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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2635/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **The Griffin Coal Mining Company Pty Ltd**

1.3. Property details

Property: Collie Coal (Griffin) Agreement Act 1979, Coal Mining Leases 12/448, 12/450, 12/451, 12/452, 12/453, 12/454, 12/455, 12/456, 12/457, 12/458, 12/459, 12/460, 12/461, 12/462, 12/515, 12/778, 12/779;
Exploration Licence 12/1
Local Government Area: Shire Of Collie
Colloquial name: Muja South

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
14		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

Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia, and are a useful tool to examine the vegetation extent in a regional context. Two Beard vegetation associations are located within the application area (GIS Database):

3; Medium forest; jarrah-marri; and

1114; Shrublands tree-heath; paperbark over teatree thicket.

Flora and vegetation surveys of the application area were undertaken by Bennett Environmental Consulting in September 2005 and October 2006 as part of larger surveys of the Muja South tenements (Environ Australia Pty Ltd, 2008). A briefing note has been submitted by Environ Australia Pty Ltd (2008) which summarises information from these surveys relevant to the application area. The vegetation types within the application area are described as:

Em: Low Forest A of *Eucalyptus marginata subsp. marginata* and *Corymbia calophylla* over Low Heath C of *Xanthorrrhoea preissii* or Dense Thicket of *Hakea undulata* or *Dryandra sessilis* or *Hakea lissocarpha* over Very Open Tall Sedges;

Af: Forest of *Corymbia calophylla* and *Eucalyptus marginata subsp. marginata* over Low Woodland A of *Allocasuarina fraseriana* over Open Scrub of *Kunzea glabrescens* over Open Dwarf Scrub D of mixed species over Very Open Tall Sedges dominated by *Lepidosperma leptostachyum*;

Be: Low Woodland A of *Eucalyptus marginata subsp. marginata* and *Allocasuarina freseriana* over Low Heath D dominated by *Bossiaea eriocarpa* over Open Low Sedges dominated by *Tetraria octandra* or *Lepidosperma leptostachyum*;

Bj: Dense Low Forest A of *Eucalyptus rudis subsp. rudis* over Thicked of *Melaleuca vimenea* over Tall Sedges of *Baumea juncea* or *Lepidosperma longitudinale*;

Li: Open Low Woodland A of *Melaleuca preissiana* and *Banksia littoralis* over Tall Sedges dominated by *Lepidosperma longitudinale*;

MV: Dense Thicket of *Melaleuca viminea* over Open Tall Sedges dominated by *Lepidosperma longitudinale* over Open Tall Grass over Dense Herb;

Hm: Dense Heath A of *Hakea varia* or *Astartea* species or *Hakea marginata* or *Melaleuca subtrigona* or *Banksia meisneri subsp. meisneri* over Tall or Low Sedges of several species;

Pa: Low Sedges of *Hypolaena viridis* or *Meeboldina scariosa* or *Platychorda applanata*;

Deg: Degraded creekline;

C: Cleared;

Er/Mv: Mosaic of **Er** and **Mv**; and

Mv/Li: Mosaic of **Mv** and **Li**.

Clearing Description
The Griffin Coal Mining Company Pty Ltd (Griffin Coal) have applied to clear 14 hectares of native vegetation within a purpose permit boundary of approximately 44 hectares (Griffin Coal, 2008). The proposed clearing is for mineral exploration associated with the Muja South Exploration project.

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

to

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

Comment
The vegetation condition of the application area has been derived from the vegetation description provided by Environ Australia Pty Ltd (2008) and aerial photography viewed by the assessing officer.

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

The application area is located approximately 15 kilometres east of Collie, within the Southern Jarrah Forest subregion of the Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The subregion is characacterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Marri-Wandoo woodlands on clayey soils (Hearn *et al*., 2002). Hearn *et al.,* (2002) states that the rare features of the Southern Jarrah Forest subregion are the extensive native forest cover, but that the biota is patchy considering geological and geomorphic uniformity. The main land use is primarily grazing (improved pastures) and dry land agriculture, forestry and conservation (Hearn *et al*., 2002).

Flora and vegetation surveys of the application area were undertaken by Bennett Environmental Consulting in 2005 and 2006 as part of larger surveys of the Muja South tenements (Environ Australia Pty Ltd, 2008). A briefing note has been submitted by Environ Australia Pty Ltd (2008) which summarises information from these surveys relevant to the application area. During the flora and vegetation surveys a total of 474 native flora taxa were recorded over an area of approximately 4,000 hectares (Environ Australia Pty Ltd, 2008). Considering the large size of the survey area, the assessing officer considers this an above average level of flora diversity.

Five conservation significant flora species and two undescribed species were recorded during the Bennett Environmental Consulting flora surveys, however, none of these species were recorded in the application area (Environ Australia Pty Ltd, 2008). These species included: *Leucopogon sp. collie* (Priority 2) *Synaphea petiolaris subsp. simplex* (Priority 2)*, Synaphea decumbens* (Priority 3)*, Acacia semitrullata* (Priority 3)*, Pultenaea skinneri* (Priority 4), *Caledenia* sp. (undescribed) and *Logania* sp. (undescribed) (Environ Australia Pty Ltd, 2008). It is recommended that should the permit be granted, conditions be placed on the permit for the purposes of flora management.

From a faunal perspective, the proposed clearing area contains a faunal assemblage that is typical of the Jarrah Forest bioregion (Bamford Consulting Ecologists, 2006). Bamford Consulting Ecologists (2008) have noted wetlands, watercourses and large trees as being particularly important habitats for fauna indigenous to the area. Five conservation significant fauna species were identified as having a high likely hood of occurring in the application area. These species were: the Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, the Quenda and the Chuditch (Bamford Consulting Ecologists, 2008). The nature of exploration drilling means that large habitat trees will not be disturbed and watercourses and wetlands will be avoided, therefore, the clearing of vegetation in this proposal is not expected to have a large impact on fauna diversity (Bamford Consulting Ecologists, 2008).

There are no known Threatened Ecological Communities (TECs) within the application areas (GIS Database). Five potentially restricted vegetation communities were recorded during the Bennett Environmental Consulting flora surveys, however, four of these were not recorded in the application area (Environ Australia Pty Ltd, 2008). General wetlands were recorded as the fifth vegetation community (Environ Australia Pty Ltd, 2008), which will be avoided during the proposed drilling operations (Griffin Coal, 2008).

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

During the flora and vegetation surveys 79 species of weeds were recorded (Environ Australia Pty Ltd, 2008). The occurrence of weeds is likely to originate from the agricultural area which lies to the east and north of the application area (Environ Australia Pty Ltd, 2008). The presence of weeds within the application area diminishes the biodiversity value of the site (CALM, 1999). The assessing officer recommends that should the

permit be granted, conditions be placed on the permit for the purpose for weed management.

The application area has been dieback mapped by CAD Resources (Griffin Coal, 2008). The results show that approximately half of the application area is dieback infested. Dieback is generally associated with low lying dampland areas (Griffin Coal, 2008). Given that approximately half of the application area is dieback free, it is important that dieback is not introduced into dieback free areas so the biodiversity values of these areas can be maintained (Environ Australia Pty Ltd, 2008). The assessing officer recommends that should the permit be granted, conditions be placed on the permit for the purpose for dieback management.

The impact to biodiversity in the region should be limited as the application area is relatively small (14 hectares). Clearing is proposed to be undertaken in a series of small segmented patches with a raised blade (Griffin Coal, 2008). As roots will be left intact and clearing will be undertaken in small patches, rehabilitation and regrowth is expected to be relatively successful, thereby reducing long term impacts to biodiversity.

Methodology

Bamford Consulting Ecologists (2006)
Bamford Consulting Ecologists (2008)
CALM (1999)
Environ Australia Pty Ltd (2008)
Griffin Coal (2008)
Hearn et al. (2002)

(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 desktop fauna survey of the application area was conducted by Bamford Consulting Ecologists (2006) on 15 June 2005. Following this, a fauna impact assessment was undertaken by Bamford Consulting Ecologists (2008) on 12 September 2008 in relation to the proposed Muja South exploration project. Based on habitat preferences and known distributions, it is likely that the following conservation significant species could occur within the application area (Bamford Consulting Ecologists, 2008):

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*);
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*);
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*);
- Quenda (*Isoodon obesulus fusciventer*); and
- Chuditch *(Dasyurus geoffroii*).

The Forest Red-tailed Black-Cockatoo (Schedule 1, fauna that is rare or likely to become extinct, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2009*) is threatened because clearing has greatly reduced the available breeding and feeding habitat (Bamford Consulting Ecologists, 2006). Feral bees and Galahs also compete with the Forest Red-tailed Black Cockatoo for nesting hollows. The range of this subspecies is closely tied to the distribution of Marri (*Corymbia calophylla*) (Bamford Consulting Ecologists, 2006).

The Carnaby's Black Cockatoo (Schedule 1, fauna that is rare or likely to become extinct, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2009*) occurs in the south-west of WA, approximately south-west of a line between the Murchison River (near Kalbarri) and Cape Arid National Park (east of Esperance) (Bamford Consulting Ecologists, 2006). Land clearing and degradation has reduced available breeding sites (tree hollows) and fragmented breeding and feeding sites. Feral bees, galahs and corellas can out-compete *the* Carnaby's Black Cockatoo for nesting hollows (Bamford Consulting Ecologists, 2006).

The Baudin's Black Cockatoo (Schedule 1, fauna that is rare or likely to become extinct, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2009*) occurs in the deep south-west of WA, approximately south-west of a line between Morangup (near Bullsbrook) and Waychinicup National Park (east of Albany) (Bamford Consulting Ecologists, 2006). Birds generally breed in the Karri, Marri and Wandoo forests, in the southern parts of the species' range and move north to the Darling Range and Swan Coastal Plain during autumn and winter (non-breeding periods) (Bamford Consulting Ecologists, 2006). Therefore, significant breeding habitats are most likely to be concentrated further south of the application area. Threatening processes for this species have been identified as clearing for agriculture and logging which have removed nesting and feeding habitats (Bamford Consulting Ecologists, 2006).

All three species of Black Cockatoo discussed above rely on tree hollows for nesting. In general, hollows of sufficient size to support Black-Cockatoos do not form until trees are at least 230 years old, and the majority of nests are found in 300-500 year old trees (Bamford Consulting Ecologists, 2006). Losses of feeding grounds, nesting trees and competition from bees and Corellas have increased the importance of available nesting hollows. Tree hollows are of significance to the conservation of Black Cockatoo species. The nature of exploration drilling means that large habitat trees will not be disturbed. Therefore, the clearing of vegetation in this proposal is not expected to have a large impact on significant habitat for these speices of Black Cockatoos (Bamford Consulting Ecologists, 2008).

The Chuditch (Schedule 1, fauna that is rare or likely to become extinct, *Wildlife Conservation* (*Specially Protected Fauna*) *Notice*, *2009*) is a large carnivorous marsupial which is known to occupy a range of habitats

from woodlands, dry sclerophyll (leafy) forests, riparian vegetation, beaches and deserts (Strahan & Van Dyck, 2008). According to Bamford Consulting Ecologists (2008), if found in the application areas, the Chuditch is likely to shelter in dense understorey vegetation and hollow logs. The proposed clearing of 14 hectares in discontinous small patches is unlikely to represent significant habitat for this speices.

The Southern Brown Bandicoot or Quenda (*Isodon obesulus*) is listed as Priority 5 (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) on the Department of Environment and Conservation's (DEC's) Priority Fauna List. This species occurs in the south-west of Western Australia in dense shrubby, often swampy vegetation with dense cover up to one metre high (Bamford Consulting Ecologists, 2006). In Jarrah and Wandoo forests the Quenda is usually associated with watercourses (Strahan & Van Dyck, 2008). Given that there are minor watercourses within the application area, it is possible that this species may persist. Griffin Coal (2008) have committed to avoid clearing vegetation for drill pads within any watercourses. The proposed clearing of 14 hectares in discontinous small patches is unlikely to represent significant habitat for this species.

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

Methodology Bamford Consulting Ecologists (2006)
Bamford Consulting Ecologists (2008)
Griffin Coal (2008)
Strahn & Van Dyck (2008)

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

Comments

Proposal may be at variance to this Principle

Flora and vegetation surveys of the application area were undertaken by Bennett Environmental Consulting in September 2005 and October 2006 as part of larger surveys of the Muja South tenements (Environ Australia Pty Ltd, 2008). A briefing note has been submitted by Environ Australia Pty Ltd (2008) which summarises information from these surveys relevant to the application area. During the flora and vegetation surveys no species of Declared Rare Flora were recorded, however, five species of Priority Flora listed with the Department of Environment and Conservation were recorded. These were:

Leucopogon sp. Collie (Priority 2);
Synaphea petiolaris subsp. simplex (Priority 2);
Synaphea decumbens (Priority 3);
Acacia semitrullata (Priority 3);
Pultenaea skinneri (Priority 4);

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

None of the above listed flora species were recorded within the application area, however, they occurred in close proximity (Environ Australia Pty Ltd, 2008). Due to the close proximity of Priority flora to the vegetation of the application area, it may be suitable for some of these species, however, it is not likely to be necessary for the continued existence of these species. Griffin Coal (2008) have committed to undertake targeted flora searches for Priority flora before any clearing takes place, if any Priority flora species are identified they will be flagged and disturbance areas will be redesigned to avoid these species. It is recommended that should the permit be granted, conditions be placed on the permit for the purposes of flora management.

During the Bennett Environmental Consulting flora and vegetation surveys two undescribed species of flora were recorded (Environ Australia Pty Ltd, 2008). These were:

Caledenia sp. (undescribed); and
Logania sp. (undescribed).

Caledenia sp. (undescribed) has been recorded during flora surveys of the Muja South tenements in 2005, 2007 and 2008 (Environ Australia Pty Ltd, 2008). This species was not recorded in the current application area. The plant was recorded as growing in vegetation associations **BI** and **Cc** which do not occur within the current application area (Environ Australia Pty Ltd, 2008). Environ Australia Pty Ltd (2008) report the plant resembles the critically endangered flora species *Caladenia busselliana,* however, its identity has not been positively confirmed due to insufficient flowering material. *Caladenia busselliana* prefers vegetation associated with winter wet swamps (Western Australian Herbarium, 1998-2009). As drilling will not occur within swamps and the vegetation association in which the plant has been found do not occur within the application area, the application area is unlikely to be necessary for the continued existence of this species.

Logania sp. (undescribed) was recorded in high numbers in natural bushland and along the disturbance corridor for a powerline. This may indicate that the species is a disturbance specialist (Environ Australia Pty Ltd, 2008). No additional searches were undertaken for this taxon as it was stated that the area where it occurred would not be cleared (Environ Australia Pty Ltd, 2008). As it appears this species can recolonise disturbed locations it is unlikely the vegetation of the application area would be necessary for the continued existence of this species.

Methodology Environ Australia Pty Ltd (2008)
Griffin Coal (2008)
Western Australian Herbarium (2009)

(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 Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest TEC is located approximately 40 kilometres to the south-east (GIS Database).

The vegetation units described by Environ Australia Pty Ltd (2008) within the application area were not considered to be TEC's or an ecological community at risk.

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

Methodology Environ Australia Pty Ltd (2008)
GIS Database:
- Threatened Ecological Communities

(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 application area is located within the Southern Jarrah Forest subregion of the Jarrah Forest Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). According to Shepherd et al. (2001), there is approximately 50.2% of vegetation remaining within the Southern Jarrah Forest IBRA subregion, of which 32.8% remains in conservation reserves. This gives the Southern Jarrah Forest IBRA Subregion a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The application area occurs within the Shire of Collie (GIS database). There is approximately 84.9% of vegetation remaining within the Shire of Collie (Shepherd et al., 2001). This places the Shire at 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the application area is classified as Beard vegetation association 3 – Medium forest; jarrah-marri and Beard vegetation association 1114 - Shrublands tree-heath; paperbark over teatree thickets (GIS Database). These vegetation types are represented within conservation reserves at both the state and bioregional level (see table below). The application area does not represent a significant remnant of vegetation in the wider regional area. The proposed clearing will not reduce the extent of Beard Vegetation Associations 3 or 1114 below current recognised threshold levels, below which species loss increases significantly.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Jarrah Forrest	4,506,675	2,426,080	~ 53.8	Least Concern	~ 14.0 (~ 25.5)
IBRA Subregion – Southern Jarrah Forest	2,607,875	1,308,941	~ 50.2	Least Concern	~ 16.8 (~ 32.8)
Local Government – Collie	170,223	144,442	~ 84.9	Least Concern	N/A
Beard veg assoc. – State					
3	2,661,515	1,863,983	~ 70.0	Least Concern	~ 18.4 (~ 26.2)
1114	19,837	13,488	~ 68.0	Least Concern	~ 20.2 (~ 29.1)
Beard veg assoc. – Bioregion					
3	2,390,535	1,661,219	~ 69.5	Least Concern	~ 16.3 (~ 23.3)
1114	19,837	13,488	~ 68.0	Least Concern	~ 20.2 (~ 29.1)

Beard veg assoc. – Subregion					
3	1,482,495	913,332	~ 61.6	Least Concern	~ 18.7 (~ 30.2)
1114	10,002	5,028	~ 50.3	Least Concern	~ 7.5 (~ 14.2)

* Shepherd et al. (2001) updated 2005
** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2001) updated 2005
GIS Database:
- Interim Biogeographic Regionalisation of Australia
- 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

According to available databases, there are no known Directory of Important Wetlands or Ramsar wetlands within the application area (GIS Database).

There are three perennial watercourses including the Collie River East and Chicken Creek found in the application area (GIS Database).

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

Griffin Coal (2008) have stated that clearing will not be required within any drainage lines during the project. An officer from the Native Vegetation Assessment Branch at the Department of Mines and Petroleum visited the application area on the 29 October 2008 and noted that the area proposed to be cleared may be subject to inundation during winter months following heavy rainfall, however, the areas are not permanently inundated with water.

The proposed clearing of 14 hectares will be undertaken in small discontinuous areas associated with exploration. It is unlikely the proposed clearing will significantly reduce vegetation associated with watercourses or wetlands.

It is the proponent's responsibility to liaise with the Department of Water to determine whether a Bed and Banks Permit is required for the proposed works.

Methodology Griffin Coal (2008)
GIS Database:
- Geodata, lakes.
- Hydrography, linear
- 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 is not likely to be at variance to this Principle

The application area is characterised by a series of low rises separated by broad, shallow drainage lines, whilst the soils are generally lateritic and gravelly (Bamford Consulting Ecologists, 2006). The majority of the application area is found on low lying areas which are surrounded by hills to the east and Muja South mine operations to the west (GIS Database).

The following measures will be implemented by Griffin Coal (2008) to prevent appreciable land degradation:

- Raised blade clearing will used during the project;
- No clearing will be undertaken during rainfall periods;
- No clearing or drilling will be undertaken within drainage lines;
- Progressive rehabilitation during the life of the project, as land becomes available;
- Rationalisation of access through the closure of redundant tracks; and
- Restriction of access through fencing.

The proposed clearing is small (14 hectares) and will be undertaken in a discontinuous method associated with exploration. It is unlikely the proposed clearing will cause appreciable land degradation.

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

Methodology Bamford Consulting Ecologsits (2006)
Griffin Coal (2008)
GIS Database:
- Topographic contours, 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 southern portions of the application area is located within the Collie State Forest Area (GIS Database). This State Forest is managed for multiple purposes, including conservation. Under the *Collie Coal Mining (Griffin) Agreement Act, 1979* Griffin Coal have been permitted access to areas of State Forest persuant to particular conditions vested with the Conservator of Forests.

The nearest conservation reserve to the application area is the Yallatup Nature Reserve which is located approximately four kilometres to the east of the application area (GIS Database). Given the distance between the reserve (four kilometres) it is unlikely that the proposed clearing would result in impacts to the Yallatup Nature Reserve.

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

Methodology GIS Database:
- CALM Managed Lands and Waters

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments **Proposal is not likely to be at variance to this Principle**
The application area is located within the Wellington Dam Catchment Area (Public Drinking Water Source Area) (GIS Database). The groundwater within the application area is fresh-brackish, at between 1000-3000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). The Department of Water (2008) (DoW) has advised that: provided more than 10% of the land in the local area remains uncleared the DoW generally does not object to the issue of a clearing permit. Due to the extent of the State Forest, the DoW has no objection to the grant of the clearing permit (DoW, 2008).

The majority of the application area is located in a low lying area of the landscape (GIS Database). It is possible that the clearing of vegetation within the low lying area (adjacent to current Muja mining operations) may initiate some sedimentation of Collie River East and Chicken Creek. However, Griffin Coal have stated that the following measures will be implemented to mitigate potential impacts of sedimentation of Collie River East and Chicken Creek:

- Raised blade clearing will be used during the project;
- No clearing will be undertaken during rainfall periods;
- No clearing or drilling will be undertaken within drainage lines;
- Progressive rehabilitation during the life of the project;
- Rationalisation of access through the closure of redundant tracks; and
- Restriction of access through fencing.

The proposed clearing of 14 hectares will be undertaken in a discontinuous method associated with exploration. It is unlikely the proposed clearing will cause an incremental deterioration in the quality of surface or underground water.

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

Methodology DoW (2008)
GIS Databases:
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSAs)
- Topographic contours, statewide

(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**
Geoscience Australia (2008) attributes four major factors which influence inland flooding. These include:

- Intensity and duration of rainfall over a catchment area;

- The capacity of the watercourses to network and convey runoff;
- The percentage of vegetation cover; and
- The topography.

Based on the four factors listed above, clearing within the application area is unlikely to exacerbate the incidence or intensity of flooding for the following reasons:

- The application area has a climate with a winter predominant rainfall pattern averaging approximately 800 millimetres per annum (GIS Database), and a moderate average annual evaporation rate exceeding the average annual rainfall by nearly two times (approximately 1,500 millimetres) (GIS Database);
- The application area stretches over the Wellington Dam Collie River Catchment area. This catchment totals approximately 282,910 hectares (GIS Database). The application area (14 hectares) is very small, when compared in relation to the large size of the Wellington Dam Collie River Catchment, and the proposed clearing is unlikely to result in an appreciable increase in runoff;
- Vegetation cover immediately surrounding the application area is high, with vegetation ranging from forest to dense thicket. Clearing is proposed to be conducted in small disjointed patches with a raised blade leaving root stocks in the ground (Griffin Coal, 2008). This will reduce rapid transitions of water to lower lying areas and increase water infiltration and absorption; and
- The topography of the application area gently slopes towards Chicken Creek and the Collie River East. Water movements across the application area during significant rainfall events are expected to be slow, filtering into the Chicken Creek and Collie River East. There is not expected to be a significant increase in water flows from the application area due to the disjunct pattern of clearing (i.e. no large open areas of cleared vegetation) and the use of raised blade methods of clearing.

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

Methodology

Geoscience Australia (2008)
Griffin Coal (2008)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments
- Hydrography, Linear
- Lakes
- Rainfall, Mean Annaul
- Rivers

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

Comments

There is one native title claim over the application area (WC98-058) (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the tenements have been granted in accordance with the future act regime of the *Native Title Act 1993*, and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are four registered Sites of Aboriginal Significance located within the application area (Site ID's 16713, 19795, 19796 and 21905) (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process. The proponent is aware of these sites and their responsiblilities to comply with the *Aboriginal Heritage Act 1972*.

The application area is located within the Wellington Dam Catchment Area, a Public Drinking Water Source Area (PDWSA) (GIS Database), and falls within Zone D under the *Country Areas Water Supply Act 1947* (DoW, 2008). The Department of Water (2008) (DoW) has advised that: provided more than 10% of the land in the local area remains uncleared the DoW generally does not object to the issue of a clearing permit. Due to the extent of the State Forest, the DoW has no objection to the grant of the clearing permit (DoW, 2008).

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.

A submission was received on the 8 September 2008 in regard to Aboriginal heritage matters and Aboriginal sites of significance that may potentially occur in the application area. It was requested that a copy of Griffin Coals Heritage Management Plan and up to date maps that include the application area in relation to Aboriginal Sites of Significance be provided. A response to this submission was issued on 10 September 2008

to clarify issues raised in the submission. It was advised that this information should be sought from Griffin Coal directly or alternatively the Department of Indigenous Affairs could be consulted to determine whether the application area is in the vicinity have been previously surveyed for Aboriginal Sites of Significance.

Methodology DOW (2008)
GIS Databases:
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

The proposal has been assessed against the clearing principles and is at variance to Principle (f), may be at variance to Principles (a) and (c), and is not likely to be at variance to Principles (b), (d), (e), (g), (h), (i) and (j).

Should a clearing permit be granted, it is recommended that conditions be imposed on the permit for the purpose of weed management, dieback management, flora management, record keeping and permit reporting.

5. References

Bamford Consulting Ecologists (2006) Fauna Survey of Griffin Coals Ewington II and Buckingham sites, January 2006, unpublished report for The Griffin Coal Mining Company Pty Ltd, Perth, Western Australia.

Bamford Consulting Ecologists (2008) Fauna Management in Association With Drilling Programmes in the Muja South Boyup Project area, unpublished report for The Griffin Coal Mining Company Pty Ltd, Perth, Western Australia.

CALM (1999) Environmental Weed Strategy for Western Australia, Department of Conservation and Land Management, Perth, western Australia.

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.

DoW (2008) Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP), 10 September 2008. Department of Water, Western Australia.

Environ Australia Pty Ltd (2008) Briefing Note: Vegetation Information to support Clearing Permit application for Muja South 3 December 2008.

Geoscience Australia (2008) What Causes Floods, Electronic source of information, viewed 15 September 2008, http://www.ga.gov.au/hazards/flood/causes.jsp.

Griffin Coal (2008) Supporting Documentation, Application to Clear Native Vegetation – Muja South exploration access, Perth, Western Australia.

Hearn *et al*. (2002) Jarrah Forest 2 (JF2 - Southern Jarrah Forest subregion) in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002'. Department of Conservation and Land Management, Western Australia.

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

Shepherd, D.P. (2007) 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. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.

Strahan & Van Dyck (2008) Mammals of Australia 3rd Edition, New Holland Publishers, 2008, Sydney Australia.

Western Australian Herbarium (1998–2009) FloraBase — The Western Australian Flora. Department of Environment and Conservation. http://florabase.dec.wa.gov.au/

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DMP	Department of Mines and Petroleum.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.

EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
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	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

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.