Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5047/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: *Iron Ore (Mount Goldsworthy) Agreement Act 1964*, Mineral Lease 281SA (AML 70/281)
Local Government Area: Shire of Ashburton
Colloquial name: Sweet View Exploration Drilling Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
97.35		Mechanical Removal	Mineral Exploration, Hydrological Investigations, Geotechnical Investigations and Supporting Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 5 July 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. Two Beard vegetation associations have been mapped within the application area:

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

A large-scale flora and vegetation survey was conducted over the application area and its surrounds in August 2010 by botanists from Onshore Environmental. Sixteen vegetation associations were mapped within the application area and these are listed below along with the landform each is associated with in brackets (Onshore Environmental, 2011; BHPBIO, 2012).

Callitris Low Forest (Gorges): Low Open Forest of *Callitris columellaris*, *Corymbia ferriticola* and *Acacia aneura* over Tussock Grassland of *Themeda* sp. *Mt Barricade* (M.E. Trudgen 2471), *Eriachne mucronata* and *Aristida burbidgeae* with Open Shrubland of *Dodonaea pachyneura*, *Ficus brachypoda* and *Capparis mitchellii.*

Corymbia Low Forest (Breakaway): Low Open Forest of *Corymbia ferriticola*, *Acacia aneura* and *Eucalyptus leucophloia* subsp. *leucophloia* over Tussock Grassland of *Themeda* sp. Mt Barricade (M.E. Trudgen 2471), *Eriachne mucronata* and *Cymbopogon ambiguus* with Open Shrubland of *Dodonaea pachyneura*, *Ficus brachypoda* and *Astrotricha hamptonii.*

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

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

Acacia Scattered Low Trees (Plains): Scattered Low Trees of *Acacia aneura* var. *tenuis* and *Acacia paraneura* over Low Scattered Shrubs of *Eremophila lanceolata*, *Solanum lasiophyllum* and *Sclerolaena cornishiana* over Scattered Tussock Grass of *Aristida inaequiglumis* and *Themeda triandra.*

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

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

Triodia Hummock Grassland (Hill Crest): Hummock Grassland of *Triodia wiseana* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over Open Mallee of *Eucalyptus kingsmillii* subsp. *kingsmillii* and *Eucalyptus gamophylla.*

Triodia Hummock Grassland (Undulating Low Hills): Hummock Grassland of *Triodia wiseana* and *Triodia* sp. Shovelanna Hill (S. Van Leeuwen 3835) with Low Shrubland of *Acacia hilliana* and *Acacia adoxa* var. *adoxa* and Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana.*

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

Triodia Hummock Grassland (Hill Slopes): Hummock Grassland of *Triodia brizoides* with Open Mallee of *Eucalyptus pilbarensis* and Scattered Low Trees of *Eucalyptus leucophloia* subsp. l*eucophloia*

Triodia Hummock Grassland (Hill Slopes): Hummock Grassland of *Triodia brizoides* and *Triodia wiseana* with Open Shrubland of *Acacia bivenosa* and *Senna glutinosa* subsp. *glutinosa* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia.*

Triodia Hummock Grassland (Hill Slopes): Hummock Grassland of *Triodia brizoides* and *Triodia wiseana* over Open Tussock Grassland of *Cymbopogon ambiguus* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia.*

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

Themeda Tussock Grassland (Breakaway): Tussock Grassland of *Themeda* sp. Mt Barricade (M.E. Trudgen 2471) and *Cymbopogon ambiguus* with Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* over Open Shrubland of *Senna glutinosa* ssp. *glutinosa.*

Completely Degraded: The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

Clearing Description

BHP Billiton Iron Ore Pty Ltd (BHPBIO) has applied to clear up to 97.35 hectares within an application area of approximately 2,991 hectares for the purpose of mineral exploration, hydrological investigations, geotechnical investigations and supporting infrastructure. The exploration drilling program will comprise of approximately 814 drill targets, three laydown areas and 81 kilometres of access tracks.

The application area is located approximately 115 kilometres north-west of Newman.

Vegetation will be cleared by dozers or excavators. Vegetation and topsoil will be stockpiled for later use in rehabilitation.

Vegetation Condition

Pristine: No obvious signs of disturbance (Keighery, 1994);
To:
Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The vegetation condition was assessed by botanists from Onshore Environmental (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 application area occurs within the Hamersley (PIL3) Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS Database). This 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).

The vegetation within the application area is broadly mapped as Beard vegetation associations 18 and 82, both of which have over 99% of their Pre-European vegetation extent remaining in the bioregion (Government of WA, 2011; GIS Database). A large scale flora and vegetation survey was undertaken over the Camp Hill area, including the application area, in August 2010 by botanists from Onshore Environmental. A total of 304 plant taxa, belonging to 126 genera from 49 families, were recorded from the survey area (Onshore Environmental, 2011). Species representation was greatest among Fabaceae, Poaceae and Malvaceae which is typical of the Pilbara (Onshore Environmental, 2011).

No Threatened Flora, Threatened Ecological Communities or Priority Ecological Communities were recorded within the application during the Onshore Environmental vegetation survey or have previously been recorded within the application area (Onshore Environmental, 2011; BHPBIO, 2012; GIS Database).

Five species of Priority Flora have been located within the application area: *Rhagodia* sp. Hamersley (P3), *Rostellularia adscendens* var. *latifolia* (P3), *Triodia* sp. Mt Ella (P3), *Acacia bromilowiana* (P4) and *Eremophila magnifica* subsp. *magnifica* (P4) (Onshore Environmental, 2011; BHPBIO, 2012). *Rhagodia* sp. Hamersley was recorded within the south-west part of the application area and the southern part of the survey area

outside the application area (Onshore Environmental, 2011). The distribution of *Rhagodia* sp. Hamersley is restricted to the Pilbara between Tom Price and Newman with none of the known populations found within conservation estates (Onshore Environmental, 2011). *Rostellularia adscendens* var. *latifolia* was recorded in two locations in the application area, *Acacia bromilowiana* was recorded in one location and *Eremophila magnifica* subsp. *magnifica* was recorded in seven locations (BHPBIO, 2012). *Triodia* sp. Mt. Ella is considered to be geographically restricted and uncommon and was found extensively within the application area (Onshore Environmental, 2011). BHPBIO (2012) avoid conservation significant flora where possible. Potential impacts to Priority Flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

Two introduced flora species were recorded within the application area. These weed species were Bipinnate Beggartick (*Bidens bipinnata*) and Spiked Malvastum (*Malvastrum americanum*) (BHPBIO, 2012). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A field survey targeting conservation significant fauna species with the potential to occur within the application area and its surrounds was undertaken by zoologists from Biologic in August 2010. Opportunistic sightings of fauna species were also recorded during a fauna habitat assessment of the survey area, which included the application area (Onshore Environmental, 2011). A total of 89 vertebrate fauna species were recorded during the survey comprising of 13 native mammals, four introduced mammals, 60 birds and 12 reptiles (Onshore Environmental, 2011). A total of 242 vertebrate taxa comprising of 31 native mammals, eight introduced mammals, 114 birds, 83 reptiles and four amphibians may occur in the survey area, based on database searches and results of nearby surveys (Onshore Environmental, 2011).

The fauna survey identified one fauna habitat type with high habitat value, 'Gorge' habitat, within the application area (Onshore Environmental, 2011; BHPBIO, 2012). A number of conservation significant fauna species are known to be associated with 'Gorge' habitat including Northern Quoll, Pilbara Leaf-nosed Bat and Ghost Bat (Onshore Environmental, 2011). The 'Gorge' habitat type is avoided by BHPBIO due to its high conservation value as well as its total inaccessibility for drilling machinery (BHPBIO, 2012). Potential impacts to the conservation significant fauna species Northern Quoll, Pilbara Leaf-nosed Bat and Ghost Bat may be minimised by the implementation of a fauna management condition.

The application area does comprise a relatively high level of biological diversity with the presence of Priority Flora and conservation significant fauna. However, the application area is much larger than the area proposed to be cleared, 2,991 hectares compared to 97.35 hectares, and the vegetation types and fauna habitat types identified within the application area also occurred in the surrounding area. The landforms and vegetation types that support a higher species richness, such as gorges and habitats supporting Priority flora, are unlikely to be extensively cleared during the proposed clearing activities (BHPBIO, 2012).

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

Methodology

BHPBIO (2012)
CALM (2002)
Government of WA (2011)
Onshore Environmental (2011)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Pre-European Vegetation
- Threatened and Priority Flora
- 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 desktop search and database review was conducted and a fauna habitat assessment of the application area and its surrounds was undertaken by zoologists from Biologic in August 2010 (Onshore Environmental, 2011). Where potential habitat for threatened fauna species was identified in the desktop review, targeted surveys were undertaken to determine their likely presence in the study area and the value of the habitat to support significant populations (Onshore Environmental, 2011). Opportunistic fauna sightings were also noted during the survey (Onshore Environmental, 2011).

A total of 89 vertebrate fauna species were recorded during the survey comprising of 13 native mammals, four introduced mammals, 60 birds and 12 reptiles (Onshore Environmental, 2011). A total of 242 vertebrate taxa comprising of 31 native mammals, eight introduced mammal, 114 birds, 83 reptiles and four amphibians may occur in the survey area, based on database searches and results of nearby surveys (Onshore Environmental, 2011).

Six broad fauna habitat types were identified within the application area:

- Hilltop and hillslopes;
- Mulga association;
- Gorge;
- Medium drainage area;
- Hardpan plain; and
- Completely degraded (Onshore Environmental, 2011; BHPBIO, 2012).

The dominant landform is 'Hilltops and hillslopes' which occupies 91.7% of the application area (BHPBIO, 2012). This habitat type is considered to exhibit a medium habitat value with its key characteristics being hummock or tussock grassland, occasional tree hollows and small pebbles and cobbles (BHPBIO, 2012). The 'Mulga association' and 'Medium drainage area' habitat types were considered to have medium habitat value and the 'Hardpan plain' and 'Completely degraded' habitat types have low habitat value (Onshore Environmental, 2011; BHPBIO, 2012). The 'Gorge' habitat type was determined to have high habitat value and its typical characteristics included caves, crevices and rock overhangs, tussock grassland, rock pools and cooler shaded locations (Onshore Environmental, 2011; BHPBIO, 2012). The 'Gorge' habitat occurred over approximately 2.3% of the application area (BHPBIO, 2012).

Five vertebrate fauna species listed as Threatened Species under the *Environment Protection and Biodiversity Act (EPBC) 1999* or specially protected under Western Australian legislation were recorded during the Biologic survey (Onshore Environmental, 2011). The conservation significant species that were recorded are listed below along with their conservation status:

- Northern Quoll (*Dasyurus hallucatus*) - Endangered under the *EPBC Act 1999* and Schedule 1 under the *Wildlife Conservation (WC) Act 1950*;
- Pilbara Orange Leaf-nosed Bat (*Rhinonicteris aurantius*) - Vulnerable under the *EPBC Act 1999* and Schedule 1 under the *WC Act 1950*;
- Rainbow Bee-eater (*Merops ornatus*) - Schedule 3 under the *WC Act 1950*;
- Ghost Bat (*Macroderma gigas*) – Priority 4; and
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 (Onshore Environmental, 2011).

A Northern Quoll scat was found in a rock overhang in hillslope habitat in the survey area but outside of the application area (Onshore Environmental, 2011). Until recently there were no previous records of Northern Quoll in the survey area or nearby areas, despite extensive use of Elliott and cage traps over many years. In 2010 zoologists from Biologic recorded a Northern Quoll scat in another rock overhang approximately 12 kilometres south-east of the survey area, otherwise the nearest published record is approximately 50 kilometres north-west of the survey area (Onshore Environmental, 2011). The lack of records over the past decade suggests that the presence of Northern Quolls is a recent phenomenon, they are resident in very low numbers in the locality and/or a result of the methodology used to detect the presence of this species (Onshore Environmental, 2011).

One Pilbara Leaf-nosed Bat call was recorded from a cave outside of the application area during the survey (Onshore Environmental, 2011). While the survey area contains a number of overhangs and caves, most are probably not humid enough to be suitable for Pilbara Leaf-nosed Bats as they are not near water. Therefore, the recording is likely to be of an itinerant bat foraging or moving through the area and none are expected to be resident (Onshore Environmental, 2011).

The survey area contains caves and overhangs that provide suitable habitat for Ghost Bats. Scats were recorded from a number of locations during the survey, including within the application area, and an individual bat was recorded within the application area as well as an ANABAT echolocation recording (Onshore Environmental, 2011). The number of records of Ghost Bat obtained during the survey suggests that Ghost Bats may be resident in the survey area (Onshore Environmental, 2011).

The Rainbow Bee-eater is a migratory species and three individuals were recorded during the survey as well as an area of possible nest burrows recorded outside the application area (Onshore Environmental, 2011). This avifauna species is highly mobile and capable of evacuating from areas being disturbed (BHPBIO, 2012).

The Western Pebble-mound Mouse was frequently recorded both within and adjacent to the application area during the survey with 64 mounds recorded (Onshore Environmental, 2011). The ‘Hilltops and hill slopes’ habitat holds value for the Western Pebble-mound Mouse as it provides pebbles for mound construction and hummock grassland provides protection and foraging areas (Onshore Environmental, 2011; BHPBIO, 2012). Some impact could potentially occur at a local level to the Western Pebble-mound Mouse but the species is a common resident in suitable habitat within the survey area and the exploration activities are expected to have minimal disturbance to the species (Onshore Environmental, 2011; BHPBIO, 2012).

The ‘Gorge’ habitat type may hold value for conservation significant species including the Ghost Bat, Northern Quoll and Pilbara Leaf-nosed Bat. These species may utilise caves and crevices in the survey area, as well as the gorge areas for hunting (Onshore Environmental, 2011; BHPBIO, 2012). Although not recorded during the survey, the Pilbara Olive Python (*Liasis olivaceus* subsp. *barroni*) and blind snake *Ramphotyphlops ganei* may utilise this habitat type (Onshore Environmental, 2011; BHPBIO, 2012). The Department of Environment and

Conservation (DEC) recommended that disturbance to potential habitat for conservation significant fauna be avoided, particularly avoiding disturbance to gorge areas (DEC, 2012). The 'Gorge' habitat type is avoided by BHPBIO due to its high conservation value as well as its total inaccessibility for drilling machinery (BHPBIO, 2012). Potential impacts to the conservation significant fauna species Northern Quoll, Pilbara Leaf-nosed Bat and 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 BHPBIO (2012)
DEC (2012)
Onshore Environmental (2011)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases there are no known records of Threatened Flora within the application area (GIS Database). A large scale flora and vegetation survey was undertaken over the Camp Hill area, including the application area, in August 2010 by botanists from Onshore Environmental. The Threatened Flora species *Lepidium catapycnon* was not recorded within the application area but was recorded in two locations in the larger survey area (Onshore Environmental, 2011; BHPBIO, 2012). The proposed clearing is unlikely to impact on the *Lepidium catapycnon* plants located outside of the application area.

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

Methodology BHPBIO (2012)
Onshore Environmental (2011)
GIS Database:
- Threatened and Priority Flora

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

Comments

Proposal is not likely to be at variance to this Principle

A search of available databases revealed there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC, Themeda grasslands on cracking clays, is located approximately 80 kilometres north-west of the application area (GIS Database).

No TECs were identified during the flora and vegetation survey conducted by Onshore Environmental botanists (Onshore Environmental, 2011).

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

Methodology Onshore Environmental (2011)
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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 99.6% of the pre-European vegetation remains (see table) (Government of WA, 2011; GIS Database). This gives it a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the clearing application area has been mapped as Beard vegetation associations:

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

According to Government of WA (2011), over 99% of both of these vegetation associations remain at a state and at a bioregional level (see table). These vegetation associations would be given a conservation status of 'Least Concern' at both a state and bioregional level (Department of Natural Resources and Environment, 2002).

The vegetation under application is not a remnant of vegetation in an area that has been extensively cleared.

	Pre-European Area (ha)*	Current Extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,427	17,729,352	~99.6	Least Concern	6.3
Beard Veg Assoc. – State					
18	19,892,305	19,843,823	~99.8	Least Concern	2.1
82	2,565,901	2,553,217	~99.5	Least Concern	10.2
Beard Veg Assoc. – Bioregion					
18	676,557	672,424	~99.4	Least Concern	16.8
82	2,563,583	2,550,899	~99.5	Least Concern	10.2

* Government of WA (2011)
** 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 WA (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**
There are no permanent wetlands or watercourses within the application area, however there are numerous minor, non perennial watercourses (GIS Database). Approximately 7% of the application area was described as the drainage lines landform (BHPBIO, 2012). Onshore Environmental (2011) classified two vegetation types within the application area that are associated with drainage lines:

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

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

The proposed drilling program will, where practicable, avoid minor drainage lines that are considered locally significant (BHPBIO, 2012).

Based on the above, the proposed clearing is at variance to this Principle. However, vegetation associated with minor drainage lines is widespread in the region and due to the minor nature of the proposed clearing for exploration activities and geotechnical investigations there is unlikely to be significant impacts on any watercourse or wetland.

Methodology BHPBIO (2012)
Onshore Environmental (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**
According to available datasets the application area intersects the Boolgeeda, Newman, Platform and Wannamunna 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). The vegetation is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Newman Land System is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). Each of the landforms in the land system have a mantle of abundant pebbles of ironstone and other rocks, which translates to a low soil erosion risk (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). The land forms in this land system generally have surface mantles of very abundant pebbles and cobbles and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Wannamunna Land System is characterised by hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (and occasionally eucalypt woodlands) (Van Vreeswyk et al., 2004). Generally the system has low susceptibility to erosion but disturbances to overland flow processes by inappropriate positioning or construction of infrastructure such as roads can have adverse effects on vegetation (Van Vreeswyk et al., 2004).

The proposed exploration activities are relatively low impact, the clearing will be not be contiguous and will consist of widely spaced discrete drill pads and access tracks, existing tracks will be used where possible, and disturbances will be rehabilitated upon completion of exploration activities (BHPBIO, 2012).

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

Methodology

BHPBIO (2012)
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 northern half of the application area is within the ex-Juna Downs pastoral lease which is a Department of Environment and Conservation (DEC) pastoral lease relinquishment area (GIS Database). The former pastoral leases will be acquired by DEC in 2015 for addition to the conservation reserve system (DEC, 2012). The western boundary of the application area is also 2 kilometres east of Karijini National Park (GIS Database).

DEC is concerned with preserving the conservation values of the ex-Juna Downs pastoral lease and recommends exploration only take place with adequate environmental management measures in place (DEC, 2012). Of specific concern were weed control and rehabilitation of ground disturbance as soon as practicable after the completion of exploration activities (DEC, 2012). BHPBIO have developed an Exploration Environmental Management Plan that addresses flora and fauna, weeds, waste, hazardous materials, dust and atmospheric land use, noise and vibration, rehabilitation and post-exploration land use, and auditing and reporting (BHPBIO, 2008). The implementation of the Exploration Environmental Management Plan will ensure environmental disturbance is minimised.

DEC have advised that the proposed exploration activities are unlikely to have a significant impact on the conservation values of the ex-Juna Downs pastoral lease or Karijini National Park providing that the site is adequately managed to minimise environmental impacts (DEC, 2012). Potential impacts to conservation areas may be minimised by the implementation of weed management and rehabilitation conditions.

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

Methodology

BHPBIO (2008)
DEC (2012)
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 or wetlands within the application area (GIS Database). There are several minor ephemeral drainage lines within the application area that would only flow following substantial rainfall events (BHPBIO, 2012; GIS Database). BHPBIO have developed an Exploration Environmental Management Plan which states that drill sites will be chosen where there is a low level of vegetation and a suitable distance from any natural watercourse or drainage line (BHPBIO, 2012). The proposed clearing is unlikely to cause deterioration in the quality of surface water in the local area.

According to available databases the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Newman Water Reserve, which is approximately 86

kilometres to the south-east (GIS Database). The proposed clearing is unlikely to affect the water quality of the water reserve due to the large distance between it and the application area.

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

Methodology BHPBIO (2012)
GIS Database:
- 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 intersects the Ashburton River and Fortescue River catchment areas (GIS Database). Given the size of the area to be cleared (97.35 hectares) in relation to the size of the catchment areas (7,877,743 and 2,975,192 hectares, respectively) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

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

Methodology GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

There is one Native Title Claim (WC11/6) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are several registered Aboriginal Sites of Significance in the vicinity of 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 May 2012 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received.

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

4. References

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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.