Government of **Western Australia**
Department of **Mines and Petroleum**

Clearing Permit Assessment Report

1. Application details

1.1. Permit application details

Permit application No.: 6916/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Rio Tinto Exploration Pty Ltd**
Postal address: PO Box 175, Belmont WA 6984
Contacts:
Phone: 08 9270 9255
Fax: 08 9270 9223
Email: Jar.andersen@riotinto.com

1.3. Property details

Property: *Iron Ore (Mt Bruce) Agreement Act 1972*, Mineral Lease 252SA (AML70/252)
Colloquial name: Turee Syncline Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
10		Mechanical Removal	Drill Sites, Access Tracks and Camp

1.5. Decision on application

Decision on Permit Application:
Decision Date:

2. Background

2.1. **History** (including previous clearing permits, compensation paid, caveats on title deeds etc.)

Date	Comments
14 August 2015	Advertised on Monday, 15 February 2016

2.2. Existing environment and information

2.2.1. Description of the native vegetation under application

Vegetation Description

Beard vegetation associations have been mapped for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database):

Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and
Beard vegetation association 567: Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii*.

Previous surveys in the area by GHD (2009a; 2009b) and Mattiske (2011) have identified sixteen vegetation assemblages within the application area:

Flowlines

MF (Minor Flowlines) - Low Open Woodland to High Open Shrubland of *Acacia aneura*, *A. pruinocarpa*, *A. pyrifolia*, *Senna artemisioides* subsp. *oligophylla*, over Open Shrubland of *S. glutinosa x luerssenii*, *S. stricta*, *Corchorus lasiocarpus* over, Low Open Shrubland of *Ptilotus obovatus*, *Indigofera monophylla*, *Rhynchosia minima* over Open Tussock Grassland of *Aristida inaequiglumis*, *Themeda* sp. Mt Barricade, *Cymbopogon* sp., *Enneapogon caerulescens* with Open Hummock Grassland of *Triodia wiseana* with *Triodia* spp.

LW1 + HG3 (Low Woodland 1, Shrubland, Hummock Grassland 2) - Low Woodland of *Acacia aneura*, *A. pruinocarpa*, *A. citrinoviridis* over Open Shrubland of *Senna stricta*, *Senna artemisioides* subsp. *oligophylla*, *Eremophila forrestii*, over Low Open Shrubland of *Senna* spp., *Sida* spp., *Marieana* spp. over Very Open Hummock Grassland of *Triodia wiseana* with Very Open Tussock Grassland of *Enneapogon caerulescens*, *Paspalidium basicladum*.

LW2 + HG1 (Low Woodland 2, Shrubland, Hummock Grassland 1) - Low Woodland of *Acacia citrinoviridis*, *A. aneura, A. hamersleyensis*, over Open Shrubland of *Senna* spp., *Eremophila latrobei, Dodonaea pachyneura, Corchorus lasiocarpus*, over Low Open Shrubland of *Dipteracanthus australasicus, Lepidium pedicellosum*, over Open Hummock Grassland of *Triodia epactia* with Open Tussock Grassland of *Cymbopogon ambiguus*, *Enneapogon caerulescens, Aristida* spp.

W (Woodland, Shrubland, Hummock Grassland) - Low Woodland to Low Open Forest of *Eucalyptus victrix, Corymbia ferriticola, Acacia citrinoviridis, A. pruinocarpa, A. ayersiana* over Scattered Tall Shrubs of *Rhagodia eremaea, Gossypium robinsonii*, over Open Shrubland of *Senna* spp., *Jasminum didymum* subsp. *lineare*, over Low Shrubland of *Dipteracanthus australasicus, Dicladanthera forrestii, Harniera kempeana, Corchorus lasiocarpus*, over Very Open Hummock Grassland of *Triodia epactia*, *T. longiceps,* with Very Open Tussock Grassland of **Cenchrus ciliaris, Themeda* sp. Mt Barricade, *Cymbopogon ambiguus, Enneapogon caerulescens*.

Hills

HG1 (Hummock Grassland 1) - Hummock Grassland of *Triodia epactica* with emergent Scattered Low Trees (variable) of *Eucalyptus leucophloia, Acacia pruinocarpa, Grevillea berryana, Hakea chordophylla, Codonocarpus cotonifolia,* with emergent scattered Tall Shrubs to Shrubs (variable) of *Petalostylis labicheioides, Acacia maitlandii, A. pyrifolia, A. inaequilatera, Senna* spp., *Eremophila phyllopoda, E. jucunda*, with Low Scattered Shrubs of *Ptilotus calostachyus, Goodenia stobbsiana, Lepidium pedicellosum, Solanum lasiophyllum*.

HG2 (Hummock Grassland 2) - Hummock Grassland of *Triodia longiceps, T. epactia* with emergent Scattered Low Trees of *Acacia pruinocarpa*, with emergent Scattered Shrubs to Low Shrubs of *Eremophila cuneifolia, E. latrobei, Senna* spp., *Sida* spp., *Stylobasium spathulatum, Triumfetta leptacantha, Lepidium pedicellosum*.

HG3 (Hummock Grassland 3) - Closed Hummock Grassland to Hummock Grassland of *Triodia wiseana*, with emergent Scattered Low Trees of *Acacia pruinocarpa, A. inaequilatera*, with emergent Scattered Shrubs to Low Shrubs of *A. arida, A. bivenosa, A. synchronicia, A.tetragonophylla, Senna spp., Tribulus suberosus, Eremophila cuneifolia, E. jucunda, E. fraseri.*

HG1 + S1 (Hummock Grassland 1, Shrubland 1) - Open Scrub to High Open Shrubland of *Acacia maitlandii* with scattered *Senna* spp., *Eremophila* spp., *Petalostylis labicheoides, Tribulus suberosus, Goodenia stobbsiana, Ptilotus* spp., with emergent Scattered Low Trees of *Eucalyptus leucophloia, E. gamophylla, E. kingsmillii, Acacia pruinocarpa, A. pyrifolia*, over Closed Hummock Grassland to Hummock Grassland of *Triodia epactica* with occasional *Triodia pungens,* with Very Open to Scattered Tussock Grassland of *Amphipogon* spp., *Eriachne* spp.

HG1 + S2 (Hummock Grassland 1, Shrubland 2) - High Shrubland to High Open Shrubland of *Petalostylis labicheoides* with scattered *Senna* spp., *Eremophila* spp., *Acacia maitlandii, Tribulus suberosus, Goodenia stobbsiana, Ptilotus* spp. *Solanum lasiophyllum, Corchorus lasiocarpus*, with emergent Scattered Low Trees of *Acacia pruinocarpa, A. pyrifolia, A. aneura*, over Hummock Grassland to Open Hummock Grassland of *Triodia epactica.*

HG1 + S3 (Hummock Grassland 1, Shrubland 3) - High Shrubland to High Open Shrubland of *Acacia maitlandii, Petalostylis labicheoides* with scattered *Senna* spp., *Eremophila spp., Tribulus suberosus, Goodenia stobbsiana, Ptilotus* spp., with emergent Scattered Low Trees of *Eucalyptus leucophloia, Corymbia ferriticola, A. pyrifolia, Hakea chordophylla,* over Closed Hummock Grassland to Hummock Grassland of *Triodia epactica* with occasional *Triodia pungens*, with Very Open to Scattered Tussock Grassland of *Enneapogon caerulescens.*

HG1 + S4 (Hummock Grassland 1, Shrubland 4) - High Shrubland of Mixed Acacia spp. (typically: *Acacia pruinocarpa*, *A. pyrifolia, A sibirica, A. inaequilatera, A. bivenosa*, etc.) over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., *Petalostylis labicheoides* scattered *Goodenia stobbsiana, Solanum lasiophyllumn, Ptilotus* spp., with emergent Scattered Low Trees of *Eucalyptus leucophloia*, over Hummock Grassland of *Triodia epactica* Very Open Tussock Grassland of *Eriachne* spp., *Themeda* sp. Mt Barricade, *Cymbopogon ambiguus*.

HG3 + S4 (Hummock Grassland 2, Shrubland 4) - High Shrubland of Mixed *Acacia* spp. (typically: *Acacia pruinocarpa, A. pyrifolia, A. bivenosa, A. adsurgens, A. synchronicia,* etc.) over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., *Petalostylis labicheoides* over Hummock Grassland of *Triodia wiseana.*

HG1 + LW1 (Hummock Grassland 1 + Low Open Woodland 1) - Low Open Forest to Low Woodland of *Acacia aneura* with *A. ayersiana*, *A. hamersleyensis* over High Shrubland of *Acacia tetragonophylla, A. synchronicia, A. pruinocarpa, Psydrax latifolia* over Shrubland to Open Shrubland of *Senna* spp., *Eremophila spp*., over Low Shrubland to Low Open Shrubland of *Senna stricta, Maireana melanocoma, Enchylaena tomentosa, Sclerolaena* spp., over Hummock Grassland to Open Hummock Grassland of Triodia epactia with scattered *T.wiseana, T. longiceps*, with Open Tussock Grassland of *Eriachne* spp*., Aristida* spp., *Enneapogon* spp.

HG1 + LW2 (Hummock Grassland 1, Low Open Woodland 3) - Low Open Woodland to Very Open Tree Mallee of *Eucalyptus gamophylla, E. kingsmillii, E. leucophloia, E. trivalva* over High Open Shrubland of *Acacia pyrifolia, A. tumida, A. pruinocarpa, A. hamersleyensis* with *Petalostylis labicheoides* over Open Shrubland to Low Open *Shrubland of Eremophila spp., Senna glutinosa, Psydrax latifolia, Tribulus suberosus* over Hummock Grassland of *Triodia epactia* with Scattered Tussock Grasses of *Eriachne* spp., *Cymbopogon ambiguus*.

LW1 + HG1 (Low Woodland 1, Hummock Grassland 1) - Low Open Forest to Low Woodland of *Acacia aneura* with *A. ayersiana, A. hamersleyensis* over High Shrubland of *Acacia tetragonophylla, A. synchronicia, A. pruinocarpa, Psydrax latifolia* over Shrubland to Open Shrubland of *Senna* spp., *Eremophila* spp., over Low Shrubland to Low Open Shrubland of *Senna stricta, Maireana melanocoma, Enchylaena tomentosa, Sclerolaena* spp., over Hummock Grassland to Open Hummock Grassland of *Triodia epactia* with scattered *T. wiseana, T. longiceps*, with Open Tussock Grassland of *Eriachne* spp., *Aristida* spp., *Enneapogon* spp.

LW1 + HG2 (Low Woodland 1, Hummock Grassland 2) - Low Woodland of *Acacia aneura*, *A. pruinocarpa* over High Open Shrubland of *Acacia tetragonophylla, Santalum lanceolatum* over Open Heath to Shrubland of *Senna* spp., *Eremophila* spp., over Low Open Shrubland of *Ptilotus* spp. And mixed chenopods, over Very Open Hummock Grassland of *Triodia longiceps.*

Plains

HG5 + S4 (Hummock Grassland 5, Shrubland 4) - High Shrubland of *Acacia tetragonophylla* with *A. aneura, A. hamersleyensis* over Shrubland of *Ptilotus obovatus, Eremophila cuneifolia* with *Senna* spp., *Chenopodium auricomum* over Open Shrubland of *Corchorus lasiocarpus*, *Enchylaena tomentosa, Tribulus suberosus, Ptilotus* spp. over Hummock Grassland of *Triodia longiceps, T. wiseana*.

Minor Gullies and Creeklines

3a - Low shrubland of *Acacia pyrifolia, Petalostylis labicheoides* over *Triodia* species and low shrubs and herbs on minor gullies in undulating hills.

Low Undulating Hills and Associated Slopes

10b - Hummock grassland of *Triodia wiseana* with patches of *Acacia arida, A. pyrifolia, A. tetragonophylla* over *Eremophila cuneifolia* over low herbs and grasses on lower undulating hills.

Clearing Description

Turee Syncline Project
Rio Tinto Exploration Pty Ltd proposes to clear up to 10 hectares of native vegetation within a total boundary of approximately 1,259 hectares for the purpose of drill sites, access tracks and camp. The proposal is located approximately 12 kilometres east of Paraburdoo in the Shire of Ashburton.

Vegetation Condition

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

To:

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

Comment

The vegetation condition is derived from vegetation and flora surveys undertaken by GHD (2009a; 2009b) and Mattiske (2011).

2.2.2. Items of interest

Theme	Value	Within meters

3. Permit assessment activities

Date	Activity	Comment	Trim Ref.
22 January 2016	Department has received application		
15 February 2016	Application advertised		

4. Assessment of application against Clearing Principles

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

Comments

Proposal may be at variance to this Principle

The application area occurs within the Hamersley (PIL3) Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS Database). This subregion is generally described as Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM, 2002).

The vegetation within the application area is broadly mapped as Beard vegetation associations 82 and 567, both of which have approximately 100% of their pre-European vegetation extent remaining in the bioregion (Government of Western Australia, 2014; GIS Database). The vegetation present within the application area is widely represented in the Hamersley sub-region and it is unlikely that the proposed clearing would impact biodiversity values within these vegetation types on a broader scale (Rio Tinto, 2012).

Two surveys (GHD, 2009a; Mattiske, 2011) have provided vegetation mapping for the application area, which has produced sixteen different vegetation types (Rio Tinto, 2012). None of the vegetation types were identified as being restricted to the application area and none are of particular conservation significance (Rio Tinto, 2012).

The study area and surrounds has been the subject of flora and vegetation surveys in 2003, 2008, 2009, and 2011 by Biota, GHD and Mattiske. Combined, these surveys covered over 12,000 hectares, including the application area. In July, August and September of 2003 a majority of the application area was surveyed by Biota, primarily for rare or unknown flora species. In June 2008, GHD undertook a Phase One field survey, returning in April 2009 to undertake a Phase Two flora survey over what is referred to as the Turee Syncline study area. In July 2011, Mattiske undertook a baseline vegetation and flora survey over a large area which

included the north eastern most corner of the application area (Biota, 2003; GHD, 2009a; GHD, 2009b; Mattiske, 2011; Rio Tinto, 2012).

The condition ranking of vegetation types was deemed to be 'completely degraded' to 'pristine', with some minor disturbances from access tracks and previous exploration activities and the rest of the vegetation largely intact (Keighery, 1994; Rio Tinto, 2012).

The flora within the application area is considered to be moderately diverse. For example, the flora surveys by GHD (GHD, 2009a; GHD 2009b) recorded a total of 327 flora taxa, compared to Karijini National Park (to the east of the survey area) which has recorded in excess of 500 taxa (Rio Tinto, 2012).

No Threatened Flora have been recorded in the application area. There has been three Priority Flora species recorded in the application area; *Eremophila coacta* (Priority 3), *Sida* sp. Barlee Range (Priority 3) and *Ptilotus mollis* (Priority 4) (DPaW, 2016; Rio Tinto 2012; GIS Database). All species were recorded numerous times within the application area but were also recorded numerous times outside of the application area (Rio Tinto, 2012). Similar habitat for these species is considered to be fairly common along the Hamersley Range (Rio Tinto, 2012).

GHD (2009a) recorded ten weed species, but considered that the survey area was relatively weed free. The weed species that have been recorded are Bipinnate Beggartick (*Bidens bipinnata*), Buffel Grass (*Cenchrus ciliaris*), Spiked Malvastrum (*Malvastrum americanum*), Whorled Pigeon Grass (*Setaria verticillata*), Indian weed (*Sigesbeckia orientalis*), *Cucumis melo* subsp. *agrestis*, Green Amaranth (*Amaranthus viridis*), Kapok Bush (*Aerva javanica*), Khaki Weed (*Alternanthera pungens*), and Ruby Dock (*Rumex vesicarius*) (GHD, 2009a). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

There are no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) occurring within the application area. The Brockman Iron cracking clay communities PEC is approximately 65 kilometres east of the application area.

The broad study areas described in Mattiske (2011), Biota (2003), GHD (2009a) and GHD (2009b) do comprise a relatively high level of biological diversity. However, the application area is much smaller than these study areas (1,259 hectares) and the area of proposed clearing smaller still (10 hectares).

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

Methodology

Biota (2003)
CALM (2002)
DPaW (2016)
GHD (2009a)
GHD (2009b)
Government of Western Australia (2014)
Keighery (1994)
Mattiske (2011)
Rio Tinto (2012)

GIS Database:
- Threatened and Prioirty Flora
- IBRA WA (Regions - Sub Regions)
- Pre-European Vegetation
- Threatened Ecological Sites Buffered

Officer Richard Smetana

(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

The study area and surrounds has been the subject of a Phase One and Phase Two vertebrate fauna study, both undertaken by GHD in June 2008 and October 2008 respectively (GHD, 2009a). These surveys covered 3,000 hectares, including the majority of the application area.

Based on these surveys, the application area includes four main habitat types:

- Ridges and scree slopes;
- Breakaways, cliff faces, gullies and gorges;
- Mulga woodland; and
- Drainage lines.

The greatest number of species was associated with the ridges and scree slopes and drainage lines habitats (GHD, 2009a). The breakaway, cliff faces, gullies and gorges habitat is likely to provide refugia for a number of native species. Given the scale and nature of the proposed activities, it is not anticipated that large amounts of

this habitat will be disturbed. These habitat types are considered to be well represented in the nearby Karijini National Park (Rio Tinto, 2012).

Thirteen species of conservation significance were identified during database searches as potentially occurring in the application area. Seven were recorded by the fauna surveys, in or adjacent to the application area. This includes three which have been identified as vulnerable to land clearing, because of their lack of mobility – Pilbara Leaf-nosed bat (*Rhinonicterus aurantia* – Vulnerable), Olive Python (*Liasis olivaceus barroni* – Vulnerable), and Western Pebble Mound Mouse (*Psuedomys chapmani* – Priority 4). The application area also contains suitable habitat for the Northern Quoll (*Dasyurus hallucatus* – Endangered). Potential roosting sites for the Pilbara Leaf-nosed Bat were identified at Turee Syncline, however, they have since been identified as being too shallow to support roost sites (Rio Tinto, 2012).

Given that the proposed clearing is spread over a large area (over 1,200 hectares), it is not expected to have a significant impact on habitat for these conservation significant fauna.

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

Methodology GHD (2009a)
Rio Tinto (2012)

Officer Richard Smetana

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

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

According to available databases, there are no records of Threatened Flora within the application area (GIS Database). No species of Threatened Flora have been recorded from any of the flora surveys conducted over the application area (Rio Tinto, 2012).

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

Methodology Rio Tinto (2012)

GIS Database:
- Threatened and Priority Flora

Officer Richard Smetana

(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**

According to available databases, there are no records of any Threatened Ecological Communities (TECs) within the application area (GIS Database). None of the vegetation communities identified during the vegetation surveys conducted over the application area was identified as being a TEC (Rio Tinto, 2012).

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

Methodology Rio Tinto (2012)

GIS Database:
- Threatened Ecological Sites Buffered

Officer Richard Smetana

(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 Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.6% of the pre-European vegetation remains (see table) (GIS Database, Government of Western Australia, 2014)).

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

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.
567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex and *Triodia basedowii*.

According to the Government of Western Australia (2014) approximately 99% of these Beard vegetation associations remain at both a state and bioregional level. Therefore the area proposed to be cleared does not

represent 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	17,808,657	17,733,584	~99.6	Least Concern	8.4
Beard veg assoc. – State					
82	2,565,901	2,553,217	~99.5	Least Concern	10.52
567	777,507	774,895	~99.7	Least Concern	22.5
Beard veg assoc. – Bioregion					
82	2,563,583	2,550,899	~99.5	Least Concern	~10.53
567	776,824	774,213	~99.7	Least Concern	~22.52

* Government of Western Australia (2014)
** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2014)

GIS Database:
- IBRA WA (Regions – Subregions)
- Pre-European Vegetation

Officer Richard Smetana

(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 numerous minor ephemeral watercourses within the application area (GIS Database). The vegetation surveys of the application area recorded five vegetation assemblages that were associated with either flowlines or creeklines (Rio Tinto, 2012). These vegetation assemblages are considered to be common within the local and regional area (Rio Tinto, 2012). Given that the proposed clearing is 10 hectares within a larger area of 1,259 hectares it is not anticipated that a large amount of these vegetation assemblages will be disturbed.

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

Methodology Rio Tinto (2012)

GIS Database:
- Hydrography, linear

Officer Richard Smetana

(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 has been mapped as occurring on the Newman, Rocklea, Platform and Marandoo land systems (GIS Database). All of these land systems are generally not prone to erosion (Van Vreeswyk et al., 2004). Areas likely to be more prone to erosion are the areas associated with drainage lines. Potential impacts caused by erosion may be minimised by the implementation of a staged clearing condition.

At a broad scale the surface soil pH of the application area is 5.5 to 6.5 and there is no known occurrence of acid sulphate soils (CSIRO, 2009). The average annual evaporation rate is over eight times the annual average rainfall so there is a low probability of the proposed clearing causing increased groundwater recharge resulting in rising saline water tables (GIS Database).

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

Methodology CSIRO (2009)
Van Vreeswyk et al. (2004)

GIS Database:
- Evaporation Isopleths

- Rainfall, Mean Annual
- Rangeland Land System Mapping

Officer Richard Smetana

(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 application area does not lie within any conservation areas or DPaW managed lands (GIS Database). The nearest conservation area is Karijini National Park which is located approximately seven kilometres east of the application area (GIS Database). The area surrounding Karijini National Park is largely uncleared, so the proposed clearing is not likely to disrupt any ecological linkages to the National Park (GIS Database).

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

Methodology GIS Database:
- DPaW Tenure
- Imagery

Officer Richard Smetana

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

There are numerous minor non-perennial watercourses within the application area (GIS Database). The majority of the surface water within the application area is likely to occur as sheet flow following heavy rains. With an annual evaporation rate over eight times the average annual rainfall any surface water is likely to evaporate quickly (GIS Database).

The groundwater within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. It would not be expected that the proposed clearing would cause salinity levels within the application or surrounding area to alter.

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

Methodology GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Satewide
- Hydrography, linear
- Rainfall, Mean Annual

Officer Richard Smetana

(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

With an average annual rainfall of 271 millimetres and an average annual evaporation rate of 3,400 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2016; GIS Database). Whilst large rainfall events may result in the flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

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

Methodology BoM (2016)
GIS Database:
- Evaporation Isopleths

Officer Richard Smetana

Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

Comments

There is one native title claim over the area under application (DAA, 2016)). This claim (WC10/16) has been registered with the Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases, there are numerous registered Aboriginal Sites of Significance within the application area (DAA, 2016)). 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 Regulation, Department of Parks and Wildlife and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 15 February 2016 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology DAA (2016)

Officer Richard Smetana

5. Assessor's recommendations

Comment / recommendation

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the *Environmental Protection Act 1986*, and the proposed clearing is at variance to Principle (f), may be at variance to Principle (a), is not likely to be at variance to Principles (b), (c), (d), (g), (h), (i), and (j), and is not at variance to Principle (e).

6. References

Biota (2003) Turee Creek Rare Flora Surveys. Prepared for Rio Tinto Iron Ore by Biota. December 2003.

BoM (2016) Climate Statistics for Australian Locations. A Search for Climate Statistics for Paraburdoo, Australian Government Bureau of Meteorology, <http://www.bom.gov.au/climate/averages/tables/cw_007178.shtml> accessed 16 March 2016.

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management, Western Australia.

CSIRO (2009) Australian Soil Resource Information System. Available online at: http://www.asris.csiro.au/index_ie.html Accessed on 22 March 2012.

DAA (2015) Aboriginal Heritage Inquiry System, Government of Western Australia, Department of Aboriginal Affairs, Perth, <http://maps.dia.wa.gov.au/AHIS2/> accessed 16 March 2016.

DPaW (2016) NatureMap - Mapping Western Australia Biodiversity, Department of Parks and Wildlife, <http://naturemap.dpaw.wa.gov.au/default.aspx> accessed 16 March 2016.

GHD (2009a) Report for Turee Syncline Project – Vegetation, Flora and Fauna Baseline Surveys. Prepared for Rio Tinto Iron Ore by GHD. March 2009.

GHD (2009b) Report for Turee Syncline – Phase Two Flora Survey. Prepared for Rio Tinto Iron Ore by GHD. October 2009.

Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.

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

Rio Tinto (2012) Statement Addressing the 10 Clearing Principles – Geotechnical and Hydrogeological Investigations – Turee Syncline. January 2011. Unpublished. Document number RTIO-HSE-0134276.

Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Technical Bulletin - An Inventory and Condition Survey of the Pilbara Region, Western Australia, No. 92. Department of Agriculture, Government of Western Australia, Perth, Western Australia.