



1. Application details

1.1. Permit application details

Permit application No.: 2162/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: ML 281SA (AML70/281) Iron Ore (Mount Goldsworthy) Agreement Act 1964
Local Government Area: Shire Of East Pilbara
Colloquial name: Boundary Ridge

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Beard vegetation associations have been mapped at 1:250,000 scale for the whole of WA, and are a useful tool to examine the vegetation extent in a regional context. Two Beard vegetation associations are located within the area proposed to be cleared (GIS Database, 2007). These vegetation associations are described as Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>; and Beard Vegetation Association 18: Low woodland; mulga (<i>Acacia aneura</i>).</p> <p>A flora survey of the two application areas was completed in July 2007 by ENV Australia. The vegetation assessment identified nine vegetation communities within the application area (ENV, 2007). These are:</p> <p>Hill crests: <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> low open woodland over <i>Petalostylis labicheoides</i> / <i>Acacia maitlandii</i> / <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> open shrubland over <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> / <i>Senna glutinosa</i> low open shrubland over <i>Triodia wiseana</i> hummock grassland.</p> <p>Upper Slope (rocky slope): <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> low open woodland over <i>Hakea chordophylla</i> / <i>Corymbia hamersleyana</i> high open shrubland over <i>Petalostylis labicheoides</i> / <i>Senna glutinosa</i> subsp. <i>glutinosa</i> / <i>Acacia hamersleyensis</i> / <i>Acacia maitlandii</i> open shrubland over <i>Ptilotus obovatus</i> / <i>Senna notabilis</i> / <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> low open shrubland over <i>Themeda triandra</i> / <i>Eriachne mucronata</i> / <i>Paspalidium clementii</i> / <i>Cymbopogon procerus</i> very open tussock grassland over <i>Triodia wiseana</i> / <i>Triodia pungens</i> hummock grassland.</p> <p>Lower slopes: <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> scattered low trees over <i>Eucalyptus gamophylla</i> low open mallee over <i>Acacia pachyacra</i> / <i>Acacia dictyophleba</i> / <i>Acacia bivenosa</i> / <i>Codonocarpus cotinifolius</i> open shrubland over <i>Senna notabilis</i> / <i>Corchorus lasiocarpus</i> var. <i>parvus</i> / <i>Keraudrenia velutina</i> subsp. <i>elliptica</i> low open shrubland over <i>Triodia wiseana</i> / <i>Triodia pungens</i> hummock grassland over <i>Themeda triandra</i> very open tussock grassland. Bands of <i>Acacia aneura</i> interspersed throughout the footslopes, and to the eastern end of the range <i>Acacia inaequilatera</i> is common.</p>	<p>The clearing of 55ha of native vegetation within a 1166 hectare purpose permit boundary is required for the purpose of exploration and resource evaluation drilling programs and associated activities (BHP Billiton, 2007a). BHP Billiton proposes to install 101 drill pads, and several vehicle tracks for the Boundary Ridge project (ENV Australia, 2007a). The drill pads will be 20 metres wide and 20 metres long, with a maximum footprint of 400 square metres, while the proposed tracks will be no wider than 4 metres (BHP Billiton, 2007a).</p> <p>The purpose permit boundary is located approximately 100km south east of Tom Price (GIS Database).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)</p> <p>to</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)</p>	<p>Vegetation within the application area was described as Very Good to Excellent, with most of the survey sites rated as Excellent (ENV, 2007). Two survey sites were rated as Good, because of disturbance resulting from old access tracks running across them. Other disturbances recorded in the project area included damage by recent fire and grazing by feral animals (ENV, 2007).</p> <p>There were four introduced flora species located within the application area (ENV Australia, 2007).</p>

Gorge/Gully (north-facing): *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over scattered *Ptilotus obovatus* var. *obovatus* / *Senna glutinosa* subsp. *glutinosa* shrubs over *Triodia wiseana* hummock grassland over scattered *Cymbopogon procerus* / *Eriachne mucronata* / *Paspalidium clementii* grasses over scattered herbs.

Gorge/Gully (south-facing): *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Acacia hamersleyensis* / *Dodonaea pachyneura* / *Acacia aneura* var. *aneura* high open shrubland over *Hibiscus haynaldii* / *Astrotricha hamptonii* / *Eremophila macmilliana* open shrubland over *Ptilotus obovatus* low open shrubland over *Eriachne mucronata* (typical form) / *Cymbopogon procerus* / *Paspalidium clementii* / *Themeda triandra* open tussock grassland over *Triodia pungens* / *Triodia wiseana* very open hummock grassland. This vegetation association includes a cliff/breakaway habitat (BR02).

Plain (Mulga Bands): *Acacia aff. aneura* (narrow fine veined; site 1259) low woodland over *Acacia pachyacra* / *Codonocarpus cotinifolius* open shrubland over *Keraudrenia velutina* subsp. *elliptica* / *Senna notabilis* low open shrubland over *Triodia melvillei* / *Triodia pungens* / *Triodia wiseana* open hummock grassland over *Enneapogon polyphyllus* / *Aristida contorta* / *Panicum effusum* very open tussock grassland over *Brunonia australis* / *Velleia connata* / *Pterocaulon sphaeranthoides* very open hermland. This vegetation association includes a drainage depression to the north of the range (BR31).

Hardpan/Drainage flat: *Corymbia aspera* scattered trees over *Eucalyptus xerothermica* / *Acacia aneura* var. *aneura* low open woodland over *Grevillea berryana* / *Eremophila longifolia* open shrubland over *Pterocaulon sphaeranthoides* / *Ptilotus obovatus* low open shrubland over *Setaria dielsii* / *Digitaria ammophila* / *Enneapogon intermedius* / *Eriachne benthamii* tussock grassland over *Bidens bipinnata* / *Pterocaulon sphaeranthoides* very open hermland.

Drainage line (*Eucalyptus victrix*): *Eucalyptus victrix* open woodland over *Acacia aff. aneura* (narrow fine veined; site 1259) open low forest over *Muehlenbeckia florulenta* open shrubland over *Enneapogon polyphyllus* / *Panicum effusum* / *Digitaria ammophila* / *Aristida holathera* var. *holathera* / *Themeda triandra* tussock grassland over *Bidens bipinnata* / *Peplidium* sp. very open hermland. This vegetation association is potentially a Priority Ecological Community, the Coolibah-Lignum flats.

Drainage line (*Eucalyptus camaldulensis*): *Eucalyptus camaldulensis* / *Corymbia aspera* / *Eucalyptus xerothermica* woodland over scattered *Pterocaulon sphaeranthoides* shrubs over *Themeda triandra*, *Digitaria ammophila* and *Aristida ingrata* grassland. This vegetation association forms an intermediary between the Drainage line (*Eucalyptus victrix*) and Hardpan/Drainage flat vegetation associations.

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 is located within the Hamersley IBRA (Interim Biogeographic Regionalisation of Australia) subregion of the Pilbara Region (GIS Database). The subregion is generally described as a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges which pan out to surrounding plains (Kendrick, 2001). The vegetation of the 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 (Kendrick, 2001).

Known features of the region with special value include the gorges and waterfalls of Hamersley Range, particularly those of Karijini National Park, spectacular exposures of Banded Iron Formations, the Themeda Grasslands of the Pilbara region and the Red Hill Station mulga stands (Kendrick, 2001). Grazing activities are the major land use within the region, while native pastures and mining also make up a considerable portion (Kendrick, 2001). The north-east of the application area is located within the Juna Downs pastoral station (GIS Database).

A targeted flora survey was conducted in July 2007, by ENV Australia (2007). During the survey a total of 294 taxa were recorded in the application area (ENV Australia, 2007). These taxa consisted of 46 families, the most represented were Poaceae (with 41 taxa recorded), Mimosaceae (30 taxa) and Malvaceae (25 taxa). While Acacia was the most represented genus, with 30 taxa, followed by Ptilotus with 15 and Senna with 12 taxa (ENV Australia, 2007). No Declared Rare Flora (DRF) were located within the application area. Three Priority Flora species and two species of Conservation Significance were recorded in the application area. Of these species recorded, only two of these, namely, *Abutilon trudgeonii* (Priority 3 / DEC) and *Triodia Mt Ella* (little collected - Priority 3 - DEC) were found in proposed drill pads where vegetation will be required to be cleared (ENV Australia 2007). However BHP Billiton have committed to avoid clearing within all the proposed drill pad areas where these species were identified, they also have stated they will avoid any gorges or gullies, as they are very difficult to conduct exploration activities within (BHP Billiton, 2008). BHP Billiton have committed to conducting targeted flora surveys to ensure all Priority Flora species and conservation significant species are flagged and avoided (BHP Billiton, 2008). Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of Priority flora management

During the flora survey, ENV Australia (2008) noted that various sites within the application area showed signs of disturbance from feral animals. In addition to this, much of the project area had been burnt in recent years. There were also old access tracks from historic drilling programs noted within the application area. It is acknowledged that the species richness and biodiversity values of these areas may have been reduced from such disturbances, however, this disturbance was not widespread over the application area. ENV Australia (2007) have stated that the majority of the sites studied had a vegetation condition of Very Good to Excellent, with most rated as excellent.

Four introduced flora species were recorded within the proposed clearing area by ENV Australia (2008). These were *Malvastrum americanum* (Spiked Malvastrum), *Setaria verticillata* (Whorled Pigeon Grass), *Bidens bipinnata* (Bipinnate Beggartick) and *Sonchus oleraceus* (Common Sowthistle). These weed species were found in relatively low numbers (ENV Australia, 2008). *Bidens bipinnata* was the most widespread of the weeds identified, with the species recorded at 14 of the proposed drill pads. *Malvastrum americanum* was found at 2 proposed drill pads, whilst *Setaria verticillata* and *Sonchus oleraceus* were recorded at 1 of the proposed drill pads (ENV Australia, 2008). The presence of introduced flora species lowers the biodiversity value of the proposed clearing area. Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Should a clearing permit be granted, it is recommended that a condition be imposed on the clearing permit for the purposes of weed management.

During the flora survey, ENV Australia (2007) identified a potential Priority Ecological Community (PEC) within the north-eastern tip of the application area. This was the Coolibah Lignum Flats Community, which is known as Woodland or forest of *Eucalyptus victrix* over thicket of *Muehlenbeckia florulenta* on red clays in run-on zones (DEC, 2008). The proposed clearing within this area is likely to alter the species composition, and reduce biodiversity values. However, BHP Billiton have committed to avoid clearing within this PEC, unless approval is granted from the Director, Environment Division, Department of Industry and Resources. Should the permit be granted, it is recommended, that a condition be placed on the permit to prevent clearing within the PEC identified within the application area.

A Fauna Assessment of the Area C Project Area was undertaken in August and September 2007 by ENV Australia (2008), this study included the Boundary Ridge Project Area. During the fauna assessment 63 fauna species were identified within the application area, including 1 amphibian, 12 mammal, 4 reptile, and 46 bird species (ENV Australia, 2008). No species of conservation significance were recorded within the Boundary Ridge Project. ENV Australia (2008) have stated that the number of bird species present was relatively high in comparison to other surveys of similar size and scope in the surrounding area. This is likely to be a result of the increased survey effort, and the presence of permanent water (Coondawanna Bore) found east of the Fork South Lease (ENV, 2008).

Of the fauna species identified within the application area, two were introduced species, these were the Dingo (*Canis lupus* subsp. *dingo*) and the House Mouse (*Mus musculus*) (ENV Australia, 2008). The presence of introduced fauna within the proposed clearing area is likely to have a detrimental impact upon the florall and faunal diversity of the area.

Six major landform units/habitat types were selected as being representative of the project area during the fauna assessment (ENV Australia, 2008). These six habitat types were breakaways, plains, scree slopes, gorges/gullies, hill crests and minor drainage lines. ENV Australia (2007) have stated that the habitats identified within the application area are well represented within the Pilbara region. However, two of the habitat types were considered to be of high conservation value, these were the gorges/gullies and the minor drainage lines. This was based on the numerous microhabitats present for conservation significant species and the moderate representation elsewhere (ENV Australia, 2008). However, BHP Billiton have made a commitment to avoid clearing within 10 metres of any major drainage lines within the application area (BHP Billiton, 2007a). This action will reduce the overall impact to significant fauna habitats. As a result it is recommended that should the permit be granted, a condition be placed on the permit to prevent clearing within 10 metres of any major drainage lines within the application area.

Based on the above, the proposed clearing may be at variance to this Principle. However, it is considered that the potential impacts of the proposed clearing can be adequately managed and minimised by imposing

appropriate conditions on the permit.

Methodology BHP Billiton (2008).
ENV Australia (2007).
ENV Australia (2008).
Kendrick (2001).
GIS Databases:
- Interim Biogeographic Regionalisation of Australia - EA 18/10/00
- Interim Biogeographic Regionalisation of Australia (subregions) - EA 18/10/00

(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

ENV Australia (2008) undertook a level two fauna assessment of the Boundary Ridge project area between 15th August and 4th September 2007. The Boundary Ridge project area was part of a broader survey referred to by ENV Australia as Area C West Fauna Assessment. The Area C West Fauna Assessment involved two processes, firstly there was a detailed desktop survey - including a search of literature, data, aerial photographs and maps for information relating to habitats likely to be found in the project areas. Secondly there was a field survey of the project area - including a fauna habitat assessment, trapping program, opportunistic searches, an ornithological census and bat recordings (ENV Australia, 2008).

The desktop survey revealed there were 50 species of mammals, 122 species of reptiles, nine species of amphibians and 135 species of birds that potentially may occur within the Area C West project area (ENV Australia, 2007). Of the species identified, a number of them were conservation significant species. These include: Rothschild's Rock-wallaby (*Petrogale rothschildi*), Black-footed Rock-wallaby (*Petrogale lateralis*), Mulgara (*Dasyercus cristicauda*), Spectacled Hare-wallaby (*Lagorchestes conspicillatus*), The Lakelands Downs Mouse (*Leggadina lakedownensis*), Western Pebble-mound Mouse (*Pseudomys chapmani*), Northern Quoll (*Dasyurus hallucatus*), Ghost Bat (*Macroderma gigas*), Orange Leaf-nosed bat (*Rhinonictis aurantius*), Long-tailed Dunnart (*Sminthopsis longicaudata*), Pilbara Olive Python (*Liasis olivaceus barroni*), Peregrine Falcon (*Falco peregrinus*) and the Night Parrot (*Pezoporus occidentalis*) (ENV Australia, 2008).

During the subsequent field survey a total of 63 fauna species were identified within the application area (ENV Australia, 2008). These included 1 amphibian, 12 mammal, 4 reptile, and 46 bird species (ENV Australia, 2008). Of the species identified, two were introduced species, these were the Dingo (*Canis lupus* subsp. *dingo*) and the House Mouse (*Mus musculus*). ENV Australia (2008) stated that there was a high level of bird species identified in comparison to previous studies in the area of similar size and scope, this is likely to be a result of the increased survey effort, and the presence of permanent water (Coondawanna Bore) found east of the Fork South Lease - which is not in the application area. None of the conservation significant species identified from the desktop survey were recorded during the field survey. However there were two species of local significance that were recorded during the field survey, namely the White-Lipped Rainbow Skink (*Carlia munda*) and the Striated Grasswren (*Amytornis striatus whitei*) (ENV Australia, 2008).

The White-lipped Rainbow Skink (*Carlia munda*) is endemic to the Pilbara, and is found in disjunct populations (ENV Australia, 2008). ENV Australia (2008) consider this species to be of conservation importance on a local level because of its restricted pattern of distribution (ENV Australia, 2008). It is acknowledged that this species is uncommon; however it has been identified in numerous surveyed sites surrounding the application area (ENV Australia, 2008). Therefore it is unlikely the proposed clearing will significantly reduce the habitat of the White-lipped Rainbow Skink on a local or regional level.

The Striated Grasswren (Priority 4 - DEC) is a northern subspecies found in the Pilbara and central Western Australia (ENV Australia, 2008). Its habitat is described as spinifex on sandhills and rocky hill slopes (Slater et al., 1986). The Striated Grasswren was recorded by ENV Australia within the application area. However this habitat is well replicated throughout the Pilbara and thus no significant impact to its overall habitat is expected from the proposed clearing (ENV Australia, 2008).

The Western Pebble-mound Mouse (Priority 4 - DEC) is found in rocky hummock grasslands and is endemic to the Pilbara (ENV Australia, 2008). Six active pebble mounds were recorded within the application area. Therefore it is likely that the Western Pebble-mound Mouse exists within the application area. This species has been recorded in many surrounding sites to Boundary Ridge, and its habitat is well represented throughout the Pilbara (ENV Australia, 2008). Additionally this species is abundant in at least five large conservation reserves found in the Pilbara (Start et al., 1980). As a result it is unlikely that the proposed clearing will have a significant impact to the overall habitat of the Western Pebble-mound Mouse.

During the field survey, ENV Australia used vegetation communities and landforms of the project area to identify broad fauna habitats (ENV Australia, 2008). As a result the following six habitat types were identified: Breakways, Plains, Scree Slopes, Gorges/Gullies, Hill Crests and Minor Drainage Lines. ENV Australia (2008) have stated that habitats of the application area are generally well represented throughout the Pilbara region. However there were two habitat types identified which were of a high conservation value, these areas:

Gorge/gully Habitat: The gorge/gully habitat was moderately represented within the project area, ENV Australia

(2008) have stated that it is considered to be of high conservation value because of the numerous microhabitats present for fauna to exploit. These include caves, rock crevices, leaf litter and logs. Based on this, it is likely this area would be suitable habitat for conservation significant species such as the Pilbara Olive Python (*Liasis olivaceus*) and the Orange Leaf-nosed Bat (*Rhinonicteris aurantius*).

Minor drainage lines: The minor drainage lines of the project area are considered to be of high conservation value to vertebrates, because of the microhabitats present and the moderate representation of this habitat elsewhere (ENV Australia, 2008). Microhabitats such as hollow branches, vegetation build up from past floods, and soft soils suitable for burrowing reptiles such as the Yellow Spotted monitor (*Varanus panoptes*). Furthermore well vegetated drainage lines can serve as important corridors for habitat movement, connecting fragmented landscapes (ENV Australia, 2008).

Based on the information above, the proposed clearing may be at variance to this Principle. However, BHP Billiton have stated they will not be required to enter gorge or gully areas (which are listed as significant habitat) for exploration works. They have also made a commitment to avoid clearing within 10 metres of any major drainage lines within the application area (BHP Billiton, 2007a). This action will prevent clearing from occurring within areas listed by ENV Australia (2008) as significant habitats. As a result it is recommended that should the permit be granted, a condition be placed on the permit to prevent clearing within 10 metres of any major drainage lines within the application area.

Methodology BHP Billiton (2007a).
ENV Australia (2008).
Slater et al., (1986).
Start et al., (1980).

(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, no known Declared Rare Flora (DRF) or Priority Flora species are found within the application areas (GIS Database).

ENV conducted a level two flora and vegetation assessment of the application area between the 13 July and the 23 July 2007. This involved a detailed database search of the application area and an on ground survey to document and describe the presence of all flora species, vegetation associations and species of conservation significance in the application area (ENV Australia, 2007).

As a result of the database search, one DRF species: *Lepidium catapycnon*, was identified as potentially occurring in the application area (ENV Australia, 2007).

No DRF species were identified during the ground survey. However, three Priority Flora species and two species of conservation significance were recorded (ENV Australia, 2007). The Priority Flora Species recorded were *Abutilon trudgenii*, *Eremophila magnifica* subsp. *velutina* and *Eremophila magnifica* subsp. *magnifica*, while the species of conservation significance identified were *Triodia* sp. *Mt Ella* and *Chenopodium saxatile*.

Abutilon trudgenii (Priority 3 - DEC) has a broad distribution, but is generally restricted to small flow lines on gently undulating plains in the Pilbara bioregion (ENV Australia, 2007). This species was recorded at three localities: flora quadrat 18 and drill pads BRS030 and BRS046. This species was likely to be disturbed, however BHP Billiton have made a commitment to relocate their drill pads to avoid this species. As a result it is recommended that should the permit be granted, a condition be placed on the permit for BHP Billiton to avoid the known location of these species.

Eremophila magnifica subsp. *magnifica* (Priority 4 - DEC) is a shrub to 1.5 metres in height and is commonly found on skeletal soils over ironstone (ENV Australia, 2007). This species was recorded at only one site, flora site 35, this is not located within areas in which BHP Billiton propose to clear. Therefore there are unlikely to be any impacts to this species.

Eremophila magnifica subsp. *velutina* (Priority 3 - DEC) is a shrub 0.5-1.5 metres tall (FloraBase, 2008). It typically grows on skeletal soils over ironstone in the Pilbara bioregion (FloraBase, 2008). The taxon was recorded from the crest of Boundary Ridge at two localities, these were flora site BR26 and, as an opportunistic collection on a hill crest (ENV Australia, 2007). None of the two areas where this species was identified are proposed to be cleared by BHP Billiton. Therefore impacts to this species are likely to be negligible.

Triodia sp. *Mt Ella* (poorly collected/ Priority 3 - DEC) is a perennial grass like herb, approximately 0.4 metres in height, occurring amongst outcrops and gullies (FloraBase, 2008). This species is listed as significant because it has rarely been collected and is known only from an area from Mt Ella to Rhodes Ridge (ENV Australia, 2007). It was initially collected as an undescribed species displaying characteristics of both *Triodia pungens* and *Triodia* sp. *Mt Ella*. However, further studies of the specimens collected, revealed, that the species collected from the gullies and gorge areas were *Triodia* sp. *Mt Ella* (ENV Australia, 2007). BHP Billiton (2007) have already stated the gorges and gully areas will not be required for exploration activities due to the difficulties in completing exploration activities within these areas. Therefore the impacts to this flora species from the

proposed clearing are likely to be minimal.

Chenopodium saxatile (uncommon) is an annual, herb, 0.1-0.3 metres high which is relatively uncommon in the Pilbara, and is typically restricted to finer soils that occur around cave entrances or overhangs (ENV Australia, 2007). This species was recorded from one flora site on a cliff face in the application area (ENV Australia, 2007). This species was not located at any of the proposed drill sites or other areas required for clearing, therefore there is unlikely to be any significant impacts to this species.

Based on the above, the proposed clearing may be at variance to this principle, however, BHP Billiton have made commitments to avoid clearing within areas where priority species occur within the application area, these are gorges and gullies and drill pads BRS030 and BRS046. Additionally BHP Billiton have committed to conducting targeted flora surveys prior to the clearing, so priority flora species can be avoided during the drilling program. As a result it is recommended that should the permit be granted, a condition be placed on the permit for BHP Billiton to conduct Priority flora surveys of proposed clearing areas, prior to clearing.

Methodology FloraBase (2008)
ENV Australia (2007).
GIS Database:
- Declared Rare and Priority Flora List - CALM 01/07/05

(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

There are no known Threatened Ecological Communities (TEC's) located within the application area (GIS Database). However there is one Priority Ecological Community (PEC) on the eastern border of the application area, and several others surrounding the project, known as the Coolibah-lignum Flats (GIS Database).

Priority 1 Ecological Communities are defined as poorly known ecological communities with apparently few small occurrences, of which most are not actively managed for conservation (DEC, 2008). These communities are typically under immediate threat from known threatening processes across their range but have not been adequately surveyed for classification as TEC's (DEC, 2008).

The PEC located on the eastern tip of the application area is described as Woodland or forest of *Eucalyptus victrix* (coolibah) over thicket of *Muehlenbeckia florulenta* (lignum) on red clays in run-on zones. Associated species include *Eriachne benthamii*, *Themeda triandra*, *Aristida latifolia*, *Eulalia aurea* and *Acacia aneura* (DEC, 2008). During the flora and vegetation survey, a vegetation association named Drainage Line (*Eucalyptus victrix*) was identified within the application area. ENV (2007) have stated that this vegetation association may be the PEC named Coolibah Lignum Flats.

Based on the information above, the proposed clearing may be at variance to this Principle. However, BHP Billiton (2008) have made a commitment to avoid clearing within the PEC, unless written approval from the Director, Environment Division, Department of Industry and Resources, is provided.

BHP Billiton (2008) have stated that the part of the PEC overlaps the boundaries of the ore body in which they will be drilling. Based on this, It may be necessary for BHP Billiton to enter the PEC and drill several holes to ascertain the full extent of the ore body. As a result, the assessing officer has consulted with the DEC to determine whether this action would be acceptable. In response to BHP Billiton's request, DEC (2008) have stated that the full extent of the PEC must be properly defined, mapped and submitted to DoIR, before clearing within this area can be considered. If this action is completed then BHP Billiton will be permitted to utilise part of the PEC area, provided the following conditions are followed:

- Clearing within the PEC will be restricted to scrub rolling; and
- Entry to the PEC will only be permitted during dry conditions.

Based on the above, it is recommended that should the permit be granted, a condition be placed on the permit to prevent clearing within the PEC, unless written approval from the Director, Environment Division, Department of Industry and Resources, is given.

Methodology BHP Billiton (2008)
DEC (2008).
ENV Australia (2007).
Kendrick (2001).
GIS Database:
- Threatened Ecological Communities - CALM

(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 area applied to clear is located within the Pilbara Bioregion (Shepherd, 2001). According to Shepherd (2001) there is approximately 99.9% of Pre-European vegetation remaining within this bioregion. The vegetation of the application area is classified as Beard Vegetation Association 18 - Low woodland; mulga (*Acacia aneura*) and Beard Vegetation Association 82 - Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database, 2007). Both of these vegetation associations remain at approximately 100% of pre-European Extent in the state and in the Pilbara Bioregion (Shepherd, 2001). The proposed clearing will not reduce the extent of either of the vegetation associations below current recognised threshold levels. The area proposed to clear does not represent a significant remnant of vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Pilbara	17804163	17794650	~ 99.9	Least Concern	6.3
Beard veg assoc. – State					
18	19,891,436	19,891,436	~ 100	Least Concern	5.8
82	2,565,930	2,565,930	~ 100	Least Concern	10.2
Beard veg assoc. – Bioregion					
18	12,403,248	12,403,248	~ 100	Least Concern	4.3
82	2,563,610	2,563,610	~ 100	Least Concern	10.2

* Shepherd et al. (2001)

** 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).

Shepherd (2001).

GIS Database:

- Interim Biogeographic Regionalisation of Australia - EA 18/10/00

- Pre-European Vegetation - DA 01/01

(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 may be at variance to this Principle

There are a number of small drainage lines which traverse the project area (GIS Database). These drainage lines are non-perennial and would only flow after major rainfall events (GIS Database).

During the vegetation survey there was a vegetation association named Gorge/Gully (south facing) identified within the application area (ENV Australia, 2007). The Gorge/Gully vegetation association consisted of Snappy Gum and *Corymbia ferritcola* low open woodland over tall shrublands of *Eremophila* and *Acacia* (ENV Australia, 2007). This vegetation association contained a number of moisture-dependant tall shrubs, ferns and annual grasses (ENV Australia, 2007). Given the moisture dependant species present and the position of this vegetation within the landscape, it is likely that the gully/gorges vegetation association contains riparian vegetation.

Based on the above, the proposed clearing may be at variance to this Principle, however BHP Billiton have committed to avoid clearing within 10 metres of major drainage lines and avoiding riparian vegetation (BHP Billiton, 2007b). As a result it is recommended that should the permit be granted, a condition be placed on the permit to prevent clearing within 10 metres of major drainage lines within the application area.

Methodology BHP Billiton (2007b).

ENV Australia (2007).

GIS Database:

- Hydrography, linear (medium scale, 250k GA)

- Hydrography, linear - DOE 1/2/04
- Geodata, Lakes - GA 28/06/02

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal may be at variance to this Principle

The application area consists of one main ridge running nine kilometres east to west, and a series of associated foothills and plains (ENV Australia, 2008). Within the main ridge of the application area are numerous gorges and gullies with breakaways, scree slopes and minor drainage lines (ENV Australia, 2008).

The application area is located within three land systems, the Newman land system, Wannamunna Land System and Boolgeeda land system (GIS Database). The majority of the application area is found on a large ridge and this is described as the Newman land system, while the lower surrounding plains to the north are described as the Boolgeeda Land system (GIS Database). There are also two small areas located on the surrounding plains in the east and west sides of the application area, which are mapped as the Wannamunna Land system (GIS Database).

The northern part of the application area lies within the Boolgeeda Land System (GIS Database). This is described as stony lower plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands (Van Vreeswyk, 2004). The landform of this system in which the application area is found is described as stony slopes and upper plains - very gently inclined slopes and upper interfluvies immediately down slope from adjacent hill systems. The soils are described as red shallow loams or red loamy earths with surface mantles of common to abundant pebbles or chert ironstone and quartz (Van Vreeswyk, 2004). According to Van Vreeswyk (2004) the Boolgeeda Land System is not susceptible to soil erosion, this is likely to be due to the stony mantle present within this land system.

The Wannamunna Land System is described as hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (Van Vreeswyk et al., 2004). The hardpan plains landform is made up of red-brown shallow loams with surface mantles of few pebbles of ironstone and is subject to sheetflows. According to Van Vreeswyk et al., (2004) this system is not particularly susceptible to soil erosion.

The Newman Land System is described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The landform in which the application area lies is Plateaux, ridges, mountains and hills - up to 400 metres; level or rounded plateaux summits and mountain crests, ridges and indented escarpments with vertical upper cliff faces and moderately inclined to very steep upper scree slopes; surface mantles of abundant to very abundant pebbles, cobbles and stones of ironstone, jaspilite, chert and other rocks. Also outcrop of parent rock (Van Vreeswyk et al., 2004). The Newman land system has a nil to minor erosion potential, which is likely to be due to the surface mantle present which provides protection from erosional forces (Van Vreeswyk et al., 2004).

The majority of the application area in its current form is protected from erosional forces as a stony mantle is present, however areas on the plains (Boolgeeda and Wannamunna Land Systems) are not completely covered by a stony mantle. Given the intense summer rainfall events associated with cyclonic activities (BoM, 2007) and the topography present, it is likely that the removal of native vegetation may cause erosion within these areas. Soils of the Newman Land System are protected by a stony mantle and are less likely to erode, however the removal of the stony mantle during clearing may initiate soil erosion.

Based on the above, the proposed clearing may be at variance to this Principle. However, it is acknowledged that progressive rehabilitation will be undertaken throughout the life of the proposed five year drilling program. BHP Billiton (2007a) have committed to rehabilitating drill pads and access tracks within six months of the completion of each stage of the program, and/or before the commencement of the next phase of drilling (whichever comes first). All disturbance to the land surface made as a result of the exploration program will be rehabilitated as per BHPBIO's 'Exploration Environmental Management Plan' (BHPBIO, 2007b).

Erosion is likely to be minimised as BHP Billiton (2007a) will not undertake any clearing (or subsequent drilling) within 20 metres of major drainage lines. Should a clearing permit be granted, it is recommended that a condition be imposed on the permit to exclude clearing from within 20 metres of major drainage lines.

Methodology BHP Billiton (2007a)
BHP Billiton (2007b)
BoM (2007)
ENV Australia (2008).
Van Vreeswyk (2004).
GIS Database:
- Rangeland Land System Mapping - DA

(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 may be at variance to this Principle

There are no conservation areas located within the application area (GIS Database). However, Karijini National Park is located approximately five kilometres to the north west of the application area. This is the second largest national park in Western Australia and is noted as being a significant conservation area in the Hamersley IBRA Subregion (Kendrick, 2001). Karijini National Park is home to a variety of birds, red kangaroos and euros, rock-wallabies, echidnas and several bat species (NatureBase, 2008). There are many geckos, goannas, dragons, legless lizards, pythons and other snakes abundant as well. The National Park is also famous for its spectacular gorges many of which are up to 100 metres deep (Naturebase, 2008).

The vegetation within the application area does not contribute significantly to the overall environmental values of Karijini National Park, nor does it provide a buffer to this conservation area. The total area of Karijini National Park is approximately 6274 kilometres (NatureBase, 2008), it is unlikely that the proposed clearing of 55 hectares of native vegetation will reduce the environmental values of the National Park mentioned.

There is one Department of Environment and Conservation (DEC) proposed 2015 pastoral lease exclusion zone (Juna Downs Station) found in the north eastern portion of the application area (GIS Database). According to DEC (2008) this area will be excluded from the Juna Downs Pastoral Lease in 2015, after which it will be set aside as a CALM Act Reserve (DEC, 2008). At this stage the exact tenure of the land has not been resolved, however DEC (2008) have indicated that the land will become a Conservation Park, as there is more flexibility in this type of tenure for multiple uses.

Given that the area in question is likely to become a Conservation Park, the proposed clearing may be at variance to this principle. However, the parts of the application area in which Ex Juna Downs Pastoral Station is located, have already suffered degradation in the form of pastoral grazing (ENV Australia, 2007). Additionally the proposed clearing within this area will not be contiguous, consisting of discrete drill pads and access tracks (BHP Billiton, 2007a). Furthermore the clearing permit if approved will only be valid for a five year period and progressive rehabilitation will occur within six months of each completion stage of the project (BHP Billiton, 2007a). Therefore the environmental values of this area are unlikely to be significantly reduced as a result of the proposed clearing.

It should be noted that the DEC are likely to set aside the Ex Juna Downs Pastoral Station as a Conservation Park, and this tenure will allow multiple land uses including exploration activities.

Methodology BHP Billiton (2007a).
DEC (2008).
ENV Australia (2008).
Kendrick (2001).
NatureBase (2008).
GIS Database:
- CALM Managed Lands and Waters - CALM 1/07/05

(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 proposed clearing area is not located within a Public Drinking Water Source Area (GIS Database).

There are no permanent watercourses or wetlands within the project area, however there are a number of non-perennial drainage lines which traverse the area (GIS Database). Care must be taken to ensure that the proposed clearing activities do not cause or increase sedimentation, erosion or turbidity to watercourses on or off site. BHP Billiton (2007a) have advised that all exploration drill sites will be located a suitable distance from natural drainage lines, including a 10 metre buffer from the boundary of major drainage lines and riparian vegetation (BHP Billiton, 2007a). Sediment traps and sumps will also be constructed where necessary to minimise the potential impacts on the quality of surface water (BHP Billiton, 2007a). Should a clearing permit be granted, it is recommended that a condition be imposed on the permit to exclude clearing within ten metres of any major drainage lines within the application area.

There are no groundwater-dependant ecosystems located within the application area (GIS Database).

The proposed clearing will be non-contiguous, and will consist of discrete drill pads and access tracks (BHP Billiton, 2007a). It is not expected that the proposed clearing will significantly impact upon groundwater levels or quality within the application area.

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

Methodology BHP Billiton (2007a).
GIS Database:

- Hydrography, linear - DOE 01/02/04.
- Public Drinking Water Source Areas (PDWSAs) - DOE 28/04/05.

(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 closest weather station to the application area is at Port Hedland (Bureau of Meteorology, 2007). Rainfall throughout the year is low, quite variable and often falls within a small time frame. Annual totals range from 250-450mm and many years can occur without rainfall (Bureau of Meteorology, 2007). The majority of rainfall comes in summer as a result of scattered thunderstorms and the occasional tropical cyclone. A secondary rainfall period occurs in May as a result of rainfall from tropical cloud bands (Bureau of Meteorology, 2007). Flooding is possible during rainfall periods as a result of cyclonic activities where large amounts of water fall within a short time frame.

The majority of the application area is located on a ridgeline (ENV Australia, 2007). The ridge is approximately 800m high at its highest point, while the surrounding plain is approximately 690-700m in height (GIS Database). The surface of the ridge is heavily sloped, and there are a number of small tributaries which lead to the surrounding plain. Rainfall is likely to flow down gradient through these small tributaries on to the surrounding plain below (GIS Database). Based on this information it is unlikely that the proposed clearing will increase the flooding potential as rainfall will be moving downstream in drainage lines towards the plains below. In addition to this there are high evaporation levels found within the application area. According to GIS Databases, the application area experiences evaporation levels of approximately 3000mm annually. This is more than six times the annual rainfall, based on this, there is little likelihood of flooding during normal rainfall events.

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

- Methodology**
- BoM (2007).
 - ENV Australia (2007).
 - GIS Databases:
 - Evaporation Isopleths - BOM 09/98
 - Topographic Contours, Statewide - DOLA 12/09/02

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

Comments

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 by DoIR on the 29th of October, inviting submissions from the public. One public submission was received on the 5th of November, raising concerns regarding the potential impacts of the proposed vegetation clearing on flora and fauna, Sites of Aboriginal Significance, and Native Title rights.

The potential impacts on flora and fauna are addressed within the relevant clearing principles.

There is one native title claim in the application area (GIS Database). This claim (WC96_06) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There is one registered Site of Aboriginal Significance located on the western border of the area applied to clear (Site ID P04413) (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

BHP Billiton has committed to the management and protection of Aboriginal heritage sites and consultation with the native title claimants (BHP Billiton, 2005). BHP Billiton has a heritage protocol agreement with the Innawonga Bunjima [IB], which covers the majority of the application area (BHP Billiton, 2005). As per this agreement and BHP Billiton obligations under the *WA Aboriginal Heritage Act 1972* and other relevant legislation, no new area of land will be disturbed until it has been subject to heritage inspections, both ethnographic and archaeological, with appropriate traditional owners (BHP Billiton, 2007a). All heritage sites identified in heritage surveys will be protected and avoided during exploration activity. Management of heritage sites (fences, buffers, etc) will be agreed and decided upon between BHP Billiton heritage staff, heritage consultants and the native title claimants during the heritage surveys (BHP Billiton, 2005).

Additionally, BHP Billiton (2007b) has an internal process; the Project Environment and Aboriginal Heritage Review (PEAHR), which is designed to prevent the inadvertent disturbance of Aboriginal heritage sites within BHP Billiton operations as well as ensuring that all areas of proposed disturbance have been subject to adequate ethnographic and archaeological inspection and consultation. Prior to the commencement of any land

disturbance activity, a PEHR must be completed and submitted to BHP Billiton's Indigenous Affairs Department, for assessment. All land disturbance activities must be approved by BHP Billiton's Environment and Aboriginal Heritage staff prior to its commencement (BHP Billiton, 2007b).

Methodology BHP Billiton (2005).
 BHP Billiton (2007a).
 BHP Billiton (2007b).
 GIS Databases:
 - Aboriginal Sites of Significance - DIA
 - Native Title Claims - DLI

4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Exploration	Mechanical Removal	55	The Clearing Principles have been addressed and the proposed clearing may be at variance to Principles (a), (b), (c), (d), (f), (g) and (h), is not likely to be at variance to Principles (i) and (j), and is not at variance to Principle (e). Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of weed management, preservation of riparian vegetation and significant habitats, management of Priority Flora and conservation significant flora species, rehabilitation and permit reporting.

5. References

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Van Vreeswyk, A.M.E. Payne, A.L. Leighton, K.A. & Hennig, P. (2004) An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, South Perth.

6. Glossary

Acronyms:

BoM Bureau of Meteorology, Australian Government.
CALM Department of Conservation and Land Management, Western Australia.

DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
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	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

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.