Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4221/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **MMG Golden Grove Pty Ltd**

1.3. Property details

Property: M59/195
M59/227
Local Government Area: Shire of Yalgoo
Colloquial name: Golden Grove Open Pit Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 28 April 2011

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 at a scale of 1:250,000 for the whole of Western Australia. One Beard Vegetation Association is located within the application area (Shepherd, 2009):

Beard Vegetation Association 420: Shrublands; bowgada & jam scrub (GIS Database).

A review of past botanical studies has been undertaken by Woodman Environmental Consulting (2010). From this review, a Mattiske Consulting (1996) survey identified six plant communities within the application area:

Acacia Woodlands:

AW3 Open low woodland or tall shrubland of mixed *Acacia* species over scattered shrubs and dense annual species dominated by mixed *Asteraceae* species and *Austrostipa trichophylla*.

AW4 Open low woodland or tall shrubland of mixed *Acacia* species over scattered shrubs and dense annual species dominated by *Monachather paradoxus* and *Waitzia acuminata*.

AW6 Open low woodland of *Acacia ramulosa*, *Acacia burkittii* and *Acacia tetragonophylla* over chenopods and annuals.

Shrublands:

S10 Open low shrubland of *Mirbelia rhagodioides, Thryptomene costata* and *Baeckea sp*. with emergent *Acacia grasbyi* and mixed *Acacia* species.

Clearing Description
MMG Golden Grove has applied to clear up to 123.9 hectares within a total area of 280 hectares of native vegetation. The clearing is for the Golden Grove Open Pit development, this comprises of an open pit, administration and workshop area, topsoil, subsoil and vegetation stockpiles, waste rock landform, access and haul roads, enhancements to existing process plant, relocation of backfill plant, expansion of explosives storage compound and abandonment bund (on closure) (Coffey Environments, 2011a).

The proposal area is situated approximately 54 kilometres south-southwest of Yalgoo (Coffey Environments, 2011a).

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

To

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

Comment
The vegetation condition has been assessed by Coffey Environments (2011a). Much of the application area has been subject to intensive exploration (Woodman Environmental Consulting, 2010). The vegetation has also been subject to grazing by goats (Woodman Environmental Consulting, 2010).

A total of twelve weed species were identified during the Mattiske Consulting (1996) survey: *Cuscuta epithymum* (Lesser Dodder); *Cirsium vulgare (*Spear Thistle*)*; *Emex australis* (Doublegee); *Hypochaeris glabra* (Smooth Catsear); *Lolium rigidum* (Wimmera Ryegrass); *Mesembryanthemum nodiflorum* (Slender Iceplant); *Pentaschistis airoides* (False Hairgrass); *Raphanus raphanistrium* (Wild Radish); *Sisymbrium orientale (*Indian Hedge Mustard); *Sonchus oleraceus (*Common Sowthistle); *Spergularia rubra* (Sand Spurry) and; *Vulpia myuros forma forma myuros*.

Doublegee is listed as a declared plant under the *Agriculture and Related*

S11 Open low shrubland of *Mirbelia rhagodioides, Thryptomene costata, Aluta aspera subsp. hesperia, Baeckea sp*. and *Hemigenia benthamii* over scattered annual species.

S12 Very open low shrubland of *Acacia aneura var. aneura, Acacia ramulosa var. ramulosa* and *Acacia aulacophylla* over *Dodonaea petiolaris, Ptilotus obovatus*, *Olearia stuartii*, *Philotheca brucei*, *Philotheca sericea* and *Mirbelia rhagodioides*.

Resources Protection Act 1976, but has no status listing for the Shire of Yalgoo (Woodman Consulting, 2010).

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 may be at variance to this Principle

Much of the application area has been subject to historic intensive exploration and mining activities (Coffey Environments, 2011a). The vegetation condition within the application area has been identified by aerial imagery and Coffey Environments (2011a) as 'completely degraded' to 'very good'. Twelve introduced taxa were recorded by the Mattiske (1996) within the Golden Grove lease area (Coffey Environments, 2011a). Potential impacts to biodiversity through further weed invasion as a result of the proposed clearing may be minimised by the implementation of a weed control condition.

Six vegetation associations were identified within the application area (Coffey Environments, 2011a). These mapped vegetation associations occur on flats and lower slopes, except vegetation association S12 which occurs on hill slopes and crests (Coffey Environments, 2011a). From many surveys conducted locally and regionally a total of 200 vascular plants from 45 families have been recorded within the Golden Grove lease area (Coffey Environments, 2011a). This includes seven conservation significant species (Priority flora) (Coffey Environments, 2011a). Floristic diversity is within the expected range for the region (Coffey Environments, 2011b).

No Declared Rare Flora species or Threatened Ecological Communities were identified within the application area (Coffey Environments, 2011a; Woodman Environmental Consulting, 2010; GIS Database). The vegetation communities identified as S11 and S12 by Mattiske (1996) are considered by Woodman Environmental Consulting (2010) to be equivalent to the Central Tallering Floristic Community 3 (FCT 3) of the Priority Ecological Community (PEC) 13: 'Gnows Nest Range and Minjar' (banded ironstone formation). This is a Priority 1 ranked PEC (Woodman Environmental Consulting, 2010). The S11 and S12 vegetation communities constitute an occurrence of PEC 13 and are therefore considered to be of high regional significance (Woodman Environmental Consulting, 2010). However, whist Gossan Hill is in close proximity to the 'Minjar' PEC, it is geographically disjunct from the Minjar or Gnows Nest Range areas. Furthermore, as the geology of the Gossan Hill is not strictly banded ironstone it is not considered part of the Minjar or Gnows Nest Range areas, (Woodman Environmental Consulting, 2010).

Coffey Environments (2011a) note that for the proposed disturbance of the total areas mapped for community vegetation communities S11 and S12 is 5.2% and 14.7% respectively. In reviewing the aerial imagery (GIS Database) and the S11 and S12 mapped vegetation communities within the application area (Coffey Environments, 2011a) much of these areas appear to have been subject to historical and recent disturbance.

Advice has been provided from the Department of Environment and Conservation (DEC), Environmental Management Branch on the 12 April 2011 regarding the impact of the clearing within the application area, specifically in relation to the vegetation communities S11 and S12 being floristically comparable to the 'Gnows Nest Range and Minjar' Priority Ecological Community (PEC) 13. The DEC advice states that “due to the level of historic disturbance associated with the site, the residual conservation value of the area within the impact footprint of this proposal is considered to be limited” (Department of Environment and Conservation, 2011).

Seven Priority 3 flora species are known or expected to occur within the application area (Coffey Environments, 2011a).

For *Calytrix uncinata* and *Drummondita fulva,* 11 and 4 known populations respectively occur on and near Gossan Hill (Woodman Environmental Consulting, 2010). The application area will impact on one population for each of these species. For both species, the majority of the known population is located in a small area between the proposed open pit and abandonment bund. MMG Golden Grove will not be clearing an area between the abandonment bund and the pit to ensure impacts to these populations are minimised (Coffey Environments, 2011a). While the clearing will impact on *D. fulva* at the local level, the impact regionally is considered low given the population at Gossan Hill is the most northern known population (Woodman Environmental Consulting, 2010). Individuals of *Micromyrtus trudgenii* and *Polianthion collinum* are also contained within this area that is not being cleared (Coffey Environments, 2011a).

Populations of *Euryomyrtus patrickiae* have been identified in vicinity of Gossan Hill and the regional distribution of this species is considered to be fairly extensive (Woodman Environmental Consulting, 2010).

This species is not likely to be impacted upon given that no known populations occur within the application area (Coffey Environments, 2011a).

Two of the 11 known populations of *Grevillea globosa* occur on or near Gossan Hill, however, the conservation of this species is not likely to significantly impacted upon given the regional distribution of this species is extensive (Woodman Environmental Consulting, 2010).

One of the six known populations of *M. trudgenii* that occur on or near Gossan Hill will be impacted by the proposed clearing. The impact regionally is considered low, however, the regional distribution is restricted within the Yalgoo Bioregion. These populations also form the most northern known populations (Woodman Environmental Consulting, 2010).

Persoonia pentasticha has been recorded within the Golden Grove lease area by Mattiske (1996) in at least four locations, however no data for actual locations was recorded (Woodman Environmental Consulting, 2010). As this species is widespread throughout the region (Woodman Consulting, 2010) the proposed clearing is not likely to significantly impact on the conservation of this species.

Fourteen populations of *P. collinum* are known in the area from Gossan Hill extending southwards to Karara Station. Of the five populations on the Golden Grove lease area, one will be reduced by approximately 24% by the proposed clearing (Woodman Environmental Consulting, 2010). The impact of the proposed clearing at the local scale has been described as moderate (Woodman Environmental Consulting, 2010).

Coffey Environments (2010a) conducted a review of existing survey data for the project area and surrounds, and searched Commonwealth and State databases to determine conservation significant fauna species that may potentially found in the project area. Targeted searches for Malleefowl (*Leipoa ocellata*) mounds and habitat suitable for conservation significant species were also undertaken (Coffey Environments, 2010a). A total of 358 vertebrate fauna species may occur within the survey area, including at least 130 bird species, 160 reptile species, 19 amphibian species and 49 mammal species. 24 conservation significant species were identified as potentially occurring in the application area (Coffey Environments, 2010a). Fauna assemblages within the application area are expected to be similar to that of surrounding areas and are not considered to be unique (Coffey Environments, 2011a). Two broad fauna habitat types have been identified within the application area and are not considered to be unique to the region (Coffey Environments, 2011a).

A troglofauna survey of the application area was conducted by Biota Environmental Sciences Pty Ltd (2010) in October 2007 and subsequently in 2010. Given that no troglobitic specimens were recorded within the application area (Biota Environmental Sciences Pty Ltd (2010) it would appear unlikely that any troglofaunal community is present.

In 2006 fauna field investigations were undertaken for the Gossan Hill area by Bamford Consulting, this included the identification of potential for short-range endemic (SRE) invertebrates (Bamford, 2007 cited in: Coffey Environments, 2011a). Only a land snail (shell only) and live slaters (isopods) were found, Bamford, (2007 cited in: Coffey Environments, 2011a) reported that the SRE invertebrates are likely to be endemic to hill areas rather than a single landform and, therefore, are unlikely to be found within the project area.

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

Methodology

Biota Environmental Sciences Pty Ltd (2010)
CALM (2002)
Coffey Environments (2010a)
Coffey Environments (2011a)
Coffey Environments (2011b)
Department of Environment and Conservation (2011)
Shepherd (2009)
Woodman Environmental Consulting (2010)
GIS Database
-Badja 1.4m Orthomosaic - Landgate 2003
-Declared Rare and Priority Flora List
- IBRA Australia
- IBRA WA (Regions - Sub Regions)
-Threatened Ecological Communities

(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

Coffey Environments (2010a) conducted a review of existing survey data for the project area and surrounds, and searched Commonwealth and State databases to determine conservation significant fauna species that may be potentially found in the project area. Targeted searches for Malleefowl (*Leipoa ocellata*) mounds and habitat suitable for conservation significant species were also undertaken by Coffey Environments between 14 and 15 December 2008 (Coffey Environments, 2010a). A total of 358 vertebrate fauna species may occur within the survey area, including at least 130 bird species, 160 reptile species, 19 amphibian species and 49 mammal species (Coffey Environments, 2010a).

Vegetation communities identified in the project area by Mattiske (1996) comprise of two broad habitat types (Coffey Environments, 2011a). These being:

- Open mulga (*Acacia aneura*) woodland with scattered herbs over a gravely clay with quartz patches, soils have more clay on the flats and are stonier on the slopes; and

- Rocky hill with shrubland of *Acacia* species to 2 metres on minimal surface soil.

These habitats are not unusual or unique to the region and it is considered that similar habitat types and vegetation types occur adjacent to the areas that are to be cleared (Coffey Environments, 2011a).

Coffey Environments (2011a) determined that Malleefowl (*Leipoa ocellata*), Schedule 1, *Wildlife Conservation Act 1950,* footprints, scratchings or mounds have not been located within the application area. However, Malleefowl have been found in numerous surveys in the bioregion and other areas of the Golden Grove mine site (Coffey Environments, 2011a). It is possible that Malleefowl may occasionally move through the project area (Coffey Environments, 2010a), therefore potential impacts to Malleefowl as a result of the proposed clearing may be minimised by the implementation of a fauna management condition.

The Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris)*, Endangered, *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*, Schedule 1, *Wildlife Conservation Act 1950*, was not observed during the survey (Coffey Environments, 2011a). While this species may utilise the application area for feeding it is unlikely to be used for breeding given the lack of suitable tree-hollows (Coffey Environments, 2011a).

Conservation significant species such as the: Rainbow Bee-eater (*Merops ornatus)*, *Migratory and Marine, EPBC Act 1999*; Fork-tailed Swift (*Apus pacificus)*, *Migratory, EPBC Act 1999*); Peregrine Falcon (*Falco peregrinus*, Schedule 4, *Wildlife Conservation Act 1950*; and the Australian Bustard (*Ardeotis australis),* DEC Priority 4 that are nomadic, transient, migratory or have undefined home ranges will be able to move quickly from the application area upon clearing to adjacent similar habitats (Coffey Environments, 2011a). The Gilled Slender Blue-tongue (*Cyclodomorphus branchialis)*, Schedule 1, *Wildlife Conservation Act 1950* has a high probability of being impacted by the clearing within the application area, however, this species is known to have a wide regional distribution (Coffey Environments, 2011a). The loss of habitat is not likely to impact on the conservation of this species overall but may have a localised impact.

Aerial imagery illustrates that areas north and west of the application area are being utilised for mining related purposes (for example a ROM Pad, airstrip and access tracks) (GIS Database). The proximity to existing mine infrastructure could be considered to act as a deterrent to many native fauna species, thereby minimising the potential for these species to frequent these parts of the application area.

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

Methodology Coffey Enviroments (2010a)
Coffey Environments (2011a)
GIS Database
- Badja 1.4m Orthomosaic - Landgate 2003

(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 is no recorded Declared Rare Flora (DRF) within the application area (GIS Database).

The taxon *Stylidium sp*. Yalgoo is declared as rare flora pursuant to the *Wildlife Conservation Act 1950* (Coffey Environments, 2011a). Several populations of this species are known mostly to the south of Golden Grove, with one population being located 1 kilometre to the east of the project area (Coffey Environments, 2011a). A species-specific site survey was conducted by Woodman Environmental Consulting in September 2010 during the flowering season to identify the presence of this flora within the project area. No individuals or populations of the species were identified (Coffey Environments, 2011a; Woodman Environmental Consulting, 2010).

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

Methodology Coffey Environments (2011a)
Woodman Environmental Consulting (2010)
GIS Database:
- Declared Rare 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 likely to be at variance to this Principle**
There are no known Threatened Ecological Communities (TEC's) within the application area (GIS Database).

The vegetation present within the project area does not comprise the whole or part of, or is necessary for the maintenance of a threatened ecological community (Coffey Environments, 2011a). The nearest known TEC, 'SHB08' and 'SHB09' (Koolanooka System) are located approximately 71 kilometres southwest of the application area (GIS Database). Given the distance between the application area and the nearest known TEC, the proposed clearing is not likely to impact on the conservation values of that TEC.

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

Methodology Coffey Environments (2011a)
GIS Database:
- Clearing Regulations - Environmentally Sensitive Areas
- 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 Yalgoo Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2009) report that approximately 98.68% of the pre-European vegetation still exists in the Pilbara bioregion. The vegetation in the application area is broadly mapped as Beard Vegetation Association 420: Shrublands; bowgada & jam scrub (GIS Database).

According to Shepherd (2009) approximately 96.66% of Beard Vegetation Association 420 remains at the state level and 96.66% at the bioregional level (Shepherd, 2009). Therefore, the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

While a small percentage of the vegetation types within the Pilbara bioregion are adequately protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of Beard Vegetation Association 420 within the bioregion is not likely to be impacted by this proposal.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Yalgoo	5,057,314	4,990,570	~98.68	Least Concern	~9.86
Beard vegetation associations - State					
420	859,632	830,931	~96.66	Least Concern	~0.06
Beard vegetation associations - Bioregion					
420	859,632	830,931	~96.66	Least Concern	~0.06

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 Australia
- 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 not likely to be at variance to this Principle

According to available databases (GIS Database) and Coffey Environments (2011a) there are no permanent watercourses or wetlands within the application area. The nearest wetland or waterbody is the Lake Wownaminya ephemeral system located approximately 27 kilometres north of the application area (Coffey Environments, 2011a).

Drainage lines that form well-defined creeks at the mid-slopes and poorly-defined creeks along the valley floors are within the application area, however, are only likely to flow following major rainfall events given low rainfall and high evaporation rates (Coffey Environments, 2011a).

From a review undertaken by Woodman Environmental Consulting (2010), six plant communities within the application area were identified by Mattiske Consulting (1996). None of the species recorded within these communities are specific to riparian areas (Coffey Environments, 2011b).

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

Methodology
Coffey Environments (2011a)
Coffey Environments (2011b)
Woodman Environmental Consulting (2010)
GIS Database:
- Hydrology, linear

(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 application area has an annual average evaporation rate of approximately ten times the annual average rainfall (Coffey Environments, 2011a; GIS Database). Based on this information, surface flows during normal rainfall events are likely to be short-lived.

There are no permanent watercourses or wetlands within the application area (GIS Database). While both well defined and poorly-defined creeks occur within the application area these are only likely to flow following major rainfall events (Coffey Environments, 2011a).

The proposed application is located within the following three land systems:

The Kalli Land System is characterised by red sandplains supporting bowgada shrublands with wanderrie grasses and residual plateau surfaces with level to gently undulating sandplains high in the landscape, the area has overall relief to about 20 metres (Payne et al.1998). The system is not generally prone to accelerated erosion (Payne et al.1998).

The Gumbreak Land System is characterised by low granite breakaways and saline alluvial plains supporting halophytic shrublands (Payne et.al. 1998). Lower slopes and alluvial plains are moderately susceptible to erosion (Payne et al. 1998). In these areas disturbance to the soil surface is likely to initiate soil erosion (Payne et al. 1998).

The Watson land system is characterised by hills, rises and gravelly plains on sedimentary rocks, supporting bowgada shrublands with non-halophytic undershrubs (Payne et al. 1998). Relief is occasionally up to about 140 metres but usually much less (Payne et al. 1998). Stone and gravel surface mantles provide effective protection against erosion; however, the disturbance or removal of the mantles may initiate erosion (Payne et al.1998). It appears that just under half of the proposed clearing areas have been mapped as the Watson land system (GIS Database).

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

Localised and short-term degradation will be partially mitigated by the construction of permanent and semi-permanent infrastructure such as the waste rock landform, administration and work shop buildings (Coffey Environments, 2011a). Erosion as a result of surface runoff will be minimised by construction of catchment drains and containment basins (Coffey Environments, 2011a).

Specific management and monitoring procedures to address the potential impacts to soil and subsequent rehabilitation will be followed in accordance with the Golden Grove Open Pit Project Soil Management Plan (Coffey Environments, 2010b) and the Golden Grove Open Pit Project Mine Closure Plan (Coffey Environments, 2010c). These documents will be assessed accordingly as part of the Mining Proposal application under the *Mining Act 1978*.

Methodology
Coffey Environments (2010b)
Coffey Environments (2010c)
Coffey Environments, (2011a)
Landloch Pty Ltd (2010)
Payne et al. (1998)
GIS Database:
- Evaporation Isopleths
- Hydrology, linear
-Rangeland 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 is not situated within a Department of Environment and Conservation managed

conservation area (Coffey Environments, 2011a; GIS Database).

The nearest conservation estate is the former leasehold Warriedar pastoral station which is located approximately 3 kilometres south-east of the application area (GIS Database). Given the distance between the application area and the nearest conservation area, the proposed clearing is not likely to impact on the conservation values of the former leasehold Warriedar pastoral station.

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

Methodology Coffey Environments (2011a)
GIS Database:
- Clearing Regulations - Environmentally Sensitive Areas
- Threatened Ecological Sites Buffered

(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) (Coffey Environments, 2011a; GIS Database).

There are no permanent watercourses or wetlands within the application area (GIS Database). The nearest wetland or waterbody is the Lake Wownaminya ephemeral system located approximately 27 kilometres north of the application area (Coffey Environments, 2011a).

Average rainfall for the local area is approximately 280 millimetres per year (Coffey Environments, 2011a). Given the area experiences a pan evaporation rate of approximately 3000 millimetres per year (GIS Database), approximately ten times the average annual rainfall, there is likely to be little surface water flow during normal seasonal rains.

Drainage lines from low-lying ridges converge in low-lying areas to form well-defined creeks at mid-slope sites and wide, poorly-defined creeks along valley floors (Coffey Environments, 2011a). Flows in these creeks are described as ephemeral and surface water flow is only likely to occur following major rainfall events (Coffey Environments, 2011a).

Surface runoff is to be directed to catchment drains and collected in containment basins on site (designed to manage a one in 100 year average recurrence interval event with a 72 hour duration period (Coffey Environments, 2011a). Water management systems are also to be installed for access and haul road surface water flows (Coffey Environments, 2011a).

The groundwater within the Golden Grove mine area ranges from fresh to saline with levels between 810 to 11,290 milligrams per litre Total Dissolved Solids (Coffey Environments, 2011a). Groundwater beneath Gossan Hill may have been as deep as 80 metres below ground surface (Coffey Environments, 2011a), therefore changes to the salinity levels in the local area are unlikely to occur as a result of the proposed clearing. However, dewatering activities of the Gossan Hill mine and Scuddles mine (adjacent to the application area) have created two large cones of depression (Coffey Environments, 2011a). While salinity of abstracted groundwater is subject to seasonal fluctuations, evidence suggests that salinity has increased as a result of increased groundwater abstraction (Coffey Environments, 2011a).

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

Methodology Coffey Environments (2011a)
GIS Database
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is located in an arid to semi-arid inter-zone and is prone to long periods of drought (Coffey Environments, 2011a). Occasional major rainfall events largely associated with tropical cyclone activity occur in the summer months and can result in localised flooding (Coffey Environments, 2011a).

Average annual rainfall for the application area is relatively low at 280 millimetres (Coffey Environments, 2011a). The average annual evaporation rate of 3000 millimetres (GIS Database) is approximately ten times the average annual rainfall and any surface water resulting from normal rainfall events is likely to be relatively short lived.

Drainage lines converge in low-lying areas to form defined creeks at mid-slopes and wide poorly defined creeks along the valley floors (Coffey Environments, 2011a). Drainage flow into these creeks is ephemeral and is only occur likely to occur after extreme rainfall events (Coffey Environments, 2011a).

The application area is within the YarraMonger catchment area which covers 4,182,476 hectares (GIS Database). Given the size of the area to be cleared (123.9 hectares) in relation to the size of the catchment area (4,182,476 hectares), the proposed clearing is not likely to increase the incidence or intensity of flooding.

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

Methodology Coffey Environments (2011a)
GIS Database
-Hydrography Catchments

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

Comments

There is one native title claim over the application area. This claim (WC96-98) has been registered with the National 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 (ie. 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 is one 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 Sites of Aboriginal Significance are damaged through the clearing process.

The clearing permit application was advertised on 28 February 2011 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application.

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.

Methodology GIS Databases:
- Aboriginal Sites of Significance
- Native Title Determined
- Native Title Federal
- Native Title NNTT

4. References

Biota Environmental Sciences Pty Ltd (2010) Golden Grove Open Pit Project Troglofauna Assessment. Prepared for Coffey Environments. Prepared by Biota Environmental Sciences Pty Ltd.

Coffey Environments (2010a) Golden Grove Open Pit Project, Fauna Risk Assessment. Prepared for Coffey Natural Systems PO Box 4223 VICTORIA PARK WA 6979. Report Date: 24 June 2010.

Coffey Environments (2010b) Environmental Management Plan for the Golden Grove Open Pit Project. Report prepared for MMG Golden Grove Pty Ltd.

Coffey Environments (2010c) Mine Closure Plan for the Golden Grove Open Pit Project. Report prepared for MMG Golden Grove Pty Ltd.

Coffey Environments (2011a) Vegetation Clearing Permit Application for the Golden Grove Open Pit Project. Minerals and Metals Group Golden Grove Pty Ltd Golden Grove Open Pit Project Volume 1: Main Report January 2011.

Coffey Environments (2011b) Email titled 'CPS 4221/1 - Golden Grove Open Pit Project - MMG Golden Grove Pty Ltd' dated 25 March 2011 signed by Marissa Haywood, Coffey Environments.

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

Department of Environment and Conservation (2011) FW: CPS4221/1 - Golden Grove Open Pit Project MMG Golden Grove. Advice from Department of Environment and Conservation, Environmental Management Branch, Murray Baker, 12 April 2011.

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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.