised on 8 November 2010 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the clearing permit application.

Methodology	GIS Database: <ul style="list-style-type: none"> - Native Title Determined - Native Title Federal - Native Title NNTT - Sites of Aboriginal Significance
Officer	Mandy Cross

5. Assessor's recommendations

Comment / recommendation

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the Environmental Protection Act 1986, and the proposed clearing may be at variance to Principle (a) and (f), is not likely to be at variance to Principles (b), (c), (d), (g), (h), (i) and (j), and is not at variance to Principle (e).

6. References

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Clearing Permit Assessment Report

1. Application details

1.1. Permit application details

Permit application No.: 4039/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**
Postal address: GPO Box A42 Perth WA 6837
Contacts: Phone: 9366 5467
Fax: 9366 6298
Email: julie.neilson@riotinto.com

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963, Mineral Lease 4SA (AML70/4)*
Colloquial name: Dowd Low Grade and Marra Mamba Extension

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: [Redacted]
Decision Date: [Redacted]

2. Background

2.1. History (including previous clearing permits, compensation paid, caveats on title deeds etc.)

Date	Comments
02 November 2010	Application checks completed, allocated to Mandy Cross for assessment.
02 November 2010	To be advertised 08 November 2010

2.2. Existing environment and information

2.2.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>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 in a regional context.</p> <p>The following Beard vegetation associations have been mapped within the application area (GIS Database):</p> <p>162: Shrublands; snakewood scrub; and 567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and <i>Triodia basedowii</i>.</p> <p>Numerous flora and vegetation surveys of areas in and around the application area have been commissioned by Hamersley Iron Pty Ltd since 2003. Keith Lindbeck and Associates undertook a flora and vegetation survey of 1727 hectares between November 2006 and March 2007, with an opportunistic site visit conducted in June 2007. This included the application area. The purpose of this survey was to consolidate the information obtained by Hamersley Iron Pty Ltd to date, and also complete the areas not surveyed.</p> <p>Twenty seven landscape units in the following three broad groupings were defined during the survey:</p> <ol style="list-style-type: none"> 1. Ranges and Hills; 2. Plains; and 3. Watercourses. 	<p>Hamersley Iron Pty Ltd has applied to clear up to 27.8 ha of rehabilitated vegetation. The application area is located approximately 9 kilometres south west of Tom Price at the Tom Price minesite (GIS Database).</p> <p>The purpose of the clearing permit application is to increase mineral production by extending the Marra Mamba pit. Clearing will be carried out using a dozer (Keith Lindbeck and Associates, 2010).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994); To Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).</p>	<p>The vegetation condition is based on the flora and vegetation surveys carried out by KLA between November 2006, and June 2007.</p>

The surveyed areas consist of typical Central Pilbara rocky ranges and rolling spinifex covered plains, with six dominant species across all sites. These six dominant species were: *Acacia aneura* var. *pilbarana*, *A. Bivenosa*, *A. Pruinocarpa*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Triodia wiseana*.

The application area falls within the surveyed area, and covers 27.8 hectares. From the vegetation maps provided by Keith Lindbeck and Associates (2007), the assessor has identified that the application area was not included in the vegetation mapping. Keith Lindbeck and Associates (2007) stated that vegetation mapping was not conducted on disturbed vegetation. Correspondence with Rio Tinto Iron Ore (pers comm. Rio Tinto Iron Ore, 2010) highlighted that the application area was previously cleared and now consists of rehabilitated species.

2.2.2. Items of interest

Theme	Value	Within meters
Declared Rare and Priority Flora List	16597	10000
Declared Rare and Priority Flora List	16600	10000
Declared Rare and Priority Flora List	22423	10000
Declared Rare and Priority Flora List	22424	10000
Declared Rare and Priority Flora List	22435	10000
Declared Rare and Priority Flora List	22436	10000
Declared Rare and Priority Flora List	27350	10000
Declared Rare and Priority Flora List	27353	10000
Declared Rare and Priority Flora List	27354	10000
Declared Rare and Priority Flora List	27355	10000
Declared Rare and Priority Flora List	27356	10000
Declared Rare and Priority Flora List	27357	10000
Declared Rare and Priority Flora List	27358	10000
Declared Rare and Priority Flora List	27359	10000
Declared Rare and Priority Flora List	27360	10000
Declared Rare and Priority Flora List	27361	10000
Declared Rare and Priority Flora List	27362	10000
Declared Rare and Priority Flora List	27363	10000
Declared Rare and Priority Flora List	27364	10000
Declared Rare and Priority Flora List	27365	10000
Declared Rare and Priority Flora List	28174	10000
Declared Rare and Priority Flora List	28180	10000
Declared Rare and Priority Flora List	28181	10000
Declared Rare and Priority Flora List	28186	10000
Declared Rare and Priority Flora List	28188	10000
Declared Rare and Priority Flora List	29306	10000
Declared Rare and Priority Flora List	29307	10000
Declared Rare and Priority Flora List	29308	10000
Declared Rare and Priority Flora List	29310	10000
Declared Rare and Priority Flora List	29311	10000
Declared Rare and Priority Flora List	30401	10000
Declared Rare and Priority Flora List	30542	10000
Declared Rare and Priority Flora List	30544	10000
Declared Rare and Priority Flora List	30547	10000
Declared Rare and Priority Flora List	31043	10000

3. Permit assessment activities

Date	Activity	Comment	Trim Ref.
22 October 2010	Department has received application		
05 November 2010	Application under assessment		
05 November 2010	Direct Interest Letter Sent	to Shire of Ashburton	
05 November 2010	Direct Interest Letter Sent	to Pilbara Native Title Service	
12 November 2010	Contacted Applicant	Emailed applicant requesting vegetation mapping for the application area.	
12 November 2010	Contacted Applicant	Applicant provided further information on the application area.	

4. 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 falls within the Hamersley sub-region of the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara bioregion (GIS Database). The vegetation within this sub-region is characterised as 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). Shepherd (2007) reported that approximately 100% of the Hamersley sub-region pre-European vegetation still exists in this bioregion.

The flora and vegetation survey conducted by Keith Lindbeck and Associates in 2006 and 2007 involved both a desktop study and a site survey of approximately 1727 hectares which included the clearing permit application area. The application area was assessed as part of the survey, however vegetation associations were not mapped due to the fact that the vegetation was highly disturbed (Keith Lindbeck and Associates, 2007). The application area currently consists of rehabilitated native vegetation (Hamersley Iron, 2010). Prior to it being cleared, a Declared Rare Flora and Priority Flora species search was conducted of the application area by Pilbara Iron in February, October and November 2003 and 17 November 2005 (Pilbara Iron, 2005).

Keith Lindbeck and Associates (2007) described 50 vegetation types from the flora and vegetation survey. There were no vegetation associations, natural features or landforms observed during the vegetation survey that were considered to be unique or of high conservation value in the context of the Pilbara bioregion (Keith Lindbeck and Associates, 2007). There are no areas of conservation estate, Threatened Ecological Communities (TECs) or Priority Ecological Communities (PEC's) occurring at, or within the immediate vicinity of, the survey area (GIS Database).

A total of 295 flora taxa were recorded within the survey area, from 112 genera and 49 families. The surveyed areas consisted of typical Central Pilbara rocky ranges and rolling spinifex covered plains, with six dominant species across all sites. These six dominant species were: *Acacia aneura* var. *pilbarana*, *A. bivenosa*, *A. pruinocarpa*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Triodia wiseana* (Keith Lindbeck and Associates, 2007).

The Department of Environment and Conservation (DEC) and Hamersley Iron database searches determined that two Declared Rare Flora (DRF) and 25 priority flora species have been recorded within the Tom Price Mine Lease area (Keith Lindbeck and Associates, 2007).

No DRF were recorded during the surveys of the application area (Keith Lindbeck and Associates, 2007; Hamersley Iron, 2010). The following seven priority flora species were recorded: (Keith Lindbeck and Associates, 2007).

- *Dampiera anonyma* P3;
- *Eremophila magnifica* subsp. *magnifica* ms P4;
- *Eremophila magnifica* subsp. *velutina* ms P3;
- *Indigofera ixocarpa* P2;
- *Olearia mucronata* P3;
- *Sida* sp. Barlee Range (S.Van Leeuwen 1642) (P3); and
- *Sida* sp. Hamersley Range (K Newbey) (P1).

All of these Priority Flora species were recorded at various locations outside of the proposed mining areas (Keith Lindbeck and Associates, 2007). The closest Priority Flora species to the application area was *Olearia mucronata* (Priority 3) which was recorded along drainage lines near the south western edge of the application area (Pilbara Iron, 2005).

As the seven Priority Flora species are not confined to the vegetation survey area or immediate vicinity, and have populations at other locations, it is considered unlikely that the proposed mining operations will impact on the conservation values of any of these species (Keith Lindbeck and Associates, 2007). Some species may respond favourably to disturbances such as the observed response of *Indigofera ixocarpa* (Priority 2) to fire. Hamersley Iron stated that it will investigate the use of Priority Flora species for mine site rehabilitation (Keith Lindbeck and Associates, 2007).

According to Keith Lindbeck and Associates (2007) five introduced flora species have been recorded as occurring within the vegetation survey area; *Cenchrus ciliaris* (Buffel Grass), *Acetosa vesicaria* (Ruby Dock), *Bidens bipinnata* (Bipinnate Beggartick), *Malvastrum americanum* (Spiked Malvastrum), *Datura leichhardtii* (Native Thornapple). The presence of introduced flora species may decrease the biodiversity of the survey area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Keith Lindbeck and Associates (2007) conducted a Threatened and Priority Fauna search of DEC databases which identified four conservation significant fauna with the potential to occur within the application area. In addition the assessing officer performed a desktop fauna search of a 40 kilometre radius around the application area using the NatureMap database. The database search recorded a total of 78 reptile species, 173 bird species, 22 mammal species and 7 amphibian species that may potentially occur within the survey area (NatureMap 2010). The results from this search indicate that the area is diverse in bird and reptile species, particularly skinks (24) and snakes (11) and parrots (10) (NatureMap 2010).

The vegetation of the application area has been previously cleared and consists of rehabilitated native vegetation (Hamersley Iron, 2010). The landforms, vegetation types and fauna habitats within the application area are well represented locally and within the Pilbara region (GIS Database and Shepherd, 2007). In addition the application area is located immediately adjacent to an established minesite and therefore, the application area is not expected to represent a higher level of diversity than other, undisturbed areas nearby. It is

considered that the proposed clearing will not reduce the biological diversity of the bioregion.

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

Methodology	CALM (2002) Hamersley Iron (2010) Keith Lindbeck and Associates (2007) NatureMap (2010) Pilbara Iron (2005) Shepherd (2007) GIS Database: <ul style="list-style-type: none">- IBRA WA (Regions - Sub-Regions)- DEC tenure- Pre-European vegetation- Threatened Ecological Sites buffered
Officer	Mandy Cross

(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 assessor conducted a search of the NatureMap database. This identified that 281 fauna species could potentially occur within a 40 kilometre radius of the application area (117°46'37"E and 22° 33'03"S) (NatureMap, 2010).

Of the 281 fauna species, nine had conservation status as listed below (NatureMap, 2010). Four of these species were also identified by Keith Lindbeck and Associates (2007) during the desktop study generated in 2006.

- *Amytornis striatus* subsp. *striatus* (Striated Grasswren) (P4);
- *Ardeotis australis* (Australian Bustard) (P4);
- *Burhinus grallarius* (Bush Stone-curlew) (P4);
- *Falco peregrines* (Peregrine Falcon) (Schedule 4 as listed by DEC);
- *Falco peregrinus* subsp. *macropus* (Schedule 4 as listed by DEC);
- *Lagorchestes conspicillatus* subsp. *leichardti* (Spectacled Hare-wallaby) (P3);
- *Leggadina lakedownensis* (Lakeland Downs Mouse) (P4);
- *Liasis olivaceus* subsp. *barroni* (Olive Python) (Vulnerable);
- *Pseudomys chapmani* (Western Pebble-mound Mouse) (P4); and
- *Sminthopsis longicaudata* (Long-tailed Dunnart) (P4).

There were no field observations of fauna recorded during the flora and vegetation survey; however potential fauna habitats were recorded during the survey. Three broad habitat types were defined during the survey (Keith Lindbeck and Associates, 2007). These were ranges and hills, plains, and watercourses. Within these habitat units, Keith Lindbeck and Associates (2007) reported that 50 vegetation types were identified, none of which were considered as being restricted to the survey area (Keith Lindbeck and Associates, 2007).

During the flora and vegetation survey, scattered colonies of Western Pebble-mound Mouse mounds were observed at several locations within the survey area (Keith Lindbeck and Associates, 2007). Keith Lindbeck and Associates (2007) reported that both the Pebble-mound Mouse and the Lakeland Downs Mouse could occur in areas proposed for mining but are more likely to occur on lowland flats or rolling plains (Keith Lindbeck and Associates, 2007). Both species occur widely throughout the Pilbara and surrounding regions. The proposed clearing is likely to have some impact on local populations, but minimal impact on a regional scale. The five avifauna species are highly mobile and can avoid mining areas. The hilly habitat types observed throughout the survey area are not considered to be preferred or favoured by these species (Keith Lindbeck and Associates, 2007).

The three species (Spectacled Hare-wallaby, Olive Python and the Long-tailed Dunnart) which were not identified within the 2006 desktop study were also shown to have potential to occur in the area (NatureMap, 2010). An analysis of the habitats favoured by these species was conducted by assessor.

The Olive Python prefers deep gorges and water holes in the ranges of the Pilbara region (Department of Sustainability, Environment, Water, Population and Communities, 2008). This fauna habitat was not recorded within the application area.

The Long-tailed Dunnart is found in rugged, rocky areas of central Western Australia and is restricted to the granite outcrop areas (Withers and Edward, 1997). This fauna habitat was not recorded within the application area.

The Spectacled Hare-wallaby is considered rare and scattered in Western Australia, but is more common in the Northern Territory and Queensland (Department of Sustainability, Environment, Water, Population and

Communities, 2008), where it inhabits open forests, woodlands, shrublands, and hummock grasslands, preferring areas where there is a mosaic of vegetation due to differences in fire history (Department of Sustainability, Environment, Water, Population and Communities, 2008).

The fauna habitats recorded within the survey area are well represented within the broader region (GIS Database) and the Pilbara bioregion remains largely uncleared (Shepherd, 2007). In addition the application area occurs adjacent to existing mining operations and has already been previously disturbed and now contains rehabilitated species. Therefore it is not expected that the application area represents significant fauna habitat compared to surrounding undisturbed areas.

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

Methodology Keith Lindbeck and Associates (2007)
NatureMap (2010)
Shepherd (2007)
Withers and Edward (1997)
GIS Database:
- Pre-European Vegetation

Officer Mandy Cross

(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

A desktop review was conducted by Keith Lindbeck and Associates (2007) to determine if any Declared Rare Flora (DRF) and Priority Flora occur within the Tom Price Mine Lease area. This review consisted of assessing both the DEC's and Pilbara Iron's Declared Rare and Priority Flora databases (Keith Lindbeck and Associates, 2007).

The search of the databases revealed that two DRF species, *Lepidium catapycnon* and *Thryptomene wittweri* occur within the Tom Price Mine Lease area (Keith Lindbeck and Associates, 2007).

Lepidium catapycnon was recorded from one location on a steep hillside near the Tom Price Mine Operations Centre, approximately 2 kilometres from the survey area. A second population of *Lepidium catapycnon* occurs north of the tailings dam, approximately 7 kilometres from the survey area (Keith Lindbeck and Associates, 2007). No further occurrences of *Lepidium catapycnon* have been recorded near the vegetation survey area despite extensive surveys undertaken by Pilbara Iron botanists and Keith Lindbeck and Associates over a four year period (Keith Lindbeck and Associates, 2007). *Thryptomene wittweri* is known to occur within the Pilbara on isolated hilltops, however none were recorded within the survey area (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)
Officer Mandy Cross

(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's) within the application area (GIS Database). In addition, Keith Lindbeck and Associates (2007) reported that no vegetation communities recorded during the flora and vegetation survey were representative of TEC's (Keith Lindbeck and Associates, 2007).

The closest TEC, Themeda Grasslands is located 23 kilometres north to north east from the application area (GIS Database). At such distance from the application area, this TEC is unlikely to be affected by the proposed clearing.

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 Buffered

Officer Mandy Cross

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

Comments Proposal is not at variance to this Principle

The application area falls within the Hamersley sub-region of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) reported that approximately 99.95% of the Pre-European vegetation remains within the Pilbara bioregion (see table).

The vegetation of the application area has been broadly mapped as Beard vegetation associations:

162: Shrublands; snakewood scrub; and

567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and *Triodia basedowii* (GIS Database).

According to Shepherd (2007) approximately 100% of these Beard vegetation associations remain at both a state and bioregional level. In addition both Beard vegetation associations are well represented in conservation estate (see table below).

Therefore the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,187	17,794,646	~99.95	Least Concern	6.32
Beard vegetation associations - State					
162	547,312	547,312	~100	Least Concern	11.4
567	777,507	777,507	~100	Least Concern	22.3
Beard vegetation associations - Bioregion					
162	20,009	20,009	~100	Least Concern	0
567	776,824	776,824	~100	Least Concern	22.4

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)

Presumed extinct Probably no longer present in the bioregion

Endangered* <10% of pre-European extent remains

Vulnerable* 10-30% of pre-European extent exists

Depleted* >30% and up to 50% of pre-European extent exists

Least concern >50% pre-European extent exists and subject to little or no degradation over a majority of this area

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

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

Methodology Department of Natural Resources and Environment (2002)

Shepherd (2007)

GIS Database:

- IBRA WA (Regions - Sub Regions)

- Pre-European Vegetation

Officer Mandy Cross

(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 may be at variance to this Principle

There are no permanent watercourses or wetlands within or in close proximity to the application area (GIS Database). Six minor ephemeral creeks pass through the application area (GIS Database).

Two riparian vegetation habitats were described adjacent to the application area during the flora and vegetation

survey (Keith Lindbeck and Associates, 2007). This region has an average annual rainfall of approximately 308 millimetres (BoM, 2010) falling mainly during the summer months, and an average annual evaporation rate of approximately 3,400 millimetres (GIS Database). It is expected that the creeks will only flow during significant rainfall.

Based on the above, the proposed clearing may be at variance to this Principle. However, the proposed clearing is unlikely to result in any significant impact to any watercourse or wetland.

Methodology BoM (2010)
Keith Lindbeck and Associates (2007)
GIS Database:
- Evaporation Isopleths
- Hydrography, linear
- Ramsar Wetlands
- Rivers

Officer Mandy Cross

(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 falls within the Newman land system (GIS Database). The Newman Land System occupies approximately 8% of the Pilbara Bioregion (Payne et al., 1988).

The Newman Land System consists of rugged jaspilite plateaux, ridges and mountains supporting hard Spinifex grasslands (Payne et al., 1988). This land system has a very low soil erosion risk due to surface coverage of either massive ironstone chert outcropping or pebble to cobblestone scree material (Keith Lindbeck and Associates, 2007; Payne et al., 1988).

The landscapes in the vegetation survey area are the end point of millions of years of erosion (Keith Lindbeck and Associates, 2007). Given that vegetation is removed on a regular basis through fire without any apparent increase in erosion, it is unlikely that removal of vegetation will by itself exacerbate land degradation (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)
Payne et al. (1988)
GIS Database:
- Rangeland Land System Mapping

Officer Mandy Cross

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

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

The application area is not located within any conservation areas or DEC managed lands (GIS Database). The Karijini National Park is the second largest national park in Western Australia (627,400 ha) and occurs approximately 12 kilometres east of the application area. (GIS Database). At this distance, it is not likely the vegetation within the application area would be required to act as a buffer to the conservation area, or be important as an ecological linkage to the conservation area. The area between the vegetation survey area and Karijini National Park is uncleared pastoral rangeland that acts as a buffer (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:
- DEC Tenure

Officer Mandy Cross

(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

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The groundwater salinity within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database).

Several ephemeral watercourses cross through the application area (GIS Database). The proposed mining operations are elevated within the landscape at head water locations and may act to reduce the flow of surface water (Keith Lindbeck and Associates, 2007).

Surface and groundwaters within the Tom Price operations are controlled to prevent both operational and environmental impacts from occurring (Keith Lindbeck and Associates, 2007). Surface flows are managed through engineered drainage systems with sediment traps installed prior to outflow points. Groundwater is regulated through dewatering (Keith Lindbeck and Associates, 2007).

Under the DEC licence to operate, surface and groundwaters are monitored with results reported to DEC and Department of Water on an annual basis (Keith Lindbeck and Associates, 2007).

The clearing of 27.8 hectares of vegetation within the application area is not likely to have a significant impact on the quality of the groundwater or surface water in the local area.

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:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSA)

Officer Mandy Cross

(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 is located within the upper Ashburton River Catchment Area which covers an area of 7,877,740 hectares (GIS Database).

This region has an average annual rainfall of approximately 308 millimetres (BoM, 2010) falling mainly during the summer months, and an average annual evaporation rate of approximately 3,400 millimetres (GIS Database). It is expected that the minor ephemeral creeks occurring within the application area will only flow during significant rainfall. It is considered unlikely that the proposed clearing will lead to an increase in flood height or duration.

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

Methodology BoM (2010)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments-Catchments

Officer Mandy Cross

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, 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 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 no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

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

The clearing permit application was advertised on 8 November 2010 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the clearing permit application.

Methodology	GIS Database: <ul style="list-style-type: none"> - Native Title Determined - Native Title Federal - Native Title NNTT - Sites of Aboriginal Significance
Officer	Mandy Cross

5. Assessor's recommendations

Comment / recommendation

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the Environmental Protection Act 1986, and the proposed clearing may be at variance to Principle (a) and (f), is not likely to be at variance to Principles (b), (c), (d), (g), (h), (i) and (j), and is not at variance to Principle (e).

6. References

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