Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5838/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **BHP Billiton Iron Ore Pty Ltd**

1.3. Property details

Property: *Iron Ore (Mount Goldsworthy) Agreement Act 1964*, Mineral Lease 249SA (AML 70/249)
Local Government Area: Shire of East-Pilbara
Colloquial name: Cundaline Exploration Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
150		Mechanical Removal	Exploration, Hydrogeological Drilling, Geotechnical Investigations and Supporting Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 28 November 2013

2. Background

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

Beard vegetation associations have been mapped for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database):

93: Hummock grasslands, shrub steppe; kanji over soft spinifex

171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex & *Triodia briziodes*

Four flora and vegetation surveys have been undertaken over the application area by Onshore Environmental Consultants (Onshore, 2013), Astron (2011), ENV (2008) and ecologia (2005). These surveys identified the following 36 vegetation associations within 13 broad floristic communities within the application area (BHP BIO, 2013):

Onshore (2013) mapped six broad floristic communities with 13 vegetation associations with the application area:

Eucalyptus Low Woodland
1a: Low Woodland of *Eucalyptus victrix, Melaleuca glomerata* and *Eucalyptus leucophloia* subsp. *leucophloia* over High Shrubland of *Melaleuca glomerata, Acacia trachycarpa* and *Acacia colei* var. *colei* over Open Hummock Grassland of *Triodia longiceps* on major drainage lines.

1b: Low Woodland of *Eucalyptus victrix* and *Acacia ampliceps* over High Shrubland of *Acacia trachycarpa* and *Acacia colei* var. *colei* over.

Acacia Open Scrub
2a: Open Scrub of *Acacia tumida* subsp. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* over Hummock Grassland of *Triodia epactia, Triodia wiseana* and *Triodia biflora* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* in minor drainage lines on mesa crests.
2b: Open Scrub of *Acacia trachycarpa* over Open Hummock Grassland of *Triodia longiceps* with Scattered Low Trees of *Eucalyptus victrix* and *Corymbia hamersleyana* on floodplains

Acacia Low Open Heath
3: Low Open Heath of *Acacia stellaticeps* over Hummock Grassland of *Triodia epactia* and *Triodia longiceps* on plains

Triodia Closed Hummock
4: Closed Hummock Grassland of *Triodia epactia* with Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana* over Low Open Shrubland of *Acacia stellaticeps* on sandy plains

Triodia Hummock Grassland
5a: Hummock Grasland of *Triodia epactia* with High Shrubland of *Grevillea wickhamii* subsp. *hispidula* and

Acacia tumida subsp. *pilbarensis* over Low Shrubland of *Acacia adoxa* var. *adoxa* and *Acacia ptychophylla* on mesa crests

5b: Hummock Grassland of *Triodia epactia* and *Triodia wiseana* with High Open Shrubland of *Acacia tumida* subsp. *pilbarensis* and Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on sandstone breakaways

5c: Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia ancistrocarpa, Acacia colei* var. *colei* and *Acacia trachycarpa* over Low Shrubland of *Acacia stellaticeps* on a mosaic of sandy and stony plains

5d: Hummock Grassland of *Triodia longiceps* and *Triodia epactia* over Low Open Shrubland of *Acacia stellaticeps* with Scattered Tall Shrubs of *Acacia tumida* var. *pilbarensis, Acacia colei* var. *colei* and *Acacia ancistrocarpa* on stony plains

5e: Hummock Grassland of *Triodia epactia* with High Shrubland of *Acacia colei* var. *colei, Acacia ancistrocarpa* and *Acacia tumida* var. *pilbarensis* and Low Open Woodland of *Corymbia flavescens* and *Corymbia hamersleyana* in drainage zones on plains

5f: Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Acacia inaequilatera* and Scattered Low Trees of *Corymbia hamersleyana* on scree slopes and footslopes

Triodia Open Hummock Grassland
6: Open Hummock Grassland of *Triodia epactia* and *Triodia biflora* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Ficus brachypoda* over High Open Shrubland of *Acacia tumida* subsp. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* on mesa clifflines and gullies

Astron (2011) mapped one broad floristic community with two vegetation associations within the application area:

Triodia Hummock Grassland
10d: Low Open Woodland of *Corymbia hamersleyana* over High Shrubland of *Grevillea wickhamii* subsp. *hispidula* and *Acacia tumida* var. *pilbarensis* over Low Shrubland of *Acacia hilliana*, *A. ptychophylla*, and *A. adoxa* over Hummock Grassland of *Triodia epactia*.

10r: Low Open Woodland of *Corymbia hamersleyana* over Tall Open Scrub of *Acacia ancistrocarpa* and *A. tumida* var. *pilbarenis* over Open Heath of *Acacia stellaticeps* over Hummock Grassland of *Triodia epactia*.

ENV (2008) mapped three broad floristic communities with 13 vegetation associations within the application area:

Woodlands
ChAcCf: *Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis*, *Acacia pyrifolia* and *Acacia colei* var. *colei* shrubland over *Tephrosia* aff. *Rosea* (HD292-37) low shrubland over *Triodia epactia* very open hummock grassland over *Pluchea rubelliflora* and *Stemodia grossa* very open herbland. This vegetation community is found in drainage lines.

ChAtTe: *Corymbia hamersleyana* scattered low trees over *Acacia tumida* var. *pilbarensis* high shrubland over *Acacia pyrifolia* open shrubland over *Acacia ptychophylla* and *Acacia adoxa* var. *adoxa* low scattered shrubs over *Triodia epactia* closed hummock grassland. This vegetation community is found in drainage lines in the north-west of the supplementary survey area.

ChTe: *Corymbia hamersleyana* low open woodland over *Grevillea wickhamii* subsp. *hispidula* shrubland over *Triodia epactia* hummock grassland. Forms the drainage lines in the eastern section of the supplementary survey area.

ElAiTw: *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia inaequilatera* open shrubland over *Triodia wiseana* hummock grassland. Covers the slopes to the north of the ridge.

Ch/ElGwTe: *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* and *Acacia tumida* var. *pilbarensis* high shrubland over *Triodia epactia* hummock grassland. This vegetation community dominates the slopes closest to the ridge.

ChGwTe: *Corymbia hamersleyana* scattered low trees over *Grevillea wickhamii* subsp. *hispidula* and *Acacia pyrifolia* shrubland over *Triodia epactia* hummock grassland. Found on low hilltops and slopes.

ChAbTw: *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* and *Acacia victoriae* open shrubland over *Triodia wiseana* hummock grassland. This vegetation community is also found in the plains, mainly in the south-eastern end of the supplementary survey area.
Ch/ElAtEm: *Corymbia hamersleyana*, *Corymbia flavescens* and *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Eriachne mucronata* (typical form) very open tussock grassland over *Triodia biflora*, *Triodia epactia* and *Triodia wiseana* hummock grassland. This vegetation type is located in the gorges, gullies and breakaways.

Shrublands
AiTe: *Acacia inaequilatera* high open shrubland over *Acacia ptychophylla* low open health over *Triodia epactia* hummock grassland. Located in minor drainage lines.

GwTe: *Grevillea wickhamii* subsp. *hispidula* high open shrubland over *Acacia stellaticeps* open shrubland over *Dampiera candicans* and *Leptosema anomalum* scattered low shrubs over *Triodia epactia* hummock grassland. Forms the drainage lines running to the south of the main ridge.

AoTe *Acacia orthocarpa*, *Grevillea pyramidalis* subsp. *leucadendron* and *Grevillea wickhamii* subsp. *hispidula* high shrubland over *Corchorus* aff. *parviflorus* (1)(GLD SRH67-5) and *Acacia adoxa* var. *adoxa* low open shrubland over *Triodia epactia* hummock grassland over *Cymbopogon ambiguus* scattered tussock grasses. This vegetation community is located to the south of the main range.

Grasslands
Gp/GwTe: *Grevillea pyramidalis* subsp. *leucadendron* and *Grevillea wickhamii* subsp. *hispidula* open shrubland over *Acacia ptychophylla*, *Acacia adoxa* var. *adoxa* and *Tephrosia* aff. *rosea* (HD292-37) low shrubland over *Triodia epactia* hummock grassland.

ChApTe *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia ptychophylla* low open shrubland over *Acacia stellaticeps* low open shrubland over *Triodia epactia* and *Triodia epactia* closed hummock grassland. This vegetation community is located in the plains.

ecologia (2005) mapped three broad floristic communities with eight vegetation associations within the application area:

Forest
1: *Corymbia flavescens* and/or *Atalaya hemlglauca* and/or *Ficus brachypoda* (sometimes with *Eucalyptus Jeucophloia* subsp. *Jeucophloia* moderately dense medium forest to sparse low woodland, over medium shrubs such as *Acacia tumida* var. *pilbarensis* / *Grevillea wickhamii* subsp. *hispidula* / *Grevillea pyramidalis* subsp. *leucodendron* / *Petalostylis labicheoides* / *Fluggea vlrosa* subsp. *melanthesoides* medium shrubs, over low shrubs such as *Solanum dioicum* and *Indigofera monophylla*, over tussock grasses such as *Cymbopogon ambiguus* / *Eriachne mucronata* (typical form), over *Triodla epactia* of *Triodia wiseana* moderately dense to sparse hummock grassland.

Woodland
2a: *Eucalyptus leucophloia* subsp. *leucophloia* (or *Corymbia hamersleyana*) open medium / low woodland or trees (sometimes with *Terminalia canescens* or *Corymbia flavescens*), over *Acacia tumida* subsp. *pilbarensis* (or *Petalostylis labicheoides*) moderately dense to scattered tall/ medium shrubland, over medium shrubs such as *Acacia pyrifolia*, over low shrubs such as *Dampiera candicans* / *Sida* sp.A Kimberley Flora (P.A. Fryxell & I.A. Craven 3900) or *Triumfetta plumigera* / *Triumfetta maconochleana*, over dwarf shrubs such as *Indigofera monophylla* , over mixed tussock grass and spinifex hummock grasses.

2b: *Eucalyptus leucophloia* subsp. *leucophloia* open low woodland, over *Hakea chordophylla* scattered tall shrubland, over *Triumfetta maconochieana* / *Senna glutinosa* subsp. *glutinosa* scattered low shrubland, over Triodla wiseana moderately dense hummock grassland.

Shrublands
3a: *Acacia tumida* var. *pilbarensis* (also with *Grevillea wickhamii* subsp. *hispidula* / Acacia pyrifolia / *Petalostylis labicheoides*) moderately dense to open tall / medium shrubland, sometimes with *Corymbia hamersleyana* open low woodland to scattered trees, or with *Eucalyptus odontocarpa* open medium / low mallee, over open to low shrubs such as *Dampiera candicans* / *Acacia ptychophylla* / *Indigofera monophylla* (small calyx form), over tussock grasses and *Triodia epactia* or *Triodia biflora* hummock grasses.

3b: *Grevlllea wickhamii* subsp. *hispldula* open to sparse tall I medium shrubland (sometimes with *Corymbia hamersleyana* / *Acacia pyrifolia* / *Acacia tumida* var. *pilbarensis*), over *Acacia ptychophylla* / *Dampiera candlcans* moderately dense to sparse dwarf shrubland (occasionally with *Indigofera monophylla* (small calyx form), over *Goodenia stobbsiana* herbs, over *Triodia epactia* or *Triodia wiseana* open (to moderately dense) hummock grassland.

3c: *Grevillea wickhamii* subsp. *hispidula* / *Acacia inaequilatera* open medium to tall shrubland, over *Goodenia stobbsiana* scattered herbs, over *Triodia epactia* moderately dense hummock grassland.

3d: *Petalostylis labicheoides* / *AcacIa tumida* var. *pilbarensis* / *Grevillea wickhamii* subsp. *hispidula* moderately dense to sparse medium shrubland (sometimes with *Corymbla hamersleyana* or *C.* aff. *hamersleyana*), over *Triodia epactia* moderately dense to sparse hummock grassland.

3e: *Grevillea wickhamii* subsp. *hispidula* moderately dense to sparse medium flow shrubland (sometimes with *Eucalyptus leucophloia* subsp. l*eucophloia*, *Petalostylis labicheoides* and *Acacia tumida* var. *pilbarensis* trees and shrubs), over *Acacia spondylophylla* (and sometimes *Solanum dioicum* / *Corchorus* spp.) / *Acacia ptychophylla* moderately dense to scattered low / dwarf shrubland, over *Trlodia epactia* moderately dense to sparse hummock grassland.

Clearing Description

Cundaline Exploration Project. BHP Billiton Iron Ore Pty Ltd (BHP BIO) proposes to clear up to approximately 150 hectares of native vegetation within a total boundary area of approximately 903.4 hectares for the purpose of exploration, hydrogeological drilling, geotechnical investigations and supporting infrastructure. The proposal is located approximately 80 kilometres north-east of Marble Bar in the Shire of East-Pilbara.

Vegetation Condition

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994)

To

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The vegetation condition was assessed by botanists from Onshore (2013), Astron (2011), ENV (2008) and ecologia (2005).

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 application area falls within the Chichester (PIL1) subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion is described as undulating Archaean granite and basaltic plains which include significant areas of basaltic ranges (CALM, 2002). Plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* (formally *Triodia pungens*) hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges (CALM, 2002).

Four flora and vegetation surveys have been conducted over the application area by Onshore (2013), Astron (2011), ENV (2008) and ecologia (2005). The vegetation was found to be represented in the surrounding areas and in the same or better condition (BHP BIO, 2013). Given the disturbed nature of parts of the application area, the subject vegetation is not considered to contain higher diversity than the surrounding area (BHP BIO, 2013).

No Threatened or Priority Flora or Threatened or Priority Ecological Communities were recorded within the application area during the flora and vegetation surveys (BHP BIO, 2013).

Two flora species of interest were recorded within the application area; *Sida macropoda* and *Stemodia* sp. Shay Gap. The record of *Sida Macropoda* is an extension of its known range in the northern Kimberley region (BHP BIO, 2013). This species is locally widespread within the broader Yarrie/Goldsworthy mining operations (Onshore, 2013). Approximately two populations of *Sida macropoda* are located within the application area. *Stemodia* sp. Shay Gap is taxonomically undescribed but is known to inhabit rocky escarpments and cliff lines around mesas (Onshore, 2013). BHP BIO (2013) has advised they will avoid these species. Given the low impact nature of the clearing, the likely impact to these species is considered to be low.

Eight weed species were identified in the application area (BHP BIO, 2013). Of these; Kapok Bush and Buffel Grass were identified as having a high rating under the Environmental Weed Strategy for Western Australia (BHP BIO, 2013). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A fauna survey has been undertaken over the entire application area by Onshore (2013). Other fauna surveys have been undertaken over parts of the application area by ENV (2011), Outback Ecology Services (Outback, 2008) and ecologia (2005). These surveys have identified that faunal diversity is comparable to the surrounding region.

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

Methodology

Astron (2011)
BHP BIO (2013)
CALM (2002)
ecologia (2005)
ENV (2008)
ENV (2011)
Onshore (2013)
Outback (2008)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Threatened and Priority Flora
- Threatened Ecological Sites Buffered

(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 fauna survey has been undertaken over the entire application area by Onshore (2013), and over parts of the application area by ENV (2011), Outback Ecology Services (Outback, 2008) and ecologia (2005). From these surveys the following five habitat types have been identified as occurring within the application area (BHP BIO, 2013):

- Drainage Lines
- Cliff Lines and Gullies
- Hill Crests/Hill Slopes
- Scree slopes / Foot slope
- Plains

Of these habitats, Drainage Lines and Cliff Lines and Gullies are considered to be of higher conservation value (Onshore, 2013). Whilst these habitats are considered to be well represented in the surrounding area (BHP

BIO, 2013), it is important to ensure that disturbance is kept to a minimum. BHP BIO (2013) has committed to keeping the disturbance to the Drainage Line habitat to a minimum where possible. Where clearing is necessary, it will be for the purposes of access tracks only (BHP BIO, 2013). BHP BIO (2013) has advised that due to accessibility issues, clearing within Cliff Lines and Gullies will be avoided. There could potentially be some clearing within areas mapped as Cliff Lines and Gullies, however BHP BIO has advised that these areas are better described as hill slopes or scree slopes (pers comm. BHP BIO, 2013), which have a lower conservation value (Onshore, 2013).

Based on the fauna assessments undertaken over the application area, six conservation significant species have been recorded within the application area and a further four conservation significant species have the potential to occur within the application area (BHP BIO, 2013):

- Australian Bustard (*Ardeotis australis*) (DPaW Priority 4) – Recorded;
- Bush Stone-curlew (*Burhinus grallarius*) (DPaW - Priority 4) – Likely;
- Ghost Bat (*Macroderma gigas*) (DPaW Priority 4) – Recorded;
- Northern Quoll (*Dasyurus hallucatus*) (Endangered under *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act); Schedule 1 under *Wildlife Conservation Act 1950* (WC Act)) – Recorded;
- Peregrine Falcon (*Falco peregrine*) (Schedule 4 under WC Act) – Possible;
- Pilbara Leaf Nosed Bat (*Rhinonicteris aurantius*) (Vulnerable under EPBC Act; Schedule 1 under WC Act) – Likely;
- Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable under EPBC Act; Schedule 1 under WC Act) - Recorded;
- Rainbow Bee-Eater (*Merops ornatus*) (Migratory under EPBC Act; Schedule 3 under WC Act) – Recorded;
- Short-tailed Mouse (*Leggadina lakedownensis*) (DPaW Priority 4) – Possible; and
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (DPaW Priority 4) – Recorded.

Suitable habitat for avian fauna species such as Australian Bustard, Bush-stone Curlew, Peregrine Falcon and Rainbow Bee-eater is widespread in the region (BHP BIO, 2013). These highly mobile species are unlikely to rely on the habitats within the application area (BHP BIO, 2013).

No suitable roosts have been identified within the application area for either the Ghost Bat or the Pilbara Leaf Nosed Bat (BHP BIO, 2013). One cave was recorded within the application area which is used as a feeding roost only (BHP BIO, 2013). These species may forage over the application area; however more suitable habitat is located in the surrounding area (BHP BIO, 2013).

There was one opportunistic record of Northern Quoll within the northern end of the application area. This was an opportunistic sighting and likely to be a transient individual (ENV, 2011). It is likely that Northern Quolls also forage within the Drainage Line habitat (BHP BIO, 2013). No natural denning habitat occurs within the application area (BHP BIO, 2013). Suitable denning and foraging habitat is available in the surrounding area and Northern Quolls are unlikely to be reliant on any habitats occurring within the application area (BHP BIO, 2013).

There was one record of the Pilbara Olive Python within the application area (BHP BIO, 2013). This species may den within the Cliff Line and Gully habitat and forage along the Drainage Line habitat (BHP BIO, 2013). BHP BIO (2013) has advised that clearing of Cliff Line and Gully habitat will be avoided due to inaccessibility. This species has been recorded within the surrounding area (ENV, 2011; ecologia, 2005).

There were no active Western Pebble–mound Mouse mounds recorded within the application area (BHP BIO, 2013). Suitable habitat for this species is widespread in the surrounding areas (BHP BIO, 2013). Similarly there is widespread habitat for the Short-tailed Mouse in the surrounding areas (BHP BIO, 2013).

BHP BIO (2013) has committed to avoiding Cliff Line and Gully habitat, but has indicated that there may be some minor clearing in the Drainage Line habitat. Drainage Line habitat is considered to have high conservation value as it offers large habitat diversity, an ecological linkage for species to move through the area as well as important foraging grounds (Onshore, 2013). Potential impacts to this habitat type may be minimised by the implementation of watercourse management conditions.

Methodology

BHP BIO (2013)
ecologia (2005)
ENV (2011)
Onshore (2013)
Outback (2008)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, there are no Threatened Flora within the application area (GIS Database).

Flora and vegetation surveys of the application area conducted by Onshore (2013), Astron (2011), ENV (2008) and ecologia (2005) have not identified any Threatened Flora species within the application area.

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

Methodology

Astron (2011)
ecologia (2005)
ENV (2008)
Onshore (2013)
GIS Database:
- Threatened and Priority Flora

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC is located approximately 146 kilometres north-east of the application area (GIS Database).

No TECs were identified during the flora and vegetation surveys conducted by Onshore (2013), Astron (2011), ENV (2008) and ecologia (2005).

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

Methodology

Astron (2011)
ecologia (2005)
ENV (2008)
Onshore (2013)
GIS Database:
- Threatened Ecological Sites Buffered

(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 is located within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Approximately 99.58% of pre-European vegetation remains within the Pilbara bioregion (Government of Western Australia, 2013).

The vegetation within the application area has been broadly mapped as Beard vegetation associations (GIS Database):

93: Hummock grasslands, shrub steppe; kanji over soft spinifex

171: Hummock grasslands, low tree steppe; snappy gum over soft spinifex & *Triodia briziodes*

More than 99% of these two Beard vegetation associations remain within the Pilbara bioregion (see below) (Government of Western Australia, 2013)

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,808,657	17,733,584	~99.58	Least Concern	18
Beard vegetation associations - State					
93	3,044,309	3,040,641	~99.88	Least Concern	0.44
171	331,951	330,643	~99.61	Least Concern	-
Beard vegetation associations - Bioregion					
93	3,042,114	3,038,471	~99.88	Least Concern	0.44
171	331,307	330,026	~99.61	Least Concern	-

* Government of Western Australia (2013)
** Department of Natural Resources and Environment (2002)

The vegetation within the application area is not considered to be a remnant of vegetation in an area that has been extensively cleared.

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
GIS Database:
- IBRA WA (regions – subregions)
- Pre-European Vegetation

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

Comments **Proposal may be at variance to this Principle**

There are no permanent watercourses or wetlands within the application area (GIS Database). An ephemeral creek (Coonjeena Creek) is located within the application area (BHP BIO, 2013).

Onshore (2013) has identified one vegetation association (1a Eucalyptus Woodland) growing in association with Coonjeena Creek (Onshore, 2013). BHP BIO has advised that clearing within this vegetation association will be avoided where possible (BHP BIO, 2013). Where clearing is necessary, the purposes of the clearing will be for access tracks (BHP BIO, 2013). Potential impacts to this surface water feature may be minimised by the implementation of a watercourse management condition.

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

Methodology BHP BIO (2013)
Onshore (2013)
GIS Database:
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

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

The application area intersects the Boolgeeda, Capricorn, Macroy and Rocklea land systems (GIS Database).

The Boolgeeda Land System is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk et al., 2004). The vegetation is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Capricorn Land System is characterised by hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). The stony surfaces of the landforms in this land system provide resistance to erosion (Van Vreeswyk et al., 2004).

The Macroy Land System is characterised by stony plains and occasional tor fields based on granite supporting hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). The system has a low or very low erosion hazard (Van Vreeswyk et al., 2004).

The Rocklea Land System is characterised by basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands (Van Vreeswyk et al., 2004). The system has very low erosion hazard (Van Vreeswyk et al., 2004).

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

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- Rangeland Land System Mapping

(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 proposed clearing is not located within a conservation reserve (GIS Database). The nearest conservation area is the ex-Meentheena pastoral lease, a former leasehold proposed for conservation, which is located approximately 63 kilometres south-east of the application area (GIS Database).

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

Methodology GIS Database:
- DEC Tenure

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

Comments **Proposal is not likely to be at variance to this Principle**
The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

There are no permanent watercourses or water bodies within the application area (GIS Database). Coonjeena Creek, which is an ephemeral drainage line, runs through the northern end of the application area (BHP BIO, 2013). According to BHP BIO (2013), Coonjeena Creek is generally dry and sandy and only experiences significant flows during sustained high intensity rainfall events associated with cyclones and rain depressions. Clearing within Coonjeena Creek is proposed to be avoided where possible, or where necessary, for the purpose of access tracks only (BHP BIO, 2013). Given the sandy nature of the creek and infrequent flow, the proposed clearing is not likely to significantly increase sedimentation or otherwise impact on water quality.

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

Methodology BHP BIO (2013)
GIS Database:
- 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 located within the DeGrey River catchment area (GIS Database). Given the size of the area to be cleared (150 hectares) in relation to the size of the catchment area (845,936 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

The application area experiences a semi-desert tropical climate with summer cyclonic or thunderstorm rainfall, with an annual average rainfall of approximately 327.2 millimetres per year (CALM, 2002; BoM, 2013). Based on an average annual evaporation rate of 3,400 - 3,600 millimetres (GIS Database), there is likely to be little surface flow during normal seasonal rains. Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2013)
CALM (2002)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments - Catchments

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 (WC1998/008) over the area under application (GIS Database). WC1998/008 has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are several Aboriginal Sites of Significance located within the application area. It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no sites of Aboriginal significance are damaged though the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment Regulation (formerly 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 amendment was advertised on 14 October 2013 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology

GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Registerd with the NNTT

4. References

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Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Technical Bulletin - An Inventory and Condition Survey of the Pilbara Region, Western Australia, No. 92. Department of Agriculture, Government of Western Australia, Perth, Western Australia.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia

DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

P1 **Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P2 **Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P3 **Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4 **Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

R **Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

X **Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

Schedule 1 **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.

Schedule 2 **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.

Schedule 3 **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

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

P1 **Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

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

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under

immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

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

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.