



1. Application details

1.1. Permit application details

Permit application No.: 3009/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972, Temporary Reserves 70/4192, 70/4266, 70/4267, 70/4737
Local Government Area: Shire Of East Pilbara
Colloquial name: Geotechnical Test Pitting Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
112		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 Beard Vegetation Associations have been mapped at a scale of 1:250,000 for the whole of Western Australia. Three Beard Vegetation Associations are located within the application areas (Shepherd et al., 2001):

Beard Vegetation Association 18: Low woodland; mulga (*Acacia aneura*);

Beard Vegetation Association 29: Sparse low woodland; mulga, discontinuous in scattered groups; and

Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

Mattiske Consulting (2008) has conducted a flora and vegetation survey over an area that included the application areas. The survey was conducted in April and May 2008 following favourable seasonal rainfall (Mattiske Consulting, 2008). Mattiske Consulting (2008) has recorded 25 vegetation units within the vegetation survey area with the following 11 being likely to be impacted by the proposed clearing:

Flowlines (Creeklines and Drainage Areas):

C2) Low woodland of *Eucalyptus xerothermica*, *Eucalyptus victrix* over *Acacia citrinoviridis* and *Acacia maitlandii*, *Gossypium australe*, *Melaleuca lasiandra*, *Petalostylis labicheoides*, *Rulingia luteiflora* over *Triodia epactia*, *Chrysopogon fallax* and *Triodia pungens* on minor creeklines with sandy soils. This vegetation unit is reported as being a widespread community with a regular occurrence in a regional context.

C3) Tall shrubland of *Acacia arida*, *Acacia bivenosa*, *Acacia ancistrocarpa*, *Acacia maitlandii*, *Acacia monticola* with occasional emergent *Corymbia deserticola* subsp. *deserticola*, *Eucalyptus gamophylla* and *Eucalyptus leucophloia* over *Gompholobium polyzygum*, *Indigofera monophylla*, *Rulingia luteiflora* over mixed *Triodia* species on sandy-loam soils in minor gullies. This vegetation unit has occurrences of the Declared Rare Flora (DRF) species *Lepidium catapycnon*. In addition the vegetation unit has a high range of flora species. This unit is reported as being a widespread community with a regular occurrence in a regional context.

X3) Tall shrubland of *Acacia bivenosa*, *Acacia monticola*, *Acacia marramamba*, *Petalostylis labicheoides* with occasional emergent *Eucalyptus leucophloia* over *Triodia pungens* and *Triodia basedowii* on calcrete soils in minor gullies. This vegetation unit is reported as being a widespread community with a regular occurrence in a regional context.

Flats and Broad Plains:

M1) Low woodland to Low open Forest of *Acacia aneura* var. *aneura*, *Acacia pruinocarpa*, *Acacia catenulata* subsp. *occidentalis*, *Acacia rhodophloia*, *Grevillea berryana* with occasional emergent *Eucalyptus leucophloia* and *Eucalyptus gamophylla* over *Psydrax latifolia*, *Keraudrenia*

nephrosperma, *Acacia distans*, *Eremophila fraseri*, *Acacia tetragonophylla*, *Eremophila forrestii* subsp. *forrestii*, *Solanum lasiophyllum* over *Chrysopogon fallax*, *Triodia pungens* and *Triodia epactia* and a range of annual species on sandy-loam flats and broad plains. This vegetation unit has occurrences of the Priority flora species *Olearia fluvialis* (P2) and *Rhagodia* sp. Hamersley (P1). In addition the unit has a high range of flora species. This unit is reported as being a widespread community with a regular occurrence in a regional context.

- M2) Low woodland of *Acacia aneura* var. *aneura* to a Tall Shrubland of *Acacia pyrifolia*, *Acacia bivenosa*, *Acacia ancistrocarpa* and *Acacia maitlandii* with occasional emergent *Eucalyptus xerothermica*, *Corymbia aspersa*, *Psyrax latifolia* and *Acacia citrinoviridis* over *Gompholobium polyzygum*, *Rulingia luteiflora*, *Themeda triandra*, *Triodia epactia* and *Triodia pungens* on sandy soils on flat edges of major creeklines. This vegetation unit is reported as being a widespread community with a regular occurrence in a regional context.
- M5) Low Woodland of *Acacia aneura* var. *aneura* to a Tall Shrubland of *Acacia pyrifolia*, *Acacia bivenosa*, *Acacia ancistrocarpa* and *Acacia maitlandii* with occasional emergent *Eucalyptus xerothermica*, *Corymbia aspersa*, *Psyrax latifolia* and *Acacia citrinoviridis* over *Gompholobium polyzygum*, *Rulingia luteiflora*, *Themeda triandra*, *Triodia epactia* and *Triodia pungens* on sandy soils on flats on edges of major creeklines. This vegetation unit is reported as being a widespread community with a regular occurrence in a regional context.
- M6) Grassland of *Aristida* and *Enneapogon* species with emergent *Acacia aneura* var. *aneura*, *Acacia citrinoviridis* over occasional low sub-shrub and patches of *Triodia angusta* on cracking clays on flats. This vegetation unit is restricted to a section of survey area, although it is relatively widespread in a regional context.

Ranges Hills and Hillslopes:

- S1) Hummock grassland of *Triodia epactia* with pockets of *Triodia basedowii* and *Triodia pungens* with emergent patches of *Corymbia hamersleyana*, *Eucalyptus gamophylla*, *Eucalyptus leucophloia* over *Acacia aneura* var. *aneura*, *Acacia pruinocarpa*, *Acacia rhodophloia*, *Codonocarpus cotinifolius*, *Psyrax latifolia* and *Grevillea berryana* over *Acacia adoxa* var. *adoxa*, *Acacia arida*, *Acacia tenuissimam*, *Acacia tetragonophylla*, *Acacia bivenosa*, *Acacia distans*, *Acacia hilliana*, *Eremophila latrobei* and *Eremophila forrestii* subsp. *forrestii* over a range of annual species on gravelly soils on lower slopes. This vegetation unit has occurrences of the Priority flora species *Rhagodia* sp. Hamersley (P1). In addition the unit has a high range of flora species. This unit is reported as being a widespread community with a regular occurrence in a regional context.
- S2) Hummock grassland of *Triodia basedowii*, *Triodia* aff. *wiseana* and *Triodia epactia* with emergent *Acacia pruinocarpa*, *Acacia inaequilatera*, *Corymbia deserticola* subsp. *deserticola*, *Corymbia hamersleyana*, *Eucalyptus leucophloia* and *Eucalyptus gamophylla* over *Eremophila latrobei*, *Acacia adoxa* var. *adoxa*, *Acacia arida*, *Acacia bivenosa*, *Eremophila exilifolia*, *Acacia spondylophylla*, *Acacia ancistrocarpa*, *Acacia bivenosa*, *Acacia inaequilatera*, *Acacia hilliana*, *Indigofera monophylla* and a range of annual species on gravelly soils on mid and upper slopes of small ranges. This vegetation unit has occurrences of the Declared Rare Flora (DRF) species *Lepidium catapycnon*. In addition the vegetation unit has a high range of flora species. This unit is reported as being a widespread community with a regular occurrence in a regional context.
- S4) Hummock grassland of *Triodia basedowii* and *Triodia pungens* with emergent *Eucalyptus leucophloia*, *Hakea lorea* subsp. *lorea*, *Grevillea wickhamii*, *Acacia ancistrocarpa*, *Acacia bivenosa*, *Acacia inaequilatera* over a range of annual species on low hills and ranges. This vegetation unit has occurrences of the Declared Rare Flora (DRF) species *Lepidium catapycnon*. In addition the vegetation unit has a high range of flora species. This unit is reported as being a widespread community with a regular occurrence in a regional context.
- X4) Hummock grassland of *Triodia basedowii*, *Triodia wiseana* and *Triodia pungens* with emergent *Eucalyptus leucophloia* and *Corymbia hamersleyana* over *Acacia adoxa* var. *adoxa*, *Acacia tetragonophylla*, *Mirbelia viminalis*, *Acacia victoriae*, *Eremophila cuneifolia*, *Acacia hamersleyana*, *Petalostylis labicheoides*, *Senna glutinosa* subsp. *glutinosa* and *Acacia bivenosa* and a range of annual species on calcrete soils in lower slopes. This unit is reported as being a widespread community with a regular occurrence in a regional context.

Clearing Description

Hamersley Iron (2009) proposes to clear up to 112 hectares of native vegetation within a larger area totalling approximately 459.7 hectares. The application areas consist of nine, linear shaped parcels of land that are spread over approximately 25 kilometres.

The proposed clearing is for the purpose of exploratory drilling (Hamersley Iron, 2009). Vegetation will be cleared by bulldozer with its blade raised or with a scrub rake in level terrain (Hamersley Iron, 2009). The application areas are located approximately 35 kilometres north-west of Newman (GIS Database).

Vegetation Condition

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

To

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

Comment

The vegetation condition was based on the flora and vegetation survey of the proposed clearing area which was conducted by Mattiske Consulting in April and May 2008.

Parts of the survey area have been modified by previously installed tracks, exploration activities and infrastructure (Mattiske Consulting, 2008). Pastoral activities have occurred in the north-western section of the survey area and in addition, the plant communities have been subject to recent and extensive fires in some sections of the survey area (Mattiske Consulting, 2008). Mattiske Consulting (2008) reports that the sections of the survey area that have not been subjected to grazing pressures could be considered to be in good condition, whilst areas subject to regular grazing could be considered to be degraded.

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 areas are located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion generally consists of mountainous areas of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite) (CALM, 2002). The Hamersley subregion generally contains mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

A flora and vegetation survey has been conducted over the Hope Downs 4 Infrastructure corridor by Mattiske Consulting in autumn 2008. Mattiske Consulting (2008) recorded a total of 301 plant taxa from 42 families and 124 genera. This total compares with a total of 914 taxa from 65 families and 230 genera recorded in both the Hope Downs 1 survey area and in the Hope Downs 4 mining survey area by Mattiske Consulting in 2005 and 2008 (Mattiske Consulting 2008). The most common families recorded were *Poaceae* (41 taxa), *Mimosaceae* (32 taxa), *Amaranthaceae* (22 taxa), *Caesalpinaceae* (19 taxa), *Chenopodiaceae* (18 taxa), *Malvaceae* (17 taxa), *Asteraceae* (17 taxa), *Papilionaceae* (16 taxa) and *Myrtaceae* (16 taxa) (Mattiske Consulting, 2008). Mattiske Consulting (2008) report that this constitutes a floral composition typical of the Pilbara region.

During the flora and vegetation survey one Declared Rare Flora species, *Lepidium catapycnon* was recorded in the survey area (Mattiske Consulting, 2008). In addition, three Priority flora species were recorded in the survey area (Mattiske Consulting, 2008):

- *Rhagodia* sp. Hamersley (Priority 1);
- *Olearia fluvialis* (Priority 2); and
- *Eremophila youngii* subsp. *lepidota* (Priority 4).

Furthermore, four flora species collected in the survey area were found to be outside their expected ranges or on the edges of their range (Mattiske Consulting, 2008):

- *Atriplex vesicaria* (slight northern extension);
- *Eucalyptus ?sheathiana* (northern extension);
- *Frankenia ?magnifica* (slight north-eastern extension); and
- *Sclerolaena ericantha* (slight northern range extension).

The plant communities that support Priority flora or flora species with range extensions are considered to be locally significant (Mattiske Consulting, 2008). The majority of plant communities that support Priority flora occur within minor and major flowlines, or on the flats (plant community M1) (Mattiske Consulting, 2008). The majority of plant communities that support flora species that occurred as range extensions occur within the minor flowlines (plant community C3) or on the flats and extensive plains (plant communities S1 and S2), and on soils dominated by calcrete and quartz pebble (plant community X4) (Mattiske Consulting, 2008). The range of species was quite variable with the alluvial flats and plains supporting the highest number of species (creekline community C3, mulga community M1 and mixed spinifex - mulga communities S1 and S2) (Mattiske Consulting, 2008). Whilst some of this variation could be attributed to variations in sampling and representation, the trends in the diversity of the species are significant in a local and regional context (Mattiske Consulting, 2008).

Mattiske Consulting (2008) identified six weed species during the flora and vegetation survey: Buffel Grass (*Cenchrus ciliaris*), Bipinnate Beggartick (*Bidens bipinnata*), Common Sowthistle (*Sonchus oleraceus*), Caltrop (*Tribulus terrestris*), Native Thornapple (*Datura leichhardtii*) and Purslane (*Portulaca oleracea*). The presence of these introduced weed species lowers the biodiversity value of the proposed clearing areas. 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 for the purposes of weed management.

Ninox Wildlife Consulting conducted a fauna survey for an area that included the application areas in May 2008. This survey identified 11 mammals, 1 amphibian, 23 reptiles and 37 birds within the survey area (Ninox Wildlife Consulting, 2008). Ninox Wildlife Consulting (2008) report that this represents quite low fauna diversity and this is attributed to the effects of a recent fire.

Based on the above, the proposed clearing may be at variance to this Principle, however, all the plant communities present within the application areas are widespread in a regional context (Mattiske Consulting, 2008).

Methodology CALM (2002)
DEC (2009a)
Mattiske Consulting (2008)
Ninox Wildlife Consulting (2008)
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 is not likely to be at variance to this Principle

Ninox Wildlife Consulting (2008) was commissioned by Hamersley Iron to conduct a literature review and site inspection to identify fauna and habitat values of the project area. The survey was carried out in May 2008 and was conducted in accordance with Environmental Protection Authority (EPA) Position Statement 3: *Terrestrial Biological Surveys as an Element of Biodiversity Protection* and Guidance Statement No. 56: *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2002; 2004).

Ninox Wildlife Consulting (2008) identified the following broad habitat types within the survey area:

1. Grassland of *Aristida* and *Eragrostis* species with emergent *Acacia aneura* var. *aneura* over occasional low subshrub and patch of *Triodia pungens* on cracking clays on flats;
2. Low Open Woodland of *Acacia aneura* var. *aneura*, *Acacia pruinocarpa* over *Acacia tetragonophylla*, *Eremophila forrestii* subsp. *forrestii* over *Triodia pungens* and a range of annual species on open sandy-loam flats and broad plains;
3. Hummock Grassland of *Triodia basedowii* with pockets of *Triodia pungens* with emergent *Eucalyptus gamophylla*, *Eucalyptus leucophloia*, *Acacia aneura* var. *aneura*, *Acacia pruinocarpa*, *Psydrax latifolia* and *Grevillea berryana* over *Eremophila fraseri* subsp. *galeata* (ms), *Eremophila forrestii* subsp. *forrestii*, *Acacia adsurgens*, *Indigofera monophylla* and a range of annual species on gravelly soil on lower slopes;
4. *Eucalyptus camaldulensis* var. *obtusa* over *Acacia citrinoviridis* and *Acacia coriacea* subsp. *sericophylla* over *Petalostylis labicheoides*, *Acacia pyrifolia*, *Melaleuca lasiandra* over *Tephrosia rosea* var. *clementii*, *Themeda triandra* and *Cleome viscosa* on major creeklines with sandy soils.

Based on the results of the survey and known distributions, the following fauna species of conservation significance are the most likely to occur within the survey area:

- Australian Bustard (*Ardeotis australis*) – Priority 4 on the DEC Threatened and Priority Fauna list;
- Pilbara Olive Python (*Liaises olivaceus barroni*) – Schedule 1 (Fauna that is rare or likely to become extinct), *Wildlife Conservation (Specially Protected Fauna) Notice 2008* and Vulnerable, *EPBC Act 1999*;
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 on the DEC Threatened and Priority Fauna list.

The Australian Bustard is a dispersive species with widespread movements over long distances (DECC, 2005). The Australian Bustard is known to inhabit grasslands, low shrublands, grassy woodlands as well as altered environments such as croplands and airfields (DECC, 2005). Suitable habitat for this species is present within the application areas, however, based on the widespread distribution of this species it is unlikely that the vegetation within the application areas represents significant habitat for this species.

The Pilbara Olive Python's preferred habitat consists of deep gorges and water holes in the ranges of the Pilbara region (Pearson, 1993 as cited in DEWR, 2007). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (Pearson, 2001, as cited in DEWR, 2007). Based on the vegetation maps and descriptions provided by Hamersley Iron (2009), none of these habitat types appear to be present within the application areas. Therefore, the vegetation within the application areas is unlikely to represent significant habitat for this species.

Populations of the Western Pebble-mound Mouse are widespread in the extensive ranges of the central and southern Pilbara, extending into the smaller ranges of the Little Sandy Desert (Van Dyck and Strahan, 2008). The Western Pebble-mound Mouse generally occurs on gentler slopes of rocky ranges where the ground is covered by a stony mulch and vegetated by hard spinifex, often with an overstorey of eucalypts and scattered shrubs (Van Dyck and Strahan, 2008). Mounds are often sited close to narrow ribbons of *Acacia*-dominated scrub that grows along incised drainage lines (Van Dyck and Strahan, 2008). Suitable habitat for this species is present within the application areas, however, this species has a widespread distribution and therefore, it is unlikely that the vegetation within the application areas represents significant habitat for this species. Hamersley Iron should make all contractors aware that Western Pebble-mound Mouse mounds may be present in rocky places within the application areas and that these should be avoided wherever possible.

The habitat types present within the application areas are well represented on a local and regional scale (Mattiske Consulting, 2008). Therefore, the vegetation of the application areas is unlikely to represent significant habitat for any fauna species. Furthermore, the linear nature of the proposed clearing, spread over 25 kilometres, is unlikely to result in a significant impact to any fauna species.

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

Methodology DEC (2009a)
DEC (2009b)
DECC (2005)
DEWR (2007)
Hamersley Iron (2009)
Mattiske Consulting (2008)
Van Dyck and Strahan (2008)

(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

Mattiske Consulting conducted a flora and vegetation survey in Autumn 2008 over an area that included the application areas. The survey was conducted in accordance with the Environmental Protection Authority (EPA) Guidance Statement 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004).

A desktop survey conducted by Mattiske Consulting (2008) has recorded 11 Priority flora species and one Declared Rare Flora (DRF) species within 50 kilometres of the application areas:

- *Acacia subtiliformis* (Priority 3);
- *Eremophila magnifica* subsp. *magnifica* (Priority 4);
- *Eremophila rigida* (Priority 1);
- *Eremophila youngie* subsp. *lepidota* (Priority 4);
- *Goodenia* sp. East Pilbara (Priority 1);
- *Indigofera gilesii* subsp. *gilesii* (Priority 3);
- *Lepidium catapycnon* (Rare);
- *Ptilotus mollis* (Priority 4);
- *Rhagodia* sp. Hamersley (Priority 3);
- *Rostellularia adscendens* var. *latifolia* (Priority 3);
- *Tephrosia* sp. Cathedral Gorge (Priority 3);
- *Themeda* sp. Hamersley Station (Priority 3).

According to Mattiske Consulting (2008) only the DRF species *Lepidium catapycnon* and the Priority 3 flora species *Rhagodia* sp. Hamersley were recorded within the application areas.

Lepidium catapycnon is an open, woody perennial, herb or shrub standing between 0.2 and 0.3 metres high (DEC, 2009a). Its stem zigzags and during October white flowers are visible (DEC, 2009a). It is found in skeletal soils on hillsides around the Wittenoom Gorge, Hamersley Range, Weeli Wolli and Newman regions (Rio Tinto, 2008). Mattiske Consulting (2008) report that this species appears to be a disturbance opportunistic species as it prefers fringes of tracks and recently disturbed sites. Vegetation maps provided by Hamersley Iron (2009) indicate that there are numerous other occurrences of this species in areas surrounding the application areas.

The flora species *Rhagodia* sp. Hamersley is a low shrub to 60 centimetres in height (Mattiske Consulting, 2008). Mattiske Consulting (2008) describe the species as being found in alluvial flats and is known from six records at the Western Australian Herbarium (Mattiske Consulting, 2008). Vegetation maps provided by Hamersley Iron (2009) indicate that there are numerous other occurrences of this species in areas surrounding the application areas.

Under section 23(f) of the *Wildlife Conservation Act 1950* the proponent is required to obtain a permit from the

Department of Environment and Conservation if any DRF are to be impacted by the proposed clearing.

Based on the above, the proposed clearing may be at variance to this Principle. Given the approvals required from the DEC to remove DRF and the presence of numerous *Rhagodia* sp. Hamersley in areas adjacent to the application areas, the proposed clearing is unlikely to have a significant impact upon the conservation status of these flora species.

Methodology DEC (2009a)
DEC (2009c)
EPA (2004)
Hamersley Iron (2009)
Mattiske Consulting (2008)
Rio Tinto (2008)

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

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

There are no Threatened Ecological Communities (TECs) within the areas applied to clear (GIS Database). The nearest known TEC is located approximately 45 kilometres west of the application areas (GIS Database).

There is a Priority Ecological Community (PEC) located approximately 16 kilometres north of the application areas (GIS Database). This PEC is the Weeli Wolli Spring community (P1) which is described by the Department of Environment and Conservation (DEC) (2008) as consisting of unusual flora assemblages as sympatric *Gossypium* spp. hybridising. DEC (2008) report that although it is a typical spring site in the Pilbara, undescribed aquatic crustaceans have been collected from this site. In addition the Weeli Wolli Spring Community consists of a high diversity of flora with the main threat to this community being dewatering (DEC, 2008).

Based on the distance of the application areas from any TECs or PECs, the proposed clearing is unlikely to have a significant impact on any TECs or PECs.

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

Methodology DEC (2008)
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 application areas fall within the IBRA Pilbara Bioregion (GIS Database). Shepherd et al. (2001) report that approximately 99.9% of the pre-European vegetation still exists in this Bioregion (see table below). The vegetation within the application areas is recorded as the following three Beard Vegetation Associations (Shepherd et al., 2001):

- **Vegetation Association 18:** Low woodland; mulga (*Acacia aneura*);
- **Vegetation Association 29:** Sparse low woodland; mulga, discontinuous in scattered groups; and
- **Vegetation Association 82:** Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

According to Shepherd et al. (2001) approximately 100% of all three of these vegetation associations remain within the Bioregion (see table below).

Therefore, the vegetation within the application areas is not a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	Least Concern	6.3
Beard veg assoc. – State					
18	19,892,437	19,890,348	~100	Least Concern	2.1
29	7,904,064	7,904,064	~100	Least Concern	0.3
82	2,565,930	2,565,930	~100	Least Concern	10.2
Beard veg assoc. – Bioregion					
18	676,561	676,561	~100	Least Concern	16.8
29	1,133,228	1,133,228	~100	Least Concern	1.9
82	2,563,610	2,563,610	~100	Least Concern	10.2

* 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 Database
- Interim Biogeographic Regionalisation of Australia

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

The application areas contain numerous ephemeral drainage lines and indefinite watercourses (GIS Database). The following three vegetation units that are associated with watercourses may be impacted by the proposed clearing (Mattiske Consulting, 2008):

- C2) Low woodland of *Eucalyptus xerothermica*, *Eucalyptus victrix* over *Acacia citrinoviridis* and *Acacia maitlandii*, *Gossypium australe*, *Melaleuca lasiandra*, *Petalostylis labicheoides*, *Rulingia luteiflora* over *Triodia epactia*, *Chrysopogon fallax* and *Triodia pungens* on minor creeklines with sandy soils. This vegetation unit is reported as being a widespread community with a regular occurrence in a regional context.
- C3) Tall shrubland of *Acacia arida*, *Acacia bivenosa*, *Acacia ancistrocarpa*, *Acacia maitlandii*, *Acacia monticola* with occasional emergent *Corymbia deserticola* subsp. *deserticola*, *Eucalyptus gamophylla* and *Eucalyptus leucophloia* over *Gompholobium polyzygum*, *Indigofera monophylla*, *Rulingia luteiflora* over mixed *Triodia* species on sandy-loam soils in minor gullies. This vegetation unit has occurrences of the Declared Rare Flora (DRF) species *Lepidium catapycnon*. In addition the vegetation unit has a high range of flora species. This unit is reported as being a widespread community with a regular occurrence in a regional context.
- X3) Tall shrubland of *Acacia bivenosa*, *Acacia monticola*, *Acacia marramamba*, *Petalostylis labicheoides* with occasional emergent *Eucalyptus leucophloia* over *Triodia pungens* and *Triodia basedowii* on calcrete soils in minor gullies. This vegetation unit is reported as being a widespread community with a regular occurrence in a regional context.

Vegetation maps provided by Hamersley Iron (2009) indicate that vegetation community X3 does not fall within the application areas. In addition, only a very small proportion of vegetation community C2 appears to occur within the application areas (Hamersley Iron, 2009). Therefore, the proposed clearing is not likely to have a significant impact on either of these vegetation communities.

The C3 community is an important community as it supports the Declared Rare Flora species *Lepidium catapycnon* and flora species that occur as range extensions (Mattiske Consulting, 2008). In addition, this community had a high level of flora diversity (Mattiske Consulting, 2008). Mattiske Consulting (2008) report that this community is widespread with a regular occurrence on a regional scale, and in addition, vegetation maps provided by Hamersley Iron (2009) illustrate that this community is widespread in areas surrounding the application areas. The proposed clearing is therefore not likely to have a significant impact on this community at

a regional scale.

The application area is located approximately 10 kilometres east of the Weeli Wolli Creek which is a wetland of subregional significance and refugia for the Hamersley subregion (CALM, 2002). Mattiske Consulting (2008), report that in relation to indirect impacts, the key issues appear to relate to the protection of the local hydrological conditions (including surface water flows and groundwater systems). It is therefore recommended that precautions be taken to ensure that the flow of any watercourses within the application areas is not disrupted by the proposed clearing activities.

Based on the above, the proposed clearing is at variance to this Principle, however, the vegetation units associated with watercourses are well represented locally, and within the Pilbara region generally. Consequently, the proposed clearing is unlikely to have any significant impacts, on watercourses at a regional scale given their widespread distribution. It is recommended that if a clearing permit is granted, a condition be imposed for the purpose of maintaining the flow of watercourses within the application areas.

Should a permit be granted, it is recommended that if any watercourses are to be disturbed the proponent should liaise with the Department of Water (DoW) to determine whether a Bed and Banks permit is necessary for the proposed works.

Methodology CALM (2002)
Hamersley Iron (2009)
Mattiske Consulting (2008)
GIS Database
- Hydrography, linear

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

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

The application areas have been mapped as occurring within the following land systems (GIS Database):

- Newman land system;
- Platform land system;
- Rocklea land system;
- Spearhole land system.

The Newman land system is described by Van Vreeswyk et al. (2004) as having rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Van Vreeswyk et al. (2004) reports that much of this system is inaccessible or poorly accessible. The dominant vegetation type is spinifex and the system is burnt fairly frequently (Van Vreeswyk et al., 2004). The land system has low soil erosion risk and approximately 91% of the vegetation is reported as being in very good condition (Van Vreeswyk et al., 2004).

The Platform land system consists of dissected slopes and raised plains supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). Van Vreeswyk et al. (2004) reports that this system is not susceptible to erosion and that approximately 97% of the vegetation within this system is in very good condition.

The Rocklea land system consists of basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands (Van Vreeswyk et al., 2004). This land system is reported by Van Vreeswyk et al. (2004) as being subject to fairly frequent burning and has a very low erosion hazard.

The Spearhole land system is reported by Van Vreeswyk et al. (2004) as consisting primarily of gently undulating hardpan plains supporting grooved mulga shrublands and hard spinifex. This system is not prone to erosion (Van Vreeswyk et al., 2004).

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

Methodology Van Vreeswyk et al. (2004)
GIS Database
- Rangelands System Mapping

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

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

The proposed clearing is not located within close proximity to any conservation areas (GIS Database). The nearest Department of Environment and Conservation (DEC) managed land is the Karijini National Park located approximately 70 kilometres west of the application areas (GIS Database).

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

Methodology GIS Database
- CALM Managed Land 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**

The application areas are located in an arid region with an annual average rainfall of approximately 310 millimetres falling mainly during the summer months (BoM, 2009) Based on an average annual evaporation rate of approximately 2,500 millimetres, any surface water resulting from rain events is expected to be relatively short-lived (ANRA, 2007).

The application areas have numerous ephemeral drainage lines running through them (GIS Database). Based on the climate of the region these creeks are expected to be dry except following significant rainfall events which are typically associated with tropical cyclones. Therefore, the proposed clearing is unlikely to have a significant impact upon surface water quality in the area.

The proposed clearing is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The Pilbara region consists of granite-greenstone bedrock in the north, and the sedimentary and volcanic rocks of the Hamersley basin in the south (DoF, 2009). The application areas are located within the south of the Pilbara region and would therefore, most likely be located in the Hamersley basin. In this basin large amounts of groundwater are used for mining related purposes, principally from calcrete and pisolite valley fill aquifers (DoF, 2009). Groundwater is generally fresh or brackish (DoF, 2009). The clearing of 112 hectares within an area of approximately 459.7 hectares that stretches across 25 kilometres, is not likely to have a significant impact upon surface or groundwater quality, or groundwater quantity.

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

Methodology ANRA (2007)
BoM (2009)
DoF (2009)
GIS Database
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

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

The application areas are located in an arid region where the average annual evaporation rate greatly exceeds the average annual rainfall (BoM, 2009). There are no permanent watercourses within the application areas, however, several ephemeral drainage lines dissect the proposed clearing areas (GIS Database). These drainages lines are expected to be dry for most of the year, and would likely only flow immediately following significant rainfall.

Natural flood events do occur in the Pilbara region following cyclonic activity. However, the proposed clearing is not expected to increase the incidence or intensity of such events given the size of the area to be cleared (112 hectares), in relation to the Fortescue River Upper catchment area (2,975,192 hectares) (GIS Database).

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

Methodology BoM (2009)
GIS Database
- Hydrographic Catchments - Catchments
- Hydrography, linear

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

Comments

There is one Native Title claim (WC99/004) over the area under application (GIS Database). This claim has been registered with the Native Title Tribunal on behalf of the claimant group. However, the tenements have been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases there are no known Aboriginal Sites of Significance within the application areas (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the

Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks permit or any other licences or approvals are required for the proposed works.

There were no public submissions received during the public comments period.

Methodology GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles, and is at variance to Principle (f), may be at variance to Principles (a) and (c), is not likely to be at variance to Principles (b), (d), (g), (h), (i) and (j) and is not at variance to Principle (e).

Should the permit be granted it is recommended that conditions be imposed for the purposes of weed management, rehabilitation, flora management, watercourse management, record keeping and permit reporting.

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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.
DMP	Department of Mines and Petroleum, 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.