Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5433/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: *Iron Ore (Mount Newman) Agreement Act 1964*, Mineral Lease 244SA (AML 70/244)
Local Government Area: Shire of East Pilbara
Colloquial name: Orebodies 42 and 43 Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 4 April 2013

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):

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.

Four recent vegetation surveys have been conducted over the application area by Syrinx (2012), ENV (2011) and Outback Ecology (2009a; 2009b). These four vegetation surveys identified the following 40 vegetation associations within 25 broad floristic communities within the application area (BHP BIO, 2013):

Syrinx (2012) mapped five broad floristic formations with eight vegetation associations within the application area:

Eucalyptus Open Forest
1a: Open Forest of *Eucalyptus camaldulensis* subsp. *obtusa* over Sedges of *Typha domingensis* and *Cyperus vaginatus* with Scattered Shrubs of *Petalostylis labicheoides* on Brown Clay Loam in the Stream Channel; and

1b: Open Forest of *Eucalyptus victrix*, *Eucalyptus camaldulensis* subsp. *obtusa* and *Acacia citrinoviridis* over Open Tussock Grassland of *Cenchrus ciliaris*, *Cynodon dactylon* and *Themeda triandra* with High Open Shrubland of *Petalostylis labicheoides*, *Melaleuca glomerata* and *Acacia pyrifolia* var.*morrisonii* on Brown Sandy to Silty Loam in the Stream Channels and on Banks (stream banks).

Mixed Open Forest
2: Open Forest of *Acacia aptaneura*, *Acacia citrinoviridis* and *Corymbia candida* subsp. *dipsodes* over Tussock Grassland of *Cenchrus ciliaris* with High Open Shrubland of *Acacia tetragonophylla* on Brown Silty Clay Loam in Drainage Depressions.

Acacia Low Open Woodland
3a: Low Open Woodland of *Acacia aptaneura, Acacia pruinocarpa* and *Acacia pteraneura* over High Open Shrubland of *Acacia ? synchronicia, Acacia sibirica* and *Acacia sclerosperma* subsp. *sclerosperma* over Very Open Hummock Grassland of *Triodia pungens* on Brown Silty Clay Loam on Plains and in Drainage Depressions; and

3b: Low Open Woodland of *Acacia aptaneura, Acacia pruinocarpa* and *Hakea lorea* subsp. *lorea* over Open Tussock Grassland of *Cenchrus ciliaris, Aristida inaequiglumis* and *Chrysopogon fallax* with Low Scattered Shrubs of *Sida fibulifera, Maireana planifolia* and *Eremophila lanceolata* on Brown Silty Clay Loam on Plains.

Triodia Hummock Grassland

5b: Hummock Grassland of *Triodia pungens* with Open Mallee of *Eucalyptus socialis* subsp. *eucentrica* over Open Shrubland *Petalostylis labicheoides*, *Acacia sclerosperma* subsp. *sclerosperma* and *Acacia bivenosa* on Red Silty Clay Loam on Plains, Risecrests and Hillslopes; and

5c: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835), *Triodia pungens* and *Triodia lanigera* with Open Shrubland of *Acacia bivenosa*, *Senna glutinosa* subsp. x *luerssenii* and *Ptilotus rotundifolius* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* on Brown Silty Loam on Hillslopes and Hillcrests.

Triodia Very Open Hummock Grassland

7: Very Open Hummock Grassland of *Triodia pungens* with High Open Shrubland of *Acacia sclerosperma* subsp. *sclerosperma*, *Eremophila longifolia* and *Acacia citrinoviridis* with Scattered Trees of *Eucalyptus xerothermica* and *Corymbia hamersleyana* on Brown Clay Loam on Plains.

ENV (2011) mapped twelve broad floristic formations with 20 vegetation associations within the application area:

***Acacia* High Shrubland**

AsCc: High Shrubland of *Acacia synchronicia*, *Acacia sclerosperma* subsp. *sclerosperma* and *Acacia aneura* var. *conifera* with Scattered Tussock Grasses of *Cenchrus ciliaris*;

AaTsGb: High Shrubland of *Acacia aneura* var. *pilbarana* with Very Open Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Scattered Shrubs of *Grevillea berryana*;

AbTpAp: High Shrubland of *Acacia bivenosa* and *A. synchronicia* with Very Open Hummock Grassland of *Triodia pungens* with Open Shrubland of *Acacia pachyacra* and *A. citrinoviridis*;

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

AscTpER: High Shrubland of *Acacia sclerosperma* subsp. *sclerosperma* with Very Open Hummock Grassland of *Triodia pungens* or *Triodia schinzii* often with Low Open Shrubland of *Eremophila phyllopoda* subsp. *obliqua*.

***Acacia* Low Closed Woodland**

AayAayC: Low Closed Woodland of *Acacia ayersiana*, *Acacia aneura* var. *pilbarana* and *Corymbia candida* subsp. *dipsodes* with Low Open Shrubland of *Acacia ayersiana* with Scattered Herbs of *Cheilanthes sieberi* subsp. *sieberi*.

***Acacia* Low Open Woodland**

AscERpT: Low Open Woodland of *Acacia sclerosperma* subsp. *sclerosperma* and *Acacia aneura* var. *pilbarana* with Low Open Shrubland of *Eremophila phyllopoda* subsp. *obliqua* with Very Open Hummock Grassland of *Triodia basedowii*.

AaCOcTb: Low Open Woodland of *Acacia aneura* var. *conifera* and *Corymbia candida* subsp. *dipsodes* with Open to Scattered Hummock Grassland of *Triodia basedowii*.

***Acacia* Low Woodland**

AaTsAt: Low Woodland of *Acacia aneura* var. *aneura*, *A. pruinocarpa* and *Hakea chordophylla* with Very Open Hummock Grassland of *Triodia schinzii* with Scattered Shrubs of *Acacia tetragonophylla*.

***Acacia* Open Shrubland**

AteTbCO: Open Shrubland of *Acacia tenuissima* and *A. bivenosa* with Very Open Hummock Grassland of *Triodia basedowii* and *T. schinzii* with Scattered Low Trees of *Corymbia candida* subsp. *dipsodes*.

***Cyperus* Sedges**

CYvEvTd: Sedges of *Cyperus vaginatus* with Low Woodland of *Eucalyptus victrix*, with some patches of vegetation dominated by Closed Sedges of *Typha domingensis*.

***Eucalyptus* Low Open Woodland**

EvCYvMg: Low Woodland to Low Open Woodland of *Eucalyptus victrix* often with Open Sedges of *Cyperus vaginatus* often with Low Open Shrubland of *Melaleuca glomerata*.

***Eucalyptus* Open Woodland**

EvAcCc: Open Woodland of *Eucalyptus victrix* with Low Open Woodland of *Acacia citrinoviridis* and *Melaleuca glomerata* with Scattered Tussock Grasses of *Cenchrus ciliaris*; and

EcCVvPl: Open Woodland of *Eucalyptus camaldulensis* subsp. *refulgens* with Very Open Sedges of *Cyperus vaginatus* and *Typha domingensis* with Scattered Shrubs of *Petalostylis labicheoides*.

***Frankenia* Low Open Shrubland**

FsCc: Low Open Shrubland of *Frankenia setosa* with Scattered Tussock Grasses of *Cenchrus ciliaris*.

***Sclerolaena* Scattered Herbs**

ScCc: Scattered Herbs of *Sclerolaena cornishiana* with Scattered Tussock Grasses of *Cenchrus ciliaris*.

***Triodia* Hummock Grassland**

TSElAs: Hummock Grassland of *Triodia* sp. Shovelanna Hill (S. van Leeuwen 3835) with Low Open Woodland of *Eucalyptus leucophloia* ssp. *leucophloia* often with Open Shrubland of *Acacia synchronicia* and *Acacia inaequilatera*.

***Triodia* Open Hummock Grassland**

TaElAh: Open Hummock Grassland of *Triodia angusta* and *T. schinzii* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with Scattered Low Shrubs of *Acacia hilliana*, *Ptilotus rotundifolius* and *Senna glutinosa* subsp. x *luerssenii;*

TSAbAh: 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*; and

TbAa: Open Hummock Grassland of *Triodia basedowii* with Open Shrubland of *Acacia aneura* var. *pilbarana* and *Acacia pachyacra*.

Outback Ecology (2009a) mapped four broad floristic formations with six vegetation associations within the application area:

***Acacia* Shrublands over *Triodia* spp. on slopes and crests**

AbTb: *Acacia bivenosa* Low Open Shrubland over *Triodia basedowii* Hummock Grassland.

***Acacia* Shrubland on plains**

AaAi: *Acacia aneura* Low Woodland over mixed shrubland over *Aristida inaequiglumis*, *Eragrostis eriopoda* Open Tussock Grassland;

AaPTb: *Acacia aneura*, *Petalostylis labicheoides* Tall Open Shrubland over *Acacia bivenosa*, *A. tetragonophylla*, *Anthobolus leptomeroides* Very Open Shrubland over *Triodia basedowii* Hummock Grassland; and

AaTe: *Acacia aneura* var *tenuis* Low Woodland/Open Forest over mixed Scattered Shrubs over *Triodia epactia* scattered Hummock Grasses.

***Corymbia* and *Eucalyptus* spp. over *Acacia* shrublands in drainage lines**

CaAcAi: *Corymbia aspera* Woodland/Open Woodland over *Acacia citrinoviridis* Tall Open Shrubland over *Acacia aneura* Closed Heath over *Aristida inaequiglumis*, *Eragrostis eriopoda* Very Open Tussock Grassland.

***Acacia* shrublands over *Triodia* spp. and Tussock grasses in drainage lines**

AabTe: *Acacia ancistrocarpa*, *A. monticola* Tall Open Shrubland over *Triodia epactia* Hummock Grassland.

Outback Ecology (2009b) mapped four broad floristic formations with six vegetation associations within the application area:

***Eucalyptus* Woodland**

1a: Woodland of *Eucalyptus camaldulensis* var. *obtusa* over Low Woodland of *Acacia citrinoviridis*, *Acacia coriacea* ssp. *pendens* and *Melaleuca glomerata* over Open Shrubland of *Acacia pyrifolia*, *Petalostylis labicheoides* and *Senna artemisioides* ssp. x *artemisioides*.

***Eucalyptus* Low Open Woodland**

2a: Low Open Woodland of *Eucalyptus xerothermica* and *Corymbia hamersleyana* over Open Shrubland of *Acacia bivenosa*, *Acacia sclerosperma* ssp. *sclerosperma* and *Acacia synchronicia* over Very Open Hummock Grassland of *Triodia pungens*.

***Acacia* Low Woodland**

4a: Low Woodland of *Acacia aneura* var. *pilbarensis*, *Acacia pruinocarpa* and *Acacia paraneura* over Shrubland of *Acacia sclerosperma* ssp. *sclerosperma*, *Eremophila longifolia* and *Rhagodia eremaea* over Open Hummock Grassland of *Triodia pungens*.

***Triodia* Hummock Grassland**

7a: Hummock Grassland of *Triodia pungens* with Low Woodland of *Eucalyptus leucophloia* and *Acacia citrinoviridis* and Open Shrubland of *Acacia aneura* var. *aneura*, *Senna glutinosa* ssp. *luerssenii* and *Eremophila latrobei* ssp. *latrobei*;

7b: Hummock Grassland of *Triodia* sp. Shovellana Hill with Low Shrubland of *Acacia hilliana*, *Acacia adoxa* var. *adoxa* and *Ptilotus rotundifolius* and Low Open Woodland of *Eucalyptus leucophloia*; and

7c: Hummock Grassland of *Triodia basedowii* and *Triodia pungens* with Shrubland of *Acacia sclerosperma* ssp. *sclerosperma* and *Acacia pachyacra* over Low Shrubland of *Eremophila margarethae.*

Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHP BIO) has applied to clear up to 60 hectares of native vegetation, within an application area of approximately 2,238 hectares. The purpose of the proposed clearing is for mineral exploration, hydrogeological drilling and associated activities.

Vegetation Condition

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994);

To

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

Comment The application area is located within the Pilbara region of Western Australia and is situated approximately 8 kilometres east of Newman.

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments

Proposal is not likely to be at variance to this Principle

The application area intersects the Augustus (GAS1) and Hamersley (PIL3) Interim Biogeographic Regionalisation for Australia (IBRA) subregions (GIS Database). The Augustus subregion is characterised by rugged low Proterozoic sedimentary and granite ranges divided by broad flat valleys (CALM, 2002). Mulga woodland with Triodia occur on shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland (CALM, 2002). The Hamersley subregion is generally described as Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

Four flora and vegetation surveys have been conducted over the application area by Syrinx (2012), ENV (2011) and Outback Ecology (2009a; 2009b). Similar vegetation to that within the application area is represented in the surrounding areas (ENV, 2011; Syrinx, 2012). Given the disturbed nature of parts of the application area, it is expected that the surrounding areas contain similar or better diversity than that of the application area (BHP BIO, 2013).

No Threatened Flora species were recorded within the application area during the flora surveys (BHP BIO, 2013). Three Priority Flora species, *Aristida jerichoensis* var. *subspinulifera* (P1), *Rhagodia* sp. Hamersley (M.Trudgen 17794) (P3) and *Goodenia nuda* (P4), have been recorded within the application area (BHPBIO, 2013). BHP BIO (2013) has committed to not clearing within 10 metres of the known populations of these species. Potential impacts to Priority Flora may be minimised by the implementation of a flora management condition.

The application area lies within the buffer of the 'Ethel Gorge aquifer stygobiont community' Threatened Ecological Community (BHP BIO, 2013; GIS Database). The TEC is subterranean and groundwater drawdown is listed as a threatening process for the Ethel Gorge stygofauna (CALM, 2002), however, the proposed clearing is not expected to have an effect on groundwater levels.

There are no other Threatened or Priority Ecological Communities within the application area (GIS Database).

Thirteen weed species have been recorded within the application area (BHP BIO, 2013). Of these, three weed species, *Cenchrus ciliaris*, *Acacia farnesiana* and *Rumex vesicarius*, have been given a high rating under the Environmental Weed Strategy for Western Australia (BHP BIO, 2013). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This can in turn lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. It is therefore important to ensure that weed species are not introduced to the application area as a result of the proposed activities. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

Four fauna surveys have been conducted over the application area and surrounding areas by Eco Logical Australia (2012), ENV (2011), Outback Ecology (2009a) and Outback Ecology (2009c). These surveys have identified that faunal diversity is the same or higher in the areas surrounding the application area.

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

Methodology

BHP BIO (2013)
CALM (2002)
Eco Logical Australia (2012)
ENV (2011)
Outback Ecology (2009a)
Outback Ecology (2009b)
Outback Ecology (2009c)
Syrinx (2012)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Threatened Ecological Sites Buffered

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal is not likely to be at variance to this Principle

Four fauna surveys have been conducted over the application area and surrounding areas by Eco Logical

Australia (2012), ENV (2011), Outback Ecology (2009a) and Outback Ecology (2009c). From these surveys, the following four vegetation communities have been identified as occurring within the application area (BHP BIO, 2013):

- Rivers and major creek lines;
- Broad alluvial lowlands;
- Alluvial plain; and
- Stony gentle slopes and low hills.

Of these habitats, the Rivers and major creeklines are considered to be of moderate to high conservation value, while the alluvial plains and lowlands are considered to be of moderate conservation value (ENV, 2011). While these habitats are considered to be reasonably common within the Pilbara region (BHP BIO, 2013), it is important to ensure that disturbance is kept to a minimum, particularly within the River and major creekline habitats. BHP BHIO (2013) has committed to keeping disturbance within this habitat to a minimum by utilising already existing tracks where possible.

Based on the fauna assessment conducted over the application area, eight conservation significant fauna species have been recorded within the application area, and a further nine are considered likely or possible to occur within the application area (BHP BIO, 2013):

- Australian Bustard (*Ardeotis australis*) (Department of Environment and Conservation (DEC) Priority 4) - Recorded;
- Bush Stone-curlew (*Burhinus grallarius*) (DEC Priority 4) - Likely;
- Cattle Egret (*Ardea ibis*) (Migratory under *Environment Protection and Biodiversity Conservation* (EPBC) Act; Schedule 3) – Likely;
- Common Sandpiper (*Tringa hypoleucos*) (Migratory under EPBC Act; Schedule 3) – Recorded;
- Eastern Great Egret (*Ardea modesta*) (Migratory under EPBC Act; Schedule 3) – Recorded;
- Fork Tailed Swift (*Apus pacificus*) (Migratory under EPBC Act; Schedule 3) – Likely;
- Gane's Blind Snake (*Ramphotyphlops ganei*) (DEC Priority 1) - Recorded;
- Ghost Bat (*Macroderma gigas*) (DEC Priority 4) – Possible;
- Great Egret (*Ardea alba*) (Migratory under EPBC Act; Schedule 3) – Recorded;
- Glossy Ibis (*Plegadis falcinellus*) (Migratory under EPBC Act; Schedule 3) – Possible;
- Peregrine Falcon (*Falco peregrinus*) (Schedule 4) – Possible;
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (Vulnerable under EPBC Act; Schedule 1) – Possible;
- Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable; Schedule 1) – Possible;
- Rainbow Bee-eater (*Merops ornatus*) (Migratory under EPBC Act; Schedule 3) – Recorded;
- Star Finch (Western) (*Neochmia ruficauda* subsp. *clarescens*) (DEC Priority 4) - Recorded;
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (DEC Priority 4) – Recorded; and
- Wood Sandpiper (*Tringa glqareola*) (Migratory under EPBC Act; Schedule 3) – Possible.

The avifauna species (Australian Bustard, Bush Stone-curlew, Cattle Egret, Common Sandpiper, Eastern Great Egret, Fork Tailed Swift, Great Egret, Glossy Ibis, Peregrine Falcon, Rainbow Bee-eater, Star Finch and Wood Sandpiper) are highly mobile and capable of evacuating from areas being disturbed (BHP BIO, 2013).

Gane's Blind Snake has been previously recorded within an Alluvial Plain habitat, which is not thought to be the preferred substrate for this species (BHP BIO, 2013). This species is thought to be unlikely to shelter or breed within the application area, however it may forage and pass through the application area on an infrequent basis (BHP BIO, 2013).

No suitable roost habitat has been identified within the application area for either the Ghost Bat or the Pilbara Leaf-nosed Bat (BHP BIO, 2013). These species may forage over the application area and the surrounding areas; however these species are not dependant on the habitats within the application area (BHP BIO, 2013).

The Pilbara Olive Python may utilise the Riverine habitat in a transitory manner, however no suitable shelter habitats have been identified for this species within the application area (BHP BIO, 2013).

One Western Pebble-mound Mouse mound has been recorded within the application area (BHP BIO, 2013). While there are more suitable habitats for this species outside of the application area, BHP BIO (2013) have committed to avoiding this known mound.

BHP BIO (2013) has committed to avoiding, where possible, clearing within the Riverine habitats, which is considered to be the habitat of highest conservation value. Potential impacts to this habitat may be minimised by the implementation of a watercourse management condition.

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

Methodology

BHP BIO (2013)
Eco Logical Australia (2012)
ENV (2011)
Outback Ecology (2009a)
Outback Ecology (2009c)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, there are no Threatened Flora within the application area (GIS Database). Flora and vegetation surveys of the application area conducted by Syrinx (2012), ENV (2011) and Outback Ecology (2009a; 2009b) have not identified any Threatened Flora species within the application area.

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

Methodology

ENV (2011)
Outback Ecology (2009a)
Outback Ecology (2009b)
Syrinx (2012)
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 may be at variance to this Principle

The application area is within the buffer of the Threatened Ecological Community (TEC) 'Ethel Gorge aquifer stygobiont community' (GIS Database).

The TEC is subterranean and groundwater drawdown is listed as a threatening process for the Ethel Gorge stygofauna (CALM, 2002), however, the proposed clearing is not expected to have an effect on groundwater levels.

There are no other TECs within the application area (GIS Database).

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

Methodology

CALM (2002)
GIS Database:
- Threatened Ecological Sites Buffered

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments

Proposal is not at variance to this Principle

The application area is located within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). Approximately 99.58% of the pre-European vegetation remains within the Pilbara bioregion (Government of Western Australia, 2011).

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

More than 98% of these three Beard vegetation associations remain within the Pilbara bioregion (see table on next page) (Government of Western Australia, 2011).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Extent in DEC Managed Lands %*
IBRA Bioregion - Pilbara	17,804,427	17,729,352	~99.58	Least Concern	~8.39
Beard vegetation associations - State					
29	7,903,991	7,900,200	~99.95	Least Concern	~5.23
82	2,565,901	2,553,217	~99.51	Least Concern	~10.55
216	280,759	279,237	~99.46	Least Concern	~0.00
Beard vegetation associations - Bioregion					
29	1,133,220	1,132,939	~99.98	Least Concern	~1.98
82	2,563,583	2,550,899	~99.51	Least Concern	~10.56
216	26,670	26,373	~98.89	Least Concern	~0.00

* Government of Western Australia (2011)
** Department of Natural Resources and Environment (2002)

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

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2011)
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**
The application area contains portions of five surface water features, Opthalmia Dam, Fortescue River, Shovelanna Creek, Homestead Creek and Warrawanda Creek (BHP BIO, 2013; GIS Database). Several vegetation communities were identified as being associated with watercourses during the flora and vegetation surveys over the application area conducted by Syrinx (2012), ENV (2011) and Outback Ecology (2009a; 2009b).

BHP BIO (2013) will, where possible, utilise existing tracks to cross these surface water features. Any additional clearing will be kept to a minimum and tracks will be constructed flat to the surface to maintain existing water flows (BHP BIO, 2013). Potential impacts to these surface water features may be minimised by the implementation of water management conditions.

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

Methodology BHP BIO (2013)
ENV (2011)
Outback Ecology (2009a)
Outback Ecology (2009b)
Syrinx (2012)
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 at variance to this Principle**
According to available databases the application area intersects the Boolgeeda, Elimunna, McKay, Newman, River and Washplain land systems (GIS Database).

The Boolgeeda, McKay and Newman land systems are generally not prone to erosion (Van Vreeswyk et al.,

2004). However the Elimunna land system is slightly susceptible to erosion in drainage tracts and the River and Washplain land systems are moderately to very highly susceptible to erosion, particularly when vegetation cover is removed.

Potential erosion impacts as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.

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

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

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments **Proposal is not likely to be at variance to this Principle**
The application area is not located within a conservation area (GIS Database). The nearest conservation area is Karijini National Park, located approximately 126 kilometres west of the application area (GIS Database). At this distance the proposed clearing is considered unlikely to impact on the 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**
The application area is partly located within the Newman Water Reserve (GIS Database), a Public Drinking Water Source Area (PDWSA) gazetted under the *Country Areas Water Supply Act 1947* in August 1983. This PDWSA has been assigned as 'Priority 1 (P1)' under the Water Source Protection Classification (DoW, 2013). Clearing activities associated with mineral production are compatible with conditions in a P1 PDWSA and all activities associated with the clearing including infrastructure, laydown areas, refuelling and topsoil storage should be compatible with the Department of Water (DoW) Land Use Compatibility Tables (DoW, 2013). The DoW advises there are Water Quality Protection Notes and Guidelines for mining and mineral processing that should be followed to reduce the risk the associated activities pose to the Water Reserve (DoW, 2013). The DoW is satisfied that the proposed clearing of 60 hectares is unlikely to have a significant impact on the quality or quantity of groundwater, provided activities are carried out in accordance with DoW advice.

There are no permanent waterbodies or watercourses within the application area, however, there are numerous minor non perennial watercourses that pass through the application area (GIS Database). Four larger non-perennial watercourses named Fortescue River, Homestead Creek, Shovelanna Creek and Warrawanda Creek occur within the application area. Clearing in the vicinity of the creeks may lead to increased erosion and, therefore, sedimentation of the creek. Potential impacts from erosion as a result of the proposed clearing may be minimised by the implementation of a watercourse management conditions.

The annual average rainfall for Newman is 325.9 millimetres and the average annual evaporation rate for the application area is approximately 3,400 - 3,600 millimetres (BoM, 2013; GIS Database). Therefore, during normal rainfall events surface water within the application area is likely to evaporate quickly. However, substantial rainfall events create surface sheet flow which is likely to have a higher level of sediments. During normal rainfall events, the proposed clearing would not likely lead to an increase in sedimentation of watercourses within the application area.

According to available databases, groundwater salinity within the application area is between 500 and 1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered fresh to marginal. The proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

Methodology BoM (2013)
DoW (2013)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- 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

The application area is located within the Fortescue River catchment area (GIS Database). Given the size of the area to be cleared (60 hectares) in relation to the size of the catchment area (2,975,192 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

The application area experiences a semi-desert tropical climate with summer cyclonic or thunderstorm rainfall, with an annual average rainfall of approximately 325.9 millimetres per year (CALM, 2002; BoM, 2013). Based on an average annual evaporation rate of 3,400 - 3,600 millimetres (GIS Database), there is likely to be little surface flow during normal seasonal rains. Whilst large rainfall events may result in flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology

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

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

Comments

There is one native title claim over the area under application: WC05/6 (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases, there are multiple 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 21 January 2013 by the Department of Mines and Petroleum inviting submissions from the public. One submission has been received stating that the clearing is not supported. The submission party has been liaised with over the past year and the Department will continue to liaise with this party in relation to clearing permit applications.

Methodology

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

4. References

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Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

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Outback Ecology (2009b) Jimblebar Linear Development Flora and Vegetation Assessment. Unpublished Report Prepared by Outback Ecology Services for BHP Billiton Iron Ore, November 2009.
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Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Technical Bulletin - An Inventory and Condition Survey of the Pilbara Region, Western Australia, No. 92. Department of Agriculture, Government of Western Australia, Perth, Western Australia.

5. Glossary

Acronyms:

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

Definitions:

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

P1	**Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	**Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	**Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	**Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	**Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	**Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

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

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

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

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

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

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

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

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

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

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

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

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

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

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

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