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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5541/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Vector Resources Limited**

1.3. Property details

Property: General Purpose Lease 77/119
Miscellaneous Licence 77/247
Miscellaneous Licence 77/248
Mining Lease 77/1263
Local Government Area: Shire of Menzies
Colloquial name: Gwendolyn East Cutback Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
107.17		Mechanical Removal	Mineral Production and Associated Infrastructure

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 6 June 2013

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

Beard Vegetation Associations have been mapped for the whole of Western Australia and are useful to look at vegetation in a regional context. Two Beard vegetation associations have been mapped within the application area:

202: Shrublands; mulga and *Acacia quadrimarginea* scrub; and
385: Shrublands; bowgada and jam scrub with scattered York gum (GIS Database).

A botanist from Niche Environmental Services undertook a Level 2 flora and vegetation survey over the application area and surrounding project area in April and September 2012. A total of 26 vegetation units within seven broad landforms were described within the larger project area. Six broad landforms and 22 vegetation units were mapped within the application area (Niche Environmental Services, 2012).

Plains Vegetation
The plains vegetation within the project area was generally defined by soils of red clay, on flat to very gently sloping plains that were noted in areas to contain pebbles and stones of ironstone, quartz and basalt.

PW1 - Low Woodland B of *Acacia ramulosa* var. *ramulosa*, *Eucalyptus ewartiana* and *A. aneura* over Open Low Scrub A of *Baeckea elderiana*, *Prostanthera grylloana* and *Eremophila forestii* subsp. *forestii* on red clay in a flat to very gently sloping valley floor.

PW2 - Low Woodland B of *Acacia ramulosa* var. *ramulosa*, *A. aneura* and *A. caesaneura* on red clay.

PW3 - Woodland of *Eucalyptus salubris* and *E. clelandii* over Open Low Scrub B of *Atriplex nummularia*, *Eremophila pantonii* and *Senna artemisioides* subsp. x *artemisioides* over Open Dwarf Scrub D of chenopods on plains with red clay and scattered gravel of ironstone and quartz.

PW5 - Open Low Woodland A of *Eucalyptus clelandii* over Open Dwarf Scrub C of *Atriplex nummularia* on red clay with scattered pebbles and stones of basalt.

PW6 - Open Low Woodland A *of Eucalyptus griffithsii* and *Casuarina pauper* over Low Woodland B of *Acacia* species on red clay with scattered ironstone and basalt pebbles.

PW7 - Open Low Woodland A of *Eucalyptus griffithsii* over Open Low Scrub A of *Eremophila scoparia* and *Atriplex nummularia* on red clay with very scattered ironstone and basalt pebbles.

PW8 - Open Low Woodland A of *Eucalyptus kochii* and *Casuarina pauper* over Low Woodland B of *Acacia* species on red clay with scattered ironstone pebbles and stones.

PW9 - Open Low Woodland A of *Eucalyptus kochii* over Low Woodland B of *Acacia* species on red clay with ironstone pebbles.

PW10 - Low Woodland A of *Eucalyptus* species over Low Woodland B of *Acacia ramulosa* var. *ramulosa*, *A. aneura* and *A. caesaneura* over red clay with scattered gravel of ironstone and quartz.

PW11 - Open Low Woodland of *Eucalyptus salubris* over Open Scrub B of *Eremophila scoparia*, *Exocarpos aphyllus* and mixed species on red clay with ironstone and quartz pebbles and stones.

PW12 - Open Woodland of *Eucalyptus oleosa* over Low Woodland B of *Acacia ramulosa* var. *ramulosa*, *A. aneura* and *A. acuminata* on red clay with basalt and ironstone pebbles.

Floodplains Vegetation
These units were characterised by proximity to ephemeral drainage lines, but generally lacked any clearly defined banks or contouring consistent with the ephemeral drainage lines. The floodplains units were considered to be consistent with plains vegetation units *sens. lat.* of the Murchison, where plain and floodplain topography plays a role in promoting the rapid movement of water from significant rainfall events into better developed drainage systems.

FPW2 - Open Woodland of *Eucalyptus griffithsii* over Open Low Woodland B of *Acacia* species and *Eremophila scoparia* on red clay with occasional sections of exposed hard cap of weather basalt.

FPW3 - Open Woodland of *Eucalyptus kochii* and *E. loxophleba* over Open Low Woodland B of *Acacia acuminata* and *Eremophila oppositifolia* subsp. *angustifolia* on red clay with occasional scattered outcropping of weathered basalt.

Ephemeral Drainage Line Vegetation
The key differences between the floodplain and ephemeral drainage line units related to the presence of some degree of bank formation in the ephemeral drainage lines.

EDW1 - Open Low Woodland A of *Eucalyptus loxophleba* and *E. kochii* over Open Low Woodland B of *Acacia ramulosa* var. *ramulosa*, *A. aneura* and *A. acuminata* on red clay with sections of exposed, laterised hard cap and calcrete.

EDW2 - Low Woodland B of *Acacia* species on red clay with exposed hard cap of concretionary laterised ironstone.

Banded Ironstone Formation and Concretionary Weathered Ironstone Vegetation
There were several small sections of low banded ironstone and concretionary weathered ironstone formations in the project areas. These were generally characterised by a low topography, containing ironstone rocks of varying sizes, some of which were clearly weathered or had undergone further geological process to form ironstone that was more concretionary in nature.

BW2 - Low Woodland B of *Acacia* species and *Grevillea nematophylla* var. *nematophylla*.

BW3 - Open Low Woodland A of *Eucalyptus* species over Low Woodland B of *Acacia ramulosa* var. *ramulosa*, *A. aneura* and *A. caesaneura* over Open Low Scrub B of *Philotheca brucei* subsp. *brucei*, *Dodonaea rigida* and *Eremophila decipiens* subsp. *decipiens* on red flat plain to very gently sloping low hills of red clay with ironstone, quartz and basalt gravel and very occasional minor outcroppings of basalt and ironstone.

Greenstone Hills Vegetation
There was a section of greenstone hills at the northern end of the proposed access track into the main project area (M77/1263).

GW - Low Woodland B of *Acacia* species and *Eremophila oldfieldii* subsp. *angustifolia* on red clay on low greenstone hill.

Basalt Hills Vegetation
The basalt hills formed part of an undulating landscape, with the low hills interspersed with sections of plains and floodplains vegetation.

BHLW - Low Woodland B *Acacia* species and *Allocasuarina dielsiana* over Open Low Scrub A of *Dodonaea rigida*, *Prostanthera althoferi* subsp. *althoferi* and *Acacia caesanaeura* on red clay with scattered basalt stones and outcropping.

BHOLW-A - Open Low Woodland A of *Casuarina pauper* over Open Low Scrub B of *Scaevola spinescens*, *Eremophila decipiens* subsp. *decipiens* and *E. scoparia* on red clay on low hill of basalt.

BHOLW-B - Open Low Woodland B of *Acacia cockertoniana*, *A. caesaneura* and *A. aneura* over Low Scrub B of *Baeckea* aff. *elderiana* on red clay on weathered basalt and ironstone.

BHS - Scrub of *Dodonaea lobulata* and *Acacia acuminata* on light red clay on low hill of basalt.

Clearing Description

Vector Resources Ltd has applied to clear up to 107.17 hectares of native vegetation for the purpose of mineral production and associated infrastructure. Clearing is to develop an existing pit as well as waste landforms, plant, campsite, water pipeline, haul roads and access roads.

The application area is located at the existing Gwendolyn East project, approximately 160 kilometres west of Menzies.

Vegetation will be cleared by machinery.

Vegetation Condition	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994); To: Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).
Comment	The vegetation condition was assessed by a botanist from Niche Environmental Services (2012).

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The application area occurs within the Eastern Murchison Interim Biogeographic Regionalisation of Australia (IBRA) subregion (GIS Database). This subregion is characterised by its internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. It includes salt lake systems associated with the occluded Paleodrainage system, broad plains of red-brown soils and breakaway complexes as well as red sandplains (CALM, 2002). Vegetation is dominated by Mulga woodlands often rich in ephemerals, hummock grasslands, saltbush shrublands and Halosarcia shrublands (CALM, 2002).

A botanist from Niche Environmental Services undertook a Level 2 flora and vegetation survey over the application area and surrounding project area in April and September 2012. Six broad landforms and 22 vegetation units were mapped within the application area (Niche Environmental Services, 2012). The majority of the vegetation was widespread in the local area and the region with none of the vegetation units considered to represent a unique assemblage of species (Niche Environmental Services, 2012). A total of 139 native flora taxa, belonging to 74 genera within 30 families, were recorded from the survey area (Niche Environmental Services, 2012). Species representation was greatest among Fabaceae, Myrtaceae, Chenopodiaceae and Asteraceae families (Niche Environmental Services, 2012).

No Threatened Flora or Threatened Ecological Communities were recorded within the application during the vegetation survey or have previously been recorded within the application area (Niche Environmental Services, 2012; GIS Database). The north-west tip of the application area is within the buffer of the Priority Ecology Community (PEC) 'Die Hardy Range/Diemels vegetation complex (banded ironstone formation)' (GIS Database). However, the vegetation observed during the vegetation survey was not considered to be any of the PECs known from the region (Niche Environmental Services, 2012).

Targeted Priority Flora searches were conducted during the spring survey after three Priority taxa were recorded during the autumn survey. Overall, four Priority Flora species were recorded during the surveys: *Malleostemon* sp. Adelong (P2), *Baeckea* sp. Parker Range (P3), *Philotheca deserti* subsp. *brevifolia* (P3) and *Eucalyptus formanii* (P4) (Niche Environmental Services, 2012). The records of *Philotheca deserti* subsp. *brevifolia* are not within the application area (Niche Environmental Services, 2012). One plant of *Malleostemon* sp. Adelong and one plant of *Baeckea* sp. Parker Range will be impacted by the proposed clearing (Niche Environmental Services, 2013). The proposed clearing is not considered to alter the disturbance profile of either species (Niche Environmental Services, 2012). There were numerous records of *Eucalyptus formanii* within the application area as well as the surrounding landscape. It was noted that in some areas this species is either a locally dominant or co-dominant species (Niche Environmental Services, 2013). While there will be impacts to a number of *Eucalyptus formanii* plants, there will still be a local population remaining in the surrounding area. In addition, many of the plants are within the tenement proposed for a water pipeline so there is capacity for Vector Resources Ltd to avoid many of the plants (Niche Environmental Services, 2013).

Seven introduced flora species and one native weed species were recorded during the flora survey. These weed species were Indian Hedge Mustard (*Sisymbrium orientale*), Maltese Cockspur (*Centaurea melitensis*), Mediterranean Turnip (*Brassica tournefortii*), Prickly Paddy Melon (*Cucumis myriocarpus*), Thorny Solanum (*Solanum hoplopetalum*), Ward's Weed (*Carrichtera annua*) and Wild Sage (*Salvia verbenaca*) (Niche Environmental Services, 2012). Care must be taken to ensure that the proposed clearing activities do not spread or introduce weed species to non-infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A Level 1 fauna investigation was conducted by Bamford Consulting Ecologists over the Gwendolyn project area, which included the application area, consisting of a desktop review and fauna assessment. The site reconnaissance field survey was undertaken in September 2012. A total of 83 fauna species were recorded during the field survey consisting of 11 reptile, 60 bird, seven native mammal and five introduced mammal species (Bamford Consulting Ecologists, 2012). The fauna assemblage is moderately rich and substantially intact except for the loss of a suite of medium sized mammal species. While likely to be typical of fauna assemblages for this region, the Gwendolyn survey area contains elements of two sub-regions, Eastern Murchison and Coolgardie, making it a unique and possibly richer assemblage than surrounding regions (Bamford Consulting Ecologists, 2012).

Some of the vegetation within the application area is already in a degraded condition. The assessment of the vegetation condition during the vegetation survey concluded in many instances that the application area was in poorer condition relative to the surrounding landscape, largely as a consequence of historic disturbances associated with mining, exploration and pastoral activities (Niche Environmental Services, 2012). Existing and

historical disturbances include old workings, the old haul road, tracks, fencelines, impacts from cattle grazing and logging (Niche Environmental Services, 2012).

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

Methodology

Bamford Consulting Ecologists (2012)
CALM (2002)
Niche Environmental Services (2012)
Niche Environmental Services (2013)
GIS Database:
- IBRA WA (Regions - Subregions)
- Threatened and Priority Flora
- Threatened Ecological Sites Buffered

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments

Proposal may be at variance to this Principle

A Level 1 fauna investigation was conducted by Bamford Consulting Ecologists over the Gwendolyn project area, which included the application area, consisting of a desktop review and fauna assessment. The site reconnaissance field survey was undertaken in September 2012.

Ten vegetation and substrate associations were identified across the survey area, although four of these can be grouped as eucalypt woodlands (Bamford Consulting Ecologists, 2012):

1. *Acacia* shrublands (dominated by *Acacia ramulosa* and *A. aneura*) with some scattered *Casuarina pauper* on Ironstone Ridges. Ridge crests contain some areas of ironstone outcropping;
2. Mixed *Acacia* shrublands (including *Acacia aneura*, *A. ramulosa*, *A. cockertoniana*, *A. burkittii*, *A. caesaneura*, *A. burkittii* and *A. tetragonophylla*) with scattered Eucalypts on gravelly ironstone slopes and rises;
3. Mixed Eucalypt Woodlands dominated by *Eucalyptus salubris* and *E. clelandii* over *Atriplex nummularia*, *Eremophila pantonii* and *Senna artemisioides* on plains with red clay and scattered gravel of ironstone and quartz;
4. Low Woodland of eucalypt species (dominated by *Eucalyptus loxophleba* and *E. formanii*) with scattered *Callitris columellaris* over *Acacia ramulosa*, *A. aneura* and *A. caesaneura* over red sandy clay loam with scattered gravel of ironstone and quartz;
5. Mixed shrublands of *Acacia aneura* and *A. ramulosa* on clay flats;
6. Minor drainage lines supporting dense *Acacia aneura* shrublands with *A. burkittii* and scattered Eucalypts;
7. *Eucalyptus clelandii* woodlands supporting chenopod shrublands on low greenstone rises and stony plains;
8. *Eucalyptus salubris* woodlands on loam flats and drainage valleys;
9. Dense *Acacia ramulosa* shrubland with scattered Mallee, *Callitris columellaris* and *Grevillea* sp. on level to gently undulating sandy / gravelly plains;
10. Cleared or previously disturbed land.

Most of the vegetation and substrate associations are regionally widespread and well represented, but the Acacia shrublands on Ironstone Ridges and pockets of eucalypt woodlands representing the northern extent of the Great Western Woodlands are restricted in distribution (Bamford Consulting Ecologists, 2012). Historical disturbance and clearing throughout eucalypt woodlands in the region has led to the reduction of large, mature eucalypt trees. The remaining mature eucalypt trees contain tree hollows, providing roosting and breeding sites for conservation significant birds and bats (Bamford Consulting Ecologists, 2012). Vector Resources Ltd (2012b) has committed to avoiding large, hollow-bearing trees wherever possible. Infrastructure and support facilities will avoid disturbance of eucalypt woodlands and Acacia shrublands on ironstone vegetation to the extent practicable (Vector Resources Ltd, 2012b).

Twelve conservation significant fauna species were recorded during the field survey that are specially protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the *Wildlife Conservation Act 1950*, DEC Priority Fauna list or considered locally significant based on distribution or local decline in populations (Bamford Consulting Ecologists, 2012):

- Malleefowl (*Leipoa ocellata*) - Vulnerable under EPBC Act; Schedule 1;
- Crested Bellbird (*Oreoica gutturalis*) - DEC Priority 4;
- Tree-stem Trapdoor Spider (*Aganippe castellum*) - DEC Priority 4;
- White-browed Babbler (*Pomatostomus superciliosus*) - DEC Priority 4;
- Chestnut Quail-thrush (*Cinclosoma castanotus*) - Locally significant;
- Gilbert's Whistler (*Pachycephala inornata*) - Locally significant;
- *Pleuroxia* sp. nov. - Locally significant;
- Redthroat (*Pyrrholaemus brunneus*) - Locally significant;
- Rufous Tree-creeper (*Climacteris rufa*) - Locally significant;
- Scarlet-chested Parrot (*Neophema splendida*) - Locally significant;
- Western Yellow Robin (*Eopsaltria griseogularis*) - Locally significant; and
- Woolley's Pseudantechinus (*Pseudantechinus woolleyae*) - Locally significant.

The following conservation significant species have been recorded nearby and are likely residents or visitors to the application area (Bamford Consulting Ecologists, 2012):

- Peregrine Falcon (*Falco peregrinus*) - Schedule 4;
- Major Mitchell's Cockatoo (*Lophochroa leadbeateri*) - Schedule 4;
- Central Long-eared Bat (*Nyctophilus timoriensis*) - DEC Priority 4;
- Shy Heathwren (*Hylacola cauta*) - DEC Priority 4;
- Regent Parrot (*Polytelis anthopeplus*) - Locally significant;
- Southern Scrub-robin (*Drymodes brunneopygia*) - Locally significant; and
- Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*) - Locally significant.

Impacts on conservation significant species are anticipated to be mostly of low to moderate significance (Bamford Consulting Ecologists, 2012). Species of note are the Malleefowl, several woodland birds in decline including the infrequently seen Scarlet-chested Parrot and a priority species, the Tree-stem Trapdoor Spider (Bamford Consulting Ecologists, 2012).

Targeted searching for Malleefowl was undertaken in areas of suitable habitat within the survey area. Nine Malleefowl mounds were recorded within dense Acacia shrublands and fresh tracks were recorded near the proposed camp. Of the mounds recorded, one was active, one mound had been recently excavated and seven were considered inactive without any evidence of recent use (Bamford Consulting Ecologists, 2012). Three of the mounds are not within the application area. Vector Resources Ltd developed a Malleefowl Management Plan which details commitments and procedures about education of staff, clearing of Malleefowl habitat, monitoring and a feral species control program. A buffer zone of 50 metres will be placed around active and inactive mounds, where practicable, and these buffer zones will be operationally restricted access areas (Vector Resources Ltd, 2012a). The Department of Environment and Conservation has endorsed the Malleefowl Management Plan (Vector Resources Ltd, 2013). Three of the mounds are within the water pipeline corridor and may be avoided but three inactive mounds are mapped within disturbance boundaries (Vector Resources Ltd, 2012a; Niche Environmental Services, 2013). Potential impacts to Malleefowl as a result of the proposed clearing may be minimised by the implementation of a fauna management condition to avoid the active Malleefowl mound.

A number of south-west Australian woodland bird species are recognised as declining (Saunders and Ingram, 1995 and Birdlife Australia, 2012, as quoted in Bamford Consulting Ecologists, 2012). These species have lost considerable areas of habitat through the Wheatbelt and adjacent Goldfields as a result of large scale habitat clearance and removal of mature Eucalypt trees. The bird species listed above as locally significant are considered declining woodland species (Bamford Consulting Ecologists, 2012). Vector Resources Ltd's (2012b) commitments to avoiding large, hollow-bearing trees wherever possible and avoiding disturbance of eucalypt woodlands for the purposes of infrastructure and support facilities, to the extent practicable, will reduce the impact on woodland bird species.

The Tree-stem Trapdoor Spider occurs on the mid to lower slopes of rocky ridges and the adjacent plains where it builds a distinctive burrow against Eucalypts, Broom brush Sheoaks and other shrubs (Bamford Consulting Ecologists, 2012). The proposed clearing will result in the loss of some habitat and the removal of a proportion of the local population. However, this species is expected to be widespread in the local areas with some individuals recorded on ironstone ridges outside the application area (Bamford Consulting Ecologists, 2012).

A probable short range endemic snail, *Pleuroxia* sp. nov., was recorded during the field survey. The status of the snail is uncertain. It is probably most closely associated with the Dryandra land system that lies largely outside impact areas (Bamford Consulting Ecologists, 2012).

The impacts on fauna are generally considered to be only minor, with this also consistent for the majority of the conservation significant species. This is due to the relatively small footprint of the project which is located mostly within widespread, common and disturbed environments (Bamford Consulting Ecologists, 2012). The exception is the eucalypt woodlands, which are small northern outliers of the Great Western Woodlands, and the impacts would be considered moderate. Eucalypt woodlands are a dominant characteristic of the region to the south (Bamford Consulting Ecologists, 2012). The commitments by Vector Resources Ltd to minimise impacts on eucalypt woodlands, Acacia shrublands on ironstone vegetation and Malleefowl mounds; plus a fauna management condition to avoid the active Malleefowl mound, will minimise the impact of the proposed clearing on significant fauna habitat.

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

Methodology

Bamford Consulting Ecologists (2012)
Niche Environmental Services (2013)
Vector Resources Ltd (2012a)
Vector Resources Ltd (2012b)
Vector Resources Ltd (2013)

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases there are no known records of Threatened Flora within the application area (GIS Database). There is one Threatened Flora species within 20 kilometres of the application area, *Tetratheca paynterae* subsp. *cremnobata* (Niche Environmental Services, 2012; GIS Database).

Flora and vegetation surveys were conducted over the application area by a botanist from Niche Environmental Services in April and September 2012 and no Threatened Flora were recorded (Niche Environmental Services, 2012).

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

Methodology

Niche Environmental Services (2012)
GIS Database:
- Threatened and Priority Flora

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

Comments

Proposal is not likely to be at variance to this Principle

A search of available databases revealed there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC is located approximately 180 kilometres north of the application area (GIS Database).

No TECs were identified during the flora and vegetation surveys conducted by a Niche Environmental Services botanist (Niche Environmental Services, 2013).

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

Methodology

Niche Environmental Services (2013)
GIS Database:
- Threatened Ecological Sites Buffered

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments

Proposal is not at variance to this Principle

The clearing application area falls within the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 99.73% of the pre-European vegetation remains (see table) (Government of Western Australia, 2013; GIS Database). This gives it a conservation status of 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the clearing application area has been mapped as Beard vegetation associations:

202: Shrublands; mulga and *Acacia quadrimarginea* scrub; and
385: Shrublands; bowgada and jam scrub with scattered York gum (GIS Database).

Over 99% of Beard vegetation association 202 remains at a state and bioregional level while approximately 61.39% and 100% of Beard vegetation 385 remains at state and bioregional levels, respectively (see table) (Government of Western Australia, 2013). Both of these vegetation associations would be given a conservation status of 'Least Concern' at a state and bioregional level (Department of Natural Resources and Environment, 2002).

The vegetation under application is not a remnant of vegetation in an area that has been extensively cleared.

	Pre-European Area (ha)*	Current Extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Murchison	28,120,587	28,044,823	~99.73	Least Concern	1.05
Beard Veg Assoc. – State					
202	448,529	448,344	~99.96	Least Concern	0.39
385	39,817	24,444	~61.39	Least Concern	-
Beard Veg Assoc. – Bioregion					
202	339,743	339,641	~99.97	Least Concern	-
385	5,530	5,530	~100	Least Concern	-

* Government of Western Australia (2013)
** Department of Natural Resources and Environment (2002)

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

Methodology

Department of Natural Resources and Environment (2002)
Government of Western Australia (2013)
GIS Database:
- IBRA WA (Regions - Subregions)
- Pre-European Vegetation

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

Comments

Proposal is at variance to this Principle

There are no permanent watercourses or wetlands within the application area (Niche Environmental Services, 2013; GIS Database). There were several ephemeral drainage lines identified within the application area and two ephemeral drainage line vegetation units were identified, EDW1 and EDW2 (Niche Environmental Services, 2012; GIS Database). The ephemeral drainage lines were generally located at lower points in the landscape, had poorly developed banks and contained species that were noted as not being restricted to this landform (Niche Environmental Services, 2013). Niche Environmental Services (2013) noted that the majority of ephemeral drainage lines were dissected by existing pastoral or exploration tracks and limited clearing of drainage line vegetation was expected.

Based on the above, the proposed clearing is at variance to this Principle. However, the design of the project has limited the amount of drainage line vegetation within the application area and only small amounts are anticipated to be cleared (Niche Environmental Services, 2013).

Methodology

Niche Environmental Services (2012)
Niche Environmental Services (2013)
GIS Database:
- Hydrography, Linear

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

Comments

Proposal is not likely to be at variance to this Principle

The application area intersects the Dryandra, Moriarty and Tealtoo Land Systems (GIS Database).

The Dryandra Land System is characterised by ridges of banded iron formation supporting dense shrublands with emergent native pines, mallees and casuarinas (Payne et al.,1998). Stone mantles protect the soil surface from erosion (Payne et al.,1998).

The Moriarty Land System is characterised by low greenstone rises and stony plains supporting halophytic and acacia shrublands with patchy eucalypt overstoreys (Payne et al.,1998). Within the sections of the project defined as being on the Moriarty Land System, the majority was considered to fit within the areas defined as being 'stony plains' and 'gravelly saline alluvial plains' (Niche Environmental Services, 2013). Several of the other units within the land system are susceptible to water erosion when perennial cover is removed but the 'stony plains' and 'gravelly saline alluvial plains' units have mantles of pebbles and cobbles to protect from erosion (Payne et al., 1998).

The Tealtoo Land System is characterised by level to gently undulating loamy plains with fine ironstone lag gravel supporting dense acacia shrublands (Payne et al., 1998). This land system is generally not prone to soil erosion (Payne et al., 1998).

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

Methodology Niche Environmental Service (2013)
Payne et al. (1998)
GIS Database:
- Rangeland Land System Mapping

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

Comments **Proposal is not likely to be at variance to this Principle**
The application area is not situated within a Department of Environment and Conservation managed conservation area (GIS Database). The nearest conservation area is the ex-Mt Elvire pastoral lease, which is former leasehold proposed for conservation, located approximately 5 kilometres 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 have a direct impact on the conservation values of the former leasehold but indirect impacts may occur if not managed properly. Rehabilitation of the site will be required under the *Mining Act 1978* which reduces the long term risk of indirect impacts. Weed control is needed to reduce the spread of weeds in the local area. Potential impacts to the conservation area may be minimised by the implementation of a weed management condition.

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

Methodology GIS Database:
- DEC Tenure

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

Comments **Proposal is not likely to be at variance to this Principle**
There are no permanent watercourses or wetlands within the application area (Niche Environmental Services, 2013; GIS Database). There were several ephemeral drainage lines identified within the application area which were generally located at lower points in the landscape and had poorly developed banks (Niche Environmental Services, 2013). There is limited clearing proposed of vegetation within ephemeral drainage lines (Niche Environmental Services, 2013). The proposed clearing is unlikely to cause deterioration in the quality of surface water in the local area.

The application area is approximately 10 kilometres south of Lake Barlee, an ANCA wetland (GIS Database). There is no direct hydraulic connection between the project area and Lake Barlee with the project unlikely to have any impact on the lake (Vector Resources Ltd, 2012b).

According to available databases the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is Menzies Water Reserve, which is approximately 150 kilometres to the east (GIS Database). The proposed clearing is unlikely to affect the water quality of the water reserve due to the large distance between it and the application area.

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

Methodology Niche Environmental Services (2013)
Vector Resources Ltd (2012b)
GIS Database:
- ANCA, Wetlands
- Hydrography, Linear
- Public Drinking Water Source Areas (PDWSAs)

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

Comments **Proposal is not likely to be at variance to this Principle**
The application area is within the Raeside-Ponton catchment areas (GIS Database). Given the size of the area to be cleared (107.17 hectares) in relation to the size of the catchment area (11,589,532 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

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

Methodology GIS Database:

- Hydrographic Catchments - Catchments

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

Comments

There are no Native Title Claims over the area under application (GIS Database). The mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no registered Aboriginal Sites of Significance recorded within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

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

The clearing permit application was advertised on 15 March 2013 by the Department of Mines and Petroleum inviting submissions from the public. One submission was received stating concerns about Aboriginal heritage and a response was sent.

Methodology

GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims - Determined by the Federal Court
- Native Title Claims - Filed at the Federal Court
- Native Title Claims - Registered with the NNTT

4. References

Bamford Environmental Consultants (2012) Vector Resources Gwendolyn Project Fauna Assessment. Prepared by M.J. & A.R. Bamford Consulting Ecologists for Vector Resources Limited, December 2012.

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

Niche Environmental Services (2012) Report Documenting the Findings of a Level 2 Flora and Vegetation Survey at the Vector Resources' Gwendolyn Gold Project. Report Prepared by Niche Environmental Services for Vector Resources Ltd, December 2012.

Niche Environmental Services (2013) Summary of Proposed Clearing for Development of the Golden Iron Resources' Gwendolyn East Cutback Project. Report Prepared by Niche Environmental Services for Vector Resources Ltd, February 2013.

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Vector Resources Ltd (2012a) Gwendolyn East Cutback Project Malleefowl Management Plan. Report Prepared by Vector Resources Ltd in consultation with Bamford Consulting Ecologists, December 2012.

Vector Resources Ltd (2012b) Mining Proposal Gwendolyn East Cutback Project Revision F. Report Prepared by Vector Resources Ltd, December 2012.

Vector Resources Ltd (2013) Email Correspondence Between Department of Environment and Conservation and Vector Resources Ltd, Dated 10 April 2013.

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.