Department of Environment and Conservation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2581/1

Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Goldfields Mine Management Pty Ltd (GMM)**

1.3. Property details

Property: LOT 12 ON PLAN 48932 (FEYSVILLE 6431)
LOT 12 ON PLAN 48932 (FEYSVILLE 6431)
LOT 11 ON PLAN 48932 (FEYSVILLE 6431)
LOT 11 ON PLAN 48932 (FEYSVILLE 6431)

Local Government Area: City Of Kalgoorlie-Boulder

Colloquial name:

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard Vegetation Association: 9 - Medium woodland, Coral Gum (Eucalyptus torquata) and Goldfields Blackbutt (Eualytus le soufii); 221 - Succulent steppe, saltbush; 468 - Medium woodland, Salmon Gum and Goldfields Blackbutt (Shepherd et al. 2006)	The proposal is to clear 75 ha of native vegetation within a 800 ha project area for mineral exploration activities including geophysical survey and drilling on the Kambalda Dome formation. Clearing is proposed to take place over the next 5 years (Goldfields Mine Management 2008).	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	Description and condition of the vegetation under application was determined from Goldfields Mine Management (2008).
Heddle Vegetation Complex: Data deficient	The area under application covers two land systems. The Graves Land System covers Lot 11 and much of Lot 12 whilst the north west portion of Lot 12 is covered by the Gumland Land System (Goldfields Mine Management 2008).		
	Western Botanical (2008) describes the area under application as supporting four broad scale landform types including, low hills, plains and low gentle rises, drainage foci and saline plains with low rises and associated drainage, with these broad landform types collectively supporting nine vegetation associations.		
	Western Botanical (2008) describes low hills within the area under application		

as supporting three vegetation associations being rocky Acacia shrublands of tall Acacia sp. Norseman on low rocky granite/schistoae hills, Eucalyptus lesouafa / E. torquate woodland over sclerophyll shrubland on low rocky greenstone hills and sclerophyll shrublands with emergent Acacia sp. Norseman on outcropping granite and schists. Plains and low gentle rises are noted to support two vegetation associations being Eucalyptus lesouefii woodland with mixed sclerophyll and chenopod shrubland and Salmon Gum and Gimlet woodland with low Chenopod (Sclerosiegia) shrubland. Saline plains with low rises and associated drainage support Maireana pyramidala shrublands and tall mixed riparian shrubland with Acacia, Dodonaea, Senna and Eremophila species. Drainage foci within the area under application are noted to support two vegetation associations being inland Jam Tree (Acacia sp. Narrow Phyllode) thicket and Salmon Gum, Silver Topped Gimlet woodland over a thicket of Eremophila ionantha

The area under application has supported historical grazing, timber harvesting and historical mineral exploration activities with associated revegetation. However the vegetation structure is largely intact and long unburnt with minimal disturbance, few tracks and few weeds present (Goldfields Mine Management 2008). Vegetation within the area under application is thus considered to be in very good (Keighery 1994) condition.

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

Nine vegetation associations have been mapped within the area under application (Western Botanical 2008). Despite a history of grazing, timber harvesting and mining the area under application supports largely intact and long unburnt native vegetation with minimal disturbance, few tracks and few weeds present (Goldfields Mine Management 2008). Vegetation is considered to be in very good (Keighery 1994) condition.

Ninox Consulting (1998) conclude from comparisons between their surveys and surveys of undisturbed areas conducted by the Western Australian Museum that despite disturbance from mining and other sources in the Kambalda area there has been little impact on the vertebrate fauna and that the Kambalda area supports a diversity of vertebrate fauna comparable to the surrounding area.

A flora and vegetation survey of the area under application identified two species of priority flora (Western

Botanical 2008) including:
- one population of Melaleuca coccinea (priority 3) totalling ~ 248 plants; and
- one population of Allocasuarina eriochlamya subsp grossa (priority 3) totalling ~ 17 plants.

Both Melaleuca coccinea and Allocasuarina eriochlamya are located on proposed seismic survey lines within the area under application and are directly subject to clearing (Western Botanical 2008).

Nine other populations of Melaleuca coccinea are known to occur in the Coolgardie Bioregion between Kalgoorlie and Norseman, whilst Allocasuarina eriochlayms subsp. grossa is known from six populations in the Coolgardie Bioregion between Kalgoorlie, Coolgardie and Norseman and one population in the Nullarbor Bioregion (Western Botanical 2008).

Two subpopulations of Melaleuca coccinea totalling ~690 plants and one large population of Allocasuarina eriochlayms subsp. grossa totalling ~1,050 plants were also located immediately north of the area covered by this application.

In addition, one potentially new species which may warrant priority status (Daviesia sp. affin. pachyloma) and two undescribed taxa (Acacia sp. Narrow phyllode and Acacia sp. Norseman) lacking conservation significance occur within the area under application. Approximately 11 clumps of Daviesia affin. pachyloma were located within the area under application. Regional advice expresses concerns regarding the proposed clearing of Daviesia affin. pachyloma and that if this species/taxon is determined to be new that it should be managed accordingly and determinations made as to the species/taxons conservation significance (Goldfields Region 2008).

Given the diversity of vegetation communities and habitat, and presence of priority flora, potentially new species/taxon and undescribed species/taxa the vegetation under application is considered to comprise a high level of biological diversity.

A condition to avoid disturbing conservation significant flora species during the construction of exploration pads and survey tracks will be placed on the permit to mitigate impacts on these species.

Methodology

References:
- Western Botanical (2008)
- Ninox Consulting (1998)
- Goldfields Mine Management (2008)
- Keighery (1994)
- Goldfields Region (2008)

GIS Databases:
- Pre-European Vegetation
- Soils, Statewide
- SAC Bio datasets 24/07/2008

(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

Nine vegetation associations have been mapped within the area under application (Western Botanical 2008) and vegetation is considered to be in very good (Keighery 1994) condition.

Nine indigenous fauna species of conservation significance have been recorded within a 50 km radius of the area under application, being;
- Chuditch (Dasyurus geoffroii) VU
- Malleefowl (Leipoa ocellata) VU
- Native butterfly Jalmenus aridus P1
- Native butterfly Ogyris subterrestris petrina P1
- Crested Bellbird (Oreoica gutturalis gutturalis) P4
- Hooded Plover (Charadrius rubricollis) P4
- Shy Heathwren (Hylacola cauta whitlocki) P4
- White-browed Babbler (Pomatostomus superciliosus ashbyi) P4
- Peregrine Falcon (Falco peregrinus) Specially Protected

Ninox Consulting (1998) conducted surveys of vertebrate fauna in May 1993, October 1994 and October 1998 across selected habitats including the four broad scale landform types identified by Western Botanical (2008) within the area under application. Of the above listed species of conservation significance Crested Bellbird, Shy Heathwren, White-browed Babbler and Peregrine Falcon were identified during these surveys.

In addition Ninox Consulting (1998) also recorded the Rainbow Bee-eater (Merops ornatus) during surveys. This migratory species is protected under the Environmental Protection Biodiversity Conservation Act 1999.

Despite the apparent suitability of habitat Ninox Consulting (1998) did not record either Chuditch or Malleefowl during surveys of locally comparable vegetation associations to those present within the area under application. Despite the absence of these species in the records it is considered likely that these species are present at low density in the area under application and that the area presents suitable foraging habitat for these species.

The Hooded Plover and native butterfly's Jalmenus aridus and Ogyris subterrestris petrina are unlikely to be present within the area under application due to the lack of salt lakes, favoured species of flora and favoured vegetation structure respectively (Western Botanical 2008; DEC 2008).

Ninox Consulting (1998) conclude from comparisons between current surveys and surveys of undisturbed areas conducted by the Western Australian Museum that the long history of mining around Kambalda has had little impact on the vertebrate fauna of the general area.

Although large areas of the same vegetation association and soils as present within the area under application exist nearby the local area is subject to growing pressure from mining activity with clearing permits totalling approximately 465 ha previously granted in close proximity to the area under application (~5km radius)

Furthermore, Ninox Consulting (1998) recorded several feral cats in the Kambalda survey area with increasing disturbance in the Kambalda area likely favouring increased invasion by this introduced predator.

Given the habitat value of vegetation within the area under application for local fauna including species of conservation significance and the potential impacts of cumulative clearing, the proposal may be at variance to this principle.

Methodology

References:
- Ninox Consulting (1998)
- Western Botanical (2008)
- Goldfields Mine Management (2008)
- DEC (2008)
- Keighery (1998)

GIS Databases:
- SAC Bio datasets 24/07/2008
- Pre-European Vegetation
- Soils, Statewide

(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

One species of rare flora, Gastrolobium graniticum, is known to occur within a 50 km radius of the area under application with the closest known record of this species located approximately 47 km west of the area under application.

Gastrolobium graniticum is known to occur within the same vegetation type and soils mapped as occurring within the area under application. This species flowers from August to September and is known to occur along the margins of granite outcrops, near drainage lines (Western Australian Herbarium 1998-). Although habitat similar to that preferred by Gastrolobium graniticum exists within the area under application, flora surveys conducted by Western Botanical (2008) did not detect this species.

It is therefore considered that the area under application is not likely to comprise, or be necessary for the continued existence of rare flora.

Methodology

References:
- Western Botanical (2008)
- Western Australian Herbarium (1998-)

GIS Databases:
- Pre-European Vegetation
- Soils, Statewide
- SAC Bio datasets 24/07/2008

(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

No Threatened Ecological Communities (TEC) are recorded within a 50 km radius of the area under application with the nearest known occurrence of a TEC being 570 km south west of the vegetation under application

Western Botanical (2008) conducted floristic surveys of the area under application in which nine vegetation associations were recorded, however none of these associations are considered to fit the criteria of a TEC.

It is therefore unlikely that the vegetation proposed to be cleared comprises the whole, or a part of, or is necessary for the maintenance of a TEC.

Methodology

References:
- Western Botanical (2008)

GIS Databases:
- SAC Bio datasets 24/07/2008

(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 likely to be at variance to this Principle

The area of vegetation under application is associated with Beard vegetation associations 9 (~685 ha), 221 (~25 ha) and 468 (~90 ha) which have 99.7%, 99.9% and 100% pre-European vegetation extent remaining respectively (Shepherd 2006).

The State government is committed to the National Objectives and Targets for Biodiversity Conservation, which includes targets that prevent the clearing of ecological communities with an extent below 30% of that present pre-1750 (Commonwealth of Australia 2001).

All three vegetation associations mapped within the area under application are above the State Government's biodiversity conservation target, with no association having less than 30% pre-European extent remaining.

As all three vegetation associations present within the area under application are above the minimum 30% pre-European extent representation, the clearing as proposed is not considered likely to be at variance to this principle.

	Pre-European area (ha)	Current extent (ha)	Remaining %	% in reserves/DEC-managed land
Bioregion:				
Coolgardie *	12,912,207	12,707,623	98.4	-
City of Kalgoorlie-Boulder *	9,542,447	9,542,381	100	-
Heddle vegetation complex				
Data deficient	-	-	-	-
Beard vegetation associations *				
9	240,509	239,898	99.7	3.6
221	63,721	63,626	99.9	5.6
468	592,023	592,023	100	4.7

* (Shepherd 2006)

Methodology

References:
- Shepherd (2006)
- Commonwealth of Australia (2001)

GIS Databases:
- Pre-European Vegetation
- Interim Biogeographic Regionalisation of Australia
- Local Government Authorities

(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 mapped minor non-perennial watercourses within the area of vegetation under application, with the nearest mapped lake being 1.5 km to the east. A low lying drainage area east of the applied area, which extends into the applied area along its eastern half, appears to provide regional drainage in a south easterly direction into Lake Lefroy ~1.5 km to the south-east.

A flora and vegetation survey within the area under application identified broad scale landform types and vegetation associations across the applied area (Western Botanical 2008). The flora and vegetation survey identified nine vegetation communities, occuping four broad landform types, being;
- Low hills;
- Non-saline Plains and Low Gentle Rises;
- Drainage Foci; and
- Saline Plains, Low Rises and Associated Drainage lines (Western Botanical 2008).

Vegetation associations mapped within the Saline Plains, Low Rises and Associated Drainage Tracts landform include Maireana pyramidata and chenopod shrublands and tall mixed riparian shrublands with Acacia, Dodonaea, Senna and Eremophila species. Vegetation within internally draining Drainage Foci landforms are

characterised by thickets of Jam tree (Acacia sp. Narrow Phyllode) and Eucalyptus ravida Woodland over a thicket of Eremophila ionantha (Western Botanical 2008).

In comparison, vegetation within the Low Hills and Non-saline Plains and Low Gentle Rises tend to support a predominantly sclerophyllous shrubland of Acacia sp. Norseman or woodland of Eucalyptus spp. over medium sized shrubs and chenopods (Western Botanical 2008).

Given that the area under application supports minor non-perennial watercourses, most likely acting as temporary drainage channels during high rainfall events to nearby Lake Lefroy, that the area of vegetation under application comprises a variety of vegetation associations growing in areas of low elevation or in drainage channels and riparian areas, parts of the vegetation under application are considered to be growing in, or in association with a watercourse.

Methodology

References:
- Western Botanical (2008)

GIS Databases:
- Hydrography, linear_1
- Hydrography, linear (hierarchy)
- Topographic Contours, Statewide

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments

Proposal may be at variance to this Principle

The majority of the area under application lies within soils associated with rocky ranges and hills of greenstone with chief soils being shallow calcareous loamy soils with shallow brown and grey-brown calcareous earths below which weathered rock occurs at shallow depths. Areas under application to the west lie within soils associated with gently sloping to gently undulating plateau areas with erosional scarps and tors and irregular traverses by narrow shallow valleys, chief soils are yellow earthy sands occasionally in depositional sites containing ironstone gravels. Areas under application to the east lie within soils associated with undulating valley plains and some rocky outcroppings, chief soils are alkaline red earths with limestone at shallow depth (Northcote et al. 1960-68).

Goldfields Mine Management (2008) advise that the Graves and Gumland land systems occupy the area under application and that the footslope and alluvial plains terrain units of these systems are susceptible to water erosion where perennial shrub cover is substantially reduced or where the soil surface is extensively disturbed (DAFWA 2007; Goldfields Mine Management 2008). In addition the area under application lies within the sheet flow area for Lake Lefroy (Goldfields Mine Management 2008) and may be prone to inundation during heavy rainfall events.

However given the proposal involves the clearing of 75 ha of native vegetation within a 800 ha area the majority of clearing is likely to be widely distributed and is unlikely to lead to an appreciable increase in soil erosion leading to sedimentation in Lake Lefroy.

The area under application does however support landform features on alluvial plains of the Graves land system including several incised drainage lines for ephemeral water flows and, saline plains and low rises with associated drainage lines (Western Botanical 2008). Clearing of vegetation cover within these areas may lead to erosion of soil and subsequent sedimentation in Lake Lefroy.

Given the risk of soil erosion within drainage lines and associated area of low elevation clearing may be at variance to this principle.

DAFWA (2007) recommend that were the proposed works traverse drainage lines that rehabilitation earthworks include provisions that prevent lateral gullying.

Given that the proposal may expose soils prone to water erosion a condition will be placed on this permit for progressive rehabilitation of areas once they are no longer required for the purpose in which they were cleared.

Methodology

References:
- Goldfields Mine Management (2008)
- Western Botanical (2008)
- Northcote et al. (1960-68)
- DAFWA (2007)

GIS Databases:
- 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 nearest conservation area to the area under application is Kambalda Nature Reserve and the associated Kambalda Timber Reserve which together form approximately 7,065 ha of reserved lands.

The project area is approximately 500 m east of Kambalda Nature Reserve and the proposal boundary does not extend west of the railway formation located along the eastern boundary of Kambalda Nature Reserve (Goldfields Mine Management 2008).

Vegetation surrounding the area under application and Kambalda Nature Reserve is well represented with ~98.4% vegetation cover remaining in the bioregion (Shepherd 2006) and vegetation being relatively continuous and undisturbed. In addition the area under application does not constitute part of an ecologically significant corridor for faunal movement.

It is thus considered that clearing as proposed will not affect the environmental values of any nearby conservation area and thus is not considered likely to be at variance to this principle.

Methodology

References:
- Goldfields Mine Management (2008)
- Shepherd (2006)

GIS Databases:
- CALM Managed Lands and Waters
- Lake Lefroy 1.4m Orthomosaic - DLI 02
- Pre-European Vegetation

(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 may be at variance to this Principle

The area under application is located approximately 1.5 km north west of Lake Lefroy. Several minor non-perennial creek lines drain in a south easterly direction through the area under application into Lake Lefroy.

The area under application is within the sheet flow area for Lake Lefroy (Goldfields Mine Management 2008) and may be prone to inundation during heavy rainfall events.

The part of the proposal area is located on the alluvial plains land unit of the Graves land system which is susceptible to water erosion where perennial shrub cover is substantially reduced or where the soil surface is extensively disturbed (DAFWA 2007; Goldfields Mine Management 2008).

Whilst the proposal is to clear 75 ha over 5 years within an 800 ha area, the proposed clearing may result in water erosion particularly in drainage tracts and low elevation plains of Graves land system. Water erosion of these soils with drainage into nearby surface water bodies may result in sedimentation and associated deterioration of water quality.

Furthermore, the proposed clearing of 75 ha in an area subject to growing mining activity is likely contribute to the long term cumulative effects of clearing in the local area, including increased surface water runoff and erosion exacerbating water quality impacts on local surface water hydrological features. Therefore the proposed clearing may be at variance to this principle.

DAFWA (2007) recommend that were the proposed works traverse drainage lines within the area under application that rehabilitation earthworks include provisions that prevent lateral gullying.

Given that the proposal may expose soils prone to water erosion a condition will be placed on this permit for progressive rehabilitation of areas once they are no longer required for the purpose in which they were cleared.

Methodology

References:
- Goldfields Mine Management (2008)
- DAFWA (2007)

GIS Databases:
- Lake Lefroy 1.4m Orthomosaic - DLI 02
- Hydrography, linear_1
- Hydrography, linear (hierarchy)

(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 area under application is located within the sheet flow area for Lake Lefroy (Goldfields Mine Management 2008) and is subject to broad scale flooding during heavy rainfall events. As the proposal involves clearing of approximately 75 ha within an 800 ha and clearing will be distributed within the larger area (Goldfields Mine Management 2008) with large tracts of intact native vegetation remaining in the local area, clearing is not likely to cause or exacerbate the incidence or intensity of broad scale flooding.

Given this, clearing as proposed is not considered likely to be at variance to this principle.

Methodology

References:
- Goldfields Mine Management (2008)

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

Comments

As saline groundwater aquifers may be intercepted during exploratory drilling operations (Goldfields Mine Management 2008) and the area under application is within the Proclaimed Groundwater Area of the Goldfields any abstraction of groundwater would require a licence (Department of Water 2008). The interception of these aquifers may also lead to local surface flooding during drilling operations. Goldfields Mine Management (2008) propose structures such as drill sumps where necessary to contain these waters during operations.

The area under application is freehold and therefore Native Title does not apply. In addition Goldfields Mine Management (2008) state that two Aboriginal heritage sites of significance are recorded within the area under application and that two Ethnographic surveys are outstanding which have been scheduled for completion by July 2008.

Mineral exploration is not a prescribed premise as defined under Environmental Protection Regulations 1987 Schedule 1 - Prescribed premises. It is the proponent's responsibility to determine whether any other licences or approvals are required for future proposed works.

Works approval is not required for the proposed mineral exploration (Submission 2007).

Methodology

References:
- Department of Water (2008)
- Submission (2007)
- Goldfields Region (2008)

4. Assessor's comments

Comment

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the Environmental Protection Act 1986, and the proposed clearing is at variance to principle (a) and may be at variance to principles (b), (f), (g) and (i).

5. References

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Department of Water. (2008). CPS 2581 Goldfields Mine Management, 5C licence water abstraction. TRIM Ref DOC58979.

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6. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)