



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5990/1
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 1972, Mineral Lease 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Orebodies 21 and 22

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
190		Mechanical Removal	Mineral Exploration, Geotechnical and Hydrogeological Investigations and Associated Activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 27 March 2014

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 and are useful to look at vegetation in a regional context. Three vegetation associations have been mapped within the application area (GIS Database):

29: Sparse low woodland; mulga, discontinuous in scattered groups;

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and

216: Low woodland; mulga (with spinifex) on rises.

There have been three flora and vegetation surveys in the local area that included parts of the application area. Astron Environmental Services (Astron) conducted a level 2 survey over the Ninga area in April 2013. Onshore Environmental conducted a level 2 survey over the Orebody 19 area in March 2013. ENV conducted a level 2 survey over Orebody 42/43 in December 2010. The following vegetation associations have been recorded within the application area:

Astron (2013):

Acacia Low Open Woodland to Low Woodland:

1b Low Woodland of *Acacia aptaneura* over Tall Open Shrubland of *A. sclerosperma* subsp. *sclerosperma* over Very Open Hummock Grassland of *Triodia epactia* and Very Open Tussock Grassland of *Aristida latifolia*;

Tall Acacia Shrubland:

2a Tall Open Shrubland to Tall Shrubland of *Acacia pruinocarpa*, *A. aptaneura* and *A. catenulata* subsp. *occidentalis* over Shrubland of *A. aptaneura*, *A. aneura*, *A. bivenosa* and *Eremophila forrestii* subsp. *forrestii* over Scattered Low Shrubs of *Scaevola parviflora* subsp. *pilbarae* over Open Hummock Grassland of *Triodia basedowii* and Very Open Tussock Grasses of *Aristida contorta*, *Paraneurachne muelleri* and *Cymbopogon procerus*;

Triodia Hummock Grassland:

3c Scattered Low Trees of *Eucalyptus leucophloia* subsp. *leucophloia* over Scattered Tall Shrubs of *Acacia pruinocarpa* and *A. aptaneura* over Low Open Shrubland of *A. hilliiana* and *A. adoxa* var. *adoxo* over Open Hummock Grassland of *Triodia basedowii*. Cenchrus Open Tussock Grassland 4a Tall Shrubland of *Acacia sclerosperma* subsp. *sclerosperma* and *A. synchronicia* over Scattered Low Shrubs of *Sida* aff. *echinocarpa* (MET 15,350) over Open Tussock Grassland of *Cenchrus ciliaris* and *Eragrostis eriopoda* and Open Hummock Grassland of *Triodia epactia*;

Acacia Shrubland:

5a Open Woodland of *Corymbia hamersleyana* and *Eucalyptus gamophylla* over Tall Shrubland of *Acacia*

monticola, *Petalostylis labicheoides* and *Santalum lanceolatum* and *A. bivenosa* over Hummock Grassland of *Triodia epactia* and *T. basedowii* and Open Tussock Grassland of *Themeda triandra* which occurs as a mosaic with vegetation association 11a in some places and thus cannot be mapped separately;

Eucalyptus Open Forest:

6a Open Forest of *Eucalyptus camaldulensis* subsp. *obtusata* and *E. victrix* over Low Woodland of *Acacia citrinoviridis*, *Melaleuca glomerata* and *A. coriacea* subsp. *pendens* over Tussock Grassland of **Cenchrus ciliaris*, **Cynodon dactylon*, *Leptochloa digitata*, *Eulalia aurea* and *Themeda triandra* and Very Open Sedges of *Cyperus vaginatus* and Very Open Hummock Grassland *Triodia longiceps*;

Triodia Open Hummock Grassland:

7b Tall Open Shrubland of *Acacia inaequilatera* over Scattered Shrubs of *Senna glutinosa* subsp. *pruinosa* over Open Hummock Grassland of *Triodia epactia*;

Grevillea Tall Shrubland:

8b This is a mosaic of two vegetation associations which could not always be mapped separately: 8a: Tall Shrubland of *Grevillea wickhamii*, *Acacia inaequilatera* and *A. monticola* over Scattered Shrubs of *Acacia pachyacra* over Hummock Grassland of *Triodia basedowii* and *T. epactia* and Open Tussock Grassland of *Amphipogon sericeus*. 7d: Tall Open Shrubland of *Acacia ancistrocarpa*, *A. bivenosa* and *A. inaequilatera* over Low Open Shrubland of *Ptilotus astrolasius* over Open Hummock Grassland of *Triodia epactia* and Open Tussock Grassland of *Eragrostis setifolia* and *Paraneurachne muelleri*;

Amphipogon Open Tussock Grassland:

9a Scattered Low Trees of *Corymbia deserticola* over Open Tussock Grassland of *Amphipogon sericeus*, and *Paraneurachne muelleri* and Very Open Hummock Grassland of *Triodia basedowii*;

Themeda Tussock Grassland:

10a Tall Open Shrubland of *Acacia monticola* and *A. bivenosa* over Tussock Grassland of *Themeda triandra* and **Cenchrus ciliaris*; and

Acacia Tall Open Shrubland:

11b This is a mosaic of two vegetation associations: 11a :Tall scrub of *Acacia ancistrocarpa*, *A. dictyophleba*, *Grevillea wickhamii* and *A. inaequilatera* over Open Hummock Grassland of *Triodia basedowii*, and *T. sp.* Shovelanna Hill (S. van Leeuwen 3835) and Very Open Tussock Grassland of *Paraneurachne muelleri* which occurs as a mosaic with vegetation association 5a. 5a: Open Woodland of *Corymbia hamersleyana* and *Eucalyptus gamophylla* over Tall Shrubland of *Acacia monticola*, *Petalostylis labicheoides*, *Santalum lanceolatum* and *A. bivenosa* over Hummock Grassland of *Triodia epactia* and *T. basedowii* and Open Tussock Grassland of *Themeda triandra*.

Onshore Environmental (2014):

Corymbia Low Woodland:

1 Low Woodland of *Corymbia ferriticola*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia aptaneura* over High Shrubland of *Dodonaea pachyneura*, *Acacia hamersleyensis* and *Ficus brachypoda* over Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Mt Ella (M.E. Trudgen 12739) on brown sandy loam on minor drainage lines, minor gorges and gullies in steep terrain;

Acacia Low Woodland:

2a Low Woodland of *Acacia aptaneura* and *Acacia pteraneura* over Low Shrubland of *Senna stricta*, *Eremophila cuneifolia* and *Senna glutinosa* subsp. *x luerssenii* and Open Hummock Grassland of *Triodia pungens* on silty orange loam on low rocky hill slopes and cliff lines;

Acacia Closed Scrub:

3 Closed Scrub of *Acacia monticola*, *Grevillea wickhamii* subsp. *hispidula* and *Petalostylis labicheoides* over Open Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Corymbia hamersleyana* on brown silty loam on minor drainage line dissecting low hills and footslopes;

Acacia Shrubland:

4 Shrubland of *Acacia hamersleyensis* and *Acacia maitlandii* over Low Shrubland of *Acacia hilliana*, *Acacia adoxa* var. *adoxata* and *Mirbelia viminalis* over *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) Open Hummock Grassland on brown silty loam on dolerite undulating hills and valleys;

Triodia Hummock Grassland:

5b Hummock Grassland of *Triodia schinzii* and *Triodia pungens* with Low Open Woodland of *Corymbia hamersleyana* and High Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia adsurgens* and *Acacia tenuissima* on sandy drainage lines through sandplains;

5c Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with High Open Shrubland of *Grevillea wickhamii* subsp. *hispidula*, *Acacia tenuissima* and *Acacia bivenosa* over Open Shrubland of *Acacia melleodora* and *Acacia trudgenii* on red silty loam on footslopes;

5d Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Shrubland of *Acacia hilliana*, *Acacia adoxa* var. *adoxata* and *Calytrix carinata* and Scattered Low Trees of *Grevillea berryana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Hakea chordophylla* on red/orange sandy loam on hill crests, upper hill slopes and low plateaux;

5e Hummock Grassland of *Triodia pungens* with High Open Shrubland of *Acacia orthocarpa* and *Acacia inaequilatera* and Low Open Shrubland of *Senna artemisioides* subsp. *oligophylla*, *Indigofera rugosa* and *Sida arsinata* on brown loamy sand on dolerite hills and steep scree slopes below ironstone ridges;

5f Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Low Shrubland of *Acacia hilliana*, *Acacia adoxa* var. *adoxo* and *Eremophila exilifolia* and Low Open Woodland of *Corymbia hamersleyana* on brown silty loam hill slopes and upper hill slopes of main range (generally north facing);

5g Hummock Grassland of *Triodia schinzii* with Low Open Woodland of *Corymbia hamersleyana* and *Corymbia aspera* and High Open Shrubland of *Acacia tenuissima*, *Acacia melleodora* and *Acacia sericophylla* on red loamy sand on sandplains;

5j Hummock Grassland of *Triodia pungens* and *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia aptaneura* and Scattered Low Shrubs of *Acacia hilliana*, *Eremophila cuneifolia* and *Calytrix carinata* on red silty loam on undulating hills and scree slopes;

5k Hummock Grassland of *Triodia* sp. Mt Ella (M.E. Trudgen 12739) and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia ferriticola* and Very Open Tussock Grassland of *Cymbopogon ambiguus*, *Eriachne mucronata* and *Themeda triandra* on broad ravines and valley slopes with minor drainage lines;

5l Hummock Grassland of *Triodia pungens* with High Open Shrubland of *Acacia synchronicia* and *Acacia pruinocarpa* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Acacia aptaneura* on localised rocky floodplains.

Triodia Open Hummock Grassland:

6 Open Hummock Grassland of *Triodia angusta*, *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and *Triodia pungens* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and High Open Shrubland of *Acacia bivenosa*, *Eremophila platycalyx* and *Acacia synchronicia* on red sand loam on undulating low hills and eroded ridges;

Themeda Tussock Grassland:

7 Tussock Grassland of *Themeda triandra*, *Cenchrus ciliaris* and *Eulalia aurea* with Low Woodland of *Acacia citrinoviridis*, *Corymbia hamersleyana* and *Eucalyptus victrix* and High Shrubland of *Acacia monticola*, *Androcalva luteiflora* and *Gossypium robinsonii* on brown loamy sand on medium sized drainage lines;

***Cenchrus Tussock Grassland:**

8a Tussock Grassland of *Cenchrus ciliaris*, *Eulalia aurea* and *Eragrostis eriopoda* with Low Open Woodland (regeneration) of *Corymbia hamersleyana* and *Acacia citrinoviridis* and High Open Shrubland of *Acacia bivenosa* and *Santalum lanceolatum* on sandy floodplains adjacent to medium drainage lines; and

8b Tussock Grassland of *Cenchrus ciliaris*, *Cenchrus ciliaris* and *Themeda triandra* with Low Open Woodland of *Corymbia hamersleyana*, *Acacia citrinoviridis* and *Acacia aptaneura* and High Open Shrubland of *Acacia monticola* and *Androcalva luteiflora* on degraded drainage line.

ENV (2011):

Acacia High Shrubland:

AmAaTb High Shrubland of *Acacia monticola* and *Acacia catenulata* subsp. *occidentalis* with Low Open Woodland of *Acacia aneura* var. *pilbarana*, *Acacia citrinoviridis* and *Corymbia candida* subsp. *dipsodes* with Very Open Hummock Grassland of *Triodia basedowii*; and

Triodia Open Hummock Grassland:

TSAAbh Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) and occasional *Triodia angusta* or *T. pungens* with Open Shrubland of *Acacia bivenosa* often with Low Open Shrubland of *Acacia hilliana*.

* denotes weed species.

Clearing Description	Orebodies 21 and 22 Exploration Project. BHP Billiton Iron Ore Pty Ltd (BHP Billiton) proposes to clear up to 190 hectares within a boundary of 3,836 hectares for the purposes of mineral exploration, hydrogeological and geotechnical investigations and associated activities. The project is located approximately 14 kilometres east of Newman within the Shire of East Pilbara.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994); to Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The vegetation condition was derived from reports prepared by Onshore Environmental (2014), Astron (2013) and ENV (2011).

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 may be at variance to this Principle The flora and vegetation surveys of the application area identified 29 different vegetation associations (BHP Billiton, 2014). The vegetation condition ranged from Excellent to Completely Degraded with the majority of the
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application area in Excellent condition (Astron, 2013; ENV, 2011; Keighery, 1994; Onshore Environmental, 2014). Parts of the application area have been previously impacted by historical drilling, clearing for infrastructure, roads, weeds and grazing (Astron, 2013). None of the vegetation associations recorded were identified as a Threatened or Priority Ecological Community (Astron, 2013; ENV, 2011; Onshore Environmental, 2014).

The Onshore (2014) flora survey recorded 276 flora taxa from 110 genera and 40 families, Astron (2013) recorded 227 flora taxa from 110 genera and 38 families and the ENV (2011) survey recorded 145 flora taxa from 70 genera and 31 families. The level of floristic diversity recorded is comparable with that of previous surveys (Astron, 2013). There were five species of Priority flora recorded during the flora surveys (Astron, 2013; ENV, 2011; Onshore Environmental, 2014); *Aristida jerichoensis* var *subspinulifera* (Priority 1), *Isotropis parviflora* (Priority 2), *Gymnanthera cunninghamii* (Priority 3), *Triodia* sp. Mt Ella (Priority 3) and *Bulbostylis burbridgeae* (Priority 4). The locations of these species and a 10 metre buffer were excluded from the application area so the proposed clearing will not be impacted on any recorded Priority flora (BHP Billiton, 2014). Whilst the known locations of Priority flora are being avoided there is further suitable habitat for these species throughout the application area (Astron, 2013; ENV, 2011; Onshore Environmental, 2014).

There are 20 weeds species that have been recorded within the application area (BHP Billiton, 2014). One species, the Native Thornapple (*Datura leichardtii*), is a Declared Pest under the *Biosecurity and Agricultural Management Act 2007*. Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The Biologic (2014) level 2 fauna survey which partly covers the application area recorded a total of 170 fauna species comprising 25 mammals, 76 birds 68 reptiles and one amphibian. The fauna surveys over the application area mapped nine broad fauna habitats (BHP Billiton, 2014). The range of habitats present are suitable to support a diverse assemblage of vertebrate fauna species (Ecological, 2014). However, several significant habitat features such as caves and waterholes have been excluded from the application area.

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

Methodology Astron (2013)
BHP Billiton (2014)
Biologic (2014)
Ecological (2014)
ENV (2011)
Onshore Environmental (2014)

(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

There has been two level 1 fauna surveys and one level 2 fauna survey conducted over areas within the application area (Biologic, 2014; Ecological, 2013; ENV, 2011). Based on the results of these surveys, there are nine broad fauna habitat types within the application area (BHP Billiton, 2014):

1. Riverine/Rivers and Major Creek Lines;
2. Minor Drainage Lines;
3. Shrubland Plains;
4. Low Shrubland Plains;
5. Mulga Plains;
6. Stony Rises and Lower Stony Hill Slopes;
7. Hill Crests;
8. Rocky Hill Tops and Breakaways; and
9. Steep Rocky Canyons, Gorges, Gullies and Cliffs.

The 'Riverine/Rivers and Major Creek Lines' habitat is predominately associated with the Fortescue River in the west of the application area and two smaller drainage lines coming down the ridge further to the east (Ecological, 2013; ENV, 2011). This habitat contained a diverse array of microhabitats including logs, debris, tree hollows, soft soils, dense vegetation and understorey (ENV, 2011). There were several areas of water present within the Fortescue River at the time of the surveys (Ecological, 2013; ENV, 2011). This habitat is likely to support a number of conservation significant fauna species in particular, Pilbara Olive Python (*Liasis olivaceus barroni* - Schedule 1; Vulnerable), Star Finch (*Neochmia ruficauda* subsp. *subclarescens* - Priority 4) and Rainbow Bee-eater (*Merops ornatus* - Migratory). The only proposed clearing within the Fortescue River is for the creation of access tracks (BHP Billiton, 2014). Potential impacts on this habitat may be minimised by the implementation of a watercourse management condition and a condition restricting the clearing of vegetation associated with the river.

The 'Steep Rocky Canyons and Cliffs' habitat provides potential shelter sites such as caves and crevices (Ecological, 2013). There were also a number of rock pools within this habitat (Biologic, 2014). These caves may provide feeding roosts for Pilbara Leaf-nosed Bats (*Rhinonictis aurantia* – Schedule 1; Vulnerable) and Ghost Bats (*Macroderma gigas* – Priority 4) (Ecological, 2013). Caves and waterholes within this habitat have

been excluded from the application area and will not be impacted by the proposed clearing. There has been minimal previous disturbance within this habitat (Ecological, 2013).

The majority of the application area is comprised of habitat types 6, 7 and 8 (BHP Billiton, 2014). These habitats tended to be more open and structurally simple than other fauna habitats (Biologic, 2014). The Western Pebble-mound Mouse (*Pseudomys chapmani* – Priority 4) has been recorded from within this habitat (BHP Billiton, 2014). These habitats are widespread throughout the local region.

The Pilbara Olive Python was recorded from several locations during the fauna surveys (Biologic, 2014; Ecological, 2013). These locations are outside the application area or were associated with waterholes that were excluded from the application area. A record of a juvenile python during the survey indicates that the local area is used for breeding by the species (Ecological, 2013). This species is often encountered in the vicinity of permanent waterholes or amongst riverine vegetation (Biologic, 2014). Waterholes and caves that were identified during the surveys have been excluded from this application (BHP Billiton, 2014). However, the Pilbara Olive Python is likely to utilise the application area whilst dispersing between 'Riverine/Rivers and Major Creek Lines' and areas of suitable shelter in the 'Steep Rocky Canyons, Gorges, Gullies and Cliffs' habitat (BHP Billiton, 2014). Impacts to the Riverine habitat associated with the Fortescue River may be minimised by a condition restricting the clearing of vegetation associated with the river. Given the relative scale of the proposed clearing (190 hectares within a boundary of 3,836 hectares), it is not anticipated to have a significant impact on habitat for the Pilbara Olive Python.

Several burrows belonging to the Brush-tailed Mulgara were recorded within the Low Shrublands Plains habitat (Ecological, 2013). The majority of this habitat contained heavy consolidated clays which are unsuitable for Mulgara burrowing however, there were three patches of this habitat that have sandy clay loam supporting *Triodia* which is suitable for Mulgara burrowing (Ecological, 2013). There has been approximately 118 hectares of this habitat mapped within the application area (Ecological, 2013). There were seven Brush-tailed Mulgara burrows recorded within the application area, two of which may be active (Biologic, 2014). Potential impacts to Mulgara may be minimised by the implementation of a condition requiring existing burrows are not disturbed.

The conservation significant species Grey Falcon (*Falco hypoleucos* - Schedule 1), Australian Bustard (*Ardeotis australis* - Priority 4), Western Pebble-mound Mouse (*Pseudomys chapmani* - Priority 4) and Rainbow Bee-eater (*Merops ornatus* - Migratory) were all recorded within the application area (BHP Billiton, 2014). Habitat for these species is widespread in the local region and the proposed clearing is not likely to have a significant impact on these species. Based on the habitats present, a number of other conservation significant fauna species may also utilise the application area. The majority of these species are bird species that are likely to transiently be within the area (Ecological, 2013).

Given the range of habitats present within the application area, it is likely to support a diverse assemblage of fauna species (Ecological, 2013). Whilst there are significant habitats within the application area, the majority of the significant features such as caves and waterholes have been excluded from the application.

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

Methodology BHP Billiton (2014)
Biologic (2014)
Ecological (2013)
ENV (2011)

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

Comments Proposal may be at variance to this Principle

According to available databases, there are no records of any Threatened Flora species within the application area (DPaW, 2014; GIS Database). None of the flora surveys conducted recorded any Threatened Flora species within the application area (Astron, 2013; ENV, 2011; Onshore Environmental, 2014).

There are areas of suitable habitat for *Lepidium catapycnon* within the application area and the species has been recorded approximately 20 kilometres west of the application area (DPaW, 2014; ENV, 2011). Given, the entire application area has not been searched, it is possible that this species may be present within the application area.

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

Methodology Astron (2013)
DPaW (2014)
ENV (2011)
Onshore Environmental (2014)
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

The application area is partly within the buffer of the Threatened Ecological Community (TEC) known as the 'Ethel Gorge aquifer stygobiont community' (GIS Database). This TEC was not recorded during any of the vegetation surveys conducted within the application area (Astron, 2013; ENV, 2011; Onshore Environmental, 2014). The proposed clearing will not impact on any subterranean communities.

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

Methodology Astron (2013)
ENV (2011)
Onshore Environmental (2014)
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 lies within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.6% of the pre-European vegetation remains (see table) (Government of Western Australia, 2013; GIS Database).

The vegetation of the application area has been broadly mapped as Beard vegetation associations 29, 82 and 216. These vegetation associations have not been extensively cleared as over 98% remains at both a State and bioregional level for all vegetation associations (see table) (Government of Western Australia, 2013). There has not been extensive clearing in the local region and the vegetation within the application area is not a remnant nor does it form part of any remnants within the local area (GIS Database).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPaW Managed Land
IBRA Bioregion – Pilbara	17,808,657	17,733,583	~99.6	Least Concern	8.37
Beard veg assoc. – State					
29	7,903,991	7,900,200	~99.9	Least Concern	5.22
82	2,565,901	2,553,217	~99.5	Least Concern	10.51
216	280,759	279,237	~99.5	Least Concern	0.00
Beard veg assoc. – Bioregion					
29	1,133,219	1,132,939	~99.9	Least Concern	1.98
82	2,563,583	2,550,898	~99.5	Least Concern	10.52
216	26,669	26,372	~99.9	Least Concern	0.00

* Government of Western Australia (2013)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Newman 1.4m Orthomosaic
- 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 numerous ephemeral watercourses within the application area (GIS Database). The majority of these are minor drainage lines similar to those that are widespread throughout the surrounding area. The

vegetation associations 3: Acacia Closed Scrub, 5a: Acacia Shrubland and 7: Themeda Tussock Grassland are all associated with incised drainage lines within the application area (Astron, 2013; Onshore Environmental, 2014). Given the proposed clearing is spread over a large area, it is not anticipated that it will have a significant impact on minor drainage lines within the application area.

The most significant ephemeral watercourse that passes through the application area is the Fortescue River (BHP Billiton, 2014). The vegetation association 6a: Eucalyptus Open Forest (Astron, 2013) is growing in association with the Fortescue River. The only proposed activities within this vegetation association are for access tracks (BHP Billiton, 2014). Potential impacts to the Fortescue River may be minimised by the implementation of a watercourse management condition and a condition restricting the clearing of vegetation associated with the river.

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

Methodology Astron (2013)
BHP Billiton (2014)
Onshore Environmental (2014)
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 is mapped as occurring on the Boolgeeda, Divide, Newman, River, Rocklea and Washplain land systems (GIS Database). The Boolgeeda and Newman land systems cover the overwhelming majority of the application area (GIS Database). Both of these land systems are generally not prone to erosion (Van Vreeswyk et al., 2004).

The Divide, Rocklea and Washplain land systems only make up less than 1% of the application area cumulatively (GIS Database). The Divide land system has some susceptibility to wind erosion immediately following fire and areas receiving concentrated flow within the Washplain land system are moderately susceptible to erosion following disturbance (Van Vreeswyk et al., 2004). The Rocklea land system has a very low erosion hazard (Van Vreeswyk et al., 2004).

The River land system correlates to vegetation associated with the Fortescue River in the west of the application area (BHP Billiton, 2014; GIS Database). This land system is highly susceptible to erosion when disturbed (Van Vreeswyk et al., 2004). Potential impacts of erosion may be minimised by the implementation of a condition limiting the clearing of vegetation within this land system to be only for the purpose of access tracks.

Given the large majority of the application area has a low risk of erosion, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2014)
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 does not lie within any conservation areas or Department of Parks and Wildlife managed lands (GIS Database). The nearest conservation area is Karijini National Park which is located approximately 130 kilometres west of the application area (GIS Database). At this distance the proposed clearing will not impact on the environmental values of the National Park.

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

There are no permanent watercourses within the application area, however, the Fortescue River passes through the western most end (GIS Database). Proposed activities within the Fortescue River are the creation of access tracks. Potential impacts to the surface water in the Fortescue River may be minimised by the implementation of a watercourse management condition and a condition restricting the clearing within the river for access tracks only.

During fauna surveys within the application area it was noted that there were several semi-permanent water pools within many of the gorges (Biologic, 2014). However, these pools have been excluded from the application area and will not be impacted by the proposed clearing (BHP Billiton, 2014). There are numerous minor ephemeral watercourses within the application area (GIS Database). Given the proposed clearing is spread out of a large area (3,836 hectares) it is not likely to have a significant impact on surface water quality in the local area.

The application area is not located within a Public Drinking Water Source Area (GIS Database). The groundwater within the application area ranges from 500 to 1,000 milligrams per litre of total dissolved solids (GIS Database). Given the relative scale of the proposed clearing (190 hectares within a boundary of 3,836 hectares), it would not be expected that it would cause salinity levels within the application or surrounding area to alter.

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

Methodology BHP Billiton (2014)
Biologic (2014)
GIS Database:
- Groundwater Salinity, Satewide
- Hydrography, linear
- 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**
With an average annual rainfall of 321.3 millimetres and an average annual evaporation rate of 3,600 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2014; GIS Database). Whilst large rainfall events may result in the flooding of the area, the proposed clearing is spread over a large area (190 hectares within a boundary of 3,836 hectares) and is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2014)
GIS Database:
- Evaporation Isopleths

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

Comments
There is one native title claim (WC2005/006) over the application area (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant groups (GIS Database). However, the 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*.

According to available databases, 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 Regulation, Department of Parks and Wildlife 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.

It is noted that the proposed clearing may impact on the Pilbara Olive Python and Rainbow Bee-eater which are protected under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of the Environment for environmental impact assessment under the *EPBC Act*. The proponent is advised to contact the Department of the Environment for further information regarding notification and referral responsibilities under the *EPBC Act*.

The clearing permit application was advertised on 17 February 2014 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received in relation to this application with an objection to the proposed clearing. The Department has liaised with the submission party and will continue to do so in order to resolve the issues raised.

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

4. References

- Astron (2013) Ninga Vegetation and Flora Assessment. Unpublished report for BHP Billiton Iron Ore Pty Ltd, dated April 2013.
- BHP Billiton (2014) Orebodies 21 and 22. Supporting information for a clearing permit application, dated January 2014.
- Biologic (2014) Orebody 19 Level 2 Vertebrate Fauna Survey. Unpublished report for BHP Billiton Pty Ltd, dated January 2014.
- BoM (2014) Bureau of Meteorology Website - Climate statistics for Australian locations, Newman Aero. Available online at: http://www.bom.gov.au/climate/averages/tables/cw_007176.shtml Accessed on 17 March 2014.
- 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 (2011) Orebody 42/43 Flora, Vegetation and Fauna Assessment. Unpublished report for BHP Billiton Iron Ore Pty Ltd, dated 24 June 2011.
- Government of Western Australia (2013) 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2012. WA Department of Environment and Conservation, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Onshore Environmental (2014) Level 2 Flora and Vegetation Survey. Unpublished report for BHP Billiton Iron Ore Pty Ltd, dated January 2014.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Technical Bulletin - An Inventory and Condition Survey of the Pilbara Region, Western Australia, No. 92. Department of Agriculture, Government of Western Australia, Perth, Western Australia.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under

consideration for declaration as 'rare flora', but are in need of further survey.

- P4 Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

- P1 Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2 Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3 Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4 Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5 Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

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

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

CD

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