



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4468/1
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 Newman) Agreement Act 1964, Mineral Lease 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Jinidi Exploration Program

1.4. Application

| Clearing Area (ha) | No. Trees | Method of Clearing | For the purpose of: |
|--------------------|-----------|--------------------|---------------------|
| 417.45 | | Mechanical Removal | Mineral Exploration |

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 18 August 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 application area (GIS Database; Shepherd, 2009):

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

A two phase flora and vegetation survey was conducted over the application area by Ecologia in Spring 2005 and autumn 2006 with ENV undertaking an additional survey in March 2008 (ENV, 2010a). From these surveys ENV (2010a) has identified the following 14 vegetation associations as occurring in the application area:

1a: Open Hummock Grassland of *Triodia pungens* and *Triodia longiceps* with Low Open Woodland of *Eucalyptus victrix*, *Eucalyptus xerothermica* and *Eucalyptus camaldulensis* subsp. *refulgens* with High Shrubland of *Acacia aneura*, *Acacia pyrifolia* and *Petalostylis labicheoides* on alluvial red-brown clay loam on floodplains / drainage lines;

1b: Hummock Grassland of *Triodia wiseana* and *Triodia pungens* with Shrubland of *Petalostylis labicheoides*, *Rulingia luteiflora* and mixed *Acacia* species with Low Open Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Eucalyptus gamophylla* (Mallee) on red-brown alluvial clay loam on floodplains;

1c: Hummock Grassland of *Triodia wiseana* and *Triodia pungens* with Shrubland of *Petalostylis labicheoides*, *Acacia aneura* and *Acacia pruinocarpa* with Low Open Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* on red-brown loam on drainage lines / floodplains;

1d: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Shrubland of *Petalostylis labicheoides*, *Acacia bivenosa* and *Rulingia luteiflora* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on drainage levees;

1e: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana*, *Eucalyptus gamophylla* (mallee) and *Corymbia deserticola* subsp. *deserticola* (mallee) with Shrubland of *Acacia bivenosa*, *Acacia inaequilatera* and *Acacia ancistrocarpa* on

red-brown loam on footslopes;

1f: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Low Open Shrubland of *Gompholobium karjini*, *Acacia arida* and *Acacia hilliana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on undulating low hills;

1g: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* and *Triodia wiseana* with Low Open Shrubland of *Acacia hilliana*, *Gompholobium karjini* and *Acacia adoxa* var. *adoxo* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on hills;

1h: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia arida*, *Acacia hilliana* and *Acacia adoxa* var. *adoxo* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on undulating low hills;

1i: Open Hummock Grassland of *Triodia wiseana*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Open Shrubland of *Acacia bivenosa*, *Acacia pyriformis* and *Acacia pruinocarpa* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on light brown loam on undulating calcrete plains;

1j: Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia angusta* with Open Shrubland of *Acacia bivenosa* and *Rulingia luteifolia* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Eucalyptus socialis* subsp. *eucentrica* (mallee) on red-brown loam on calcrete drainage lines;

2a: High Shrubland of *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* and *Rulingia luteiflora* with Open hummock Grassland of *Triodia wiseana* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on minor drainage lines;

2b: High Shrubland of *Acacia aneura* var. *intermedia*, *Acacia aneura* var. *pilbarana* and *Acacia catenulata* subsp. *occidentalis* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* with Very Open Hummock Grassland of *Triodia pungens* and *Triodia wiseana* on red-brown clay loam on hillcrests and breakaways;

3a: Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* with Low Open Shrubland of *Senna venusta*, *Scaevola parvifolia* subsp. *pilbarae* and *Ptilotus obovatus* with Very Open Tussock Grassland of *Aristida holathera* var. *latifolia* and *Aristida holathera* var. *holathera* on red-brown loam on lower footslopes; and

3b: Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia ferricola* with Open Shrubland of *Acacia aneura*, *Acacia pyriformis* and *Rulingia luteifolia* with Very Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) on red-brown loam on gorges/ steep gullies.

| | |
|-----------------------------|---|
| Clearing Description | <p>BHP Billiton Iron Ore Pty Ltd is proposing to clear up to 417.45 hectares for the purpose of mineral exploration.</p> <p>Clearing will be conducted using a dozer/excavator and vegetation and topsoil will be stockpiled for later use in rehabilitation.</p> |
| Vegetation Condition | <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994);</p> <p>To</p> <p>Pristine: No obvious signs of disturbance (Keighery, 1994).</p> |
| Comment | <p>The application area is located within the Pilbara region of Western Australia and is situated approximately 53 kilometres north west of Newman.</p> <p>The application area overlaps previously granted permits CPS 2073/2 and CPS 3042/1 which have a combined total of 127.45 hectares of uncleared native vegetation already approved for clearing (BHP Billiton Iron Ore, 2011). BHP Billiton Iron Ore (2011) intend to relinquish these permits.</p> |

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 proposed clearing is located approximately 53 kilometres north west of Newman in the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation of 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).

A flora and vegetation survey of the application area was conducted by staff from ENV (2010a) between 4 March and 20 March 2008. A total of 371 flora taxa were recorded within the survey area of approximately 12,154 hectares. A total of 358 flora taxa were recorded from two surveys conducted by Ecologia within the local area (ENV, 2010a). It is therefore considered unlikely that the application area contains greater floral diversity than the surrounding areas.

A total of seven introduced plant taxa, *Cenchrus ciliaris*, *Malvastrum americanum*, *Setaria verticillata*, *Bidens bipinnata*, *Cucumis melo* subsp. *agrestis*, *Portulaca oleracea*, *Vachellia farnsiana* and *Flaveria trinervia* were recorded within the application area during the flora survey conducted by ENV (2010a). 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.

The application area is partly located within the buffer zone of a Priority 1 Ecological Community (PEC), Weeli Wolli Spring Community (GIS Database). The PEC is not located within the application area and given the low impact nature of the proposed clearing it is considered unlikely that the proposed clearing will impact upon this community.

Five Priority flora species have been recorded within the application area:

Brunonia sp. Long hairs (Priority 1) – known from three records on Florabase with only two records in the Pilbara (Western Australian Herbarium, 2011). One individual was recorded by Woodman Environmental (2010) within the application area and no distinct difference between this species and *Brunonia australis* could be made;

Goodenia sp. East Pilbara (Priority 3) – known from 14 records on Florabase (Western Australian Herbarium, 2011);

Indigofera gilesii subsp. *gilesii* (Priority 3) – known from 14 records on Florabase (Western Australian Herbarium, 2011);

Rhagodia sp. Hamersley (Priority 3) – known from eleven records on Florabase (Western Australian Herbarium, 2011); and

Goodenia nuda (Priority 4) – known from 20 records on Florabase (Western Australian Herbarium, 2011) (BHP Billiton Iron Ore, 2011).

BHP Billiton Iron Ore (2011) have stated that no exploration activities will occur near the recorded locations of *Brunonia* sp. Long hairs or *Rhagodia* sp. Hamersley. Drilling may occur in the same area as *Goodenia* sp. East Pilbara, *Indigofera gilesii* subsp. *gilesii* and *Goodenia nuda* (BHP Billiton Iron Ore, 2011). However, each of these three species have extensive distributions outside the application area and Priority flora will be avoided where possible, as outlined in BHP Billiton Iron Ore's Exploration Environmental Management Plan (BHP Billiton Iron Ore, 2011). It is unlikely that the proposed clearing will significantly impact on the conservation status of any of the above species.

Two fauna surveys, conducted by ENV in 2008 and Ecologia in 2005 and 2006, recorded a total of 183 fauna species within the application area comprising of two amphibian, 69 reptile, 81 bird and 31 mammal species (ENV, 2010b). The faunal assemblages at Jinidi were compared to other regional surveys and the diversity at Jinidi was considered typical of the Pilbara region (BHP Billiton Iron Ore, 2011).

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

Methodology

BHP Billiton Iron Ore (2011)
CALM (2002)
ENV (2010a)
ENV (2010b)
Western Australian Herbarium (2011)
Woodman Environmental (2010)
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 not likely to be at variance to this Principle

A fauna survey of the application area was conducted by staff from ENV (2010b) in March 2008. This survey identified the following six fauna habitats within the application area:

Gorge: high habitat value;
Minor drainage line: high habitat value;
Breakaway: medium habitat value;
Alluvial plain: medium habitat value;
Scree slope: Medium habitat value; and
Hilltop: Low habitat value.

The following seven conservation significant fauna species have been recorded within the application area (ENV, 2010b):

- Pilbara Leaf-nosed Bat (*Rhynonictoris aurantia*) (Vulnerable, Schedule 1): recorded at one cave within the application area. This cave is not considered to be a roost cave (BHP Billiton Iron Ore, 2011);
- Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable, Schedule 1): uncommon within the application area. Highly suitable habitat located at Weeli Wolli Creek, outside of the application area;
- Blind snake (*Ramphotyphlops ganeii*) (Priority 1): one individual recorded within the application area. Unlikely to occur within the application area in high density and widespread throughout the Pilbara bioregion;
- Australian Bustard (*Ardeotis australis*) (Priority 4): six individuals recorded from three locations within the application area. The Australian Bustard is a highly nomadic species and is considered unlikely to be significantly impacted by the proposed clearing;
- Ghost Bat (*Macroderma gigas*) (Priority 4): calls recorded at three caves, these caves were considered unlikely to be utilised for roosting (Biologic, 2011);
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (Priority 4): recorded from 27 locations across the application area (ENV, 2010b). BHP Billiton Iron Ore (2011) record locations of all encountered Western Pebble-mound Mouse mounds and exploration activities are planned to avoid these locations where possible; and
- Rainbow Bee-eater (*Merops ornatus*) (Migratory): the loss of habitat from the proposed exploration drilling program is considered negligible compared to other suitable habitat remaining within its national distribution.

It is likely that caves within the application area are utilised for foraging by the Ghost Bat and the Pilbara Leaf-nosed Bat, however, given the rugged terrain this habitat occurs in, BHP Billiton Iron Ore (2011) have stated that no exploration activities will be undertaken within this area.

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

Methodology BHP Billiton Iron Ore (2011)
Biologic (2011)
ENV (2010b)

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

Comments Proposal is at variance to this Principle

No Declared Rare Flora (DRF) species are known to occur within the application area, however, a 50 metre buffer for the DRF species *Lepidium calycinum*, encroaches on the south west corner of the application area (GIS Database).

According to BHP Billiton Iron Ore (2011), one location of DRF species *Lepidium calycinum* is known within the application area. While BHP Billiton Iron Ore (2011) have committed to avoiding this location, potential impacts to DRF as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

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

Methodology BHP Billiton Iron Ore (2011)
GIS Database:
- Declared Rare and Priority Flora List

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

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

There are no known records of Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest known TEC is approximately 49 kilometres south east 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 bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Shepherd (2009) reports that approximately 99.89% of the pre-European vegetation remains in the Pilbara bioregion.

The vegetation in 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* (GIS Database; Shepherd, 2009).

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 |
| IBRA Subregion - Hamersley | 5,634,727 | 5,634,727 | ~100 | Least Concern | ~12.88 |
| 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 | 2,563,583 | 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 located within the application area, however there are numerous ephemeral watercourses (GIS Database).

Based on vegetation mapping conducted by ENV (2010a), there are five vegetation associations within the application area that are associated with drainage areas:

- 1a: Open Hummock Grassland of *Triodia pungens* and *Triodia longiceps* with Low Open Woodland of *Eucalyptus victrix*, *Eucalyptus xerothermica* and *Eucalyptus camaldulensis* subsp. *refulgens* with High

Shrubland of *Acacia aneura*, *Acacia pyrifolia* and *Petalostylis labicheoides* on alluvial red-brown clay loam on floodplains / drainage lines;

1c: Hummock Grassland of *Triodia wiseana* and *Triodia pungens* with Shrubland of *Petalostylis labicheoides*, *Acacia aneura* and *Acacia pruinocarpa* with Low Open Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* on red-brown loam on drainage lines / floodplains;

1d: Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia pungens* with Shrubland of *Petalostylis labicheoides*, *Acacia bivenosa* and *Rulingia luteiflora* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on drainage levees;

1j: Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia wiseana* and *Triodia angusta* with Open Shrubland of *Acacia bivenosa* and *Rulingia luteiflora* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana* and *Eucalyptus socialis* subsp. *eucentrica* (mallee) on red-brown loam on calcrete drainage lines; and

2a: High Shrubland of *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* and *Rulingia luteiflora* with Open hummock Grassland of *Triodia wiseana* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* on red-brown loam on minor drainage lines.

These vegetation communities are common throughout the application area and are not considered to be locally or regionally significant. Given the low impact nature of the exploration activities to be undertaken, it is considered unlikely that the proposed clearing will have a significant impact on any vegetation growing in association with these vegetation communities.

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

Methodology ENV (2010a)
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 following seven 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 Egerton land system is characterised by dissected hardpan plains supporting mulga shrublands and hard Spinifex hummock grasslands (Van Vreeswyk et al., 2004). This land system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The McKay land system is characterised by hills, ridges, plateaux remnants and breakaways of meta sedimentary rocks supporting hard Spinifex grasslands (Van Vreeswyk et al., 2004). This land 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 prone to degradation and has erosion resistant surfaces (BHP Billiton Iron Ore, 2011).

The Oakover land system is characterised by breakaways, mesas, plateaux and stony plains of calcrete supporting hard Spinifex grasslands (Van Vreeswyk et al., 2004). This land system is not generally 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 Spearhole land system is characterised by gently undulating hardpan plains supporting groved mulga shrublands and hard Spinifex (Van Vreeswyk et al., 2004). This land system is not prone to erosion (Van Vreeswyk et al., 2004).

Given that none of the land systems are susceptible 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 BHP Billiton Iron Ore (2011)
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 reserve is Karijini National Park, located approximately 56 kilometres west of the application area (GIS Database). At this distance it is 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 GIS databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Newman Water Reserve, approximately 26 kilometres south east of the application area (GIS Database). At this distance it is unlikely that the proposed clearing will impact on the water quality of the Newman Water Reserve.

The groundwater salinity within the application area is approximately 500 – 1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). Given the non contiguous, low impact nature of the clearing within the Hamersley Groundwater Province (101,668,326 hectares), 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 an average annual rainfall of approximately 313.2 millimetres recorded at Newman Aero weather station approximately 52 kilometres south east of the application area (BoM, 2011; CALM, 2002). The majority of rainfall in this area usually falls in summer cyclonic or thunderstorm events (CALM, 2002). Large runoff as well as localised and regional flooding can occur following intense rainfall events (BHP Billiton Iron Ore, 2011).

The incidence or intensity of flooding is not likely to be significantly influenced by the proposed clearing (BHP Billiton Iron Ore, 2011). The rocky substrate of the cleared areas and the surrounding areas of rocky hillsides and stony plains would act to attenuate water velocities and dissipate runoff, therefore reducing the possibility of flooding (BHP Billiton Iron Ore, 2011).

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

Methodology BHP Billiton Iron Ore (2011)
BoM (2011)
CALM (2002)

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

Comments
There is one Native Title Claim (WC05/6) over the area under application (GIS Database). This claim has 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 is one registered Aboriginal Site 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 11 July 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the proposed clearing.

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

4. References

- BHP Billiton Iron Ore (2011) Jinidi Exploration Program, Purpose Permit Vegetation Clearing Permit Application Supporting Documentation. Unpublished Report dated June 2011.
- Biologic (2011) Jinidi Cave Assessment. Unpublished Report dated August 2011.
- BoM (2011) BoM Website - Climate Averages by Number, Averages for NEWMAN AERO. www.bom.gov.au/climate/averages/tables.shtml (Accessed 1 August 2011).
- Department of Conservation and Land Management (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- ENV (2010a) Jinayri Mining Lease Flora and Vegetation Survey. Prepared for BHP Billiton Iron Ore Pty Ltd. Unpublished Report dated August 2010.
- ENV (2010b) Jinayri Mining Lease Vertebrate Fauna Survey. Prepared for BHP Billiton Iron Ore Pty Ltd. Unpublished Report dated February 2010.
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5. Glossary

Acronyms:

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| 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 |

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.