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

# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

**Permit application No.:** 4639/1
**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 281SA (AML 70/281)
**Local Government Area:** Shire of Ashburton, Shire of East Pilbara
**Colloquial name:** Hill 65 Exploration Drilling Program

### 1.4. Application

| Clearing Area (ha) | No. Trees | Method of Clearing | For the purpose of: |
|---|---|---|---|
| 140.2 | | Mechanical Removal | Mineral Production |

### 1.5. Decision on application

**Decision on Permit Application:** Grant
**Decision Date:** 22 December 2011

## 2. Site Information

### 2.1. Existing environment and information

*2.1.1. Description of the native vegetation under application*

**Vegetation Description**

Beard vegetation associations have been mapped for the whole of Western Australia. Two Beard vegetation associations have been mapped within the applicaiton area (GIS Database; Shepherd, 2009):

18: Low woodland; mulga (*Acacia aneura*); and
82: Hummock grassland, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database; Shepherd, 2009).

Two flora and vegetation surveys have been conducted over the application area (BHP Billiton Iron Ore, 2011). The majority of the application area was surveyed by Astron Environmental Services (Astron) (2010) in April and May 2010, while the remaining area was covered by Onshore Environmental (2011) in August 2010. These surveys identified the following 32 vegetation associations within the application area (BHP Billiton Iron Ore, 2011):

**Astron (2010) communities:**
2a: Low Woodland of *Acacia aneura* var. *pilbarana* over Shrubland of *Acacia tetragonophylla, Sida* aff. *fibulifera* and *Solanum lasiophyllum* over Very Open Hummock Grassland of *Triodia melvillei, T. brizoides* and *T. pungens* on Red Brown Clayey Loam on Alluvial Drainage Flats;

2b: Scattered Low Trees of *Acacia pruinocarpa* over Shrubland of *Eremophila fraseri* and other mixed species over Open Tussock Grassland of *Themeda triandra* and Open Hummock Grassland of *Triodia* mixed species on Red Brown Loamy Colluvium on some Lower Slopes;

3a: Scattered Low Trees to Low Open Woodland of *Acacia aneura* var. *pilbarana* / *A. sibirica* over Open Shrubland of mixed species over Open to Very Open Tussock Grassland of mixed species and Very Open Hummock Grassland of *Triodia melvillei* on Red Brown Clayey Loams on Hardpan Plains/Internal Drainage Plains;

4a: Scattered Low Trees to Low Woodland of *Acacia aneura* var. *pilbarana* over Shrubland of mixed species over Tussock Grassland of mixed species and Very Open Hummock Grassland of *Triodia melvillei* on Red Brown Clayey Loams on Alluvial Drainage Flats;

4b: Low Open Forest of *Acacia aneura* var. *pilbarana* and *Eucalyptus xerothermica* over Shrubland of *Acacia* mixed species over Tussock Grassland of *Themeda triandra* over Open Herbland of **Malvastrum americanum* and **Bidens bipinnata* on Sandy Alluvium and/or Colluvium Within Some Incised Drainage Areas;

5a: Scattered Low Trees of *Acacia aneura* var. *pilbarana* over Very Open Tussock Grassland of *Aristida contorta* on Red Brown Clayey Loams, on Alluvial Drainage Flats and in some Plain Areas;

6a: Low Woodland to Low Open Woodland *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana*, *C. ferriticola*, *C. deserticola* over Open Shrubland of mixed species over Open Tussock and Hummock Grassland of mixed species on Red Brown Loamy Colluvium in Gorges;

7b: Woodland of *Eucalyptus camaldulensis* subsp. *obtusa* and *E. victrix* over Low Open Woodland of *Acacia aneura* var. *pilbarana* and *A. tetragonophylla* over Tussock Grassland of *Eulalia aurea* and Hummock Grassland of *Triodia* species on Sandy Alluvium within some Incised Drainage Areas;

7c: Low Woodland of *Eucalyptus victrix* and *Acacia aneura* var. *pilbarana* over Open Shrubland of mixed species over Open Tussock to Tussock Grassland of *Eulalia aurea* and *Themeda triandra* on Sandy Alluvium within some Incised Drainage Areas;

7d: Low Open Woodland of *Acacia aneura* var. *pilbarana* and *Corymbia hamersleyana* over Shrubland of mixed species over Hummock Grassland of *Triodia* species (soft spinifex) on Sandy Alluvium within some Incised Drainage Areas;

8a: Low Open Forest of *Eucalyptus victrix*, *Corymbia hamersleyana* and *Acacia aneura* var. *pilbarana* over Open Shrubland of *Acacia maitlandii* and other mixed species over Tussock Grassland of mixed species on Sandy Alluvium within some Incised Drainage Areas;

9a: Low Woodland to Open Forest of *Corymbia hamersleyana*, *Eucalyptus victrix* and *E. xerothermica* over Shrubland of mixed species over Tussock Grassland of *Themeda triandra* and *Eulalia aurea* and Hummock Grassland of *Triodia* species on Sandy Alluvium within some Incised Drainage Areas;

9b: Open Forest of *Acacia aneura* var. *pilbarana*, *A. pruinocarpa* and *Eucalyptus xerothermica* over Tall Open Shrubland of *E. trivalva, Eremophila longifolia* and *A. dictyophleba* over Tussock Grassland of *Themeda triandra* and *Eriachne* sp. on Sandy Alluvium within some Incised Drainage Areas;

9c: Low Open Woodland of *Corymbia hamersleyana* and *Eucalyptus victrix* over Tall Shrubland of *E. gamophylla* and mixed species over Open Tussock Grassland of *Themeda triandra* on Sandy Alluvium within some Incised Drainage Areas;

10a: Low Open Woodland of *Acacia aneura* var. *pilbarana*, *Corymbia deserticola* and *A. pruinocarpa* over Open Shrubland of mixed species over Hummock Grassland of *Triodia melvillei* on Red Brown Clayey Loams, on Alluvial Drainage Flats in some Plain Areas;

10b: Low Open Woodland of *Acacia aneura* var. *pilbarana* and *Eucalyptus xerothermica* over Shrubland of mixed species over Hummock Grassland of *Triodia melvillei* and Tussock Grassland of mixed species on Red Brown Loamy Alluvium and/or Colluvium on some Lower Slopes;

10c: Tall Open Shrubland of *Acacia pruinocarpa* and *A. aneura* var. *pilbarana* over Open Shrubland of *Acacia* species and mixed species over Hummock Grassland of *Triodia* species (mixed soft and hard spinifex) and Very Open Tussock Grassland of mixed species on Red Brown Clayey Loams, on Alluvial Drainage Flats in some Plain Areas;

10d: Open Woodland of *Eucalyptus gamophylla* and *Eucalyptus* species over Shrubland of *Acacia* species over Hummock Grassland of *Triodia* species (soft spinifex) on Red Brown Loamy Colluvium and/or Alluvium on some Lower Slopes;

10e: Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Open Shrubland of *Acacia* species over Open Hummock Grassland of *Triodia* species (hard spinifex) on Skeletal Loamy Soils on Hilltops and Upper Slopes;

10g: Low Open Woodland of *Eucalyptus leucophloia* ssp. *leucophloia*, *Grevillea wickhamii* and *E. gamophylla* over Shrubland to Open Shrubland of *Acacia* species over Hummock Grassland of *Triodia* species (hard spinifex) on Skeletal Loamy Soils on Hilltops and Upper Slopes;

10h: Low Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over Low Open Shrubland of mixed species over Hummock Grassland of *Triodia* pungens on Skeletal Loamy Soils on Hilltops and Upper Slopes;

10i: *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia* spp. Scattered shrubs over *Triodia wiseana/T. brizoides* (hard spinifex) hummock grassland; and

10j: *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia* spp. Scattered

shrubs over *Triodia wiseana/T. brizoides* (hard spinifex) hummock grassland.

**Onshore Environmental (2011) Communities:**
4: Low Open Forest of *Acacia aneura* var. *tenuis* and *Eucalyptus xerothermica* over Shrubland of *Eremophila forrestii* subsp. *forrestii* over Open Tussock Grassland of *Themeda triandra, Eriachne benthamii* and *Aristida inaequiglumis;*

*5:* Low Woodland of *Acacia aneura* var. *tenuis, Acacia pruinocarpa* and *Hakea lorea* subsp. *lorea* over Open Shrubland of *Eremophila forrestii* subsp. *forrestii* and *Eremophila lanceolata* over Very Open Tussock Grassland of *Themeda triandra, Eulalia aurea* and *Aristida inaequiglumis;*

8: High Shrubland of *Acacia monticola, Acacia elachantha* and *Gossypium robinsonii* over Open Hummock Grassland of *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana*;

10a: Hummock Grassland of *Triodia wiseana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over High Open Shrubland of *Petalostylis labicheoides*, *Acacia hamersleyensis, Hakea chordophylla* and *Acacia pyrifolia* var. *pyrifolia*;

10d: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. Van Leeuwen 3835) and *Triodia pungens* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola* and *Eucalyptus leucophloia* subsp. *leucophloia* over Very Open Mallee of *Eucalyptus gamophylla;*

10e: Hummock Grassland of *Triodia melvillei* with High Open Shrubland of *Acacia aneura* var. *tenuis, Acacia pruinocarpa* and *Acacia pachyacra* over Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia, Corymbia deserticola* subsp. *deserticola* and *Eucalyptus xerothermica;*

10g: Hummock Grassland of *Triodia brizoides* with Open Mallee of *Eucalyptus repullulans* and Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia*;

10i: Hummock Grassland of *Triodia brizoides* and *Triodia wiseana* with Open Shrubland of *Acacia bivenosa and Senna glutinosa* subsp. *glutinosa* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*; and

11a: Tussock Grassland of *Themeda triandra, Eulalia aurea* and *Cymbopogon procerus* with Low Woodland of *Corymbia hamersleyana* and *Eucalyptus xerothermica* over High Shrubland of *Acacia elachantha, Petalostylis labicheoides* and *Acacia monticola*.

**Clearing Description**

BHP Billiton Iron Ore Pty Ltd is proposing to clear up to 140.2 hectares of native vegetation for the purpose of mineral exploration, hydrological investigations and associated infrastructure.

Clearing will be conducted using a dozer/excavator. Vegetation and topsoil will be stockpiled for later use in rehabilitation.

**Vegetation Condition**

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

To

Pristine: No obvious signs of disturbance (Keighery, 1994).

**Comment**

The application area is located within the Pilbara region of Western Australia and is situated approximately 87 kilometres east southeast of Tom Price.

## 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 at variance to this Principle**

The application area is located approximately 87 kilometres east southeast of Tom Price in the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). At a broad scale, vegetation can be described as Mulga low woodlands over bunch grasses on fine textured soils in valley floors and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002). Rare features of the subregion include gorges of the Hamersley Ranges (particularly those within Karijini National Park), Palm Spring, Duck Creek and Themeda grasslands (CALM, 2002). Permanent spring systems such as Weeli Wolli are also listed for their importance as refugia (CALM, 2002).

Two flora and vegetation surveys have been conducted over the application area and surrounding areas with Astron Environmental Services (Astron) (2010) covering all but 400 hectares of the application area, which was covered by Onshore Environmental (2011).

There are no known Priority Ecological Communities (PEC's) or Threatened Ecological Communities (TEC's) within the application area (GIS Database).

Flora and vegetation surveys conducted by Astron (2010) and Onshore Environmental (2011) identified the following three priority flora species within the application area:

- *Aristida jerichoensis* var. *subspinulifera* (Priority 1): known from three records on FloraBase (West Australian Herbarium, 2011). This species was recorded at two locations within the north eastern corner of the application area (BHP Billiton Iron Ore, 2011). Given the conservation significance of this species, BHP Billiton Iron Ore (2011) have committed to avoiding this species during the proposed exploration program. Potential impacts to this species may be minimised by the implementation of a flora management condition;

- *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3): known from eleven records on FloraBase (West Australian Herbarium, 2011). This species was recorded at six locations within the application area and at 33 locations outside of the application area during flora and vegetation surveys conducted by Astron (2010) and Onshore Environmental (2011); and

- *Eremophila magnifica* subsp. *magnifica* (Priority 4): known from 17 records on FloraBase (West Australian Herbarium, 2011). This species was recorded at four locations within the application area and 28 locations outside of the application area during flora and vegetation surveys conducted by Astron (2010) and Onshore Environmental (2011).

The proposed clearing is unlikely to impact on the conservation of Priority 3 flora species *Rhagodia* sp. Hamersley (M Trudgen 17794) or Priority 4 flora species *Eremophila magnifica* subsp. *magnifica*. However, given the small known distribution for Priority 1 species *Aristida jerichoensis* var. *subspinulifera*, the proposed clearing may impact on the conservation of this species. Potential impacts to the conservation of *Aristida jerichoensis* var. *subspinulifera* may be minimised by the implementation of a flora management condition.

Three introduced taxa, *Bidens bipinnata*, *Cenchrus ciliaris* and *Malvastrum americanum*, were recorded in the application area during flora surveys conducted by Astron (2010) and Onshore Environmental (2011). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This can in turn lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. None of these species are listed as a 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Agriculture and Food. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Two fauna surveys have been conducted over the application area and surrounding area by Astron (2010) and Onshore Environmental (2011). These surveys identified two habitats of high significance (Ironstone Ridges – Gorges, Cliffs and Caves and Drainage Lines – Major Drainage Lines). A number of conservation significant fauna are known to be associated with the Gorges, Cliffs and Caves habitat, including the Pilbara Olive Python, Pilbara Leaf-nosed Bat, Northern Quoll, Long Tailed Dunnart and Ghost Bat. The fauna surveys conducted by Astron (2010) and Onshore Environmental (2011) recorded the Ghost Bat (Priority 4) and Western Pebble-mound Mouse (Priority 4) within the application area and have listed a further ten conservation significant fauna species as possible or likely to occur within the application area. Potential impacts to conservation significant fauna species may be minimised by the implementation of a fauna management condition.

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

**Methodology**

Astron (2010)
BHP Billiton Iron Ore (2011)
CALM (2002)
Onshore Environemental (2011)
West Australian Herbarium (2011)
GIS Database:
- IBRA WA (regions – subregions)
- 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 at variance to this Principle**

Two fauna surveys have been conducted over the application area and surrounding area by Astron (2010) and Onshore Environmental (2011). These surveys identified the following seven fauna habitats with medium to high significance:

Ironstone Ridges – Gorges, Cliffs and Caves (High Significance);
Drainage Lines – Major Drainage Lines (High Significance);
Ironstone Ridges – Hillcrests and Slopes (Medium Significance);
Stony Lower Slopes and Plains (Medium significance);
Mulga Woodland / Groved Mulga on Plains (Medium Significance);

Drainage Depression (Medium Significance); and
Spinifex Hummock Grassland on Sand / Loam (Medium Significance).

Fauna surveys conducted by Astron (2010) and Onshore Environmental (2011) have identified the potential for the following 12 conservation significant fauna species to occur within the application area (BHP Billiton Iron Ore, 2011):

- Northern Quoll (*Dasyurus hallucatus*) (Schedule 1 and Endangered) – not recorded within the application area however has been recorded nearby and may utilise the 'Ironstone Ridges – Gorges, Cliffs and Caves' habitat;

- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (Schedule 1 and Vulnerable) – not recorded within the application area, however was recorded in a cave approximately 700 metres northeast of the application area. Astron (2010) have identified this species as being a likely visitor / resident as suitable caves may be present and there are local records;

- Pilbara Olive Python (*Liaisis olivaceus barroni*) (Schedule 1 and Vulnerable) – not recorded during the Astron (2010) and Onshore Environmental (2011) surveys, however the 'Ironstone Ridges – Gorges, Cliffs and Caves' habitat is considered suitable for this species;

- Peregrine Falcon (*Falco peregrinus*) (Schedule 4) – not recorded during Astron (2010) and Onshore Environmental (2011) fauna surveys, however Cliffs and tall open woodland in the application area are considered to be suitable habitat. This species is common throughout the Pilbara and has the ability to egress from disturbance;

- Unnamed Blind Snake (*Ramphotyphlops ganei)* (Priority 1) – not recorded within the application area, however was recorded nearby. Blind snakes are typically very hard to detect during biological surveys therefore it is considered likely that this species occurs within the application area. It is known from a broad distribution within the Pilbara and given the low impact, non-contiguous nature of the proposed clearing it is considered unlikely that the conservation of this species will be impacted;

- Grey Falcon (*Falco hypoleucos*) (Priority 4) – not recorded during Astron (2010) and Onshore Environmental (2011) fauna surveys, however Cliffs and tall open woodland in the application area are considered to be suitable habitat. This species is common throughout the Pilbara and has the ability to egress from disturbance;

- Ghost Bat (*Macroderma gigas*) (Priority 4) – scats were recorded at the entry to a deep complex cave within the application area. This species is patchily distributed across Australia, and is sensitive to disturbance. Potential impacts to this species as a result of the proposed clearing may be minimised by the implementation of a fauna management condition;

- Western Pebble-mound Mouse (*Pseudomys chapmani*) (Priority 4) – active mounds recorded within the application area. This species is endemic to the Pilbara and Upper Gascoyne. While it is likely that the proposed clearing will impact on this species, BHP Billiton Iron Ore (2011) have committed to avoiding mounds where possible as all known locations are recorded and drill programs are prepared to avoid these locations where possible;

- Australian Bustard (*Ardeotis australis*) (Priority 4) – not recorded within the application area, however has been assessed as likely to be present. This species is typically widespread and nomadic, however locally scare. Given the low impact, non-contiguous nature of the proposed clearing and the highly mobile nature of the Australian Bustard, it is considered unlikely that the proposed clearing will impact on the conservation of this species;

- Bush-stone Curlew (*Burhinus grallarius*) (Priority 4) – not recorded within the application area, however suitable habitat of dry open woodlands is present. Suitable habitat for this species is common and the loss of the small amount of proposed clearing is considered negligible for the conservation of this species;

- Long-tailed Dunnart (*Sminthopsis longicaudata*) (Priority 4) – not recorded within the application area, however has been assessed as possibly occurring in the Gorges, Cliffs and Caves habitat. This species has a broad known distribution from the Central Deserts to the Gascoyne and Pilbara regions. It is therefore considered unlikely that the proposed clearing will impact on the conservation of this species;

- Lakeland Downs Mouse (*Leggadina lakedownensis*) (Priority 4) – not recorded within the application area, however has been assessed as possibly occurring as suitable habitat is present. This species occurs throughout the Pilbara and Kimberly regions and while the proposed clearing may have some impact at a local level it is considered unlikely to impact on the conservation of this species;

- Fork-tailed Swift (*Apus pacificus*) – this is an aerial species which forages high in the airspace and is relatively independent of ground habitat. It is therefore considered unlikely that the proposed clearing will impact on the conservation of this species; and

- Rainbow Bee-eater (*Merops ornatus*) (Migratory) – not recorded within the application area however has been recorded nearby and has therefore been assessed as likely to occur. The amount of clearing proposed within the suitable habitat for this species is considered negligible compared to the suitable habitat remaining

nationally. It is therefore considered unlikely that the proposed clearing will impact on the conservation of this species.

The majority of these conservation significant fauna species are highly mobile and suitable habitat is common throughout the Pilbara. Four species, the Northern Quoll, Pilbara Leaf-nosed Bat, Pilbara Olive Python and Ghost Bat, have more specialised habitats which may impact upon the species if cleared within the application area. Potential impacts to the conservation significant fauna species Northern Quoll, Pilbara Leaf-nosed Bat, Pilbara Olive Python and the Ghost Bat may be minimised by the implementation of a fauna management condition.

Additionally, two locally significant species were recorded within the application area:

- Northern Brushtail Possum (*Trichosurus vulpecular arnhemensis*) - a large number of scats for the Northern Brushtail Possum were recorded at the entrance to a cave (Astron, 2011). This record occurs approximately 100 kilometres south of its known distribution in the Pilbara (Astron, 2011). Potential impacts to the conservation of this species may be minimised by the implementation of a fauna management condition; and

- Rothschild's Rock Wallaby (*Petrogale rothschildi*) – this species has been heavily impacted on the mainland due to the introduction of the red fox. Given the low impact, non contiguous nature of the proposed clearing and the mobility of this species, it is considered unlikely that the proposed clearing will impact on the conservation of this species.

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

**Methodology** Astron (2010)
BHP Billiton Iron Ore (2011)
Onshore Environmental (2011)

**(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**
There are no known records of Declared Rare Flora (DRF) species within the application area (GIS Database). Flora surveys of the application area and its surrounds conducted by Astron (2010) and Onshore Environmental (2011) have not identified any DRF species within the application area. The flora survey conducted by Onshore Environmental (2011) identified one DRF species, *Lepidium catapycnon*, approximately 1 kilometre north of the application area. At this distance, it is considered unlikely that the proposed clearing will impact on the conservation of this species.

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

**Methodology** Astron (2010)
Onshore Environmental (2011)
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**
There are no known records of Threatened Ecological Communities within the application area (GIS Database). The nearest known TEC is approximately 84 kilometres north west of the application area (GIS Database). At this distance there is little likelihood of any impact to the TEC as a result of the proposed clearing.

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

**Methodology** 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). Shepherd (2009) reports that approximately 99.89% of the pre-European vegetation remains in the Pilbara bioregion.

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

18: Low woodland; mulga (*Acacia aneura*); and
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana.*

According to Shepherd (2009) approximately 100% of Beard vegetation associations 18 and 82 remain within the Pilbara bioregion (see table below).

| | Pre-European area (ha)* | Current extent (ha)* | Remaining %* | Conservation Status** | Pre-European % in IUCN Class I-IV Reserves |
|---|---|---|---|---|---|
| IBRA Bioregion - Pilbara | 17,804,193 | 17,785,001 | ~99.89 | Least Concern | ~6.32 |
| Beard vegetation associations - State | | | | | |
| 18 | 19,892,305 | 19,890,275 | ~99.99 | Least Concern | ~2.13 |
| 82 | 2,565,901 | 2,565,901 | ~100 | Least Concern | ~10.24 |
| Beard vegetation associations - Bioregion | | | | | |
| 18 | 676,557 | 676,557 | ~100 | Least Concern | ~16.8 |
| 82 | 2,563,853 | 2,563,583 | ~100 | Least Concern | ~10.25 |

* Shepherd (2009)
** Department of Natural Resources and Environment (2002)

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

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

**Methodology** Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (regions – subregions)
- Pre-European Vegetation

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

**Comments** **Proposal is not likely to be at variance to this Principle**
There are no permanent wetlands or watercourses within the application area, however there are numerous minor non-perennial watercourses (GIS Database). Flora and vegetation surveys of the application area conducted by Astron (2010) and Onshore Environmental (2011) identified numerous vegetation communities associated with minor non-perennial watercourses.

The vegetation associations defined within the application area are common locally and regionally. Given the low impact, non contiguous nature of the proposed clearing, it is considered unlikely that the proposed clearing will significantly impact upon any vegetation growing in association with non-perennial watercourses.

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

**Methodology** Astron (2010)
Onshore Environmental (2011)
GIS Datanase:
- 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 following four 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). This vegetation is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Newman land system is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard Spinifex grasslands (Van Vreeswyk et al., 2004). This land system is not susceptible to erosion (Van Vreeswyk

et al., 2004).

The Platform land system is characterised by dissected slopes and raised plains supporting hard Spinifex grasslands (Van Vreeswyk et al, 2004). This land system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Wannamunna land system is characterised by hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (and occasionally eucalypt woodlands). This land system generally has low susceptibility to erosion (Van Vreeswyk et al., 2004).

Given that none of the land systems are prone to erosion, the proposed clearing is not likely to cause appreciable land degradation.

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 application area is not located within a conservation reserve (GIS Database). The nearest conservation reserve is Karijini National Park, located approximately 0.5 kilometres west of the application area (GIS Database). Given the low impact and non-contiguous nature, it is considered unlikely that the proposed clearing will impact on the environmental values of any conservation areas.

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

**Methodology** GIS Database:
- DEC Tenure

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

**Comments** **Proposal is not likely to be at variance to this Principle**
According to available Databases, the application area is not located within a Public Drinking Water Source Area (PDWSA). The nearest PDWSA is the Neman Water Reserve, located approximately 77 kilometres south east of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the quality of the Newman Water Reserve.

The groundwater salinity within the application area is approximately 500 -1,000 millimetres/Litre Total Dissolved Solids (TDS) (GIS Database). Given the non contiguous, low impact nature of the proposed clearing within the Hamersley Groundwater Province (10,166,832 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

**Methodology** GIS Database:
- Groundwater Provinces
- Groundwater Salinity, Statewide
- Public Drinking Water Source Area (PDWSA)

**(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.**

**Comments** **Proposal is not likely to be at variance to this Principle**
The application area experiences a semi-desert tropical climate with summer cyclonic or thunderstorm events, with an annual average rainfall of approximately 457.6 millimetres recorded at Wittenoom weather station approximately 83 kilometres north of the application area (BoM, 2011; CALM, 2002). The average annual evaporation rate for the application area is approximately 3,400 millimetres (GIS Database), any surface water resulting from rainfall events is likely to be relatively short lived.

Given the size of the area to be cleared (140.2 hectares) compared to the size of the Ashburton catchment area (7,877,743 hectares) (GIS Database) it is considered unlikely that the proposed clearing will lead to any appreciable increase in run off, and subsequently cause or exacerbate the incidence or intensity of flooding.

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

**Methodology** BoM (2011)
CALM (2002)
GIS Database:
- Evaporation Isopleths
- Hydrophic Catchments – Catchments

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

**Comments**

There are three Native Title Claims (WC96/61, WC98/62 and WC10/15) over the area under application (GIS Database). These claims have been registered with the 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 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 10 October 2011 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received in relation to the cumulative impacts of clearing in the Shire of East Pilbara. Cumulative impacts have been taken into account under Principle (e).

**Methodology** GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims – Filed with the Federal Court
- Native Title Claims – Registered with the NNTT

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## 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.