Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.:	8771/1
Permit type:	Purpose Permit

1.2. Proponent details

Proponent's name:	**Hamersley Resources Limited**

1.3. Property details

Property:	*Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserves 70/4192, 70/4882, 70/4883
Local Government Area:	Shire of East Pilbara
Colloquial name:	Rhodes Ridge

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
805		Mechanical Removal	Mineral Exploration, Hydrogeological and Geotechnical Investigations, Camp and Associated Activities

1.5. Decision on application

Decision on Permit Application:	Grant
Decision Date:	27 February 2020

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The vegetation of the application area is broadly mapped as the following Beard vegetation associations (GIS Database):

18: Low woodland; mulga (*Acacia aneura*);
29: Sparse low woodland; mulga, discontinuous in scattered groups;
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* and
175: Short bunch grassland – savanna/grass plain.

The clearing permit boundary covers an area of over 8,100 hectares. Several flora surveys have been conducted over portions of the permit boundary with the most recent undertaken in September 2019. The following vegetation associations have been recorded within the application area (Astron, 2019):

Vegetation of Hills and Slopes

H11: (*Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees with) *E. gamophylla* low open mallee woodland to low mallee woodland over mixed *Acacia* spp. scattered tall shrubs to tall open shrubland over *Triodia vanleeuwenii* and *T. pungens* open hummock grassland to hummock grassland;

H16: *Acacia trudgeniana* and *A. pruinocarpa* tall open shrubland to tall shrubland over *Triodia pungens* hummock grassland (with *Eriachne mucronata* scattered tussock grasses);

H17: *Eucalyptus leucophloia* subsp. *leucophloia* or *Corymbia deserticola* subsp. *deserticola* scattered low trees with *Acacia pruinocarpa* and *A. aptaneura* (*A. trudgeniana* or *A. marramamba*) scattered tall shrubs to tall open shrubland over *Triodia pungens* hummock grassland;

H18: *Eucalyptus leucophloia* subsp. *leucophloia* (and/or *Corymbia hamersleyana*) scattered low trees with *Acacia aptaneura*, *A. catenulata* subsp. *occidentalis* and *A. pruinocarpa* tall open shrubland to tall shrubland over *Triodia pungens* and *T. vanleeuwenii* (*T. wiseana*) very open hummock grassland to hummock grassland;

H19: *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Acacia pruinocarpa* and *A. catenulata* subsp. *occidentalis* (*A. sibirica, A. rhodophloia* and/or *A. aptaneura*) tall open shrubland to tall shrubland over *Triodia vanleeuwenii* and *T. pungens* (*T. wiseana*) hummock grassland;

H20: *Eucalyptus victrix* and/or *Corymbia candida* scattered low trees with *Acacia aptaneura* and/or *A. pruinocarpa* (*A. tetragonophylla*) tall open shrubland to tall shrubland over *Ptilotus obovatus* low open shrubland to shrubland over **Cenchrus* spp. and *Themeda triandra* very open tussock grassland;

H21: *Eucalyptus repullulans* low open mallee woodland to low mallee woodland with *Acacia pruinocarpa* and/or *A. aptaneura* (and *A. tetragonophylla*) scattered tall shrubs to tall open shrubland over *Ptilotus obovatus* low open shrubland over *Triodia wiseana* open hummock grassland to hummock grassland;

H22: (*Corymbia ferriticola* or *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees with) *Acacia catenulata* subsp. *occidentalis, A. aptaneura* and/or *A. pruinocarpa* tall open shrubland to tall shrubland over *Triodia pungens* and/or *T. vanleeuwenii* and/or *T. wiseana* very open hummock grassland with *Eriachne mucronata* scattered tussock grasses to very open tussock grassland;

Vegetation of Plains

P1: *Acacia aptaneura* and *A. catenulata* subsp. *occidentalis,* (*A. pruinocarpa*) tall shrubland to tall open scrub over *Eremophila forrestii* subsp. *forrestii* open shrubland to shrubland over *Triodia pungens* (*T. vanleeuwenii*) scattered hummock grasses to very open hummock grassland;

P3: *Acacia aptaneura*, *A. catenulata* subsp. *occidentalis* and *A. pruinocarpa* tall open shrubland to tall shrubland over *Eremophila forrestii* subsp. *forrestii* scattered shrubs to open shrubland over *Triodia pungens* open hummock grassland to hummock grassland;

P5: *Acacia aptaneura* tall shrubland over *Aristida obscura*, *Aristida ingrata* and *Themeda triandra* very open tussock grassland;

P7: *Acacia aptaneura* and *A. catenulata* subsp. *occidentalis* (*Grevillea berryana*) tall shrubland over *Ptilotus schwartzii* var. *schwartzii* low scattered shrubs over *Triodia melvillei* scattered hummock grasses to very open hummock grassland with *Aristida contorta* scattered tussock grasses;

P8: (*Corymbia candida*, *Eucalyptus xerothermica* and/or *E. victrix* scattered low trees with) *Acacia aptaneura* (*A. catenulata* subsp. *occidentalis* and *A. pruinocarpa*) tall open shrubland to tall shrubland over *Ptilotus obovatus* low scattered shrubs to low open shrubland over *Themeda triandra*, *Chrysopogon fallax*, *Enneapogon* spp. and *Eragrostis* spp. scattered tussock grasses to very open tussock grassland;

P9: *Acacia aptaneura* (and *A. pteraneura*) scattered tall shrubs over *Eremophila lanceolata* or *E. caespitosa* and/or *Ptilotus schwartzii* var. *schwartzii* low scattered shrubs to low open shrubland over *Aristida contorta* scattered tussock grasses to very open tussock grassland;

P11: *Acacia aptaneura* tall open shrubland to tall shrubland over *Eremophila lanceolata* low scattered shrubs to low open shrubland over *Triodia melvillei* very open hummock grassland with *Aristida contorta* and Poaceae sp. scattered tussock grasses to very open tussock grassland;

P12: *Acacia aptaneura* or *A. pachyacra* and/or *Acacia pruinocarpa* scattered tall shrubs over *Triodia melvillei* open hummock grassland with *Eragrostis eriopoda* and/or *Aristida contorta* scattered tussock grasses;

P13: *Eucalyptus xerothermica* and/or *Corymbia candida* scattered low trees over *Acacia aptaneura* and *Hakea lorea* subsp. *lorea* scattered shrubs to tall open shrubland over *Themeda triandra* (*Chrysopogon fallax*, *Eragrostis* spp. and *Aristida* spp.) open tussock grassland to tussock grassland;

P14: *Acacia aptaneura* and *A. catenulata* subsp. *occidentalis* (*A. pruinocarpa* and *A. ayersiana*) tall shrubland over *Eremophila forrestii* subsp. *forrestii* scattered shrubs over *Ptilotus obovatus* low scattered shrubs over *Triodia melvillei* open hummock grassland to hummock grassland;

P15: (*Eucalyptus victrix* scattered trees with *Acacia aptaneura* scattered tall shrubs over) *Astrebla elymoides* (*Aristida latifolia*, *Chrysopogon fallax*, and *Eragrostis setifolia*) open tussock grassland to tussock grassland;

P16: (*Eucalyptus xerothermica* scattered low trees with *Acacia aptaneura* and/or *Hakea lorea* subsp. *lorea* scattered tall shrubs over) *Aristida latifolia* and *Eragrostis* spp. open tussock grassland;

P17: *Eucalyptus victrix* scattered low trees to open woodland with *Acacia aptaneura* tall open shrubland to tall shrubland over *Themeda triandra*, *Chrysopogon fallax* and *Aristida latifolia* very open tussock grassland to tussock grassland;

Vegetation of Drainage Lines

D1: *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees to low open woodland with *Petalostylis labicheoides*, *Acacia monticola* and *A. maitlandii* scattered tall shrubs to tall shrubland over *Dodonaea lanceolata* var. *lanceolata* and *Androcalva luteiflora* scattered shrubs to open shrubland over *Triodia pungens* very open hummock grassland to open hummock grassland with *Themeda triandra* and *Eriachne mucronata* very open tussock grassland to open tussock grassland;

D2: *Acacia aptaneura*, *A. catenulata* subsp. *occidentalis* and *A. pruinocarpa* tall shrubland to tall open scrub over *Petalostylis labicheoides* scattered shrubs to open shrubland over *Triodia pungens* very open hummock grassland with *Chrysopogon fallax* scattered tussock grasses;

D8: *Eucalyptus xerothermica* scattered low trees to low open woodland with *Acacia aptaneura* and *A. catenulata* subsp. *occidentalis* tall open shrubland to tall open scrub over *Triodia pungens* scattered hummock grasses to very open hummock grassland with *Themeda triandra* very open tussock grassland to open tussock grassland;

D11: *Eucalyptus victrix* (*E. xerothermica*) low open woodland to open woodland over *Rhagodia eremaea* scattered low shrubs over *Astrebla elymoides*, *Aristida latifolia* and *Eragrostis* spp. open tussock grassland;

D12: *Eucalyptus victrix* open woodland over *Duma florulenta* (and *Rhagodia eremaea*) open shrubland to shrubland over *Eriachne flaccida*, *Astrebla elymoides* and *Aristida latifolia* (*Chrysopogon fallax*) very open tussock grassland;

D13: *Eucalyptus victrix* open woodland over *Eulalia aurea*, *Themeda triandra* and *Eriachne flaccida* closed tussock grassland;

Cleared: Areas devoid of vegetation due to clearing for roads, tracks, drill lines, drill pads or other infrastructure.

Clearing Description

Rhodes Ridge project.
Hamersley Resources Ltd proposes to clear up to 805 hectares of native vegetation within a boundary of approximately 8,148 hectares, for the purposes of mineral exploration, hydrogeological and geotechnical investigations, camp and associated activities. The project is located approximately 33 kilometres northwest of Newman, within the Shire of East Pilbara.

Vegetation Condition

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

to

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The vegetation condition was derived from a vegetation survey conducted by Astron (2019).

The vegetation condition was described using a scale based on Trudgen (1988) and have been converted to the corresponding conditions from the Keighery (1994) scale.

Rainfall in the 2 years prior to the survey was below average. Consequently many of the flora species likely to be in the area were not able to be identified or had no material to allow confident identification (Astron, 2019).

3. Assessment of application against Clearing Principles

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

Comments

Proposal is not likely to be at variance to this Principle

The clearing permit application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion (GIS Database). The Hamersley subregion is characterised by ranges and plateaux, dissected by gorges, supporting Mulga low woodland over bunch grass (CALM, 2002).

A flora and vegetation survey of the application area identified 27 vegetation units present (Astron, 2019). None of these vegetation associations were considered to be a Threatened Ecological Community (Astron, 2019; GIS Database). The vegetation description for the vegetation unit D12 is considered to be analogous to the description of the 'Coolibah woodlands over lignum (*Duma florulenta*) over swamp wandiree' Priority Ecological Community (PEC) (Astron, 2019). This PEC is a sub-type of the 'Coolibah-lignum flats: *Eucalyptus victrix* over lignum community' PEC (DBCA, 2019). The vegetation unit P15 has similarities with the 'West Angelas Cracking-Clays' PEC (Astron, 2019). Due to the poor seasonal conditons at the time of the flora survey, many grass species were not able to be identified to the species level which limited the ability to compare against the characteristic species of the PEC (Astron, 2019). However, despite the limitations in identifications, it is considered that vegetation unit P15 is likely to represent the 'West Angelas Cracking-Clays' PEC (Astron, 2019). Disturbance within the areas of PEC should be avoided and potential impacts may be minimised by the implementation of a condition excluding clearing of these vegetation communities.

The flora survey of the application area recorded 192 flora species from 34 families and 91 genera (Astron, 2019). Due to the below average rainfall prior to the survey, many species were not present and the floristic diversity was considered to be below average for the region (Astron, 2019). No Threatened flora species have been recorded within the application area (Astron, 2019; GIS Database). Three species of Priority flora were recorded during the flora survey of the application area; *Aristida jerichoensis* var. *subspinulifera* (Priority 3), *Indigofera gilesii* (Priority 3) and *Rhagodia* sp. Hamersley (Priority 3) (Astron, 2019).

Aristida jerichoensis var. *subspinulifera* was recorded from plains habitat with three locations recorded within the P8 vegetation unit and another location within the P9 vegetation unit (Astron, 2019). There was 55 individuals recorded across these locations however, it is likely that in a more favourable season with the grass species in better condition, that this species would be recorded at further locations (Astron, 2019). Vegetation units P8 and P9 are well represented and widespread across the application area with 1,061 and 1,430.7 hectares mapped respectively (Astron, 2019). Together they comprise 30.5% of the vegetation mapped during the flora survey (Astron, 2019). The proposed clearing is not likely to significantly reduce the amount of habitat for this species, however impacts to Priority flora should be avoided where possible.

There were 12 individuals of *Indigofera gilesii* recorded from 4 locations within the application area (Astron, 2019). All of these records were from rocky gully habitat in the H22 vegetation unit (Astron, 2019). There was 31.6 hectares of vegetation unit H22 mapped within the application area (Astron, 2019). A further 67 individuals of this species have recently been recorded from 5 locations approximately 11 kilometres west of the permit area, from within gully and gorge habitats (Astron, 2019). Given *Indigofera gilesii* inhabits vegetation

units which are more restricted in the landscape, potential clearing of its habitat has the potential to be more significant than other Priority flora likely to be within the permit area.

Rhagodia sp. Hamersley was recorded from 130 locations within the permit area with a total of 376 individuals counted (Astron, 2019). It was widespread across the permit area with the majority of the records from plain habitat (Aston, 2019). It was recorded in 10 different vegetation units on plains, however it was also found on hills and slopes vegetation units and drainage lines units (Astron, 2019). Recent targeted searches have identified over 22,000 individuals of *Rhagodia* sp. Hamersley within the local area (20 kilometre radius) (Astron, 2019). Given the abundance of this species and the wide range of habitats it occupies, the proposed clearing is not likely to have a significant impact on this species.

Vittadinia sp. Coondewanna Flats (Priority 1) has been previously recorded within the permit area but was not recorded during the current survey (Astron, 2019; GIS Database). As this an annual herbaceous species, it is not likely to be detectable until surveys are undertaken following adequate rainfall. It is known from floodplains and gilgai sandy clay and is most likely to be found in vegetation units P9, P15, P16 and P17. *Isotropis parviflora* (Priority 2) was previously recorded in the survey area in 2014 from two locations (Astron, 2019). This species was searched for at known locations but was not able to be found during the most recent flora survey (Astron, 2019). This species is thought to be short lived and may require favourable conditions to be detectable (Astron, 2019). *Teucrium pilbaranum* (Priority 2), *Goodenia* sp. East Pilbara (Priority 3), *Themeda* sp. Hamersley Station (Priority 3) and *Goodenia nuda* (Priority 4) have also all been previously recorded within the permit area, however due to the poor season prior to the survey, were not able to be detected during the most recent flora survey (Astron, 2019; GIS Database). The Priority flora species *Euphorbia inappendiculata* var. *queenslandica* (Priority 1), *Aristida lazaridis* (Priority 2), *Oxalis* sp. Pilbara (Priority 2) and *Xerochrysum boreale* (Priority 3) have been previously recorded in the vicinity of the permit area and were also unable to be detected due to low rainfall season proceeding the survey. Based on known records and habitat preferences, they are all considered likely to be present within the permit area (Astron, 2019).

The vegetation units with the potential to support the highest diversity of Priority flora species (based on records from the current flora survey, previous known records and species likely to occur based on the habitat present) are the P8 (five species), P9 (nine species), P16 (six species) and P17 (ten species) vegetation units (Astron, 2019). Apart from vegetation unit P16, which had 38 hectares mapped in the permit area, the other three vegetation units all had over 1,000 hectares mapped during the flora survey (Astron, 2019). Along with vegetation unit P3 (which has records of two Priority flora species), these four vegetation units comprise over 60% of the permit area (Astron, 2019).

Whilst the proposed clearing is not likely to have an impact on the Priority flora at a regional level, the cumulative impacts of clearing on these species can have an impact in the longer term. Where possible, impacts to Priority flora species and their habitat should be avoided. Potential impacts on Priority flora may be minimised by the implementation of a flora management condition.

There were five introduced flora species recorded within the permit area (Astron, 2019). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This can in turn lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

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

Methodology

Astron (2019)
CALM (2002)
DBCA (2019)

GIS Database:
- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Flora
- Threatened Fauna

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

Comments

Proposal may be at variance to this Principle

A Level 1 fauna survey over the permit area identified the following fauna habitats (Astron, 2019):

- Clay plain
- Mulga woodland
- Low hills and slopes

- Rocky hill
- Minor drainage

The clay plain habitat was the most common habitat found within the permit area (Astron, 2019). This habitat has a moderate diversity of microhabitats, including tree hollows and logs and some areas of sandy soils suitable for burrowing species (Astron, 2019). Both the mulga woodland and low hills and slopes habitat were considered to be of low value to a majority of fauna species due to a low diversity of microhabitats (Astron, 2019). The rocky hill habitat also has a low diversity of microhabitats, however it was considered to be of moderate value for fauna due to its potential for supporting conservation significant fauna (Astron, 2019). The minor drainage habitat was also considered to have a moderate value for fauna (Astron, 2019). This habitat has a moderate diversity of microhabitats, including tree hollows and woody debris (Astron, 2019). Drainage lines are also often used by fauna to traverse between habitats.

Based on known records and the habitats present within the permit area, there are a number of conservation significant fauna species which are likely to be present. The Endangered species Northern Quoll (*Dasyurus hallucatus*), the Vulnerable species Ghost Bat (*Macroderma gigas*), Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) and Pilbara Olive Python (*Liasis olivaceus barroni*) and Priority 2 species Pilbara Barking Gecko (*Underwoodisaurus serosus*) and *Lerista macropisthopus remota* are all considered likely or have the potential to be present within the permit area (Astron, 2019). The Priority 4 species Western Pebble-mound Mouse (*Pseudomys chapmani*) has been recorded within the permit area during the current survey (Astron, 2019).

The permit area does not contain any gorge/gully or breakaway habitat which are more likely to contain deep/humid caves, water sources and areas of shelter for the Ghost Bat, Northern Quoll, Pilbara Leaf-nosed Bat and Pilbara Olive Python (Astron, 2019). However, all four of these species are likely to forage within the permit area. There is a mine adit within the permit area in which Ghost Bats have been known to roost in low numbers (Astron, 2019). A condition on clearing permit 8270/1 which overlaps this permit excludes clearing within 200 metres of this adit. A replicate condition on this permit may minimise the potential impacts on the Ghost Bat.

The Pilbara Barking Gecko and *Lerista macropisthopus remota* are likely to be found within the application area, within the Rocky Hill habitat, and the Mulga Woodland and Clay Plain habitats. The habitats suitable for these species are widespread and common throughout the Pilbara region (Astron, 2019). The application area is unlikely to represent significant habitat for these species. The application area is also considered to have a low diversity of micro habitats that are utilised by these species, generally due to the sparse understorey and leaf litter present, or soils being generally stony and compact (Astron, 2019).

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

Methodology Astron (2019)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

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

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

There are no known records of Threatened flora within the application area (GIS Database). Flora surveys of the application area did not record any species of Threatened flora (Astron, 2019). Based on the habitat present within the permit area, it is not likely that the vegetation would support Threatened flora species (Astron, 2019; GIS Database).

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

Methodology Astron (2019)

GIS Database:
- Pre-European Vegetation
- Threatened and Priority Flora

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

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

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database). A flora and vegetation survey of the application area did not identify any

TECs (Astron, 2019). Based on the vegetation present and the known distribution of the TECs in the Pilbara bioregion, the vegetation within the permit area is not likely to comprise or be necessary for the maintenance of a TEC.

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

Methodology Astron (2019)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

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

Comments

Proposal is not at variance to this Principle

The application area falls within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99.57% of the pre-European vegetation still exists in the Pilbara Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 18, 29, 82 and 175 (GIS Database). These vegetation associations have not been extensively cleared as over 99% of the pre-European extent of each of these vegetation associations remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). The permit area does not contain any remnants nor does it form part of any remnants in the local area (GIS Database).

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

Methodology Government of Western Australia (2019)

GIS Database:
- IBRA Australia
- Imagery
- 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 area proposed to clear (GIS Database). There are numerous minor ephemeral watercourses within the permit boundary (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The vegetation associations D1, D2, D8, D11, D12 and D13 were all identified as growing in association with drainage lines (Astron, 2019). In respect to fauna habitat, drainage habitat is often restricted at a local level and has the potential to support larger trees which can be used for roosting and nesting. They also often have more abundant leaf litter and looser soil which supports more burrowing animals. Whilst riparian vegetation is restricted in the local area, drainage lines are common in the surrounding region and the proposed clearing is not likely to clear a significant amount of this vegetation.

Based on the above, the proposed clearing is at variance to this Principle**.** Potential impacts to vegetation growing in association with a watercourse may be minimised by the implementation of a watercourse management condition.

Methodology Astron (2019)

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 area lies within the Boolgeeda, Newman, Spearhole and Wannamunna land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development).

Excluding the Wannamunna land system, all of the land systems within the permit area are generally not prone to erosion (Van Vreeswyk et al., 2004). The Wannawunna land system generally has a low susceptibility to erosion, however the system is prone to degradation if grazing pressure is excessive (Van Vreeswyk et al.,

2004). Disturbances to overland flow processes by inappropriate positioning or construction of infrastructure such as roads can have adverse effects on vegetation (Van Vreeswyk et al., 2004).

Provided the clearing is not concentrated in one area, the proposed clearing of 805 hectares across a permit area of approximately 8,148 hectares is not likely to cause appreciable land degradation. Potential impacts from land degradation may be minimised by the implementation of a rehabilitation condition.

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:
- Landsystem Rangelands

(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**

There are no conservation areas in the vicinity of the application area. The nearest Department of Biodiversity, Conservation and Attractions managed land is the former Juna Downs Pastoral Lease which is located approximately 37 kilometres northwest of the application area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.

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

Methodology GIS Database:
- DPaW Tenure

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

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

There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear, however there are numerous minor ephemeral watercourses within the permit area (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows.

The groundwater salinity of the permit area has been broadly mapped as being 500 - 1,000 milligrams per litre total dissolved solids (GIS Database). The depth of the groundwater in the area is not known, however, the proposed clearing of 805 hectares within a larger boundary of approximately 8,148 hectares is unlikely to cause deterioration in the quality of underground water.

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

Methodology GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, Linear
- Public Drinking Water Source Areas

(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 climate of the region is semi-arid, with a low average rainfall of approximately 324.3 millimetres per year (BoM, 2020).

There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

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

Methodology BoM (2020)

GIS Database:
- Hydrographic Catchments - Catchments

- Hydrography, linear

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

The clearing permit application was advertised on 13 January 2020 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim over the area under application (DPLH, 2020). This claim has been determined by the Federal Court on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are numerous registered Aboriginal Sites of Significance within the application area (DPLH, 2020). 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 Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

Methodology DPLH (2020)

4. References

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DPLH (2020) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. http://maps.daa.wa.gov.au/AHIS/ (Accessed 24 February 2020).

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

Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) An inventory and condition survey of the Pilbara Region, Western Australia. Technical Bulletin No. 92. Department of Agriculture, South Perth, Western Australia.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
DoEE	Department of the Environment and Energy, Australian Government
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora
DoE	Department of the Environment, Australian Government (now DoEE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DoEE)
DWER	Department of Water and Environmental Regulation, Western Australia

EPA	Environmental Protection Authority, Western Australia
EP Act	*Environmental Protection Act 1986*, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	*Rights in Water and Irrigation Act 1914*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**
Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**
Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**
Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX **Extinct species**
Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW **Extinct in the wild species**
Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its*

life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI **Migratory species**
Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD **Species of special conservation interest (conservation dependent fauna)**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS **Other specially protected species**
Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 **Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 **Priority Two - Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 **Priority Three - Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 **Priority Four - Rare, Near Threatened and other species in need of monitoring**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.