



1. Application details

1.1. Permit application details

Permit application No.: 2231/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Iron Ore (Hamersley Range) Agreement Act 1963
Mineral Lease 4SA
Local Government Area: Shire Of Ashburton
Colloquial name: North East Box Cut Waste Dump Rehabilitation

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

Vegetation within the clearing application area has been mapped at a 1:250,000 scale as Beard Vegetation Association 567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex & *Triodia basedowii* (Shepherd et al., 2001; GIS database).

A vegetation and flora survey of the North East Boxcut Waste Dump rehabilitation footprint was undertaken by Pilbara Iron and Biota Environmental in February 2007. The vegetation types located within the clearing application area have been described by Keith Lindbeck and Associates, (2007a) as:

- Class 1: *Acacia aneura*, *A. aneura* var. *pilbarana*, *Eucalyptus trivalva* low open forest, over *Eremophila forestii* shrubland, over *Triodia melvillei*, *T. wiseana* hummock grassland, over *Themeda triandra* very open tussock grassland.

- Class 2: *Eucalyptus leucophloia*, *Acacia pruinocarpa*, *A. aneura* low woodland, over *Capparis umbonata* scattered tall shrubs, over *Triodia melvillei*, *T. wiseana* hummock grassland.

- Class 3: *Eucalyptus trivalva*, over *Acacia atkinsiana*, *A. maitlandii*, *Petalostylis labicheoides* high shrubland, over *Triodia melvillei* open hummock grassland, over *Themeda triandra* tussock grassland.

- Class 4: *Eucalyptus gamophylla*, *E. leucophloia* low open woodland, over *Acacia bivenosa*, *A. exilis*, *A. atkinsiana* high shrubland, over *Acacia maitlandii* open shrubland, over *Triodia wiseana*, *T. melvillei* hummock grassland.

- Class 5: *Eucalyptus leucophloia*, *E. trivalva*, *Acacia pruinocarpa*, *A. aneura* low woodland, over *Capparis umbonata*, *Acacia atkinsiana*, *A. bivenosa* high shrubland, over *Triodia melvillei*, *T. wiseana* hummock grassland.

- Class 6: *Eucalyptus leucophloia* low woodland, over *Acacia pruinocarpa*, *A. atkinsiana*, *A. synchronicia* high open shrubland, over *Triodia melvillei*, *T. wiseana* hummock grassland.

- Class 7: *Acacia aneura*, *Eucalyptus trivalva*, low open

Clearing Description

Hamersley Iron Pty Ltd has applied to clear up to 50 hectares of native vegetation for the reshaping of the North East Box Cut waste dump for rehabilitation. The proposed clearing will enable the pushing down of the existing waste dump and the development of an abandonment bund around the base of the rehabilitated waste dump. The vegetation will be cleared by a dozer with its blade down. All vegetative material and topsoil from the cleared area will be collected and stockpiled for future rehabilitation purposes (Hamersley Iron, 2008).

Vegetation Condition

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994)

to

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

Comment

Botanists from Pilbara Iron described the condition of the vegetation as good due to the disturbance being primarily restricted to less than 20% of the total area.

Aerial photography submitted with the clearing permit application shows that sections of the application area have been impacted on by silt which has been deposited from surface water runoff from the North East Box Cut waste dump. In one particular area within the application area, stunted growth of vegetation has been observed. This area has been classified as vegetation type 9A (Hamersley Iron, 2008).

forest, over *Acacia aneura*, *A. atkinsiana* high shrubland, over *Triodia melvillei* open hummock grassland.

- Class 8: *Eucalyptus gamophylla*, *E. trivalva* low open woodland, over *Acacia atkinsiana*, *A. bivenosa* open heath, over *Triodia wiseana*, *T. melvillei* hummock grassland.

- Class 9: *Eucalyptus trivalva*, *Acacia aneura* low open woodland, over *Acacia exilis* high open shrubland, over *Triodia melvillei* hummock grassland.

- Class 9A: Vegetation sub-class of Class 9, however, disturbance due to recent fires and silt run off has been identified. Stunted growth is evident in this area.

- Class 10: *Acacia aneura*, *Eucalyptus xerothermica*, *E. trivalva* closed forest, over *Senna artemisioides* open shrubland, over *Triodia melvillei* open hummock grassland, over *Themeda triandra* open tussock grassland.

- Class 11: *Acacia aneura*, *Eucalyptus xerothermica*, *E. trivalva* low open forest, over *Acacia exilis*, *A. bivenosa*, *A. stowardii*, *A. atkinsiana* open shrubland, over *Triodia melvillei*, *T. wiseana* hummock grassland.

- Class 12: *Eucalyptus trivalva*, *Acacia aneura* low open forest, over *Acacia bivenosa*, *A. atkinsiana* high open shrubland, over *Triodia melvillei*, *T. wiseana* hummock grassland.

- Class 13: *Eucalyptus leucophloia*, *E. gamophylla* low open woodland, over *Acacia bivenosa*, *A. stowardii*, *A. maitlandii*, *Petalostylis labicheoides* high shrubland over, *Acacia exilis*, *A. atkinsiana* shrubland, over *Triodia wiseana*, *T. melvillei* hummock grassland.

- Class 14: *Eucalyptus xerothermica*, *E. gamophylla*, *E. trivalva* low open forest, over *Petalostylis labicheoides*, *Acacia stowardii*, *A. maitlandii*, *A. atkinsiana* open scrub, over *Triodia wiseana*, *T. melvillei* hummock grassland.

- Class 15: *Eucalyptus gamophylla*, *E. trivalva*, *Acacia aneura* low woodland, over *Acacia exilis*, *A. rhodophloia*, *A. bivenosa* open scrub, over *Triodia wiseana*, *T. melvillei* hummock grassland.

- Class 16: Disturbed areas, heavily affected by clearing activities (Keith Lindbeck and Associates, 2007a).

3. Assessment of application against clearing principles

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

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

The area of proposed clearing is found within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion which encompasses an area of 17,804,164 hectares (GIS database). The Hamersley subregion is characterised by sedimentary ranges and plateaux, dissected gorges, low Mulga woodlands over bunch grasses in valley floors and Eucalyptus woodlands over *Triodia* spp. on skeletal soils of the ranges (Kendrick, 2001). The vegetation of the area proposed to clear consists of two vegetation associations (Beard Vegetation Associations 82 and 181), both of which are common and widespread throughout this region, with approximately 100% of the pre-European vegetation remaining (Shepherd et al., 2001).

The application area is situated within the Mount Tom Price mine site which has been significantly degraded by past and present mining activities, and is located immediately adjacent to the North East Box Cut waste dump (Keith Lindbeck and Associates, 2007a).

A botanical survey by botanists from Pilbara Iron recorded a total of 76 flora species from 44 genera and 24 families. Two weed species, Buffel Grass (*Cenchrus ciliaris*) and Beggar's Trick (*Bidens bipinnata*), were located on disturbed areas (Keith Lindbeck and Associates, 2007a). Photographs of the application area show the vegetation condition to be good with slight impacts from mining activities impacting on vegetation growth. The remnant vegetation communities within the application area are unlikely to be considered as rare, geographically restricted or of significant conservation value. The vegetation communities and potential fauna habitats within the application area are likely to be considered as common within the Pilbara region, and are unlikely to be of higher biodiversity than the surrounding areas. The proposed clearing is unlikely to have a significant impact on the biological diversity of the region.

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

Methodology Keith Lindbeck and Associates (2007a)
Kendrick (2001)
Shepherd et al. (2001)
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- Pre-European Vegetation

(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**

A rare and priority fauna search from the Department of Environment and Conservation Threatened Fauna Database was undertaken for the Tom Price region that included the application area (Keith Lindbeck and Associates, 2007a). A search was conducted using the Department of Environment and Water Resources' Protected Matters Search Tool to identify species listed under the *Environmental Protection and Biodiversity Conservation Act 1999* which may potentially occur within the application area (Keith Lindbeck and Associates, 2007a). The review concluded that seven species of conservation significance could potentially occur within the application area (Keith Lindbeck and Associates, 2007a). These include:

- Orange Leaf-nosed Bat (*Rhinioncteris aurantius*), listed under Schedule 1 (Fauna that is rare or is likely to become extinct) of the Wildlife Conservation (Specially Protected Fauna) Notice 2006.
- Pilbara Olive Python (*Liasis olivaceus barroni*), listed under Schedule 1 (Fauna that is rare or is likely to become extinct) of the Wildlife Conservation (Specially Protected Fauna) Notice 2006
- Peregrine Falcon (*Falco peregrinus*), listed under Schedule 4 (Other specially protected fauna) of the Wildlife Conservation (Specially Protected Fauna) Notice 2006.
- Western Pebble-mound Mouse (*Pseudomys chapmani*), Priority 4 on the Department of Environment and Conservation (DEC) Priority Fauna List.
- Lakeland Downs Mouse (*Leggadina lakedownensis*), Priority 4 on the DEC Priority Fauna List
- Ghost Bat (*Macroderma gigas*), Priority 4 on the DEC Priority Fauna List, and;
- Australian Bustard (*Ardeotis australis*), Priority 4 on the DEC Priority Fauna List (Keith Lindbeck and Associates, 2007a).

The Orange Leaf-nosed Bat is known to prefer warm humid caves for roosting, although some have been found in tree hollows. Foraging habitats include grasslands, open woodlands, savannah woodlands and spinifex covered hills, although habitat use may be influenced by roost availability (Australian Museum Online 2007; EPA (Qld), 2006). The species is known from less than 10 localities in the Pilbara and from one locality in the Gascoyne. No natural colony sites are known from the Pilbara (Environment Australia, 1999). Known colonies in the Pilbara occupy abandoned, deep and partially flooded mines that trap pockets of warm, humid air in the mines constant temperature zone (Environment Australia, 1999). The application area appears to lack the presence of caves or hollows which provide suitable roosting habitat for this species and as a result, the species is unlikely to inhabit the area. It is unlikely that the vegetation within the application area would be regarded as significant habitat for this species.

The Pilbara Olive Python is known to occur throughout the Hamersley and Chichester Ranges, parts of the East Pilbara and the Barlee Range Nature Reserve. It is known to inhabit rocky areas near waterholes with caves, overhang ledges and crevasses that provide shelter. The application area is devoid of rocky shelters, caves, ledges and vegetated waterholes (GIS Database; Keith Lindbeck and Associates, 2007a). It is unlikely that the vegetation within the application area will provide suitable habitat for the Pilbara Olive Python. The proposed clearing is unlikely to impact on significant habitat for this species.

The Peregrine Falcon has a ubiquitous distribution throughout mainland Australia and inhabits a wide range of habitats including forest, woodlands, wetlands and open country (Keith Lindbeck and Associates, 2007b). Kendrick (2001) states in the biodiversity audit of the Pilbara 3 - Hamersley subregion that the Peregrine Falcon is an uncommon resident, with very little data available regarding the species apart from occasional sightings. Given the widespread habitat and distribution of the Peregrine Falcon, the proposed clearing is unlikely to impact on significant habitat for this species.

The Western Pebble-mound Mouse is relatively widespread and abundant throughout much of the Pilbara 3 subregion, and parts of the Gascoyne (Kendrick, 2001; Keith Lindbeck and Associates, 2007b). The species occurs on spinifex covered, gentle colluvial slopes with pebbles of size (approximately 70 grams) suitable for the transport and construction of pebble mounds (Keith Lindbeck and Associates, 2007b). Within the application area, there is a lack of undulating spinifex covered lower slopes with a pebble mantle that would provide significant habitat for the Western Pebble-mound mouse. It is unlikely that the vegetation proposed to be cleared would be regarded as significant habitat for this species.

The Lakeland Downs Mouse is distributed across the Pilbara and Kimberley regions of Western Australia, and is known to occur on sandy soils and cracking clays that support grasslands (Keith Lindbeck and Associates, 2007b). There are no cracking clay ecosystems within the application area (Keith Lindbeck and Associates, 2007a). The soils within the application area appear to consist of stony surfaces and mantles which are

unlikely to provide suitable habitat for this species (Payne et al., 1988). The proposed clearing is unlikely to impact on significant habitat for the Lakeland Downs Mouse.

The Ghost Bat is known to show preference for large, deep caves, crevices and old underground mining workings (Keith Lindbeck and Associates, 2007b; Australian Museum Online, 2008). The application area lacks the presence of caves, crevices or mine shafts which may provide suitable roosting habitat for this species and as a result, the species is unlikely to inhabit the area. One of the main conservation threats to the Ghost Bat is the loss of feeding habitat by clearing. The Ghost Bat preys on large insects, frogs, birds, lizards and small mammals including other bats. They swoop on their prey and then fly to a feeding site to eat (Australian Museum Online, 2008). The vegetation under application adjoins an operational waste dump and as a result has been impacted on. Similar and higher quality vegetation types are widespread throughout the surrounding region. The proposed clearing is unlikely to significantly impact on habitat for the Ghost Bat.

The Australian Bustard is known to occur within open rangeland habitats such as *Triodia* hummock grassland, grassy woodland, sandplains with spinifex, chenopod flats and low shrublands (Johnstone and Storr, 1998). During their breeding season the species can show preference for open grassland areas which border protective shrubland or woodlands (Australian Wildlife Conservancy, 2008). The species is known to be nomadic, with irregular widespread movements over long distances (Johnstone and Storr, 1998; Department of Environment and Climate Change NSW, 2008). Descriptions of the vegetation types within the application area demonstrate that the majority of the vegetation types consist of low open woodlands over hummock grasslands. It is possible that the application area may provide suitable habitat for the Australian Bustard. However, the vegetation type within the application is likely to be common and widespread throughout the Pilbara and not restricted to the application area (Shepherd et al. 2001; Payne et al. 1988). Given the nomadic nature of the species and its ability to cover long distances, the proposed clearing is unlikely to impact on significant habitat for the Australian Bustard.

A number a migratory bird species that are protected under the CAMBA and JAMBA treaties (China and Japan/ Australia Migratory Bird Agreements) may potentially occur within the application area. These include the Rainbow Bee-eater (*Merops ornatus*), Great Egret (*Ardea alba*), Cattle Egret (*Ardea ibis*), Oriental Plover (*Charadrius veredus*) and Fork-tailed Swift (*Apus pacificus*). All of these species may utilise the habitat within and adjoining the application area, for nesting or foraging, at different times throughout the year. The habitat types that have been identified within the application area are not restricted to the application area and there is a widespread distribution of similar, and for some species more suitable, habitat types throughout the Pilbara region. The proposed clearing is unlikely to impact on significant habitat required for the existence of these migratory species.

The dominant fauna habitats within the application area appear to consist of Acacia and Eucalyptus low open woodlands over *Triodia wiseana* and *T. melvillei* grasslands. The vegetation under application occurs within an operational mine site and is located adjacent to a waste dump. Several small areas within the application area have been impacted on by siltation from the adjacent waste dump and as a result, the vegetation condition ranges from good to degraded (Keith Lindbeck and Associates, 2007a; Keighery, 1994). The vegetation communities and habitat types within the application area are considered as being common, widespread and well represented in the Pilbara bioregion and there are no landscape or vegetation features such as caves, ledges, hollows or waterholes within the application area that would provide significant habitat for fauna indigenous to Western Australia (Keith Lindbeck and Associates, 2007a). Due to the disturbance which has occurred within the application area and considering the close proximity of the application area to the operational mine site, higher quality fauna habitat is likely to occur in the surrounding areas.

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

Methodology Australian Museum Online (2007)
Australian Wildlife Conservancy (2008)
Biota (2004b)
Department of Environment and Climate Change NSW (2008)
Department of Environment and Water Resources (2008)
Environment Australia (1999)
EPA (Qld) (2006)
Johnstone and Storr (1998)
Keith Lindbeck and Associates (2007a)
Keith Lindbeck and Associates (2007b)
Kendrick (2001)
Payne et al. (1998)
Shepherd et al. (2001)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

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

According to available datasets no Declared Rare Flora (DRF) or Priority Flora species have been recorded within the application area (GIS database).

A flora and vegetation survey of the application area was undertaken by botanists from Pilbara Iron and Biota Environmental in February 2007. The survey involved a targeted search for DRF and Priority Flora species, and identified and described the vegetation communities within the application area.

No DRF or Priority Flora species were recorded during the survey of the application area (Keith Lindbeck and Associates, 2007a).

Keith Lindbeck and Associates were commissioned by Pilbara Iron Pty Ltd to conduct a flora and vegetation survey over 1727 hectares of vegetation within the Tom Price *Iron Ore (Hamersley Range) Agreement Act 1963* Mineral Lease 4SA. The flora and vegetation survey covered a large portion of the North East Platform project area and included the clearing application area (Keith Lindbeck and Associates, 2007c).

No DRF were recorded during the flora and vegetation survey (Keith Lindbeck and Associates, 2007c).

Ten Priority Flora species were recorded during the survey (Keith Lindbeck and Associates, 2007c). These were:

- *Cynanchum* sp. Hamersley (M. Trudgen 2302), Priority 3.
- *Dampiera anonyma*, Priority 3.
- *Eremophila magnifica* Chinnock subsp. *magnifica*, Priority 4.
- *Eremophila magnifica* subsp. *velutina*, Priority 3.
- *Indigofera ixocarpa*, Priority 2.
- *Olearia mucronata*, Priority 2.
- *Sida* sp. Barlee Range (S. van Leeuwen 1642), Priority 3.
- *Sida* sp. Pilbara (S. van Leeuwen 4377), Priority 3.
- *Sida* sp. Wittenoom (W.R. Barker 1962), Priority 1 (now listed as *Sida arsinata* R.M. Barker; Not Threatened) (Florabase, 2008), and;
- *Triumfetta leptacantha*, Priority 3.

None of the Priority Flora species that were identified during the flora and vegetation survey were recorded within the clearing application area (Keith Lindbeck and Associates, 2007c). The ten Priority Flora species identified during the survey were not confined to the North East Platform survey area and have populations at other locations throughout the Tom Price *Iron Ore (Hamersley Range) Agreement Act 1963* Mineral Lease 4SA (Keith Lindbeck and Associates, 2007c). The closest recorded Priority Flora species to the application area was the Priority 2 listed *Indigofera ixocarpa*, which was recorded approximately 1.5 kilometres south-west from the clearing application area (Keith Lindbeck and Associates, 2007c). Given the distance between the application area and the nearest known population of *Indigofera ixocarpa*, the proposed clearing is unlikely to impact on the in situ existence of this species, or any of the other Priority Flora species listed above.

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

Methodology Keith Lindbeck and Associates (2007a)
Keith Lindbeck and Associates (2007c)
GIS Database:
- Declared Rare and Priority Flora List

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

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

There are no records of Threatened Ecological Communities (TEC's) within the application area (GIS database; Keith Lindbeck and Associates, 2007a). The nearest known TEC is located approximately 35 kilometres north-east of the application area (GIS database). Given the distance between the proposal and the nearest known TEC, the proposed clearing is not likely to impact on the conservation of the TEC.

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

Methodology Keith Lindbeck and Associates (2007a)
GIS Database:
- Threatened Ecological Communities - CALM 12/4/05

(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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region in which approximately 99.9% of the pre-European vegetation remains (GIS database; Shepherd et al. 2001).

The vegetation of the clearing application area has been mapped as Beard vegetation association 567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii* (GIS Database). According to Shepherd et al. (2001) approximately 100% of these vegetation associations remain at both the state and regional level.

According to the Bioregional Conservation Status of Ecological Vegetation Classes the conservation status for the Pilbara Bioregion and Beard vegetation association 567 is of "Least Concern".

The Pilbara bioregion area remains largely uncleared, and there is also approximately 22.3% of Beard vegetation association 567 protected within conservation reserves. As a result, the conservation of vegetation association 567 within the Pilbara bioregion is unlikely to be impacted on by this proposal.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	Least Concern	6.3
Beard veg assoc. – State					
567	777,517	777,517	~100	Least Concern	22.3
Beard veg assoc. – Bioregion					
567	776,833	776,833	~100	Least Concern	22.3

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al. (2001)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00
- Pre-European Vegetation - DA 01/01

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

Comments Proposal is at variance to this Principle

There are no permanent watercourses, drainage systems or wetlands within the application area (GIS database). The proponent has advised that the proposed clearing will not impact on any significant creek or drainage systems (Keith Lindbeck and Associates, 2007a). Several ephemeral creek systems have been recorded within the application area (GIS database). These creek systems largely act as minor drainage lines and are widespread across the Pilbara region (Keith Lindbeck and Associates, 2007a; GIS database).

The closest major river systems are the Hardey River located approximately 10 kilometres north-west, and Bellary Creek located approximately 5 kilometres south of the application area (Keith Lindbeck and Associates, 2007a). Given the distance separating the application area and the nearest watercourses, the vegetation within the application is not likely to act as a significant buffer area to these watercourses.

As there are watercourses within the application area, the proposed clearing is at variance to this Principle. However, the watercourses in question are minor, natural drainage channels that are widespread across the Pilbara landscape (GIS database), and are responsible for quickly dispersing floodwaters after significant rainfall events. Furthermore, the vegetation communities growing in association with the watercourses are considered common and widespread in the Pilbara bioregion (Keith Lindbeck and Associates, 2007a; Shepherd et al., 2001; GIS Database). The proposed clearing is unlikely to significantly impact on vegetation communities growing in association with these minor ephemeral creek systems.

Methodology Keith Lindbeck and Associates (2007a)
Shepherd et al. (2001)
GIS Database:
- Hydrography, linear
- Pre-European Vegetation

(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

According to the Department of Agriculture in Technical Bulletin No 62 "An inventory and condition survey of the rangelands in the Ashburton River catchment, Western Australia" (Payne et al., 1988) the application area consists of the Platform Land System (GIS Database).

The Platform Land System occurs as narrow raised plains extensive dissected slopes with hard Spinifex and shrubs. The landform units of the Land System include stony upper plains, dissected slopes with incised drainage and drainage floors (Payne et al., 1988). The soil types consist of shallow, very stony reddish brown loams, cemented gravels and pebbles, and reddish brown loamy sands on drainage floors. For this land system there is likely to be a low risk of soil erosion due to the stony nature of the surface materials.

The application area is not associated with any wetlands or low lying depressions (GIS Database). Tom Price which is situated approximately six kilometres north north-west of the application area receives mean annual rainfall of 405.3 millimetres and an annual evaporation rate of 3600 millimetres (Keith Lindbeck and Associates, 2007a; GIS Database). Annual rainfall is variable with monsoonal events from tropical cyclones capable of producing significant rainfall events during summer months (Keith Lindbeck and Associates, 2007a). Numerous non-perennial watercourses are distributed across the landscape, and these are responsible for quickly dispersing floodwaters after significant rainfall events (GIS Database). The proposed clearing is unlikely to cause or increase the risk of water logging occurring either on-site or off-site.

The application area is located immediately adjacent to the North East Box Cut waste dump. Assessment of aerial photography shows that surface water runoff from the North East Box Cut waste dump has caused siltation within preferential flow pathways for up to 1.1 kilometres in a south-easterly direction (Keith Lindbeck and Associates, 2007a). During the vegetation and flora survey botanists from Pilbara Iron noted that there is evidence of stunted vegetation growth within vegetation type 9a. Aerial photography shows that vegetation type 9a occurs in an area which has been heavily impacted on by siltation (Keith Lindbeck and Associates, 2007a). The clearing of native vegetation within the application area may increase the distance that sediment from the waste dump is transported by surface water runoff. As a result, the impact of siltation on vegetation may be exacerbated in areas immediately east of the application area. The purpose of the proposed clearing is for the rehabilitation of the North East Box Cut waste dump. The rehabilitation will include an abandonment bund at the base of the waste dump to ensure that sediment runoff is contained. The abandonment bund is likely to retain sediment and reduce the risk of siltation further impacting on downstream vegetation.

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

Methodology Keith Lindbeck and Associates (2007a)
Payne et al. (1988)
Pilbara Iron (2007)
GIS Database:
- Evaporation Isopleths
- Hydrography, linear_1
- Rangeland Land System Mapping

(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

There are no CALM managed conservation areas within the clearing application area. The nearest conservation area is Karijini National Park located approximately 10 kilometres east of the application area (GIS database). The proposed clearing is associated with an existing operational mine site and is not likely to cause appreciable additional impact to the conservation values of Karijini National Park.

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

Methodology CALM Database:
- CALM Managed Lands and Waters - CALM 1/07/05

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

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

There are no permanent wetlands or water bodies within the application area (GIS Database). The closest major river systems are the Hardey River which is located approximately six kilometres north-west, and Bellary Creek which is located approximately five kilometres south of the application area (Keith Lindbeck and Associates, 2007a; GIS Database). The application area is located within the Platform Land System which consists of soils that are likely to show high resistance to erosion due to the stony nature of the surface materials, thereby minimising the risk of sedimentation and turbidity impacting on surface water quality of

downstream water bodies (GIS Database; Payne et al., 1988).

The application area is located within the Turee Creek catchment system which occupies an area of approximately 675,300 hectares (Hamersley Iron, 2008). Groundwater salinities of the application area have been recorded in the range 500 - 1000 mg/L Total Dissolved Solids. Tom Price which is situated approximately six kilometres north north-west of the application area receives mean annual rainfall of 405.3 mm/yr and an evaporation rate of 3600 mm/yr (Keith Lindbeck and Associates, 2007a; GIS Database). Given the low rainfall to high evaporation ratio, the majority of groundwater recharge within the Turee Creek catchment system will most likely occur following significant rainfall events. The proposed clearing of 50 hectares is unlikely to significantly increase groundwater recharge or impact on groundwater quality within the Turee Creek catchment.

The proposed clearing area is not within a Public Drinking Water Source Area (GIS database).

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

Methodology Hamersley (2007)
GIS Database:
- Hydrography, linear_1
- Public Drinking Water Source Areas (PDWSAs)

(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 not associated with any permanent wetlands or watercourses (GIS database). The average annual rainfall of the application area is approximately 405.3 millimetres, with local flooding occurring seasonally in the Pilbara region between December and March (Keith Lindbeck and Associates, 2007a). Numerous non-perennial watercourses are distributed across the landscape, and these are responsible for quickly dispersing floodwaters after significant rainfall events, thereby reducing peak flood heights (GIS database). It is unlikely that the clearing required under this proposal will impact on drainage patterns within the Turee Creek catchment system, or result in an increase in peak flood heights

The clearing of native vegetation for the expansion and rehabilitation of the North East box cut waste dump is not likely to cause or increase the incidence of flooding.

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

Methodology Keith Lindbeck and Associates (2007a)
GIS Database:
- Hydrography, linear - DOE 1/2/04
- Rivers, 1M - GA 01/06/00
- Lakes, 1M - GA 01/06/00

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

Comments

There is one native title claim over the area under application; WC97/089 (GIS database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There is one registered Site of Aboriginal Significance (Site ID: 11186) within the area under application (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged 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.

Methodology GIS Database:
- Native Title Claims
- Aboriginal Sites of Significance_1

4. Assessor's comments

Purpose	Method	Applied	Comment
		area (ha)/ trees	

The Clearing Principles have been addressed and the proposed clearing is at variance to Principle (f), is not likely to be at variance to Principle (a), (b), (c), (d), (g), (h), (i) or (j) and is not at variance to Principle (e).

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of rehabilitation and reporting areas cleared.

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6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation

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

Definitions:

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

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

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

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

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

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

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

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