



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4676/1
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)
Iron Ore (Mount Goldsworthy) Agreement Act 1964, Mineral Lease 281SA (AML 70/281)
Miscellaneous Licence 47/92
Miscellaneous Licence 52/99
Local Government Area: Shire of East Pilbara
Colloquial name: Jinidi Village Substation

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15		Mechanical Removal	Geotechnical Investigations, Power Line Construction and Associated Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 12 January 2012

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. Three Beard vegetation associations have been mapped within the application area (GIS Database; Shepherd, 2009):

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

A flora and vegetation survey of the application area was conducted by ENV (2009a) in May 2009. The following 30 vegetation communities were recorded as occurring within the application area:

COTG - Open Tussock Grassland of **Cenchrus ciliaris* with High Shrubland of *Acacia citrinoviridis* on Red- brown Loam on Disturbed Drainage Lines;

AHOS - High Open Shrubland of *Acacia aneura*, *Acacia catenulata* subsp. *occidentalis* and *Acacia pruinoarpa* over Very Open Hummock Grassland of *Triodia wiseana* and *Triodia melvillei* with Low Open Shrubland *Eremophila forrestii* subsp. *forrestii* and *Ptilotus obovatus* on Red-brown Loam on Plains/Low Undulations;

AHS01 - High Shrubland of *Acacia aneura*, *Petalostylis labicheoides* and *Rulingia luteiflora* over (Very Open) Hummock / Tussock Grassland of *Themeda triandra*, *Triodia pungens* and *Chrysopogon fallax* with Low Open Woodland of *Eucalyptus xerothermica*, *Corymbia hamersleyana* and (mallee) *Eucalyptus gamophylla* on Red-brown Loam (some clay) on Floodplains/Drainage Lines.

AHS02 - High (Open) Shrubland of *Acacia aneura* with Open Tussock Grassland of *Aristida contorta*, *Chrysopogon fallax* and *Enneapogon polyphyllus* on Red-brown Loam with Clay Surface on Plains;

AOS01 - Open Scrub of *Acacia elachantha* and *Acacia ancistrocarpa* with Very Open Hummock Grassland of *Triodia pungens* and *Triodia Basedowii* with Low Open Shrubland of *Senna glutinosa* subsp. *glutinosa* x *glaucifolia*, *Scaevola parvifolia* subsp. *pilbarae* and *Acacia adoxa* var. *adoxo* on Red-brown Loam with on Low Rises/Undulations;

AOS02 - Open Scrub of *Acacia monticola*, *Acacia elachantha* and *Dodonaea lanceolata* var. *lanceolata* with Open hummock Grassland of *Triodia wiseana* and *Triodia pungens* with Low Open Woodland of *Corymbia hamersleyana* on Red-brown Loam on Drainage Lines;

AOS03 - Open Scrub of *Acacia catenulata* subsp. *occidentalis*, *Acacia pruinocarpa* and *Acacia aneura* over Hummock Grassland of *Triodia melvillei* with Scattered Low Trees of *Corymbia deserticola* subsp. *deserticola* and *Corymbia hamersleyana* on Red-brown Sandy Loam on Plains;

AS - (Open) Shrubland of *Acacia ancistrocarpa*, *Rulingia luteiflora* and *Acacia inaequilatera* over Hummock / Tussock Grassland of *Triodia pungens*, *Triodia brizoides* and *Themeda triandra* with Low Open Woodland of (mallee) *Eucalyptus gamophylla* and *Eucalyptus leucophloia* subsp. *leucophloia* on Red-brown Loam on Minor Drainage Line;

ACS - Closed Scrub of *Acacia catenulata* subsp. *occidentalis* over Very Open Hummock Grassland of *Triodia pungens* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* on Red-brown loam on Floodplain/Drainage lines;

ETG - Tussock Grassland of *Eulalia aurea* and *Themeda triandra* with Open Shrubland of *Petalostylis labicheoides*, *Rulingia luteiflora* and *Acacia pyrifolia* var. *pyrifolia* with Low Open Woodland of *Eucalyptus camaldulensis*, *Eucalyptus victrix* and *Eucalyptus xerothermica* on Red-brown Clay on Major Drainage Lines;

TTG01 - Tussock Grassland of *Themeda triandra*, **Cenchrus ciliaris* and *Sorghum plumosum* (with very open sedges of *Cyperus vaginatus*) with Low Open Shrubland of *Rulingia luteiflora*, *Acacia inaequilatera* and *Tephrosia rosea* var. *glabrior* with Open Woodland of *Eucalyptus victrix* on Red-brown Clayey Loam with on Drainage Lines;

TTG02 - Open to Closed Hummock / Tussock Grassland of *Themeda triandra*, *Triodia pungens* and *Eriachne tenuiculmis* with High Shrubland of *Acacia citrinoviridis*, *Acacia bivenosa* and *Rulingia luteiflora* with Low Woodland of *Eucalyptus victrix* and *Eucalyptus xerothermica* on Alluvial Red-brown Sand and Loam (some clay) on Drainage Lines;

TTGH03 - Open Tussock / Hummock Grassland of *Themeda triandra*, *Triodia wiseana* and **Cenchrus ciliaris* (sedges of *Cyperus vaginatus*) with Open Shrubland of *Acacia bivenosa* and *Melaleuca glomerata* with Open Woodland of *Eucalyptus victrix* and *Corymbia hamersleyana* on Alluvial Red-brown Loam with on Minor Drainage Lines/Floodplains;

TCHG - Closed Hummock Grassland of *Triodia basedowii* and *Triodia pungens* with Very Open Mallee of *Eucalyptus gamophylla* with High Open Shrubland *Acacia inaequilatera*, *Acacia bivenosa* and *Acacia pruinocarpa* on Skeletal Red-brown Loam on Low Hillslopes;

THG01 - Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia bivenosa*, *Rulingia luteiflora* and *Petalostylis labicheoides* with Very Open Mallee of *Eucalyptus socialis* subsp. *eucentrica*, *Corymbia hamersleyana* and *Eucalyptus trivalva* on Red-brown Loam on Calcrete Rises / Outcrops;

THG02 - Hummock Grassland of *Triodia pungens* and *Triodia brizoides* with High Open Shrubland of *Acacia aneura*, *Acacia catenulata* subsp. *occidentalis* and *Astrotricha hamptonii* with Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia ferriticola* subsp. *ferriticola* with Scattered Tussock Grass of *Eriachne mucronata* on Red-brown Loam on Outcrops/Cliff Faces;

THG03 - Tussock / Hummock Grassland of *Triodia pungens*, *Eriachne mucronata* and *Themeda triandra* with High Open Shrubland of *Acacia citrinoviridis*, *Acacia tumida* var. *pilbarensis* and *Acacia pruinocarpa* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia candida* subsp. *dipsodes* on Skeletal Red-brown Loam on Major Gullies;

THG04 - Hummock Grassland of *Triodia wiseana* with Open Shrubland of *Acacia inaequilatera* and *Acacia bivenosa* (with Scattered *Eucalyptus leucophloia* subsp. *leucophloia*) on Skeletal Red-brown Loam on Hills;

THG05 - (Closed) Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia basedowii* and *Triodia brizoides* with High to Low Open Shrubland to Scattered of *Acacia hilliana*, *Acacia pruinocarpa* and *Hakea chordophylla* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* on Skeletal Redbrown Loam on Hills;

THG06 - Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia wiseana* and with High Open Shrubland of *Acacia ancistrocarpa*, *Acacia bivenosa* and *Acacia inaequilatera* with Very Open Mallee of *Eucalyptus gamophylla* on Red-brown Loam on Low Hillslopes;

THG07 - Hummock / Tussock Grassland of *Triodia pungens* and *Themeda triandra* with Shrubland

of *Acacia ancistrocarpa*, *Acacia bivenosa* and *Rulingia luteiflora* with Low Open Woodland of *Eucalyptus xerothermica*, *Eucalyptus gamophylla* and *Corymbia hamersleyana* on Red-brown Loam on Drainage Lines/Floodplains;

THG08 - Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with (High) Shrubland of *Acacia ayersiana*, *Acacia aneura* and *Acacia catenulata* subsp. *occidentalis* with Scattered Mallees of *Eucalyptus gamophylla* on Red- brown Loam on Plains/Floodplains;

THG09 - Hummock / Tussock Grassland of *Triodia angusta*, *Triodia pungens* and **Cenchrus ciliaris* with (Open) Shrubland of *Acacia aneura*, *Acacia pruinocarpa* and *Acacia tetragonophylla* on Red-brown Loam on Plains/Floodplains;

THG10 - Hummock / Tussock Grassland of *Triodia angusta*, *Triodia wiseana* and *Themeda triandra* with High Open Shrubland of *Acacia bivenosa*, *Petalostylis labicheoides* and *Rulingia luteiflora* with *Eucalyptus xerothermica*, *Eucalyptus trivalva* and *Eucalyptus gamophylla* on Red-brown Sandy and Clayey loams on Minor Drainage Lines;

THG11 - Tussock / Hummock Grassland of *Triodia pungens*, *Eriachne mucronata* and *Themeda triandra* with High Open Shrubland of *Acacia citrinoviridis*, *Acacia tumida* var. *pilbarensis* and *Acacia pruinocarpa* with Low Open Woodland of *Corymbia deserticola* subsp. *deserticola*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia candida* subsp. *dipsodes* on Skeletal Red-brown Loam on Major Gullies;

THG12 - Hummock / Tussock Grassland of *Triodia pungens* and *Themeda triandra* with Low Open Shrubland of *Acacia adoxa* var. *adoxo* and *Tephrosia rosea* on Skeletal Red-brown Clayey Loam on Minor Drainage Lines;

THG13 - Hummock Grassland of *Triodia wiseana* and *Triodia pungens* with Shrubland of *Acacia ancistrocarpa*, *Stylobasium spathulatum* and *Acacia aneura* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Eucalyptus xerothermica* on Red- brown Loam on Minor Drainage Lines;

EOF - Open Tussock / Hummock Grassland of *Themeda triandra*, *Triodia wiseana* and **Cenchrus ciliaris* (sedges of *Cyperus vaginatus*) with Open Shrubland of *Acacia bivenosa* and *Melaleuca glomerata* with Open Woodland of *Eucalyptus victrix* and *Corymbia hamersleyana* on Alluvial Red-brown Loam with on Minor Drainage Lines/Floodplains;

EOTG02 - Open Tussock Grassland of *Eragrostis eriopoda*, *Paraneurachne muelleri* and *Chrysopogon fallax* with Low Shrubland of *Sida* sp. verrucose glands (F.H. Mollemans 2423), *Eremophila margarethae* and *Hibiscus sturtii* var. *platyklamys* with Open Shrubland of *Acacia pruinocarpa* and *Hakea chordophylla* on Red-brown Loam on Floodplains; and

EOTG01 - Open Tussock Grassland of *Enneapogon intermedius*, *Tripogon loliiformis* and *Bothriochloa ewartiana* with High Open Shrubland of *Acacia pruinocarpa* with Scattered Mallee of *Eucalyptus socialis* subsp. *eucentrica* on White-Brown Loam on Low Calcrete Rise.

Clearing Description	BHP Billiton Iron Ore Pty Ltd has applied to clear up to 15 hectares of native vegetation, within a broader area of approximately 1,370 hectares, for the purpose of geotechnical investigations, construction of a Jinidi Village Substation and 33kv Transmission Line. Clearing will be conducted by mechanical means.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).
Comment	The application area is located within the Pilbara region of Western Australia and is situated approximately 2.5 kilometres north west of Newman and extends approximately 82 kilometres north west towards Area C.

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 proposed clearing is located 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 <i>Eucalyptus leucophloia</i> over <i>Triodia brizoides</i> 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).
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A flora and vegetation survey of the application area was conducted by ENV (2009a) in May 2009. A total of 501 flora taxa from 172 genera and 58 families were recorded within the application area (ENV, 2009a). While this is a large number of taxa, it is noted that the application area spans a large distance and crosses many vegetation communities. Given that the application area is relatively narrow and the low impact nature of the proposed clearing, it is considered unlikely that the proposed clearing will significantly impact on the biodiversity of the local area.

A flora and vegetation survey of the application area conducted by ENV (2009a) identified one Declared Rare Flora (DRF) and six Priority Flora species within the application area (ENV, 2009a):

- *Lepidium catapycnon* (Rare) – recorded at nine locations during a flora survey conducted by ENV (2009a) and seven locations during a flora survey conducted by Onshore Environmental and Biologic (BHP Billiton Iron Ore, 2011). BHP Billiton Iron Ore (2011) has advised they will avoid all known locations of this species. Potential impacts to this species may be minimised by the implementation of a flora management condition;
- *Euphorbia* sp. Bruce flats (Priority 2) – recorded at three locations within the application area during a flora survey conducted by ENV (2009a). This species is known from one location approximately 92 kilometres west northwest of the application area (West Australian Herbarium, 2012). Given very little is known about this species, the proposed clearing may impact on the conservation of this species. Potential impacts to this species may be minimised by the implementation of a flora management condition;
- *Vigna* sp. central (Priority 2) – recorded at seven locations during a flora survey conducted by ENV (2009a). There are six records of this species lodged with the West Australian Herbarium (2012) distributed across the Pilbara ranging from Onslow in the West to East of tom Price and East of Marble Bar. Given the broad distribution of this species it is considered unlikely that the proposed clearing will impact on the conservation of this species;
- *Acacia subtiliformis* (Priority 3) – recorded at 21 locations during a flora survey conducted by ENV (2009a). This species has been recorded by nearby flora surveys for the Jinayri Access Road and Jinayri to Area C Infrastructure Corridor (ENV, 2009a);
- *Goodenia* sp. East Pilbara (Priority 3) – recorded at 25 locations within the application area during a flora survey conducted by ENV (2009a). There are 14 records of this species on FloraBase distributed in the south east of the Pilbara bioregion (West Australian Herbarium, 2012);
- *Rhagodia* sp. Hamersley (Priority 3) – recorded at 45 locations within the application area during a flora survey conducted by ENV (2009a). This species is known from 12 locations in the south east of the Pilbara bioregion (West Australian Herbarium, 2012); and
- *Goodenia nuda* (Priority 4) – recorded at three locations within the application area during a flora survey conducted by ENV (2009a). There are 24 records of this species on FloraBase with a distribution across the Pilbara bioregion and one record in the east of the Gascoyne bioregion (West Australian Herbarium, 2012).

The proposed clearing has the potential to adversely impact two conservation significant flora species, *Lepidium catapycnon* (Rare) and *Euphorbia* sp. Bruce flats (Priority 2). Potential impacts to the conservation of these species as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

Fourteen introduced flora species, *Acetosa vesicaria*, *Aerva javanica*, *Argemone ochroleuca* subsp. *ochroleuca*, *Bidens bipinnata*, *Cenchrus ciliaris*, *Chloris virgata*, *Citrullus colocynthis*, *Cucumis melo* subsp. *agrestis*, *Cynodon dactylon*, *Malvastrum americanum*, *Portulaca oleracea*, *Setaria verticillata*, *Solanum nigrum* and *Vachellia farnesiana*, were recorded within the application area during a flora survey of the application area conducted by ENV (2009a). 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 lies within two buffer zones for the Weeli Wollli Natural Springs Priority 1 Ecological Community (PEC) (GIS Database). The PEC is related to the vegetation growing in association with permanent natural springs occurring along Weeli Wollli Creek, which is 10 kilometres east of the application area at its closest point (BHP Billiton Iron Ore, 2011). It is therefore unlikely that the proposed clearing will impact on the conservation values of this PEC.

A fauna survey of the application area was conducted by ENV (2009b) in May 2009. This survey identified seven fauna habitats within the application area (ENV, 2009b):

- Alluvial Plain (Moderate conservation value);
- Scree/Low Hills (Low conservation value);
- Riverine (High conservation value);
- Stony Plain (Moderate conservation value);
- Gorge/Gully (High Conservation value);
- Minor Drainage Line (Moderate conservation value); and
- Hill Crest (Moderate conservation value).

A total of 76 fauna species were recorded during a fauna survey of the application area conducted by ENV (2009b). This included two conservation significant fauna species, the Rainbow Bee-eater (Migratory) and Australian Bustard (Priority 4) (ENV, 2009b). Given the small scale of the proposed clearing (15 hectares within

a boundary of approximately 1,370 hectares) it is considered unlikely that the proposed clearing will significantly impact faunal diversity or the conservation of any conservation significant species.

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

Methodology BHP Billiton Iron Ore (2011)
CALM (2002)
ENV (2009a)
ENV (2009b)
West Australian Herbarium (2012)
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 may be at variance to this Principle

A fauna survey of the application area was conducted by ENV (2009b) in May 2009. This survey identified seven fauna habitats within the application area (ENV, 2009b):

- Alluvial Plain (Moderate conservation value);
- Scree/Low Hills (Low conservation value);
- Riverine (High conservation value);
- Stony Plain (Moderate conservation value);
- Gorge/Gully (High Conservation value);
- Minor Drainage Line (Moderate conservation value); and
- Hill Crest (Moderate conservation value).

A total of 76 fauna species comprised of nine reptile, 59 bird and eight mammal species, were recorded within the application area (ENV, 2009b). Two of the species recorded within the application area are conservation significant species (ENV, 2009b):

- Australian Bustard (*Ardeotis australis*) (Priority 4) – One deceased individual of this species was recorded within the application area. This species is highly mobile and wide ranging with the potential to forage anywhere within the Pilbara. It is considered unlikely that the proposed clearing will impact on the conservation of this species; and

- Rainbow Bee-eater (*Merops ornatus*) (Migratory) – Recorded within the Riverine habitat in the application area, which is where this species is most likely to forage. This species feeds on airbourne insects, and nests throughout its Western Australian range in burrows excavated in sandy ground or river banks, often at the margins of roads and tracks.

An additional 12 conservation significant fauna species were assessed as potentially occurring within the application area (ENV, 2009b). Suitable habitat types within the application area for three conservation significant reptile species, *Lerista macropisthopus remota* (Priority 2), *Ramphotyphlops ganeii* (Priority 1) and the Pilbara Olive Python (Vulnerable, Schedule 1), are considered to be of low to moderate significance for the conservation of these species (ENV, 2009b).

The Great Egret (Migratory) and Common Sandpiper (Migratory) are likely to occur within the riverine habitat, however it is unlikely that either of these species are residents within the application area, being likely to forage along the major drainage lines in summer and autumn after major rainfall events.

The Peregrine Falcon (Schedule 4) and the Grey Falcon (Priority 4) are rare within the Pilbara bioregion and are not likely to occur in the project area on a regular basis (ENV, 2009b). These species may utilise the riverine and floodplain habitats within the application area for foraging.

The Bush Stone-curlew (Priority 4) is very rare within the local area and it is therefore not expected to occur within the application area regularly (ENV, 2009b).

The Fork-tailed Swift (Migratory) forages high in the air-space and is therefore unlikely to be impacted by the proposed clearing (ENV, 2009b).

The Star Finch (Priority 4) may nest in trees in the project area, particularly in Riverine or Minor Drainage Line habitat (ENV, 2009b). BHP Billiton Iron Ore (2011) have committed to not clearing within 50 metres of either the Weeli Wolli or Coondiner Creeks, therefore the conservation of this species is not likely to be impacted.

The Northern Quoll (Endangered, Schedule 1) may occur along creeklines in Riverine or Minor Drainage Line habitat and denning in caves (ENV, 2009b). Few caves are expected to be impacted by the proposed clearing, however, potential impacts to the Northern Quoll may be minimised by the implementation of a fauna management condition.

Suitable habitat within the application area for both the Long-tailed Dunnart (Priority 3) and Western Pebble-mound Mouse (Priority 4) is considered to be of low or moderate significance for these species (ENV, 2009b).

The Ghost Bat (Priority 4) and the Pilbara Leaf-nosed Bat (Vulnerable, Schedule 1) roost and breed in deep, humid caves (ENV, 2009b). Provided that no significant caves are destroyed by the proposed development, there will be minimal impact to either of these species (ENV, 2009b). Potential impacts to the Ghost Bat and Pilbara Leaf-nosed Bat may be minimised by the implementation of a fauna management condition.

Due to the small amount of clearing (15 hectares within a broader boundary of approximately 1,370 hectares) along with the low to moderate significance of the majority of the fauna habitats present, it is considered unlikely that the proposed clearing will impact on the conservation of most of the conservation significant fauna species. A fauna survey of the application area conducted by ENV (2009b) noted that provided no significant caves are destroyed, potential impacts to the Ghost Bat and Pilbara Leaf-nosed Bat will be minimal. ENV (2009b) also noted that there is potential denning habitat for the Endangered Northern Quoll within the application area. Potential impacts to the Northern Quoll, Pilbara Leaf-nosed Bat and the Ghost Bat may be minimised by the implementation of a fauna management condition.

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

Methodology BHP Billiton Iron Ore (2011)
ENV (2009b)

(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

One Declared Rare Flora (DRF) species, *Lepidium catapycnon*, was recorded within the application area during a flora and vegetation survey conducted by ENV (2009a). Nine locations of this species were recorded within the application area during this survey (ENV, 2009a). An additional survey conducted by Onshore and Biologic in 2009 identified seven locations of this species within the application area (BHP Billiton Iron Ore, 2011).

Two locations of the DRF species were recorded as spanning all or most of the width of the application area (BHP Billiton Iron Ore, 2011). BHP Billiton Iron Ore (2011) have committed to avoiding all known populations of DRF species *Lepidium catapycnon*.

Potential impacts to the DRF species *Lepidium catapycnon* 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)
ENV (2009a)

(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 1.5 kilometres east of the application area at its closest point (GIS Database). Given the low impact nature of the proposed clearing (geotechnical investigations and powerline construction) it is considered unlikely that the proposed clearing will impact the TEC.

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 Biogeographical 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 in the application area has been broadly mapped as Beard vegetation associations:

- 18: Low woodland; mulga (*Acacia aneura*);
- 29: Sparse low woodland; mulga, discontinuous in scattered groups; and
- 82: Hummock grasslands, low tree steppe; snappy gum over *Tridial wiseana*.

According to Shepherd (2009) approximately 100% of Beard vegetation associations 18, 29 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
29	7,903,991	7,903,991	~100	Least Concern	~0.29
82	2,565,901	2,565,901	~100	Least Concern	~10.24
Beard vegetation associations - Bioregion					
18	676,557	676,557	~100	Least Concern	~16.80
29	1,133,220	1,133,220	~100	Least Concern	~1.91
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 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). Weeli Wollli Creek occurs in the northern section of the application area, while Coondiner Creek crosses the application area (GIS Database). BHP Billiton Iron Ore (2011) have committed to avoid clearing within 50 metres of both of these creeks. Potential impacts to Weeli Wollli Creek and Coondiner Creek may be minimised by the implementation of a watercourse management condition.

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

Methodology BHP Billiton Iron Ore (2011)
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 12 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 Calcrete land system is characterised by low calcrete platforms and plains supporting shrubby hard spinifex grasslands (Van Vreeswyk et al., 2004). This land system has been assessed as having a low erosion

risk (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 Elimunna land system is characterised by stony plains on basalt supporting sparse acacia and cassia shrublands and patchy tussock grasslands (Van Vreeswyk et al., 2004). Some drainage floors of this land system are slightly susceptible to erosion, however most of this land system is inherently resistant (Van Vreeswyk et al., 2004).

The McKay land system is characterised by hills, ridges, plateaux remnants and breakaways of meta sedimentary and 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 susceptible to erosion (Van Vreeswyk et al., 2004).

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 prone to degradation or susceptible to soil 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 River land system is characterised by active flood plains and major rivers supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex grasslands (Van Vreeswyk et al., 2004). This land system is largely stabilised by buffel grass and spinifex and accelerated erosion is uncommon, however, susceptibility to erosion is high or very high if vegetation is removed (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, 2004). This land system has very low erosion susceptibility (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).

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).

The River land system is highly susceptible to erosion if vegetation cover is removed and some of the drainage floors of the Elimunna land system are slightly susceptible to erosion. These two land systems total approximately 2.6 % of the application area (BHP Billiton Iron Ore, 2011). It is therefore considered unlikely that the proposed clearing will 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 area (GIS Database). The nearest conservation area is Karijini National Park, located approximately 42 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, part of the application area is located within the Newman Water Reserve (GIS Database). Advice from the Department of Water (DoW) (2011) noted that BHP Billiton is the water service provider for this water source and therefore BHP Billiton would be responsible for the remediation of any contamination of the water source caused by the proposed clearing. DoW (2011) advises that protecting the drinking water supply is a cheaper option than both treatment and remediation. DoW (2011) advise that potential impacts to the Newman Water Reserve may be minimised by following Water Quality Protection Guidelines, available from <http://drinking.water.wa.gov.au>.

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 (10,166,832 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

There are no permanent water bodies within the application area (GIS Database). The application area experiences a semi-desert tropical climate with an average annual rainfall of approximately 319.3 millimetres recorded at Newman Aero weather station approximately 2.5 kilometres south east of the application area at its closest point (BoM, 2011; CALM, 2002). The average annual evaporation rate within the application area is approximately 3,400 – 3,600 millimetres (GIS Database). It is therefore considered unlikely that water will pool in the application area for long periods of time.

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

Methodology BoM (2011)
CALM (2002)
DoW (2011)
GIS Database:
- Groundwater Provinces
- Groundwater Salinity, Statewide
- 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 experiences a semi-desert tropical climate with an average annual rainfall of approximately 319.3 millimetres recorded at Newman Aero weather station approximately 2.5 kilometres south east of the application area at its closest point (BoM, 2011; CALM, 2002). The majority of rainfall in this area usually falls in summer cyclonic and thunderstorm events (CALM, 2002). Large runoff as well as localised and regional flooding can occur following intense rainfall events. Given the low impact, non contiguous nature of the proposed clearing, it is considered unlikely to cause or exacerbate the incidents 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)

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

Comments

There are five Native Title Claims (WC10/15, WC10/17, WC05/6, WC96/61 and WC98/62) 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 four 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 7 November 2011 by the Department of Mines and Petroleum inviting submissions from the public. One submission related to this permit was received regarding the cumulative impacts of clearing within the Pilbara. A letter of response was sent outlining the processes followed during the assessment and cumulative impacts were assessed under Principle (e).

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

4. References

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- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
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- ENV (2009a) Newman to Yandi Transmission Line - Flora and Vegetation Assessment. Unpublished Report prepared for Worley Parsons Services Pty Ltd dated November 2009.
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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.