



## 1. Application details

### 1.1. Permit application details

Permit application No.: 2135/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Mount Gibson Mining Ltd

### 1.3. Property details

Property: Mining Leases 70/896, 70/1062, M70/1063  
Local Government Area: Shire of Mullewa  
Colloquial name: T6B Project – Stage 1

### 1.4. Application

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

## 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
The area applied to clear has been broadly mapped at a scale of 1:250,000 as: Beard Vegetation Association 40: Shrublands; Acacia scrub, various species, Beard Vegetation Association 228: Shrublands; <i>Acacia quadrimarginea</i> scrub, and Beard Vegetation Association 420: Shrublands; bowgada & jam scrub (GIS Database).	This clearing permit application is for a Purpose Permit to clear up to 101.4 hectares of native vegetation within a boundary of approximately 247 hectares (GIS Database). The proposed clearing area is located at the Talling Peak Iron Ore Mine, situated approximately 63 kilometres north of Mullewa and 125 kilometres north-east of Geraldton (GHD, 2007a).	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994) to Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).	The Talling Peak Iron Ore Mine is located on the Wandina and Talling pastoral stations (GIS Database). Domestic goats ( <i>Caprus hirtus</i> ) are run as the main livestock in the area, and as such GHD (2007a) noted large numbers of goat droppings and evidence of grazing across mining tenement 70/896. Goats are causing appreciable degradation to the vegetation of the Talling Peak area (GHD, 2007a).
GHD (2007a) undertook a flora and vegetation survey of the proposed T6B pit footprint area and part of the T3/T6 waste dump expansion area from the 20 <sup>th</sup> – 21 <sup>st</sup> of December 2006. A reconnaissance survey of the proposed T3/T6 waste dump extension area vegetation types and condition was carried out from the 5 <sup>th</sup> – 7 <sup>th</sup> of February 2008 for those areas not surveyed in December 2006 (GHD, 2008c). Vegetation associations for the remainder of the proposed clearing area were interpreted by desktop analysis. This involved studying aerial photography and reviewing previous Spring flora surveys undertaken in the area.	This clearing permit application will allow the proponent to implement stage 1 of the T6B mining project. Stage 2 of this project is planned to be implemented in the near future and will be subject to a separate clearing permit application and Mining Proposal.		
The following vegetation types were described for the proposed clearing area:	Stage 1 of the T6B project will involve clearing approximately 14.4 hectares to construct the T6B stage 1 open cut pit (which will join the existing T3 and T4 pits to become one large pit). Approximately 82.8 hectares is required to expand the existing T3/T6 and T4 waste dumps. In preparation for mine closure, approximately 4.2 hectares of native vegetation needs to be cleared in order to construct the T5 and T6 abandonment bunds (GHD, 2007a). The proposed bund locations have been designed over existing tracks and partially cleared areas where possible to minimise disturbance of native vegetation (GHD, 2007a).		The two main sources of vegetation degradation noted by GHD (2007a) were goat grazing and dust. Sections of vegetation were noted to be 'Completely Degraded' adjacent to existing pits, access tracks and safety bunds. Vegetation condition in the T3/T6 waste dump expansion survey area ranged from 'Excellent' to 'Very Good'. GHD (2007a; 2008c) acknowledged that it was not possible to undertake an assessment of vegetation condition for all areas subject to this clearing permit application, as the vegetation and flora survey did not cover the entire application area.
1. <i>Acacia quadrimarginea</i> over mixed shrubs;			
2. <i>Acacia quadrimarginea</i> , <i>Acacia ramulosa</i> var. <i>linophylla</i> over mixed shrubs;			
3. Completely degraded – No remnant vegetation; and			
4. Mixed Acacia ( <i>Acacia eremaea</i> ), <i>Grevillea obliquistigma</i> over mixed shrubs ( <i>Eremophila</i> spp.) on drainage lines (GHD, 2007a).	It should be noted that whilst this clearing permit application is seeking approval to disturb 101.4 hectares of land, much of the application area is completely degraded and contains existing waste dumps, open cut pits, access tracks, safety bunds and evidence of mineral exploration.		

### 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 area applied to clear is within the Yalgoo Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The Yalgoo bioregion is an interzone between the south-western and Murchison bioregions, and whilst it is rich and diverse in both flora and fauna, most species are wide ranging and typically occur in one or more adjoining bioregions (CALM, 2002). Pastoralism is the dominant land use in the Yalgoo, comprising approximately 76% of the total land area (CALM, 2002). However, mining also has an increasing interest in the bioregion (CALM, 2002).

The proposed clearing area is located at the existing Tallering Peak Iron Ore Mine, situated approximately 63 kilometres north of Mullewa (GHD, 2007a). The proposed T6B pit stage 1 area includes part of the lower and upper rocky slopes of the Tallering Ridge, a Banded Ironstone Formation (BIF) some 8 kilometres long, striking north-east to south-west, and elevated some 150 metres above the natural surrounding ground surface level (GHD, 2008a). The Tallering Ridge is the largest and southernmost of three distinct BIF ridges that occur within the Tallering Peak mining leases. This ridge is currently being mined and consists of the T2, T3, T4 and T6A pits to date. The crest of this ridge is not part of this clearing permit application. Of the other two ridges, the Central Ridge has been partly mined (T5 pit), whilst the Northern Ridge has not been mined to date (GHD, 2008a).

BIF's are characterised by unique geology, soils and relative isolation. As a consequence, BIF's provide unique habitat for flora and fauna species. The biodiversity value of BIF's relates to the endemic plant species, rare and restricted plant species and distinct communities that exist in these unique landscapes. The Department of Environment and Conservation (DEC), in conjunction with the Department of Industry and Resources (DoIR), recently undertook the "Strategic Review of the Conservation and Resource Values of the Banded Ironstone Formation of the Yilgarn Craton" to identify the biodiversity values and iron prospectivity of various BIF ridges in the Midwest and Goldfields. The purpose of this review was to provide additional information to allow the Western Australian government to take a strategic approach to resource utilisation and biodiversity conservation decision making (DEC & DoIR, 2007). In this review, DEC & DoIR (2007) rate the Tallering Peak to be a lower biodiversity value site in comparison to other BIF's in the Yilgarn Craton. This rating acknowledges that significant mining has already taken place at Tallering Peak.

CALM (2002) identifies the Tallering Peak Ironstone as a unique landform feature in the Yalgoo bioregion. Whilst a range of vegetation and flora surveys have been undertaken in the Tallering Peak area over the past 15 years, it is acknowledged that no regional vegetation survey has been undertaken to map the vegetation communities at a regional scale. Consequently, a poorly known Priority 1 Ecological Community is listed from the Tallering Peak area. This includes, but is not limited to, *Philotheca sericea* and *Thryptomene decussata* low shrublands (DEC, 2007b). It is noted that GHD (2007a) have advised that this particular community is found on the southern slopes of the Tallering Ridge (outside of the proposed clearing area).

From a biodiversity perspective, the presence of an estimated 137 individuals of the unidentified *Eremophila* species (currently referred to as *Eremophila aff. serrulata*) located in the steep, rocky upper slopes of the proposed T6B pit stage 1 area is of importance. The biodiversity value of the proposed clearing area would increase significantly should *Eremophila aff. serrulata* be determined a new species or sub-species. The 137 plants proposed for clearing represent 8.3% of the confirmed population of 1,653 plants (GHD, 2008a). The cumulative impact of this proposal and projects undertaken at the Tallering Peak Iron Ore Mine to date represents 21.7% (358 plants) of the confirmed population. This cumulative impact figure needs to be treated with caution given that some *Eremophila aff. serrulata* plants on the ridge (outside of the proposed clearing area) are being severely impacted by fly rock and rockslides associated with the mining activity.

Should a clearing permit be granted, it is recommended that the proponent offset the loss of the 137 *Eremophila aff. serrulata* plants by placing a recently identified population of approximately 600 suspected *Eremophila aff. serrulata* plants into a Flora Management Zone (FMZ). Of this population, 222 plants have been confirmed as *Eremophila aff. serrulata*. This population is located to the north-east of the proposed clearing area, further along the Tallering Ridge in an area which is not subject to current mining operations. Incorporation of this population into a FMZ would involve fencing the entire population to restrict access to feral goats which are known to have detrimental impacts upon flora in the area.

From a faunal perspective, habitats present within the proposed waste dump expansion areas are well represented on a regional basis and are therefore unlikely to be significant (Bamford Consulting Ecologists, 2003; 2008). Rocky upper slope habitats within the proposed T6B pit stage 1 area are not likely to represent significant habitat for Short Range Endemic (SRE) invertebrate species. This area is most likely too steep and rocky for trapdoor spiders (Bamford Consulting Ecologists, 2008). Further SRE surveys need to be undertaken on the various ridges and outcrops in the Tallering Peak area during winter to improve knowledge on the ecology and distribution of unidentified millipede and isopod specimens collected during the May 2003 survey. Bamford Consulting Ecologists (2008) concluded that habitat within the T6B pit stage 2 area (not subject to this clearing permit application) may be suitable for these unidentified species. The proponent is committed to undertaking further SRE survey work which has been scheduled for June 2008.

The biodiversity value of the Tallering Peak area is being significantly diminished by domestic goats which are the main livestock of the Tallering and Wandina pastoral stations (GHD, 2007a). The proponent has made

some effort to curtail the detrimental impact that goat grazing is having upon native vegetation at Talling Peak by establishing several FMZ's in and around the mine site. A site visit to Talling Peak on 4 December 2007 by the assessing officer, DoIR, confirmed that at least one FMZ at the site is fenced off with star pickets and strands of wire. The other FMZ's in and around the site were not visited during this fieldtrip.

It is relevant to note that much of the proposed clearing is not located on the slopes of the Talling Ridge. The proponent is committed to maintaining the crest of the ridge above the mining pit (GHD, 2008a). Approximately 14.4 hectares of disturbance is required for the construction of the T6B stage 1 pit, whilst the majority of disturbance for waste dump expansions and abandonment bunds is located on relatively flat plains with no outcroppings or breakaways. The T4 waste dump already encroaches on the Talling Ridge, and whilst the proposed expansion to this dump will disturb some rocky, sloping habitat, a majority of the expansion will take place over flat plains. Of the 14.4 hectares required for the T6B stage 1 pit, GHD (2007a) mapped large areas as 'degraded' and 'completely degraded'. These areas are immediately adjacent to existing open cut pits, access roads and safety bunds.

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

**Methodology** Bamford Consulting Ecologists (2003).  
Bamford Consulting Ecologists (2008).  
CALM (2002).  
DEC & DoIR (2007).  
GHD (2007a).  
GHD (2008a).  
GIS Database:  
- Interim Biogeographic Regionalisation of Australia.

**(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**

Bamford Consulting Ecologists (2003) undertook a fauna review and targeted fauna survey of the Talling Peak area between 15<sup>th</sup> - 19th May 2003. The fauna review involved studying existing fauna information for the Talling Peak area, whilst the targeted fauna survey entailed searching for conservation significant vertebrate and invertebrate fauna which Ninnox Wildlife Consulting (1995) had earlier identified as possibly occurring in the Talling Peak area (Bamford Consulting Ecologists, 2003).

The targeted fauna survey conducted by Bamford Consulting Ecologists (2003) included a range of survey methods such as Elliott trapping, harp trapping, spotlighting, systematic searches and opportunistic sightings, anabat recording (using a bat detector that records and transforms ultrasonic bat echolocation calls for analysis and identification with computer software), roost/nest searching and invertebrate pit trapping (Bamford Consulting Ecologists, 2003). The survey was hampered by inclement weather and limited by time constraints (Bamford Consulting Ecologists, 2003).

On the basis of existing records, species distributions and habitat preferences, a total of 247 vertebrate fauna species may occur in the Talling Peak area, with a further 17 species now believed to be extinct (Bamford Consulting Ecologists, 2003). The targeted fauna survey conducted by Bamford Consulting Ecologists located 13 species not recorded by Ninnox Wildlife Consulting in 1995, bringing the total number of fauna species actually recorded at the site to 116 (Bamford Consulting Ecologists, 2003).

The following conservation significant vertebrate taxa protected under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* and/or the *Western Australian Wildlife Conservation Act 1950* were the subject of a targeted fauna search by Bamford Consulting Ecologists (2003): Malleefowl (*Leipoa ocellata*), Black-flanked Rock Wallaby (*Petrogale lateralis lateralis*), Peregrine Falcon (*Falco peregrinus*), Major Mitchell's Cockatoo (*Cacatua leadbeateri*) and the Western Spiny-tailed Skink (*Egernia stokesii badia*). Species listed on the Department of Environment and Conservation's (DEC's) Priority fauna list were also the subject of targeted searches and included: Bush Stone-curlew (*Burhinus grallarius*), Australian Bustard (*Ardeotis australis*), Crested Bellbird (*Oreoica gutturalis gutturalis*), skink (*Cyclodomorphus branchialis*), and skink (*Lerista yuna*).

The Malleefowl (listed as Vulnerable under the *EPBC Act 1999* and Schedule 1 'Fauna that is rare or likely to become extinct', *Wildlife Conservation (Specially Protected Fauna) Notice 2006*) is not likely to be impacted by the proposed clearing. The proposed clearance area for the T6B pit is likely to be too rocky for the Malleefowl (Bamford Consulting Ecologists, 2003), however the flat plains area proposed for the T3/T6 waste dump expansion is more likely to represent suitable habitat. Bamford Consulting Ecologists (2003) spent approximately 13 person hours searching for the presence of Malleefowl mounds, of which none were located.

The Black-flanked Rock Wallaby (listed as Vulnerable under the *EPBC Act 1999* and Schedule 1 'Fauna that is rare or likely to become extinct', *Wildlife Conservation (Specially Protected Fauna) Notice 2006*) is deemed to be locally extinct from the Talling Peak area (Bamford Consulting Ecologists, 2003). Whilst the proposed clearance area provides suitable habitat for this species, no sightings were made despite exhaustive searches of rocky outcrops in the area (Bamford Consulting Ecologists, 2003).

A pair of Peregrine Falcons (listed as Schedule 4 'Other specially protected fauna' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006*) were observed in the Tallering Peak area during the fauna survey by Bamford Consulting Ecologists, with a possible nest recorded on a rocky outcrop to the south of the Tallering Hill Trig point (Bamford Consulting Ecologists, 2003). A Spring survey would be required to determine whether this species is breeding in the area (Bamford Consulting Ecologists, 2003). The Peregrine Falcon was also observed during the 1995 fauna survey of the Tallering Peak by Ninnox Wildlife Consulting. Given that the Peregrine Falcon is a mobile and wide-ranging species, it is not likely that the proposed clearing will result in a loss of significant habitat for this species.

Major Mitchell's Cockatoo (listed as Schedule 4 - 'Other specially protected fauna' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006*) is likely to occur in the Tallering Peak area only as a vagrant (Bamford Consulting Ecologists, 2003). Whilst the Tallering Peak is within the known distribution of Major Mitchell's Cockatoo, the habitat is likely to be unsuitable (Bamford Consulting Ecologists, 2003). Major Mitchell's Cockatoo is dependent on tree hollows including large Mallee Eucalypts for nesting (Pizzey & Knight, 1997), however vegetation in the Tallering Peak area typically consists of Mulga scrub which is unsuitable for nesting.

The Western Spiny-tailed Skink (listed as Endangered under the *EPBC Act 1999* and Schedule 1 'Fauna that is rare or likely to become extinct', *Wildlife Conservation (Specially Protected Fauna) Notice 2006*) was not recorded during the May 2003 fauna survey despite trapping and hand searching (Bamford Consulting Ecologists, 2003). This species was not found in the 1995 fauna survey by Ninnox Wildlife Consulting, despite intensive trapping and searching. According to the Department of Environment and Water Resources (2007) this species is known to inhabit York Gum, Salmon Gum and Gimlet woodlands. Given that these vegetation types do not exist in the application area, it is unlikely that the Western Spiny-tailed Skink will be impacted by the proposed clearing.

The Bush Stone-curlew (listed as Priority 4 by the DEC) was not recorded from the Tallering Peak area in 1995, but was heard calling to the south-west of Tallering Peak in the May 2003 fauna survey (Bamford Consulting Ecologists, 2003). The proposed clearing area is not likely to provide suitable habitat for this species. The Bush Stone curlew prefers to inhabit sandplain areas with Spinifex grasses, Mallee woodlands, dry and lightly timbered watercourses and coastal scrub (Pizzey & Knight, 1997). Suitable habitat does exist to the south-west of Tallering Peak along minor watercourses (Bamford Consulting Ecologists, 2003). The proposed clearing is not likely to result in a loss of significant habitat for the Bush Stone-curlew.

The Australian Bustard (listed as Priority 4 by the DEC) was not recorded in the fauna survey by Ninnox Wildlife Consulting in 1995, or the May 2003 survey by Bamford Consulting Ecologists. This species is not likely to occur in the application area as the habitat is largely unsuitable, however the Australian Bustard may occur in the general area on a semi-regular basis. It is not likely to be significantly impacted by the proposed clearing (Bamford Consulting Ecologists, 2003).

The Crested Bellbird (listed as Priority 4 by the DEC) was heard calling throughout the study area by Bamford Consulting Ecologists (2003). The Tallering Peak area is within the intergrade zone between the south-western subspecies (*Oreoica gutturalis gutturalis*) and the inland subspecies (*Oreoica gutturalis pallescens*). Based on this information, the birds which were heard calling are likely to have been intermediate in character and therefore not belonging to the Priority taxon (Bamford Consulting Ecologists, 2003).

The skink *Cyclodomorphus branchialis* (listed as Priority 2 by the DEC) was not located in the Tallering Peak area despite intensive searches of suitable habitat in 1995 and 2003 (Ninnox Wildlife Consulting, 1995; Bamford Consulting Ecologists, 2003). On this basis, it would appear unlikely to occur in the proposed clearance area (Bamford Consulting Ecologists, 2003).

The skink *Lerista yuna* (listed as Priority 3 by the DEC) is known only from areas north-east and south-east of Yuna (DEC, 2007), located approximately 65km south west of the proposed clearing area (GIS Database). *Lerista yuna* was not found despite intensive searching of apparently suitable habitat in 1995 and 2003 (Ninnox Wildlife Consulting, 1995; Bamford Consulting Ecologists, 2003). Based on this information, *Lerista yuna* is not likely to be present or subsequently impacted by the proposed clearing.

With consideration to invertebrate animals, Bamford Consulting Ecologists (2003; 2008) has undertaken two separate surveys in the Tallering Peak area. Of concern are the Short-range endemic (SRE) fauna. SRE's have naturally small ranges, poor powers of dispersal and are often confined to specialised discontinuous habitats (Harvey 2002, cited in DEC & DoIR, 2007). The Banded Ironstone Formations of the Midwest are known to harbour an array of SRE's, particularly trapdoor spiders, millipedes and land snails (Harvey 2002, cited in DEC & DoIR, 2007). Given that Banded Ironstone Formations are relictual and fragmented habitat there is a potential for localised endemism.

Bamford Consulting Ecologists (2003) undertook three nights of invertebrate pitfall trapping at Tallering Peak in May 2003. Five trapdoor spider species were collected, in addition to two species of snails, one species of millipede, two unidentified isopod specimens (slaters) and three species of centipedes.

One of the trapdoor spider species collected, *Gaius villosus*, represented a westerly range extension of more than 100 kilometres. Prior to this collection, this species was known only from more inland sites in the

Murchison bioregion. The remaining four trapdoor spiders could not be identified to species level because they were either juveniles or because their genera have not been sufficiently studied (Bamford Consulting Ecologists, 2003).

One snail species, *Pleuroxia bethana*, was found in large numbers in all rocky areas visited during the 2003 survey. This species has a restricted range from Kalbarri to south of Geraldton and north-east of Mullewa, therefore its occurrence within the Talling Peak area was expected. Rainfall activity during the May 2003 survey most likely contributed to the high number of specimens collected. The other snail, *Succinea sp.*, was represented by a single damaged shell found inside a rotten log on flat plains. The taxonomy of this genus is poorly known, but it is widespread across Australia (Bamford Consulting Ecologists, 2003).

The millipede collected during the 2003 survey was an unidentified and previously uncollected species currently referred to as *Antichiropus sp. nov. "Talling"*. Four specimens of this millipede were collected from the southern edge of Talling Hill and from an area which has since been mined. Given the unique environment of Talling Peak, this species is likely to be confined to rocky hills in the local area (Bamford Consulting Ecologists, 2003).

Bamford Consulting Ecologists (2008) undertook preliminary surveys for significant invertebrates at the Talling Peak Iron Ore Mine on the 23rd and 24th of January 2008. Specifically, the survey was carried out for trapdoor spiders as other invertebrate groups, such as millipedes, which are active only during cool, moist conditions were unlikely to be found. However, habitat assessment for other invertebrates was still possible and was carried out as part of this survey (Bamford Consulting Ecologists, 2008).

No trapdoor spider species were recorded within the proposed T6B pit area. Burrows of two trapdoor spider species were found in the lower slopes of the Talling ridge south of the proposed pit expansion area. This area appeared to be more suitable habitat for trapdoor spiders than the steep and rocky terrain of the pit expansion area (Bamford Consulting Ecologists, 2008). Burrows of the two trapdoor spider species belonged to *Gaius villosus* (collected during the 2003 survey) and the Shield-backed Trapdoor Spider; *Idosoma nigrum* (Schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2006*).

One burrow of *Gaius villosus* was found in the proposed waste dump expansion area. No other evidence of SRE invertebrates was recorded. SRE invertebrates tend to occur in habitat that is restricted in area, and given that the proposed waste dump expansions are located in habitat that is extensive in the region, this area is unlikely to support significant invertebrates (Bamford Consulting Ecologists, 2008).

The Shield-backed Trapdoor Spider was found to be abundant on the lower, gravelly loam southern slopes of the Talling Ridge (outside of the proposed clearing area). It is acknowledged that the proposed vegetation clearing is not likely to directly impact this species given that it was not recorded within the proposed clearing area.

Based on habitat assessment, Bamford Consulting Ecologists (2008) concluded that the proposed clearing area for waste dump expansions (which comprises a majority of this application) is not likely to provide habitat for SRE invertebrates. The proposed pit expansion area may provide habitat for probable SRE invertebrates such as *Pleuroxia bethana*, *Antichiropus sp. nov. "Talling"* and an unidentified isopod collected during 2003. All three taxa are likely to be restricted to high, rocky ground. However, these three species are more likely to utilise habitat in the proposed T6B stage 2 pit area (which will be subject to a separate clearing permit application and Mining Proposal in the future). The proposed pit expansion area covered by this clearing permit application is unlikely to represent significant habitat. Bamford Consulting Ecologists (2008) acknowledges that habitat within the Talling Peak area has already been impacted to some extent by mining. Surveys of the surrounding area in winter, when snails, millipedes and isopods are readily located are proposed. This will aid in gaining a better understanding of the distribution of these species prior to seeking approval for the stage 2 proposal.

The four most important habitats identified in the Talling Peak area by Bamford Consulting Ecologists (2003) include a mine adit in the Talling Peak (located north-east of the proposed clearing area), breakaway areas, rocky outcrops on the Talling Hill range and watercourses. Numerous fauna species rely on these habitats for roosting/nesting and feeding (Bamford Consulting Ecologists, 2003).

The mine adit is an important roosting area for bats, with two locally significant species identified from the adit: Hill's Sheath-tail Bat (*Taphozous hillii*) and the Inland Cave Bat (*Vespadelus finlaysoni*). Two individuals of the locally significant Stimson's Python (*Antaresia stimsoni*) were also recorded from the mine adit (Bamford Consulting Ecologists, 2003). A site visit to Talling Peak confirmed that the mine adit is approximately 800 - 1000 metres from the proposed clearing area and is not likely to be impacted.

Breakaway areas and rocky outcrops are present throughout the Talling Peak area. Bamford Consulting Ecologists (2008) identified that these areas are likely to provide specialised habitat for SRE invertebrates. It is acknowledged that some high, rocky upper slope habitats will be lost should a clearing permit be granted. However, these areas have already been impacted to some extent by mining. Other outcrops and ridges exist in the Talling Peak area which are not subject of current mining operations and are considered of greater importance than the Talling Ridge which is currently being mined.

The proposed clearing area includes an un-named ephemeral watercourse which has been impacted by existing mining activities. This watercourse will be further impacted by this clearing proposal (GHD, 2007a). The proposed clearing is unlikely to impact upon significant watercourses which are important from a faunal perspective.

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

**Methodology** Bamford Consulting Ecologists (2003).  
Bamford Consulting Ecologists (2008).  
DEC & DoIR (2007).  
Department of Environment and Water Resources (2007).  
GHD (2006).  
GHD (2007a).  
Ninox Wildlife Consulting (1995).  
Pizzey & Knight (1997).  
GIS Database:  
- Hydrography, linear.  
- Natmap 250K Series Mapping.

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

**Comments Proposal is at variance to this Principle**

There are no known records of Declared Rare Flora (DRF) species within the proposed clearing area (GIS Database). A flora survey of the proposed T6B pit footprint area and part of the T3/T6 waste dump expansion area was undertaken by GHD between 20<sup>th</sup> and 21<sup>st</sup> of December 2006. No DRF species were recorded (GHD, 2007a). GHD (2008c) did not locate any DRF species during a reconnaissance survey of part of the waste dump expansion area. Muir Environmental conducted two flora surveys of the Talling Peak area between the 5<sup>th</sup> and 7<sup>th</sup> of October 1998 and 11<sup>th</sup> – 17<sup>th</sup> of June 2000. No DRF species were located during either survey (Muir Environmental, 1998; 2000). Spring flora surveys of the Talling Peak project area were conducted by Matiske Consulting Pty Ltd in 1992 and 1994. No DRF species were recorded on either occasion (Matiske Consulting Pty Ltd, 1994). It is therefore unlikely that the proposed clearing will have any impact upon DRF species.

Three Priority Flora species will be impacted by the proposed clearing. These species are (GHD, 2007a): *Micromyrtus placooides* (P1), *Prostanthera petrophila* (P1) and *Grevillea stenostachya* (P3).

*Micromyrtus placooides* is a rounded shrub growing 0.5 - 2.5 metres high (Western Australian Herbarium, 2007). This species is known to grow on a number of different substrates, including ironstone (Western Australian Herbarium, 2007). *M. placooides* has previously been recorded at Paynes Find and Weld Range (GHD, 2007a). According to Muir Environmental (2000) there is an estimated 50,000 plants of *M. placooides* across the Talling Ridge, associated valley to the north-west, and several populations away from the main ridge. GHD (2007a) report that the plants are known to exist as 44 populations, ranging from a few plants to hundreds and to several thousand. GHD (2007a) estimate that approximately 4,200 plants of *M. placooides* have been cleared since the operation of the Talling Peak Iron Ore Mine in 2003, and that a further four plants will be removed as part of this clearing permit application. The total cumulative loss of this species at Talling Peak is therefore estimated at 8.4% (GHD, 2007a). It must be stated that this is an estimation only as no exact count of *M. placooides* plants within the proposed clearing area has been undertaken.

*Prostanthera petrophila* is a spreading shrub which grows to a height of 0.6 - 1.5 metres (Western Australian Herbarium, 2007). This species is known from rocky banded ironstone outcrops and laterite soils (Western Australian Herbarium, 2007). This species has previously been recorded from a number of locations including Weld Range, Mt Barloweerie and Woolgorong (Western Australian Herbarium, 2007). Approximately 1,300 *P. petrophila* plants are known from mining lease M70/896 at Talling Peak (Muir Environmental, 2000). To date, GHD (2007a) estimate that only one individual plant of *P. petrophila* has been removed since the operation of the Talling Peak Iron Ore Mine, and that approximately 50 plants will be removed as part of this clearing permit application. The total cumulative loss of this species at Talling Peak is therefore estimated at 3.9% (GHD, 2007a). It must be stated that this is an estimation only as no exact count of *P. petrophila* plants within the proposed clearing area has been undertaken.

*Grevillea stenostachya* is a dense pungent shrub growing 0.6 - 1.5 metres high (Western Australian Herbarium, 2007). This species has previously been recorded from the Carnarvon, Murchison, Yalgoo and Geraldton Sandplain bioregions (Western Australian Herbarium, 2007) from locations including Toolonga, Belele, Talisker, Kalli, Wannoo, Wooramel and Wandina (GHD, 2007a). Muir Environmental (2000) estimated that approximately 35,000 plants of *Grevillea stenostachya* occur in the northern and southern ridges of Talling Peak and the intervening plain. GHD (2007a) estimate that 270 plants of *Grevillea stenostachya* will be removed as part of this clearing permit application. The total cumulative loss of this species at Talling Peak is therefore estimated at 1.0 % (GHD, 2007a). Again, it must be stated that this is an estimation only as no exact count of *G. stenostachya* plants within the proposed clearing area has been undertaken.

The proponent has established a number of Flora Management Zones (FMZ's) at the Talling Peak Iron Ore Mine. FMZ's are fenced off to protect Priority and significant flora and their habitat from grazing by goats, and

also to restrict access to mine site personnel (ATA Environmental, 2007). The importance of Priority Flora and FMZ's is communicated to all mine site personnel through the induction process, and posters and signage around the site raise awareness of the existence of Priority Flora. All of the above listed Priority Flora species have populations within FMZ's at the Talling Peak Iron Ore Mine. As an offset to this clearing proposal, the proponent has committed to extending an existing FMZ and creating a new FMZ to the north-east along the Talling Ridge. This will increase the area under FMZ's by 42% to a total of 87.5 hectares (GHD, 2008b).

In addition to the above listed Priority Flora species, a potentially new species of *Eremophila* (similar to *Eremophila serrulata*) will be impacted by the proposed clearing (GHD, 2007a). This species is currently referred to as '*Eremophila aff. serrulata*'. Taxonomic studies are currently being undertaken for *Eremophila aff. serrulata* to determine whether the taxon is significantly different to the more common *Eremophila serrulata* (GHD, 2007b). Essentially, differences relate to leaf size and the presence of calyx lobe fringe hairs (GHD, 2008c). DEC officers have indicated that if taxonomic studies deem this species to be significantly different, it is likely to be classified as DRF under the *Wildlife Conservation Act 1950*, as it is known only from the Talling Peak location (GHD, 2007b).

*Eremophila aff. serrulata* was first collected from Talling Peak by Muir Environmental in June 2000. At this time, Muir Environmental (2000) estimated that there were approximately 120 individual plants of this species, occurring in two populations on mining tenement M70/896. In 2006, Mount Gibson Mining commissioned ATA Environmental to undertake further flora surveys at the Talling Peak Iron Ore Mine to definitively determine the population numbers adjacent to the existing open cut pit as part of the approval process for the development of the T6A pit (GHD, 2007b). ATA Environmental located 216 plants of *Eremophila aff. serrulata* in September 2006, and a further 1,095 plants in December 2006 (ATA Environmental, 2006; cited in GHD, 2007b). Based on the results of these surveys, ATA Environmental (2007) noted that the preferred habitat of *Eremophila aff. serrulata* appeared to be very steep, rocky upper slope habitat. The total population at this time was estimated at 1,431 plants along Talling Ridge, located adjacent to the open pits (GHD, 2007b).

Approximately 221 individual plants of *Eremophila aff. serrulata* were cleared between October/November 2006 - June 2007 for the construction of the T6A pit (GHD, 2008a). Vegetation clearing associated with the development of this pit totalled 9.4 hectares, and was therefore exempt from the requirements of a clearing permit, in accordance with Regulation 5, Item 20 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Between the 27<sup>th</sup> and 29<sup>th</sup> August 2007, two experienced GHD staff undertook a targeted search for *Eremophila aff. serrulata*. The timing of the survey coincided with the flowering period for *Eremophila aff. serrulata*, however GHD (2007b) estimated that only 10 - 20% of plants had flowered at the time of the survey. Poor winter rainfall is the most probable explanation for the low percentage of plants in flower (GHD, 2007b). The targeted flora survey investigated six sites, including the north-eastern area of the Talling Ridge, the Talling Peak and other outcrops and ridges in the local area (GHD, 2007b).

Results of the targeted flora survey were able to confirm an additional 222 plants as being *Eremophila aff. serrulata*, however a further 75 plants were not flowering and could not be confirmed as *Eremophila aff. serrulata* (GHD, 2007b). A further 15 plants could not be confirmed due to the absence of calyx lobe fringe hairs on older flowers (GHD, 2007b). Given the extent of the targeted search and the difficulty in identifying individual specimens (particularly when not flowering), GHD (2007b) estimate that an additional 350 - 500 plants of *Eremophila aff. serrulata* are present along the northern half of the Talling Ridge on Mount Gibson Mining's tenements than were previously known (GHD, 2007b). None of these plants are within the footprint area for this clearing permit application and are located approximately 0.5 - 1 kilometre to the north-east (GHD, 2007b). The results of this targeted survey increased the known population of *Eremophila aff. serrulata* within the local region from 1,431 plants to approximately 1,781 - 1,931 plants (GHD, 2007b).

In February 2008, Mount Gibson Mining commissioned GHD to undertake further targeted searches for *Eremophila aff. serrulata* in the local area. GHD (2008c) re-visited all areas searched during the August 2007 survey, and also searched an area to the north-east of the Talling Peak and a creekline area located to the east of Talling Ridge. In summary, the survey located approximately 1,000 plants in loamy sands in an ephemeral creekline to the east of Talling Ridge which may potentially be *Eremophila aff. serrulata*. This population could not be confirmed as *E. aff. serrulata* as no plants were flowering at this time. This population is a potentially important finding (if confirmed) as it would demonstrate a different habitat and substrate type to that previously identified as preferred by *Eremophila aff. serrulata* (i.e. high ridgelines).

The 350 - 500 plant population found by GHD (2007b) was also re-visited during the 2008 survey, and GHD (2008c) estimate this population to be closer to 600 individuals. Again, plants were not flowering and only 222 of the estimated 600 plants have been confirmed as *Eremophila aff. serrulata* (GHD, 2007b; 2008c).

Of concern, GHD (2008c) noted that known populations of *Eremophila aff. serrulata* recorded by Muir Environmental in 2000 and ATA Environmental in 2006 along the Talling Ridge adjacent to the T6A pit have been severely affected by mining activities. Fly rock and large volumes of scree have been tipped over the edge of the Talling Ridge by mining activities associated with the T6A pit, directly impacting upon native vegetation (GHD, 2008c). Few plants have survived the damage where scree and associated rockslides have moved down the slopes of the Talling Ridge (GHD, 2008c). The extent of this impact upon *Eremophila aff. serrulata* has not been quantified in terms of numbers of plants affected.

The DEC is likely to visit Talling Peak between May - August 2008 during the flowering period of *Eremophila*

*aff. serrulata* as part of taxonomic surveys to confirm possible populations recorded by GHD in August 2007 and February 2008. The proponent is working in collaboration with the DEC and the Botanic Gardens and Parks Authority (BPGA) to undertake taxonomic work with a view to confirming the identity of *Eremophila aff. serrulata* as a new species or sub-species. Should the species be deemed significant, the proponent will investigate undertaking propagation techniques for the *Eremophila aff. serrulata* through the BPGA (GHD, 2008a).

As part of this clearing permit application, Mount Gibson Mining Ltd is proposing to clear an estimated 137 individual plants of *Eremophila aff. serrulata*. These plants are located adjacent to the T6A pit in rocky upper slope habitat. Based on information provided by GHD (2008c), these plants are likely to be in poor health as a result of their proximity to open pit mining operations. Table 1 below summarises the cumulative impacts of mining at Talling Peak on *Eremophila aff. serrulata*. Figures in this table should be treated with caution given that GHD (2008c) identified some plants of *Eremophila aff. serrulata* located outside of the proposed clearing area to be severely impacted by mining activities.

**Table 1: Cumulative Impact of Projects on *Eremophila aff. serrulata***

Plants	No's <sup>1</sup>	T6B Stage 1 Clearing Impact	T6B Stage 1 % Impact	Cumulative impact (Projects to date + T6B Stage 1)	Cumulative % Impact Stage 1	Cumulative impact (Projects to date + T6B Stage 1 and 2)	Cumulative % Impact Stage 2
Confirmed <i>Eremophila aff. serrulata</i>	1653	137	8.3	358	21.7	640	38.7
Likely <i>Eremophila aff. serrulata</i> population <sup>1</sup>	2030 <sup>2</sup>		6.7		17.6		31.5
Potential <i>Eremophila aff. serrulata</i> population <sup>2</sup>	3030 <sup>3</sup>		4.5		11.8		21.1

Note:

1. Numbers from GHD (2008c)

2. Likely population – includes confirmed numbers and those plants that could not be definitively identified due to lack of flowering material, but that showed similar growth habit and leaf size to the confirmed plants and were located in similar habitat (i.e. along the ridge).

3. Potential population – includes confirmed and likely numbers and other plants that could not be definitively identified due to lack of flowering material, but that showed similar growth habit and leaf size to the confirmed plants, however, were located in different habitat to the known populations (i.e. ephemeral creekline).

Should a clearing permit be granted, it is recommended that the proponent offset the loss of the 137 *Eremophila aff. serrulata* plants by placing a recently identified population of approximately 600 suspected *Eremophila aff. serrulata* plants into a Flora Management Zone (FMZ). Of this population, 222 plants have been confirmed as *Eremophila aff. serrulata*. This population is located to the north-east of the proposed clearing area, further along the Talling Ridge in an area which is not subject to current mining operations. Incorporation of this population into a FMZ would involve fencing the entire population to restrict access to feral goats which are known to have detrimental impacts upon flora in the area.

Given that the proposed clearing will involve the removal of Priority Flora and an *Eremophila* species which may prove to be of conservation significance, the proposal is deemed at variance to this Principle. However, the cumulative impact of mining at Talling Peak on these Priority Flora species is expected to be small. In addition, the loss of 137 *Eremophila aff. serrulata* individuals is being offset by the creation of a new FMZ to the north-east of current mining operations which will result in 222 confirmed *Eremophila aff. serrulata* plants (of an unconfirmed population of 600 individuals) being fenced off to prevent goat grazing.

**Methodology** ATA Environmental (2007).  
 GHD (2007a).  
 GHD (2007b).  
 GHD (2008a).  
 GHD (2008b).  
 GHD (2008c).  
 Matisse Consulting Pty Ltd (1994).  
 Muir Environmental (1998).  
 Muir Environmental (2000).  
 Western Australian Herbarium (2007).



GIS Database:  
- Declared Rare and Priority Flora List

**(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 (TECs) in the proposed clearing area (GIS Database; GHD, 2007a). The nearest known TEC is located approximately 105 kilometres south-east (GIS Database).

A Priority 1 Ecological Community is present in the Talling Peak area (GHD, 2007a). 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, 2007). These communities are typically under immediate threat from known threatening processes across their range but have not been adequately surveyed for classification as TECs (DEC, 2007). Priority 1 Ecological Communities are not formally protected under the *EPBC Act 1999* (DEC, 2007).

The 'Talling Peak Vegetation Complexes' (Ironstone Range) Priority Ecological Community (PEC) has been described from Talling Peak. This includes, but is not limited to, *Philothea sericea* and *Thryptomene decussata* low shrublands (DEC, 2007). Known threats to the Talling Peak PEC are mining and goats (CALM, 2002). The Talling Peak Ironstone is considered to be a rare feature of the Yalgoo bioregion due to its unique landforms and vegetation complexes (CALM, 2002). The vegetation communities of Talling Peak have not been well researched, analysed or documented (particularly at the regional level), and are therefore difficult to quantify (DEC, 2007). It is possible that the vegetation of Talling Peak could be classified as a TEC if a regional vegetation survey was undertaken and the Talling Peak vegetation complexes were found to exist nowhere else (DEC, 2007).

GHD (2007a) have indicated that the PEC described from the Talling Peak area does not occur within the T6B pit area, or the portion of the waste dump extension area that was surveyed. *Philothea sericea* and *Thryptomene decussata* were not prevalent in the areas surveyed, but did exist as components of the *Acacia quadrimarginea*, *A. ramulosa* var. *linophylla* shrubland vegetation community (GHD, 2007a). The PEC is considered to occur on the eastern slopes of the Talling Ridge, within an existing Flora Management Zone (GHD, 2007a). This area will not be cleared.

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

**Methodology** DEC (2007).  
GHD (2007a).  
GIS Database:  
- Threatened Ecological Communities.

**(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 within the Interim Biogeographic Regionalisation for Australia (IBRA) Yalgoo bioregion (GIS Database). According to Shepherd et al (2001) there is approximately 99% of the pre-European vegetation remaining in the Yalgoo bioregion. The vegetation of the application areas is classified as Beard Vegetation Association 40: Shrublands; Acacia scrub, various species, Beard Vegetation Association 228: Shrublands; *Acacia quadrimarginea* scrub, and Beard Vegetation Association 420: Shrublands; bowgada & jam scrub (GIS Database). There is approximately 93.2%, 100% and 100% of the pre-European vegetation remaining of Beard Vegetation Associations 40, 228 and 420 in the Yalgoo bioregion respectively (Shepherd et al, 2001). Whilst Beard Vegetation Associations 40, 228 and 420 are not well represented in conservation reserves within the Yalgoo bioregion, the area proposed to clear does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard Vegetation Associations 40, 228 or 420 below current recognised threshold levels, below which species loss increases significantly.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA bioregion – Yalgoo	5,057,673	5,007,353	~99	least concern	9.9
Beard veg assoc. – State					
40	369,068	347,640	~94.2	least concern	1.5
228	10,384	10,384	~100	least concern	0
420	859,654	829,300	~96.5	least concern	0.1
Beard veg assoc. – bioregion					
40	301,731	281,086	~93.2	least concern	1.9
228	3,587	3,587	~100	least concern	0
420	621,433	621,433	~100	least concern	0

\* Shepherd et al. (2001) updated 2005

\*\* 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 et al (2001).  
GIS Databases:  
- Interim Biogeographic Regionalisation of Australia.  
- 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 watercourses or wetlands within the proposed clearing area (GIS Database). A number of small ephemeral streams are generated from flows off the Talling Ridge, generally dispersing as overland sheetflow when they reach the surrounding flat plain (GHD, 2007a). Sheetflows occur within 1 - 1.5 kilometres of the Talling Ridge (GHD, 2007a).

This clearing proposal will impact upon a larger un-named ephemeral stream which collects runoff from the Central Ridge, southern side of the North Ridge, as well as the north-western side of the Talling Ridge (GHD, 2007a). This stream continues southwards towards the Bangemall Creek which feeds the Greenough River, located approximately 6 kilometres south-west of the mine (GHD, 2007a). The un-named stream has already been modified by the existing T3/T6 waste dump, and will be further impacted by this clearing proposal (GHD, 2007a).

Based on the above, the proposed clearing is at variance to this Principle. However, the watercourse to be impacted only flows following significant rainfall events (which are uncommon in the Talling Peak area) and supports Mulga shrubland. It is not expected that the vegetation associated with this watercourse has any significant environmental value. A diversion drain will be constructed to ensure that flows are directed around the proposed waste dump expansion area into drainage lines downstream. This will reduce the likelihood of downstream Mulga vegetation suffering water starvation. The proponent is advised to liaise with the Department of Water to determine whether a Bed and Banks Permit is required for the proposed creek diversion.

**Methodology** GHD (2007a).  
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 may be at variance to this Principle**

The area applied to clear is within the Talling land system (GIS Database), as mapped by the Department of Agriculture Western Australia (1998). The Talling land system is characterised by ridges and hills of banded ironstone which support bowgada and other Acacia shrublands (Department of Agriculture Western Australia, 1998). This description is consistent with the landform and vegetation types described from the Talling Peak Iron Ore Mine by GHD (2007a). According to the Department of Agriculture Western Australia (1998), the Talling land system is characterised by a stony surface mantle which provides effective protection against soil erosion. The disturbance or removal of this stony mantle may initiate soil erosion.

Within the proposed clearing area, it is expected that soils on the slopes of the ridge would be shallow (10 centimetres deep) and dominated by the presence of blocky fragmental rock material (80%) (GHD, 2007a). It is

therefore expected that there would be minimal erodible material in the proposed T6B pit area. Material most likely to erode (topsoil) will be stripped immediately following the clearing operations and transported directly onto an area ready for rehabilitation (GHD, 2007a). Where necessary, topsoil will be stockpiled for later use in rehabilitation in other areas of the mine site. Topsoil stockpiles will be of a height less than 2 metres and brush material from cleared vegetation will be used to aid stabilisation of the stockpiles, discourage weed establishment and minimise erosion (GHD, 2007a).

Proposed clearing for the waste dump expansions and abandonment bund construction is earmarked for much lower elevations on relatively flat areas. Clearing for waste dump construction will be undertaken progressively as required (GHD, 2007a). This will ensure that large areas are not exposed to wind and water erosion for extended periods of time. As with the T6B pit area, topsoil from the proposed waste dump and abandonment bund construction areas will be stripped and appropriately stockpiled for use in rehabilitation.

Based on flora surveys undertaken at Tallering Peak, the Doublegee (*Emex australis*) is the only weed species known from the area (GHD, 2007a). Proposed clearing activities have the potential to spread this species to non-infested areas if appropriate management measures are not implemented. Mount Gibson Mining will implement the following practices to ensure that the Doublegee (or any other weed species) are not spread throughout the site:

- topsoil stripped from known weed infested areas will be stored separately from "weed free" topsoil in a designated area to avoid use in weed-free areas;
- all heavy earthmoving equipment moving from weed infested to "weed free" areas will be cleaned to remove weed seeds and plant pathogens;
- the importing of fill material from weed infested areas will be avoided;
- signage will be provided where appropriate to restrict human and/or vehicles from entering weed infested areas;
- existing populations of Doublegee will be controlled and eradicated if possible using appropriate herbicide treatment over a number of years; and
- the distribution of Doublegee will be monitored annually in Spring to assess the effectiveness of the control program. Further herbicide spraying will be undertaken if deemed necessary (GHD, 2007a).

Should the permit be granted, it is recommended that a condition be imposed on the permit to enforce weed management commitments made by the proponent. Similarly, it is recommended that a condition be imposed to limit the extent of vegetation clearing permitted to be undertaken per calendar year. This will ensure that vegetation clearing is undertaken on a progressive basis, thereby minimising wind and water erosion risks.

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

**Methodology** Department of Agriculture Western Australia (1998).  
GHD (2007a).  
GIS Database:  
- Rangeland land system mapping.  
- Topographic Contours, Statewide.

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

**Comments Proposal is not likely to be at variance to this Principle**

The proposed clearing area is located approximately 6.8km north-east of the 'A Class' Urawa Nature Reserve (GIS Database). There are no other conservation areas nearby (GIS Database). The area under application is located at the Tallering Peak Iron Ore Mine and is immediately adjacent to open cut pit mining operations, waste dumps and associated mining infrastructure (GHD, 2007a). It is therefore unlikely that this area acts as a significant remnant, buffer, or ecological linkage to the Urawa Nature Reserve.

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

**Methodology** GHD (2007a).  
GIS Database:  
- CALM Managed Lands and Waters.

**(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**

Surface water flows in the Tallering Peak area are restricted to significant rainfall events which may occasionally occur following cyclonic activity or thunderstorms (GHD, 2007a). Flows generated off the Tallering Ridge are not likely to carry large amounts of suspended material given the poor soil coverage on the ridge. Water flowing off the ridge and onto the surrounding flat plain typically dissipates as overland sheetflow into surrounding native vegetation. It is unlikely that clearing on the Tallering Ridge slopes for the construction of the T6B pit will result in sedimentation or turbidity of larger downstream watercourses such as the Bangemall Creek or the Greenough River.

Vegetation clearing for waste dump expansions and abandonment bund construction is proposed for much lower elevations in flat areas with greater soil coverage. Clearing in these areas presents a greater risk to the quality of surface water. To ensure that sediment transportation off site is minimised, Mount Gibson Mining will conduct all clearing and mining operations as per its Surface Water Drainage Management Plan (GHD, 2007a). Management measures outlined in this plan include:

- minimising vegetation clearing wherever possible;
- careful project scheduling to ensure construction proceeds immediately following clearing wherever possible; and
- bunding around pit and access areas to divert stormwater runoff. Water will be diverted along cleared areas, away from natural vegetation and pit voids (GHD, 2007a).

There is a potential for ponding and erosion to occur at the base of the T3/T6 waste dump (GHD, 2007a). A drain will be constructed at the toe of the dump and stormwater/runoff will be passed through a detention basin to remove any solids prior to being discharged into the surrounding environment as sheetflow (GHD, 2007a).

Very little groundwater has been encountered during the mining operations at Tallering Peak (GHD, 2007a). Groundwater is typically found in small quantities at depths greater than 25 metres below the surface (GHD, 2007a). Dewatering at the site to date has not had any notable impacts upon the local native vegetation. The proposed vegetation clearing is not expected to have any significant impact upon groundwater levels or quality.

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

**Methodology** GHD (2007a).

**(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 average annual rainfall of Mullewa (the closest recording station to the proposed clearing area) is 339.5 millimetres (GHD, 2007a). Average annual evaporation is in the range of 3000 millimetres (GIS Database). Winter rainfall is generally more significant, however summer rains associated with thunderstorms or tropical lows can bring substantial falls (GHD, 2007a). Rainfall in semi arid areas typically infiltrates into the substrate or evaporates (GHD, 2007a).

The proposed clearing for stage 1 of the T6B pit includes the lower and upper slopes of the Tallering Ridge, elevated some 150 metres above the surrounding plain (GIS Database). Such topography naturally facilitates runoff and discourages the ponding of water. Clearing for the T3/T6 and T4 waste dumps is proposed for much lower elevations, as is the clearing for the T5 and T6 abandonment bunds (GIS Database). There may be a potential for water to pond at the base of the T3/T6 waste dump. Drains will be constructed where necessary to reduce the incidence of ponding. It is not expected that the proposed clearing will increase or exacerbate the incidence or intensity of natural flood events which may occasionally occur in the area.

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

**Methodology** GHD (2007a).  
GIS Database:  
- Evaporation Isopleths.  
- Topographic Contours.

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

**Comments**

The clearing permit application was advertised by DoIR, inviting submissions from the public. One public submission was received, raising concerns regarding the potential impacts of the proposed vegetation clearing on Native Title rights, Sites of Aboriginal Significance, biodiversity and Threatened Ecological Communities.

There are two native title claims over the area under application (GIS Database). These claims (WC96/093 & WC04/010) have been registered with the National Native Title Tribunal on behalf of the claimant groups (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 are two registered Sites of Aboriginal Significance within the area applied to clear (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.

The potential impacts of the proposed clearing on biodiversity and Threatened Ecological Communities are addressed under the relevant Clearing Principles (a) and (d) respectively.

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 T6B Project was referred to the Environmental Protection Authority (EPA) by DoIR on 25<sup>th</sup> October 2007. Subsequent to this referral, the proponent split the T6B project into two separate stages (T6B stage 1 and T6B stage 2). The main concerns raised by the EPA related to the T6B pit expansion on the southern side of the Talling Ridge, where a large population of the unidentified *Eremophila aff. serrulata* is located (T6B stage 2). The EPA chairman supports the proponent's decision to defer cutback of the south-western portion of the T6B pit and undertake further investigations into the flora values of the area prior to seeking approval. The EPA chairman is satisfied that elements of the T6B stage 1 proposal will not lead to any significant effects on the environment. The original referral was withdrawn by DoIR on 14th April 2008, in accordance with advice from the EPA. It is expected that the T6B stage 2 proposal will be referred to the EPA upon submission to DoIR.

**Methodology** GIS Databases:  
 - Aboriginal Sites of Significance.  
 - Native Title Claims.

#### 4. Assessor's comments

Purpose	Method	Applied area (ha)/ trees	Comment
Mineral Production	Mechanical Removal	101.4	The Clearing Principles have been addressed and the proposed clearing is at variance to Principles (c) and (f), may be at variance to Principles (a), (b), (d) and (g), is not likely to be at variance to Principles (h), (i) or (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 managing significant flora, weed management, erosion control, rehabilitation and permit reporting.

#### 5. References

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## 6. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government.
<b>CALM</b>	Department of Conservation and Land Management, Western Australia.
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia.
<b>DA</b>	Department of Agriculture, Western Australia.
<b>DEC</b>	Department of Environment and Conservation
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DoE), Western Australia.
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia.
<b>DoE</b>	Department of Environment, Western Australia.
<b>DoIR</b>	Department of Industry and Resources, Western Australia.
<b>DOLA</b>	Department of Land Administration, Western Australia.
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environment Protection Act 1986, Western Australia.
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System.
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia.
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI</b>	Rights in Water and Irrigation Act 1914, Western Australia.
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia.
<b>TECs</b>	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*} :-

<b>P1</b>	<b>Priority One - Poorly Known taxa:</b> 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.
<b>P2</b>	<b>Priority Two - Poorly Known taxa:</b> 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.
<b>P3</b>	<b>Priority Three - Poorly Known taxa:</b> 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.
<b>P4</b>	<b>Priority Four – Rare taxa:</b> 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.
<b>R</b>	<b>Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):</b> 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.