Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4836/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Mount Magnet South NL

1.3. Property details

Property: Mining Lease 59/233
Mining Lease 59/234
Local Government Area: Shire of Mount Magnet
Colloquial name: Kirkalocka Gold Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 5 April 2012

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 and are useful to look at vegetation in a regional context. The following Beard vegetation association is located within the application area (GIS Database):

18: Low woodland; mulga (*Acacia aneura*).

A Level 2 flora and vegetation survey was conducted over an area of approximately 4,000 hectares by Niche Environmental Services (Niche) between 30 August and 1 September 2011. The survey identified two vegetation units in the application area. Niche (2011) describes these as follows:

1. Vegetation unit W1: Open Low Woodland B to Low Woodland B of *Acacia aneura* var. *aneura*, *A. ramulosa* var. *ramulosa* and *Acacia fuscaneura* over Open Low Scrub B of mixed species over Very Open Low Grass of *Aristida contorta*, *Austrostipa elegantissima* and *Monachather paradoxus* and Very Open Herbs to Herbs of mixed species on sand loam to clay sand loam.

This vegetation unit was defined by an upper storey to five metres of *Acacia* species, with *Acacia aneura* var. *aneura*, *A. ramulosa* var. *ramulosa* and *A. fuscaneura* the most commonly recorded species, and *A. tetragonophylla*, *A. craspedocarpa* and *A. caesaneura* as other widespread species. There was a scattered, emergent canopy to 15 metres of *Callitris columellaris* and *Eucalyptus kochii* subsp. *plenissima*. The midstorey was variable and was generally dominated by *Eremophila* species, with occasional records of *Senna* species. The understorey was variable

Clearing Description
Mount Magnet South NL (Mount Magnet South) has applied to clear 74 hectares within an application area of approximately 616.3 hectares (GIS Database). The application area is located approximately 66 kilometres south, south west of Mount Magnet (GIS Database).

The purpose of the application is to expand various components of the Kirkalocka Gold Mine and construct additional infrastructure. Mount Magnet South intends to reopen the Kirkalocka Gold Mine including expansion of pits, an upstream lift of the existing tailings storage facility, increasing the existing waste landform and constructing a new waste landform, topsoil stockpiles, haul roads, dewatering water bores and access roads (Mount Magnet South, 2012). Clearing will be by mechanical means.

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

To

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

Comment
Most of the application area is occupied by the Kirkalocka Gold Mine (current disturbance footprint is 327 hectares). The mine has been in care and maintenance since 2008 and drilling programs have been undertaken from 2009.

The application area is located on Kirkalocka pastoral station and has been subject to grazing.

The Short Range Endemic (SRE) survey had an estimated survey sufficiency of 70%. Although considered adequate, it is possible that some SRE species inhabiting the survey area have not been collected (Ecologia Environment (Ecologia), 2011a).

in terms of species presence and density. The composition and density of the understorey was linked to hydrology, with a clear increase linked to higher levels of soil moisture. The understorey was observed as fitting into three broad types, either grass dominated, Asteraceae dominated or *Calandrinia* dominated, or an intergrade of the three.

2. Vegetation unit W2: Open Low Woodland B to Low Woodland B of *Acacia aneura* var. *aneura*, *A. ramulosa* var. *ramulosa* and *Acacia fuscaneura* over Open Low Scrub B of mixed species over Very Open Low Grass of *Aristida contorta*, *Austrostipa elegantissima* and *Monachather paradoxus* and Very Open Herbs to Herbs of mixed species on clay loam to clay within unchannelled ephemeral drainage lines.

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The application area was surveyed as part of a larger Level 2 flora and vegetation survey conducted between 30 August and 1 September 2011 over an area of approximately 4,000 hectares.

The majority of the vegetation was found to be in good to excellent condition (Niche, 2011). Niche (2011) noted that vegetation had been impacted by mining, exploration and pastoral activities. Niche (2011) added that the condition of the vegetation improved rapidly with distance from the disturbance.

The application area consists of wash plains dominated by *Acacia* species (Niche, 2011). Two vegetation units, W1 and W2, were identified within the application area. These were similar structurally and floristically with the key difference being density of species and substrate, linked to changes in hydrology (Niche, 2011). W1 covered an area of approximately 2,654 hectares and occurred on sand loam to clay sand loam. W2 covered an area of approximately 970 hectares and occurred on clay loam to clay within unchannelled ephemeral drainage lines that lacked channel or bank development. Mount Magnet South (2012) proposes to clear 42 hectares of W1 vegetation and 32 hectares of W2 vegetation and states that approximately 40% of the proposed clearing is in already disturbed ground. According to Niche (2011), the wash plains vegetation was considered to be common and widespread in a local and regional context.

A total of 150 species (including subspecies and variants) from 83 genera and 38 families were recorded from the survey area with the dominant families including Fabaceae, Asteraceae, Chenopodiaceae and Poacae (Niche, 2011). Niche (2011) noted that a high number of annual species were recorded, indicating the survey was conducted at the right time of the year. According to Niche (2011), vegetation in the survey area contains species that are common, with widespread distributions across the Murchison bioregion.

Four introduced species were recorded within the survey area including *Acetosa vesicaria*, Purslane (*Portulaca oleracea*), *Pentaschistis airoides* subsp. *airoides* and *Cleretum papulosum* subsp. *papulosum* (Niche, 2011). Of these weeds, Niche (2011) identified *Acetosa vesicaria* as having the capacity for environmental impacts. This species was recorded within or adjacent to existing pits and waste landforms (Niche, 2011). None of the weeds recorded are a 'Declared Plant' under the *Agriculture and Related Resources Protection Act 1976* (DAFWA, 2012). Potential impacts from weeds as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

According to available databases (GIS Database) and Niche (2011), no Threatened Flora, Priority Flora or Threatened or Priority Ecological Communities are located within the application area.

A vertebrate fauna survey recorded 49 bird species, three native mammals and one reptile within a 2,800 hectare survey area including the application area (360 Environmental, 2011). One conservation significant fauna species, the Rainbow Bee-eater (*Merops ornatus*) (Marine; Migratory under *EPBC Act*; Schedule 3), was observed in flight outside the application area. The fauna habitats were found to be well represented within the survey area and surrounding region (360 Environmental, 2011).

A total of 84 specimens representing six orders, nine families and 14 species of invertebrates were collected during a short range endemic (SRE) survey (Ecologia, 2011a). According to Ecologia (2011a), the number of species collected was small suggesting the survey area is not species rich. Six species were identified as potential SREs (four recorded within the application area) and one conservation significant species, the Shield-backed Trapdoor Spider (*Idiosoma nigrum*) (Schedule 1), was collected within the application area. This occurrence represents new distribution data for the Shield-backed Trapdoor Spider but is within its recorded distribution range. A targeted survey was subsequently conducted and recorded 131 Shield-backed Trapdoor Spider burrows within 37 hectares, with one burrow recorded inside the application area (Ecologia, 2011b).

Given the majority of the application area has been previously disturbed and vegetation is considered widespread on a local and regional basis, it is unlikely that the application area comprises a higher level of

biological diversity than surrounding areas.

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

Methodology

360 Environmental (2011)
DAFWA (2012)
Ecologia (2011a)
Ecologia (2011b)
Mount Magnet South (2012)
Niche (2011)
GIS Database:
- Threatened and Priority Flora
- 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 not likely to be at variance to this Principle

A Level 1 vertebrate fauna survey, SRE Fauna Baseline Survey and *Idiosoma nigrum* targeted survey have been conducted in the application area. The Level 1 vertebrate fauna survey was conducted within the Kirkalocka area by 360 Environmental and included a reconnaissance survey from 3 to 7 September 2011 (360 Environmental, 2011). The SRE fauna study was conducted by Ecologia in early September 2011 and included dry pitfall trapping, hand foraging and leaf litter collection at 12 sampling sites (Ecologia, 2011a). The *Idiosoma nigrum* targeted survey was conducted by Ecologia from 28 September to 3 October 2011 (Ecologia, 2011b).

Two broad habitat types were identified within the application area including woodland of *Acacia* species (Habitat A) and previously disturbed *Acacia* woodland (Habitat E) (360 Environmental, 2011). Habitat A is further classified into two units that intergrade across the survey area with one unit associated with an unchannelled drainage line. 360 Environmental (2011) notes there is limited difference between the two from a structural, functional, species and habitat perspective. According to 360 Environmental (2011), the fauna habitat types are well represented within the survey area and surrounding region and none were recognised as restricted fauna habitats.

A total of 49 bird species, three native mammals and one reptile were recorded in the 2,800 hectare survey area (360 Environmental, 2011). Large bird tracks possibly belonging to Ibis (*Threskiornis* sp.), Wedge-tailed Eagle (*Aquila audax*) or Malleefowl (*Leipoa ocellata*) (Vulnerable; Schedule 1) were observed in the survey area (360 Environmental, 2011). 360 Environmental (2011) deemed these to be Ibis as the tracks were only located in an isolated area, a large number were observed suggesting a flock of birds and tracks were produced while the soil was still damp suggesting the tracks were made in areas of flooding. 360 Environmental (2011) also compared the tracks against a Malleefowl reference track confirming the tracks were not Malleefowl.

One conservation significant fauna species, the Rainbow Bee-eater (Marine; Migratory under *EPBC Act*; Schedule 3), was observed in flight outside the application area (360 Environmental, 2011). This species has a widespread distribution and occurs within a variety of habitats. It is therefore unlikely that this species is dependent on habitats within the application area.

Although not recorded during the survey, several other conservation significant species were identified as having the potential to occur within the survey area. Several of these were identified as likely to occur within the survey area, however, due to the availability of suitable habitat outside the application area, their mobility and/or widespread distribution were considered unlikely to be significantly impacted by the proposed clearing (360 Environmental, 2011).

Based on a desktop study area of 100 kilometres, a total of 55 invertebrate species were identified as having the potential to occur within the survey area with 50 recognized as species of conservation significance (Ecologia, 2011a). A total of 84 specimens representing six orders, nine families and 14 species of invertebrates were collected during the survey. Six species were identified as potential SREs (four recorded in the application area) and one conservation significant species, the Shield-backed Trapdoor Spider (Schedule 1), was collected in the application area (Ecologia, 2011a). Given vegetation within the survey area extends beyond the survey boundaries, Ecologia (2011a) considered it likely that the invertebrate assemblage extends well beyond the survey area. Based on this the proposed clearing is unlikely to have a significant impact on potential SREs.

The *Idiosoma nigrum* targeted survey involved one hectare searches at 37 survey sites (i.e. 37 hectare survey area) which extended over an area of approximately 2,000 hectares within vegetation types W1 and W2. The survey recorded 131 burrows resulting in a mean of 3.64 burrows per hectare with a standard error of mean of 1.18 (Ecologia, 2011b). The burrows were present in 18 hectares or 50% of the surveyed area and occurred across most of the survey area with the exception of sites to the north east where there may be a lack of suitable habitat and within the mine site disturbance footprint. Ecologia (2011b) found there was no significant difference in the medians of burrows within and outside the project area indicating that spider density is not dependent on the habitat located inside the project area. According to Ecologia (2011b), the low average density of 3.64 individuals per hectare suggested that successful conservation of the species in vicinity of the

project would be directly dependent on the amount of suitable habitat in the area.

The burrows were found within the boundaries of drainage lines and underneath more dense acacia vegetation which provided maximum shade and moisture harvesting opportunities (Ecologia, 2011b). This corresponds with the majority of the burrows being found in the W2 vegetation unit and indicates W2 is possibly the more significant vegetation type for the species in this area (DEC, 2012).

One burrow was recorded within the application area in a survey site located in the northern portion of the application area (Ecologia, 2011b). Survey sites in the vicinity of this part of the application area recorded the highest number of burrows with 20 and 31 burrows recorded in two survey sites directly adjacent to the application area. This is likely to be related to an ephemeral drainage line that occurs in the area. Mount Magnet South (2012) states it has designed this portion of the application area in response to the information provided in the targeted survey to have the least impact on *Idiosoma nigrum*. Mount Magnet South (2012) also proposes to minimise impacts through reducing impacts to surface flows, education, feral animal management (i.e. fencing to keep out feral animals), bushfire prevention, dust control and minimising clearing (through procedures and clearing in disturbed areas where possible).

The extent and regional significance of the Shield Back Trapdoor Spider population is unknown (DEC, 2012), however, the results of the survey can be used to estimate population size and proposed impacts to the Shield Back Trapdoor Spider from the proposed clearing. Based on the mean burrows per hectare, the proposed clearing of 74 hectares may impact on 269 ±1.2 individuals (Mount Magnet South, 2012). This represents 3.7% of an estimated population size of 7,280 ±1.2 individuals where the population estimate is for 2,000 hectares (i.e. extent over which the survey sites were located). Given vegetation types W1 and W2 appear to extend beyond this area and burrows were found in the periphery survey sites, it is likely this species occurs in surrounding areas of similar vegetation. Based on the estimated impacts, presence of suitable habitat outside the application area, management measures proposed by Mount Magnet South and the widespread range across which the species has previously been recorded, the proposed clearing is unlikely to have a significant impact on this species.

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

Methodology
360 Environmental (2011)
DEC (2012)
Ecologia (2011a)
Ecologia (2011b)
Mount Magnet South (2012)

(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). The nearest record of Threatened Flora is located approximately 70 kilometres south west of the application area (GIS Database).

No Threatened Flora was recorded during the vegetation survey undertaken between 30 August and 1 September 2011 (Niche, 2011).

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

Methodology
Niche (2011)
GIS Database:
- Threatened and Priority Flora

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest known TEC is approximately 140 kilometres south west of the application area (GIS Database).

The vegetation survey did not record any TECs (Niche, 2011).

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

Methodology
Niche (2011)
GIS Database:
- Threatened Ecological Sites Buffered

(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 Murchison Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 100% of the pre-European vegetation remains (see table) (GIS Database; Shepherd, 2009).

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

18: Low woodland; mulga (*Acacia aneura*).

According to Shepherd (2009), approximately 100% of this Beard vegetation association remains 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 – Murchison	28,120,587	28,120,587	~100	Least Concern	1.06
Beard veg assoc. – State					
18	19,892,305	19,890,275	99.99	Least Concern	2.13
Beard veg assoc. – Bioregion					
18	12,403,172	12,403,172	100	Least Concern	0.37

* Shepherd (2009)
** Department of Natural Resources and Environment (2002)

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

Methodology

Department of Natural Resources and Environment (2002)
Shepherd (2009)
GIS Database:
- IBRA WA (Regions – Sub Regions)
- Pre-European Vegetation

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

Comments

Proposal is at variance to this Principle

There are two minor, non-perennial watercourses within the application area (GIS Database). These converge and drain in a north-westerly direction (GIS Database). Aerial photography of the application area shows these drainage lines have been disturbed to some degree by the existing mine site (GIS Database). The drainage line is described as an undefined ephemeral drainage line with a lack of channel or bank development that is surrounded by vegetation that relies on sheet flow (Mount Magnet South, 2012; Niche, 2011). The drainage line flows into Kirkalocka Creek which is located approximately six kilometres north west of the application area (GIS Database).

The vegetation survey identified one vegetation unit (W2) associated with the undefined ephemeral drainage line. The key difference between this vegetation unit and the other vegetation unit (W1) identified within the application area is density of species and substrate which are linked to changes in hydrology (Niche, 2011). The vegetation in the application area was considered to be common and widespread in a local and regional context (Niche, 2011). Given vegetation along the drainage line occurs throughout the application area, it is unlikely that the proposed clearing will result in significant impacts to watercourses within the application area.

Mount Magnet South (2012) states the proposed infrastructure will be positioned to minimise impacts on surface flows and therefore does not anticipate that the proposed mine expansion will have a significant impact on the surface water or downstream vegetation.

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

Methodology

Mount Magnet South (2012)
Niche (2011)
GIS Database:
- Kirkalocka 1.4m Orthomosaic – Landgate 2003
- Hydrography, linear

- Rivers

(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 Woodline land system (GIS Database). The Woodline land system is described as hardpan wash plains supporting acacia shrublands and woodlands (Payne et al., 1998). This land system is generally not prone to accelerated soil erosion, however, impedance to overland flow can cause water starvation effects on vegetation downslope (Payne et al., 1998). Niche (2011) noted that the wash plains were essentially flat, with a few areas having a very low gradient. The proposed clearing is, therefore, unlikely to lead to appreciable soil erosion.

The average annual evaporation rate is over 13 times the average annual rainfall, so recharge to the groundwater would be expected to be minimal, thereby reducing the likelihood of raised saline water tables occurring as a result of the proposed clearing (BoM, 2012; GIS Database).

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

Methodology

BoM (2012)
Niche (2011)
Payne et al. (1998)
GIS Database:
- Evaporation Isopleths
- Rangeland Land System Mapping

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

Comments

Proposal is not likely to be at variance to this Principle

The application area does not lie within any conservation areas or Department of Environment and Conservation (DEC) managed lands (GIS Database). The nearest conservation area is the former Burnerbinmah Pastoral Lease which is now managed by DEC and is located approximately 13 kilometres south west of the application area (GIS Database). Based on the distance between the application area and the nearest conservation area, the proposed clearing is not likely to impact the environmental values of any conservation area.

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

Methodology

GIS Database:
- 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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). There are no permanent waterbodies or watercourses within the application area, however, there are two minor non perennial watercourses that pass through the application area (GIS Database). The drainage is described as an undefined ephemeral drainage line that has a lack of channel or bank development (Mount Magnet South, 2012; Niche, 2011).

The annual average rainfall for Mount Magnet is 238.2 millimetres and the average annual evaporation rate for the application area is approximately 3,200 millimetres (BoM, 2012; GIS Database). Therefore, during normal rainfall events surface water within the application area is likely to evaporate quickly. However, substantial rainfall events create surface sheet flow which is likely to have a higher level of sediments. During normal rainfall events, the proposed clearing would not likely lead to an increase in sedimentation of watercourses within the application area.

According to available databases, groundwater salinity within the application area is between 3,000 and 7,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered brackish to saline. The proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

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

Methodology

BoM (2012)
Mount Magnet South (2012)
Niche (2011)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide

- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is located within the YarraMonger catchment area (GIS Database). Given the size of the area to be cleared (74 hectares) in relation to the size of the catchment area (4,182,476 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

With an average annual rainfall of 238.2 millimetres and an average annual evaporation rate of 3,200 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2012; GIS Database). Whilst large rainfall events may result in 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 (2012)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments – Catchments

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

Comments

There is one native title claim over the area under application: WC96/98 (GIS Database). This claim 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 no registered Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 30 January 2012 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology

GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims – Registered with the NNTT

4. References

360 Environmental (2011) Kirkalocka Gold Mine Level 1 Vertebrate Fauna Survey. Unpublished report for Mount Magnet South NL dated October 2011.

BoM (2012) Climate Statistics for Australian Locations. A Search for Climate Statistics for Mount Magnet, Australian Government Bureau of Meteorology, viewed 17 February 2012, <http://www.bom.gov.au/climate/averages/tables/cw_007057_All.shtml>.

DAFWA (2012) Declared Plants Search. Department of Agriculture and Food. http://agspsrv95.agric.wa.gov.au/dps/version02/01_plantsearch.asp, viewed 7 March 2012.

DEC (2012) Advice to assessing officer for clearing permit application CPS 4836/1. Received on 26 March 2012.

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.

Ecologia (2011a) Mount Magnet South NL Kirkalocka Gold Mine Short Range Endemic Invertebrate Fauna Survey. Unpublished report for Mount Magnet South NL dated December 2011.

Ecologia (2011b) Mount Magnet South NL Kirkalocka Gold Mine *Idiosoma nigrum* Targeted Survey. Unpublished report for Mount Magnet South NL dated December 2011.

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

Mount Magnet South (2012) Kirkalocka Gold Mine Supporting Documentation for a Vegetation Clearing Permit Application (Purpose Permit). Unpublished report dated 18 January 2012.

Niche (2011) Level 2 Flora and Vegetation Survey at the Mount Magnet South NL Kirkalocka Gold Project. Unpublished report

for Mount Magnet South NL dated October 2011.
Payne, A.L., Van Vreeswyk, A.M.E., Pringle, H. J. R., Leighton, K.A. & Hennig, P. (1998) Technical bulletin no. 90: An inventory and condition survey of the Sandstone-Yalgoo-Paynes Find area, Western Australia. Department of Agriculture, Western Australia.
Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
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
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:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005.* Department of Conservation and Land Management, Como, Western Australia} :-

P1	**Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	**Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	**Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	**Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	**Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	**Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1	**Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
Schedule 2	**Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are

declared to be fauna that is need of special protection.

Schedule 3 **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

P1 **Priority One: Taxa with few, poorly known populations on threatened lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P2 **Priority Two: Taxa with few, poorly known populations on conservation lands**: Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P3 **Priority Three: Taxa with several, poorly known populations, some on conservation lands**: Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

P4 **Priority Four: Taxa in need of monitoring**: Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

P5 **Priority Five: Taxa in need of monitoring**: Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999)*

EX **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

EX(W) **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

CR **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

EN **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

VU **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

CD **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.