Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6672/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Western Areas Limited**

1.3. Property details

Property: Mining Lease 77/544
Local Government Area: Shire of Kondinin
Colloquial name: North Iron Cap Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 3 September 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. One Beard vegetation association is located within the application area (GIS Database):

Beard vegetation association 511: Medium woodland; salmon gum & morel.

A flora and vegetation survey was conducted over the Greater North Ironcap area (which included the application area) by Botanica Consulting in 2012. The following broad vegetation communities were mapped within the application area:

1) Low woodland of E. *salmonophloia* over open tree mallee of E. *cylindrocarpa*/E. *cylindriflora*/E. *pileata*;
2) Open tree mallee of E. *livida* over heath of *Acacia steedmaniil/Allocasuarina campestris* and low heath of *Phebalium ambiguum/Acacia sulcata* on rock outcrop;
3) Regrowth forest of E. *salmonophloia*/E. *salubris* over heath of *Melaleuca cucullata/Melaleuca pauperiflora* subsp. *pauperiflora* and open dwarf scrub of *Wilsonia humilis/ Acacia acanthoclada*;
4) Open scrub mallee of E. *polita*/E. *platycorys*/E. *horistes* over low heath of *Melaleuca hamata* and dwarf scrub of *Microcybe multiflora/Acacia intricata*; and
5) Shrub malee of E. *eremophila* and E. *urna* over heath of *Daviesia nematophylla* and *Melaleuca adnata.*

Clearing Description North Iron Cap Project.
Western Areas Limited proposes to clear up to 9 hectares of native vegetation within a total boundary of approximately 433 hectares, for the purpose of mineral exploration. The project is located approximately 80 kilometres east of Hyden in the Shire of Kondinin.

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

To:

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).

Comment The vegetation condition was derived from a flora and vegetation survey conducted by Botanica Consulting (2012).

Note: The majority of the application area (approx. 80%) is comprised of vegetation community 1.

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 occurs within the Southern Cross (COO2) subregion of the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by gently undulating uplands dissected by broad valleys with bands of low greenstone hills (CALM, 2002). Diverse Eucalyptus woodlands rich in endemic Eucalyptus occur around salt lakes, low greenstone hills, valley alluvials and broad plains of calcareous earths (CALM, 2002). Mallees and scrub-heaths occur on uplands as

well as sand lunettes associated with playas along the broad valley floors and sand sheets around the granite outcrops. The scrubs are rich in endemic acacias and Myrtaceae (CALM, 2002).

The application area is located within the Lake Cronin Area which is listed on the Register of National Estate due to its high level of flora and fauna diversity and endemism (AHD, 2015). The lake itself is located approximately 6.6 kilometres south west of the application area (GIS Database).

According to the Environmental Protection Authority (EPA), the region supports extensive shrubland, sandplain and woodland environments including an excellent representation of a range of vegetation types that are now extensively cleared in the Wheatbelt. Based on its high biodiversity conservation significance and competing land use interests, various forms of conservation reservation and management are proposed for the area (EPA, 2009). The application area is also located within an area proposed to be managed under section 33(2) of the *Conservation and Land Management Act 1984* and is adjacent to a proposed "A" class nature reserve (EPA, 2009), which is situated near the north west boundary of the application area. The proposed nature reserve was intended to protect the North Ironcap Iron Hill (EPA, 2009). To date, no formal protection currently exists over these areas.

No Threatened Ecological Communities (TECs) are known within the application area. The application area is located within the boundary of the Priority Ecological Community (PEC) "Ironcap Hill Vegetation Complexes", which includes Mt Holland, Middle Ironcap Hill, North and South Ironcap Hills, Digger Rock and Hatter Hill" (GIS Database). Given that the PEC has known extent of 25,184.377 hectares (GIS Database), the proposed clearing of 9 hectares of native vegetation represents less that 0.5% of the PEC. This being considered, significant impacts to the PEC are unlikely.

Available records show that 14 Priority listed flora species are known to occur within close proximity (5 kilometres) of the application area (DPaW, 2015a). A level 1 flora and vegetation survey was conducted from 1 to 2 September 2012, over the Greater North Ironcap Area by Botanica Consulting, which also included the application area. During the flora survey, five Priority flora species were identified. The Priority 4 listed flora species *Microcorys* sp. *Forrestania* (V. English 2004) was the only Priority flora species identified within the application area and was recorded at numerous locations (Botanica, 2012).

Given the known presence of a number of Priority flora species and that a targeted search to identify all Priority flora populations was not conducted, there remains the potential for Priority flora species to occur within the areas intended for clearing (Botanica, 2012). The proponent will implement internal procedures to manage Priority flora, which includes the identification and avoidance of Priority flora species (Western Areas Limited, 2015a). Previous advice obtained from the Department of Parks and Wildlife (DPaW) for the Greater North Ironcap Area, advised that the area has known high biodiversity conservation significance and recommends that targeted searches for conservation significant flora species occur prior to clearing (DPaW, 2014). Potential impacts to Priority flora species as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

There is a small amount of ironstone ridge fauna habitat within the application area, which is considered to be restricted and is unique compared to other fauna habitats in the general region. The ironstone ridge habitat may also be part of the Banded Iron Formation (BIF) vegetation (AES, 2015a). The ironstone ridge habitat corresponds to vegetation type 2 which is also known habitat for Threatened Flora. Potential impacts to the ironstone ridge habitat as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition.

All remaining vegetation types and fauna habitats identified within the application area are considered common and widespread (AES, 2015a).

Four introduced species, Angular Pigface (*Carpobrotus aequilaterus*), Cape Weed (*Arctotheca calendula*), Ursinia (*Ursinia anthemoides*) and Stinkwort (*Dittrichia graveolens*) have been identified within the Greater North Ironcap area (Botanica, 2012). The proposed clearing activities have the potential to result in the introduction or spread of weed species, which may negatively impact on the biodiversity of the local area. 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 at variance to this Principle.

Methodology

AES (2015a)
AHD (2015)
Botanica (2012)
CALM (2002)
DPaW (2015a)
EPA (2009)
Western Areas Limted (2015a)
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 is at variance to this Principle

A level 1 fauna survey was conducted over the application area during autumn by Australian Ecological Services (AES, 2015a). The survey took place from 27 to 31 May 2015. Eight broad fauna habitats were identified (AES, 2015a) which largely correspond to the vegetation communities mapped by Botanica (2012). With the exception of the ironstone ridge habitat that corresponds to vegetation community 2, all fauna habitat types identified within the application area are considered common and widespread (AES, 2015a).

Five fauna 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, or are highly likely to utilise the vegetation under application (AES, 2015a; DPaW, 2015b):

- Carnaby's Cockatoo (*Calyptorhynchus latirostris* – EPBC Act and WC Act Endangered);
- Rainbow Bee-eater (*Merops ornatus* – EPBC Act, Migratory);
- Carpet Python (*Morelia spilota imbricata* – WC Act Schedule 4);
- Chuditch (*Dasyurus geoffroii* – WC Act, Schedule 1); and
- Malleefowl (*Leipoa ocellata* - WC Act, Schedule 1).

It has been estimated that extensive amounts of good quality potential foraging habitat for Carnaby's Cockatoos occurs in the local area (AES, 2015b), however suitably sized breeding trees (Salmon Gum) are present within the application area (AES, 2015a). The proponent has developed a Carnaby's Cockatoo Conservation Management Plan (CMP) for nearby areas (see Keith Lindbeck and Associates, 2012) and this will be implemented for the application area. The CMP includes potential breeding hollows being inspected by a suitably qualified environmental professional prior to clearing and the avoidance of large trees and stags with hollows (Keith Lindbeck and Associates, 2012). Potential impacts to prospective Carnaby's Breeding trees as a result of the proposed clearing may be further minimised by the implementation of a fauna management condition.

The Rainbow Bee-eater is highly mobile and is unlikely to rely on the vegetation under application as a food source but may use the soft soils or soil banks within the application area to create burrows for breeding during spring. Areas of potential breeding habitat should be inspected prior to clearing and avoided during the breeding season (AES, 2015a).

Large areas of suitable foraging habitat for the Chuditch and Carpet Python are present nearby (AES, 2015a) and the proponent has developed and will implement fauna management measures to reduce potential impacts to these species, including internal ground disturbance and snake relocation and handling procedures (Western Areas Limited, 2015b; 2015c).

No Malleefowl mounds have been found within the application area (AES, 2015a). Two inactive Malleefowl mounds were observed to the south of the application area (AES, 2015a) and will not be impacted by the proposed clearing. Extensive amounts of Malleefowl foraging habitat occurs throughout the local area and vicinity (AES, 2015a); therefore the proposed clearing of 9 hectares of native vegetation is unlikely to significantly reduce the amount of available foraging habitat for Malleefowl.

Seven species of conservation significance have also been identified as potentially utilising the application area; the Shy Heathwren (*Hylacola cauta whitlocki* - DPaW P4), Rufous Fieldwren (*Calamanthus campestris montanellus* - DPaW P4), Lake Cronin Snake (*Paroplocephalus atriceps* - DPaW P3), Crested bellbird (*Oreoica gutturalis gutturalis* - DPaW P4), Western Rosella (*Platycercus icterotis xanthogenys* - DPaW P4), Western Mouse (*Pseudomys occidentalis* - DPaW P4) and Western Brush Wallaby (*Macropus irma* - DPaW P4) (AES, 2015a).

Of the Priority fauna species listed above, the Lake Cronin Snake is the least mobile. This species is poorly understood and despite several fauna surveys in the local area, has not been recorded (Astron, 2014; AES, 2015a). Given the amount of nearby alternative suitable habitat and the highly mobile nature of the remaining Priority fauna species known from the local area (AES, 2015a; Astron, 2014), clearing related impacts are likely to be negligible. The proponent has developed and will implement fauna management measures to reduce potential impacts to local fauna species, including species of conservation significance.

While there is only a small amount of the restricted ironstone ridge habitat present within the application area, it is significantly different from other fauna habitats in the general region and may possibly be part of the Banded Iron Formation (BIF) vegetation (AES, 2015a). The overall condition of this habitat is considered to range from very good to excellent and the rocky ridges provide suitable habitat for a number of fauna species, including Short Range Endemic (SRE) species (AES, 2015a).

Vertebrate fauna that may utilise the restricted ironstone habitat include the Chuditch, Lake Cronin Snake, Carpet Python and the Western Mouse (AES, 2015a). The Western Mouse and Lake Cronin Snake may frequent the ironstone ridge habitat but are known to exploit other habitat types (such as woodlands and scrublands) that are widespread in the local area and region (AES, 2015a; Botanica, 2012). The ironstone ridge fauna habitat is likely to provide potential denning habitat for the Chuditch and may support SRE invertebrate species (AES, 2015a). Targeted fauna surveys are required to assess the ironstone ridge habitat

adequately. Potential impacts to the restricted ironstone ridge fauna habitat as a result of the proposed clearing may be minimised by the implementation of a restricted clearing condition.

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

Methodology
AES (2015a)
AES (2015b)
Astron (2014)
Botanica (2012)
DPaW (2015b)
Keith Lindbeck and Associates (2012)
Western Areas (2015b)
Western Areas (2015c)

(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 close proximity (5 kilometre radius) to the application area; *Banksia sphaerocarpa* var. *dolichostyla* and *Eucalyptus steedmanii* (GIS Database; DPaW, 2015a).

Eucalyptus steedmanii prefers gravely loam over ironstone and sand (DPaW, 2015b) and is known from several records within the region, including a population over 450 kilometres from the application area (AES, 2015a). Based on the soils identified within the application area (AES, 2015a) preferred habitat for this species does not occur.

A flora and vegetation survey was conducted by Botanica Consulting in September 2012. No Threatened flora were recorded within the application area, however the Threatened flora species *Banksia sphaerocarpa* var. *dolichostyla* was recorded nearby to the west within vegetation community 2 (Botanica, 2012). There is a small amount of this vegetation community present within the central part of the application area, therefore it is considered that habitat for Threatened flora does occur within the application area and there remains a potential for this species to persist. To minimise potential impacts to Threatened flora, the proponent has developed and will implement internal management procedures. Potential impacts to Threatened flora as a result of the proposed clearing may be further minimised by the implementation of a restricted clearing condition.

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

Methodology
AES (2015a)
DPaW (2015a)
DPaW (2015b)
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 (GIS Database). The closest TEC is located approximately 80 kilometres east.

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

Methodology
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 Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, in which approximately 98% of the pre-European vegetation remains (see table below) (GIS Database; Government of Western Australia, 2014).

The vegetation within the application area has been mapped as Beard vegetation association 511 (GIS Database). As the below table illistrates, Beard vegetation association 511 is well represented at a state and bioregional level, retaining approximatley 74% of pre-European vegetation within the State and approximatley 94% within the Coolgardie bioregion (Government of Western Australia, 2014). 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 - Coolgardie	12,912,204	12,648,491	~ 98	Least Concern	~ 16
Beard veg assoc. - State					
511	700,693	520,625	~ 74	Least Concern	~ 15
Beard veg assoc. - Bioregion					
511	464,424	435,177	~ 94	Least Concern	~ 19

* 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

(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 study area; however one minor non-perennial watercourse dissects the northern part of the application area (GIS Database). During the flora and vegetation survey, no vegetation types within application area were found to be growing in association with a watercourse or wetland (Botanica, 2012). Potential impacts to the minor non-perennial watercourse as a result of the proposed clearing may be minimised by the implementation of a watercourse/vegetation management condition.

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

Methodology Botanica (2012)
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**
According to available mapping, the application area is comprised of predominantly sandy soils (GIS Databases; AES, 2015a) and small parts of the application area contains ironstone ridges. Sandy soils are known to be susceptible to wind erosion, therefore it is important to minimise the length of time the land is left open following clearing. While significant land degradation is unlikely, 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 AES (2015a)
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 application area occurs within the Lake Cronin Area which is listed on the Register of National Estate (GIS Database). At over 31,000 hectares, the Lake Cronin Area is significant, as it functions to maintain existing processes at a regional scale and provide important refuge for many species (AHD, 2015). At its closest point, the application area is approximately 6.6 kilometres west, north west of Lake Cronin and 3.6 kilometres west of the Lake Cronin Nature Reserve boundary (GIS Database). Disturbance, largely by mining activities is evident to the west, however Lake Cronin Nature Reserve is surrounded by extensive intact vegetation, especially to the east (GIS Database). This being considered, the proposed clearing of up to 9 hectares of vegetation will not

significantly affect ecological linkages to the reserve.

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

Methodology AHD (2015)
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 not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Ravensthorpe Catchment Area, which is approximately 140 kilometres to the south (GIS Database).

The application area is located within a semi-arid, warm Mediterranean environment (CALM, 2002) with an average annual rainfall of 372 millimetres recorded at Hyden approximately 80 kilometres west of the application area (BoM, 2015). The small size of the proposed clearing within this climate is unlikely to result in significant changes to surface flows.

Groundwater in the area occurs in weathered and fractured bedrock aquifers. Groundwater salinity ranges from generally saline to hypersaline and is on average around 40 000 mg/L TDS (Western Areas, 2012). Monitoring of groundwater in the area indicates that the depth to ground water level is at least 40 metres below ground level (Western Areas, 2015c). The proposed clearing of up to 9 hectares of native vegetation is unlikely to cause deterioration in the quality of groundwater in the local area.

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

Methodology BoM (2015)
CALM (2002)
Western Areas (2012)
Western Areas (2015c)
GIS Database:
- Groundwater Salinity, Satewide
- Hydrography, linear
- Public Drinking Water Source

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

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

The application area is located within a semi-arid, warm Mediterranean environment (CALM, 2002) with an average annual rainfall of 372 millimetres recorded at Hyden approximately 80 kilometres west of the application area (BoM, 2015). Rainfall is usually experienced during winter months and it is likely that during times of intense rainfall there may be some localised flooding in the area (CALM, 2002). However, given the size of the Swan-Avon Yilgarn catchment (5,836,045 hectares) (GIS Database), the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.

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

Methodology BoM (2015)
CALM (2002)
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 two native title claims (WC2003/006 and WC2000/007) 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 no Sites of Aboriginal Significance located in the area applied to clear (GIS Database; DAA, 2015). 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.

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 10 August 2015 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received. Where relevant, environmental concerns raised within this submission have been addressed within the assessment report. Concerns regarding rare flora, restricted and threatened flora species, ecological communities, environmentally sensitive areas and proposed nature reserves have been considered within Principles (a), (c) and (d).

Methodology

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

4. References

AHD (2015) Register of National Estate: Lake Cronin Area. Australian Heritage Database http://www.environment.gov.au.

AES (2015a) Level 1 Fauna Survey North Iron Cap (Northern Area), Forrestania. *Unpublished Report.* Australian Ecological Services, Wanneroo, Western Australia.

AES (2015b) Proposed Flying Fox Lounge Lizard sandpit clearing permit envelope fauna review. *Unpublished Report.* Australasian Ecological Services, Wanneroo, Western Australia.

Astron (2014) Forrestania Nickel Operations Lounge Lizard Vegetation, Flora and Fauna Biological Assessment. *Unpublished report.* Astron Environmental Services, East Perth, Western Australia.

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

Botanica (2012) Flora and Vegetation Survey of the Greater North Ironcap Area - Tenements: E77/1764, M77/543, M77/219, M77544, M77/582 and M77/99. *Unpublished Report.* Botanica Consulting, Boulder, Western Australia.

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>.

Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.

DPaW (2014) Advice received for clearing permit application CPS 6196/1 (Received on 19 August 2014). Department of Parks and Wildlife, Kensington, Western Australia.

DPaW (2015a) NatureMap, Department of Parks and Wildlife <http://naturemap.dec.wa.gov.au>.

DPaW (2015b) Florabase, Department of Parks and Wildlife <florabase.dpaw.wa.gov.au>.

EPA (2009) Advice on Conservation Values and Review of Nature Reserve Proposals in the Lake Cronin Region. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the *Environmental Protection Act 1986*. Report Number 1329. Published Report Prepared by the Environmental Protection Authority, June 2009. Government of Western Australia, 2013.

Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2014. 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.

Keith Lindbeck and Associates (2012) Forrestania Nickel Project, Spotted Quoll – Cosmic Boy Haul Road, Carnaby's Black Cockatoo Conservation Management Plan. *Prepared for Western Areas Limited.* Keith Lindbeck and Associates, Bullcreek, Western Australia.

Western Areas Ltd (2012) Supporting Document for Clearing Permit Application CPS 5427/1 - Mining Tenement M77/219. *Unpublished Report.* Western Areas Limited, West Perth, Western Australia.

Western Areas Ltd (2015a) Supporting Document for Clearing Permit Application CPS 6654/1 - Mining Tenement M77/545. *Unpublished Report.* Western Areas Limited, West Perth, Western Australia.

Western Areas Limited (2015b) Forrestania Nickel Operation, Ground Disturbance Procedure (FNO-ENV-PRO-013). Western Areas Limited, West Perth, Western Australia.

Western Areas Limited (2015c) Forrestania Nickel Operation, Snake Rescue and Relocation Procedure (FNO-ENV-PRO-016). Western Areas Limited, West Perth, Western Australia.

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.