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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6545/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Robe River Limited**

1.3. Property details

Property: *Iron Ore (Robe River) Agreement Act 1964*, Mineral Lease 248SA (AML 70/248)
General Purpose Lease 47/1235
General Purpose Lease 47/1236

Local Government Area: Shire of East Pilbara
Colloquial name: West Angelas Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 11 June 2015

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 for the whole of Western Australia. Four Beard vegetation associations are located within the application area (GIS Database):

Beard vegetation association 18: Low woodland; mulga (*Acacia aneura*);

Beard vegetation association 29: Sparse low woodland; mulga, discontinuous in scattered groups;

Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over Triodia wiseana; and

Beard vegetation association 169: Shrublands; mulga & minnieritchie scrub

Multiple flora surveys have been conducted within the clearing application area and a total of 250 vegetation units have been mapped. The main landform types within the application area are: plains, including Mulga woodlands and cracking clays; hills; gorges and gullies; and major and minor drainage lines (Rio Tinto, 2015).

Clearing Description West Angelas Project.
Robe River Limited proposes to clear up to 500 hectares of native vegetation within a total boundary of approximately 29,761 hectares, for the purpose of mineral exploration, hydrogeological and geotechnical investigations and associated activities. The project is located approximately 100 kilometres north west of Newman in the Shire of East Pilbara.

Vegetation Condition The majority of the vegetation in the application area appears to be in a "Very Good" to "Excellent" condition. An operational mine site is located within the application area boundary and historic clearing has occurred throughout the area, therefore parts of the vegetation have been highly disturbed or completely cleared.

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

To:

Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994)

Comment The vegetation condition was derived from available aerial imagery, previous clearing permit assessments and information obtained from past surveys within the area (GIS Database; Rio Tinto, 2015).

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 at variance to this Principle

The application area is located within the Hamersley subregion of the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). At a broad scale, vegetation of the Hamersley subregion can be described as Mulga low woodlands 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 objective of this application is to consolidate at least 11 existing clearing permits held by Robe River Limited. Existing live permits are to be surrendered and future clearing is to be conducted under CPS 6545/1. Based on reported annual clearing for existing live permits within the application area (of approximately 29,761 hectares), a total of 455.41 hectares of native vegetation have been cleared out of a possible 1771.2 hectares approved to be cleared. While this does not take into consideration areas cleared under Part IV approvals, the current application to clear up to 500 hectares will result in a reduction in the amount of native vegetation proposed to be cleared within the local area.

The western section of the application area borders the Karijini National Park, while the eastern end of the application area is at a distance of more than 30 kilometres (GIS Database). Given the application areas proximity to a National Park and that sixteen introduced (weed) species are known from the application area (Rio Tinto, 2015), the introduction and/or spread of weeds should be managed. 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 subjected 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.

The majority of the vegetation units known from the application area are considered to be well represented both locally and throughout the Hamersley subregion (Rio Tinto, 2015). However there are at least two vegetation units within the application area that have been identified as significant such as Mulga (*Acacia aneura*) on flats and lower slopes including grove / inter grove mulga and Ground water Dependent Ecosystems (GDEs). The Department of Parks and Wildlife (DPaW) lists a number of ecosystems within each IBRA subregion that are deemed to be other 'Ecosystems at Risk' and mulga (*Acacia aneura*) on flats and lower slopes including grove / inter grove mulga, eastern Hamersley Range may in future be deemed threatened should these be subject to ongoing threatening processes (DPaW, 2015a). GDEs are commonly known to rely on the availability of groundwater in order to maintain their structure and function. Areas of significant vegetation will be avoided where possible (Rio Tinto, 2015).

Multiple flora surveys have been conducted within the application area and a total of 250 vegetation units have been mapped (Rio Tinto, 2015). Previous surveys of the application area have recorded between 262 and 976 flora taxa.

Based on available aerial imagery, previous clearing permit assessments and information obtained from past surveys within the area, the condition of the vegetation varies, but appears to be in a predominantly 'Very Good' to 'Excellent' condition. However, disturbance has occurred within parts of the application area due to the presence of an operational mine and previous mineral exploration activities.

Twenty six Priority flora species have been recorded within the application area, this includes six Priority 1, five Priority 2, thirteen Priority 3 and two Priority 4 species. Of these, potential impacts to the following eight Priority flora species are considered to be of greatest significance (DPaW, 2015a):

- *Eremophila* sp. West Angelas (S. van Leeuwen 4068) (P1)
- *Hibiscus sp.* Mt Brockman (E. Thoma ET 1354) (P1)
- *Sida sp.* Hamersley Range (K. Newbey 10692) (P1)
- *Josephinia* sp. Marandoo (M.E. Trudgen 1554) (P1)
- *Aristida lazaridis* (P2)
- *Eremophila forrestii* subsp. Pingandy (M.E. Trudgen 2662) (P2)
- *Euphorbia clementii* (P2)
- *Oxalis* sp. Pilbara (M.E. Trudgen 12725) (P2)

DPaW (2015b) also recommended that *Aristida jerichoensis* var. *subspinulifera* (P3), *Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen 15708) (P2) and *Vittadinia pustulata* (P3) be avoided within the application area. Potential impacts to Priority flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition. The proponent has developed and will implement environmental controls and management procedures (Rio Tinto, 2015). All Priority listed flora will be avoided where possible.

Fauna habitats that occur within the application area are relatively common and widespread in the local area and in the Pilbara region (Rio Tinto, 2015). The gorge/gullies habitats found within the application area are considered the most significant fauna habitat, potentially providing habitat for species of conservation significance (Rio Tinto, 2015). Potential impacts to gorge/gullies habitat as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition.

There are no known Threatened Ecological Communities (TECs) mapped within the application area (GIS

Database), however the Priority Ecological Community (PEC) "West Angelas cracking clay community," a Priority 1 PEC, occurs throughout the central part of the application area. This community is thought to be in a mostly 'Excellent' condition and has a mapped extent of approximately 447 hectares within the application area. DPaW (2015a) has advised that all mapped occurrences of this community appear to fall within the application area, and significant impacts to the West Angelas cracking clay community should be avoided due to the community's highly restricted distribution (DPaW, 2015a).

Rio Tinto has committed to avoiding clearing within the PEC where possible and has advised that the only likely scenario for any clearing within the PEC would be if critical access is required (Rio Tinto, 2015). Potential impacts to the PEC as a result of any proposed clearing may be minimised by the implementation of a priority ecological community management condition.

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

Methodology

CALM (2002)
DPaW (2015a)
DPaW (2015b)
Rio Tinto (2015)
GIS Database:
- IBRA WA (Regions - Sub Regions)
- Pre-European vegetation
- Threatened Ecological Sites Buffered

(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 number of fauna surveys have been conducted either within, or within close proximity to, the application area. Over 63 fauna habitats have been described from the application area from 17 previous reports (Rio Tinto, 2015). The main landform types identified within the application area are: plain, including Mulga woodlands and cracking clay; hills; gorges and gullies; and major and minor drainage lines (Rio Tinto, 2015).

Three species of conservation significance listed as either threatened species under the *Environment Protection and Biodiversity Conservation Act* (EPBC) *1999* or protected under Western Australian legislation (*Wildlife Conservation Act 1950* (WC)) have been recorded within the application area (DPaW 2014; Rio Tinto, 2015):

- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* – EPBC Act Vulnerable, WC Act Vulnerable);
- Rainbow Bee-eater (Merops ornatus - EPBC Act Marine; Migratory); and
- Fork-tailed Swift – (*Apus pacificus* – EPBC Act Marine; Migratory);

The Pilbara Olive Python (*Liasis olivaceus barroni* – EPBC Act Vulnerable, WC Act Vulnerable) and Grey Falcon (*Falco hypoleucos* - WC Act Vulnerable) have also been recorded within the local area and are likely to utilise parts of the application area as refuge or foraging habitat (DPaW, 2014; DoE, 2015a; AWC, 2015).

The Pilbara Olive Python has been shown to have a home range of around four square kilometres and prefers escarpments, gorges and water holes (DoE, 2015a). Whilst the home range size would not see the Pilbara Olive Python able to seek refuge outside of the application area, extensive areas of suitable habitat occur throughout the application area that will remain un-impacted by the proposed clearing and a large portion of the Pilbara Olive Python habitat is conserved in Karijini National Park (DoE, 2015a). The proponent has developed and will implement fauna management procedures to minimise potential impacts to this species.

Priority listed fauna species, recognised by DPaW as being of conservation significance, that are likely to occur within the application area include the Pilbara Barking Gecko (*Underwoodisaurus seorsus*) (P2), Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4), Australian Bustard (*Ardeotis australis*) (P4), Short-tailed Mouse, Karekanga (*Leggadina lakedownensis*) (P4) and the Ghost Bat (*Macroderma gigas*) (P4) (DPaW, 2014; Rio Tinto, 2015).

Wide ranging species, migratory species or species that forage or hunt over vast areas such as the Grey Falcon, Fork-tailed Swift, Australian Bustard and Rainbow Bee-eater are unlikely to be impacted by the proposed clearing.

The Pilbara Leaf-nosed Bat, Ghost Bat, Pilbara Barking Gecko, Western Pebble-mound Mouse, Short-tailed Mouse and Ghost Bat are likely to be residents. The Gorge/Gullies habitat is considered the most significant fauna habitat, potentially providing habitat for the Pilbara Leaf-nosed Bat, the Ghost Bat and the Pilbara Olive Python (mentioned above). The Pilbara Leaf-nosed Bat and Ghost Bat roost in caves, which are present within the application area (Rio Tinto, 2015), however the proposed clearing for exploration, hydrogeological and geotechnical investigations is unlikely to impact on caves. Impacts to the Pilbara Leaf-nosed Bat and Ghost Bat as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition. Clearing within the Gorge/Gully habitat will be restricted to only allow clearing for access tracks. The proponent has developed and will implement fauna management procedures to further reduce potential impacts (Rio

Tinto, 2015).

The Pilbara Barking Gecko was only recorded from one location within the application area on rocky hills (Rio Tinto, 2015), suitable habitat is prevalent throughout the application area and this species is known to occur within conservation areas (DPaW, 2014). The Short-tailed Mouse is a widespread species, known from Cape York to the Pilbara (DEC, 2012). The proposed clearing is unlikely to result in any significant impacts to the Pilbara Barking Gecko or the Short-tailed Mouse.

Seventy nine Western Pebble-mound Mouse mounds have been recorded within the application area (Rio Tinto, 2015). This species is widespread within the ranges of the central and southern Pilbara (Van Dyck & Strahan, 2008). Given that impacts to individual mounds will be avoided (Rio Tinto, 2015), and considerable amounts of suitable habitat remain in the local area and region, the proposed clearing is unlikely to result in any significant adverse impacts to this species.

The Northern Quoll (*Dasyurus hallucatus*) may occur within the application area. In the Pilbara region, the species tends to prefer the Rocklea, Macroy and Robe land systems (DoE, 2015b). These land systems comprise of basalt hills, mesas (and buttes of limonites), high and low plateaux, lower slopes, occasional tor fields and stony plains supporting either hard or soft spinifex grasslands. The Northern Quoll has also been recorded in other land systems which comprise sandstone and dolomite hills and ridges, shrublands, sandy plains, clay plans and tussock grasslands and coastal fringes including dunes islands and beaches (DoE, 2015b).

Fauna habitats that occur within the application area are relatively common and widespread in the Pilbara region and all are extensive outside the application area in the locality (Rio Tinto, 2015). Therefore it is considered unlikely that the vegetation proposed to be cleared represents significant habitat for local fauna species in a regional context.

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

Methodology
AWC (2015)
DEC (2012)
DoE (2015a)
DoE (2015b)
DPaW (2014)
Rio Tinto (2015)
Van Dyke & Strahan (2008)
GIS Database
- Imagery

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

Comments

Proposal may be at variance to this Principle

According to available databases, there are two species of Threatened Flora known to occur within the local area (GIS Database; DPaW, 2014),

The application area has been subjected to at least nine biological surveys (Rio Tinto, 2015). One Threatened flora species has been recorded within the application area, *Lepidium catapycnon*. Locations where this species is known to occur will be avoided and targeted searches will be undertaken prior to clearing (Rio Tinto, 2015). This species responds to disturbance and is not likely to be impacted by the proposed clearing in the longer term (DPaW, 2015a).

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

Methodology
DPaW (2014)
DPaW (2015a)
Rio Tinto (2015)
GIS Database
- Threatened and Priority Flora List

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

Comments

Proposal is not at variance to this Principle

According to available datasets, there are no Threatened Ecological Communities (TECs) within the application area. There have been numerous flora and vegetation surveys within the application area and no TECs have been identified (Rio Tinto, 2015).

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

Methodology Rio Tinto (2015)
GIS Database:
- Threatened Ecological Sites Buffered
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Ecological Communities Boundaries

(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 occurs within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, in which approximately 99% of the pre-European vegetation remains (see table below) (GIS Database; Government of Western Australia, 2013).

The vegetation within the application area has been mapped as Beard vegetation associations 18, 29, 82, and 169 (GIS Database), all of which retain approximately 99% of their pre-European extent at a state and bioregional level (Government of Western Australia, 2013). Given the amount of vegetation remaining in the local area and bioregion, the vegetation proposed to be cleared is not considered to represent a remnant within an extensively cleared area.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DPaW Managed Lands
IBRA Bioregion - Pilbara	17,808,657	17,733,584	~ 99	Least Concern	~ 8.4
Beard vegetation associations - State					
18	19,892,304	19,843,727	~ 99	Least Concern	~ 6.3
29	7,903,991	7,900,200	~ 99	Least Concern	~ 5.2
82	2,565,901	2,553,217	~ 99	Least Concern	~ 10.6
169	430,552	430,540	~ 100	Least Concern	~ 7.0
Beard vegetation associations - Bioregion					
18	676,556	672,424	~ 99	Least Concern	~ 15.9
29	1,133,219	1,132,939	~ 99	Least Concern	~ 2.0
82	2,563,583	2,550,899	~ 99	Least Concern	~ 10.6
169	103,844	103,843	~ 100	Least Concern	~ 29.1

* Government of Western Australia (2013)
** 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 (2013)
GIS Database:
- IBRA WA (regions - subregions)
- 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 may be at variance to this Principle

There are no significant wetlands or watercourses within the application area, however several small, minor ephemeral drainage lines and Turee Creek east branch are present (Rio Tinto, 2015; GIS Database). These drainage systems are likely to contain water following large rainfall events. Riparian vegetation is likely to occur along drainage lines and the proponent has committed to minimising disturbance to these areas (Rio Tinto, 2015).

Potential impacts to vegetation growing in association with a watercourse as a result of the proposed clearing may be minimised by the implementation of a watercourse management condition.

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

Methodology Rio Tinto (2015)
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

Ten land units were identified within the application area (Rio Tinto, 2015). Of these, two are considered prone to erosion under pastoral use; the Brockman land system and the Jamindie land system (DAFWA, 2015).

For the proposed clearing of up to 500 hectares within a total application area of approximately 29,761 hectares, the overall risk of clearing resulting in land degradation is low (DAFWA, 2015). However soil erosion is liable to occur where vegetation is disturbed or removed along with protective stony mantles, especially where surface hydrology is altered and flows concentrated on the disturbance footprint (DAFWA, 2015).

The majority of the land systems within the application area have incised drainage lines or drainage tracts that often have sandy or loamy banks, which are liable to erode if cleared. The minor area of dark brown loamy sands on the hardpan plains land unit of the Jamindie land system is particularly erosion prone if disturbed by clearing (DAFWA, 2015). Approximately 36.7 hectares of this land system occurs within the application area (Rio Tinto, 2015). The proponent has developed and will implement erosion management control procedures (Rio Tinto, 2015).

Given that some areas within the application area are prone to erosion, it is important to minimise the length of time the land is left open following clearing. Potential land degradation as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition, in conjunction with internal management practises.

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

Methodology

DAFWA (2015)
Rio Tinto (2015)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- Soils, statewide

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

Comments

Proposal is not likely to be at variance to this Principle

The western section of the application area borders the Karijini National Park, while the eastern end of the application area is at a distance of more than 30 kilometres (GIS Database). Potential impacts to the environmental values of conservation areas as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The local area is well vegetated and extensive amounts of the vegetation associations and habitat types present within the application area occur throughout the local area and region (Rio Tinto, 2015). In addition to this, the proposed clearing of up to 500 hectares of native vegetation occurs within an application area of approximately 29,761 hectares, where the majority of the vegetation remains intact. Approximately 455.41 ha of native vegetation have been cleared within the application area to date. Given the amount of remaining vegetation in the local area and region, the proposed clearing is unlikely to disrupt fauna movement; therefore the proposed clearing is not likely to impact the environmental values of nearby conservation areas.

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

Methodology

GIS Database:
- DEC 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

The application area is located within the proclaimed Pilbara groundwater area under the *Rights in Water and Irrigation Act 1914* (GIS Database). Any groundwater extraction and/or taking or diversion of surface water for purposes other than domestic and/or stock watering is subject to licence by the Department of Water. The application area is not located within a Public Drinking Water Source Area (PDWSA).

The majority of the application lies within the Ashburton River catchment, parts are within the Fortescue River catchment. Several small, minor ephemeral drainage lines and Turee Creek east branch, are located within the application area (Rio Tinto, 2015; GIS Database). These drainage lines are likely to flow after significant rainfall events, which usually occur between December to April (BoM, 2015), and localised altered flow regimes and increased sedimentation may result from the proposed clearing activities. Potential impacts to surface water

quality as a result of the proposed clearing may be minimised by the implementation of a watercourse management condition.

The application area has a groundwater salinity that is marginal (500 – 1000 milligrams/Litre Total Dissolved solids) (GIS Database). The proposed clearing of up to 500 hectares of native vegetation (at various locations) within an application area of approximately 29,761 hectares that has extensive amounts of vegetation remaining, is unlikely to result in any significant impacts to groundwater quality.

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

Methodology GIS Database:
- Groundwater Salinity, Satewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)
- RIWI Act, Groundwater 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

Mean annual rainfall for Newman (nearest recording site) is approximately 322 mm (BoM, 2015). The Pilbara region has an arid climate, with rainfall events occurring throughout the summer months (Dec – April) (BOM, 2015) and cyclonic rains are common.

Several small, minor ephemeral drainage lines and Turee Creek east branch are located within the application area (Rio Tinto, 2015; GIS Database). These drainage lines are likely to flow after significant rainfall events.

Extensive clearing of native vegetation may increase the potential for localised and/or wide scale flooding (Rio Tinto, 2015). However, given that the proposed clearing of 500 hectares of native vegetation is to be undertaken at various locations within an application area of approximately 29,761 hectares, stretching across two catchments (Ashburton River catchment and Fortescue River catchment with a combined area of 10,853,979.54 hectares), the proposed clearing is not likely to increase the potential for flooding in this region (GIS Database).

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

Methodology BoM (2015)
Rio Tinto (2015)
GIS Database:
- Hydrographic Catchments – Catchments

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

Comments

There are three native title claims (WC2010/016, WC2010/011 and WC2005/003) over the application area (GIS Database; DAA, 2015). 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 many registered Sites of Aboriginal Significance located in the area applied to clear (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process. The proponent is aware of these requirements and will ensure that all sites are avoided or appropriate approvals will be obtained prior to undertaking any ground disturbing activities (Rio Tinto, 2015).

It is the proponent's responsibility to liaise with the Department of Environment Regulation, the 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 27 April 2015 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received raising concerns regarding the cumulative impacts of all clearing in the local area. This issue has been addressed within the assessment when considering the relevant clearing principles.

Methodology DAA (2015)
Rio Tinto (2015)
GIS Database:
- Aboriginal Sites of Significance

4. References

AWC (2015) *Falco hypoleucos* Wildlife Profile, Australian Wildlife Conservancy, Subiaco, Western Australia. <http://www.australianwildlife.org>

BoM (2015) Climate Statistics for Australian Locations. A Search for Climate Statistics for Newman, Australian Government Bureau of Meteorology. <http://www.bom.gov.au>

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

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

DAFWA (2015) Land degradation advice for CPS 6545/1. Department of Agriculture and Food Western Australia, South Perth, Western Australia.

DEC (2012) *Leggadina lakedownensis* Fauna Profile, Department of Environment and Conservation, Kensington, Western Australia < http://www.dpaw.wa.gov.au>

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DoE (2015a) *Liasis olivaceus barroni* in Species Profile and Threats Database, Department of the Environment, Canberra, <http://www.environment.gov.au>

DoE (2015b) *Dasyurus hallucatus* in Species Profile and Threats Database, Department of the Environment, Canberra. < http://www.environment.gov.au>.

DPaW (2014) NatureMap, Department of Parks and Wildlife <http://naturemap.dec.wa.gov.au>.

DPaW (2015a) PEC Advice for CPS 6545/1 – Robe River Limited – Clearing of 500 ha of native vegetation within Mineral Lease 248SA, General Purpose Lease 47/1235 and General Purpose Lease 47/1236. Department of Parks and Wildlife, Species and Communities Branch, Kensington, Western Australia.

DPaW (2015b) Additional PEC Advice for CPS 6545/1 – Robe River Limited – Clearing of 500 ha of native vegetation within Mineral Lease 248SA, General Purpose Lease 47/1235 and General Purpose Lease 47/1236. Department of Parks and Wildlife, Species and Communities Branch, Kensington, Western Australia.

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Rio Tinto (2015) Desktop Flora, Vegetation and Fauna Habitat Assessment at West Angelas: Native Vegetation Clearing Permit – Supporting Report. Rio Tinto Iron Ore, Perth, Western Australia.

Van Dyke, S., & Strahan, R. (2008). The mammals of Australia. Reed New Holland: Sydney.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
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
s.17	Section 17 of *the Environment Protection Act 1986*, Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2013) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T **Threatened species:**
Specially protected under the *Wildlife Conservation Act 1950,* listed under Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna or the Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

Threatened Fauna and Flora are further recognised by the Department according to their level of threat using IUCN Red List criteria. For example Carnaby's Cockatoo *Calyptorynchus latirostris* is specially protected under the *Wildlife Conservation Act 1950* as a threatened species with a ranking of Endangered.

Rankings:
CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild.
EN: Endangered - considered to be facing a very high risk of extinction in the wild.
VU: Vulnerable - considered to be facing a high risk of extinction in the wild.

X **Presumed Extinct species:**
Specially protected under the Wildlife Conservation Act 1950, listed under Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora (which may also be referred to as Declared Rare Flora).

IA **Migratory birds protected under an international agreement:**
Specially protected under the Wildlife Conservation Act 1950, listed under Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice.
Birds that are subject to an agreement between governments of Australia and Japan, China and The Republic of Korea relating to the protection of migratory birds and birds in danger of extinction**.**

S **Other specially protected fauna:**
Specially protected under the Wildlife Conservation Act 1950, listed under Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice.

P1 **Priority One - Poorly-known species:**
Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

P2 **Priority Two - Poorly-known species:**
Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

P3 **Priority Three - Poorly-known species:**
Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities 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 localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

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 do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

P5 **Priority Five - Conservation Dependent species:**
Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.