Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2051/1
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: Mining Lease 74/163
Local Government Area: Shire of Ravensthorpe
Colloquial name: Ironclad Prospect

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 26 May 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 1:250,000 scale for the whole of Western Australia. Two Beard vegetation associations have been mapped over the area proposed to be cleared (GIS Database). These associations are:

516: Shrublands; mallee scrub, black marlock; and
691: Shrublands; *Dryandra quercifolia* & *Eucalyptus* spp. thicket (GIS Database, Shepherd, 2009).

The vegetation within the clearing permit application area has been mapped in further detail by Craig (2007). A 10 metre wide corridor was surveyed along each of the proposed exploration lines (5 metres either side). Three vegetation communities were mapped as occurring within the proposed clearing areas:

***Allocasuarina campestris* tall shrub association:** the shallow loamy sands over outcropping granite support an open mallee and mid-dense heath which includes tall shrubs of *Allocasuarina campestris*, low shrubs of *Acacia mimica* subsp *angusta*, and a dense undergrowth of the grass *Spartochloa scirpoidea* and sedge *Lepidosperma brunonianum*;

***Melaleuca hamata* mallee - heath association:** the loams on gentle slopes support a community characterised by the broombush *Melaleuca hamata* and numerous mallees, including *Eucalyptus suggrandis*, *E. flocktoniae, E. incrassata, E. pileata, E. pluricaulis*. Other common shrubs are *Acacia ingrata, Melaleuca lateriflora, Boronia inornata* and *Dodonaea pinifolia*. The sedge *Ganhia ancistrophylla* is common, as are a number of unnamed *Lepidosperma* species; and

***Eucalyptus sporadica* association:** a creekline flows north-west through the application area (Ironclad Prospect) and is vegetated by a narrow band of thicket, with occasional trees of Yate *Eucalyptus occidentalis* and the closely-related *E. sporadica*; hybrids between these two species are evident. Other common species are *Callitris drummondii, Acacia* sp. Cape Arid (AS Weston 8164), *A. saligna, Calothamnus quadrifidus, Melaleuca cuticularis, M. elliptica*, the grass *Spartochloa scirpoidea* and sedge *Chrorizema multiarticulatal* (Craig, 2007).

Clearing Description

Pioneer Resources Ltd has applied to clear up to 0.8 hectares of native vegetation for the purposes of mineral exploration and access tracks (the Ironclad Project). The area has been previously disturbed by historical mining and exploration activities. An extensive network of gridlines, tracks and fences allow light vehicle access to much of the proposed clearing area for exploration, however, washouts and regrowth have partially blocked access for larger vehicles. These tracks may require clearing for safe access (Pioneer Nickel Ltd, 2007).

Vegetation Condition

Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994);

To

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

Comment

Pioneer Resources Ltd's Ironclad project area is located on Mining Lease M74/163, close to the historical Elverdton Tailings Storage Facility, approximately nine kilometres south-east of Ravensthorpe. Mining and exploration have been conducted on an intermittent basis in the Elverdton-Desmond area for approximately 100 years (Pioneer Nickel Ltd, 2006). As a result of these activities there is an abundance of old mine workings in the vicinity of the clearing application area (Pioneer Nickel Ltd, 2006).

A flora survey of the area was conducted by Craig (2007). This survey specifically targeted nominated grid lines and drill sites to ensure that areas containing Declared Rare and Priority Flora were identified before commencement of proposed operations (Craig, 2007).

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 8.5 kilometres south east of Ravensthorpe within the Fitzgerald subregion of the Esperance Plains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The vegetation of this subregion is characterised by herbfields and heaths (rich in endemics) on abrupt granite tors and quartzite ranges that rise from the plain, while Eucalypt woodlands occur in gullies and alluvial foot-slopes (CALM, 2002).

The application area is located within the Elverdton-Desmond area. The Elverdton-Desmond area and surrounding areas are one of the three areas of highest flora endemism in Western Australia, with more than 60 endemic species with a range of less than 30 kilometres (Pioneer Nickel Ltd, 2006). The application area is within the Ravensthorpe Range (GIS Database). The Ravensthorpe Range is recognised as an Environmentally Sensitive Area (ESA), as it forms a part of the Ravensthorpe Corridor, and has been listed on the Register of National Estate, due to its high level of botanical diversity (GIS Database; Australian Heritage Database, 2011). The Ravensthorpe Corridor is an important vegetation remnant that links the Fitzgerald River National Park and Crown land east of the Vermin Proof Fence and beyond to the Goldfields (Craig, 2005). The application area also forms the eastern sector of the Fitzgerald Biosphere which is a part-tenured management concept recognised by United Nations Educational, Scientific and Cultural Organisation (UNESCO) as well as State and Commonwealth Governments (Craig, 2005).

The Ravensthorpe area has had a long history of exploration and mining (~100 years) and farming (~130 years). There has been considerable disturbance in the Elverdton-Desmond area as a result of historical mining and exploration activities (Pioneer Nickel Ltd, 2006). Aerial photography of the application area shows a vast array of exploration and access tracks (GIS Database). A weed of National Significance, Bridal Creeper (A*sparagus asparagoides*), occurs around old mine workings and along creeklines (Craig, 2005). Weed invasion is likely to increase from the edges of disturbed areas and therefore the proposed clearing is likely to favour the spread of weeds, which will lead to a decrease in biodiversity of the area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A flora survey conducted by Craig (2005; 2007) undertaken in March and April 2007 identified one Priority flora species (*Eucalyptus desmondensis* (P4)) from within the application area. *Eucalyptus desmondensis* (Priority 4) is a small mallee, principally restricted to granite sands in the Ravensthorpe Range, with the largest population known in the Mt Desmond - Elverdton area (Craig, 2007). Only six other outlying populations are known (north of Mt McMahon, Nindilbillup Road, north-west of Cordingup, Udarrup Spring, Road Eleven and Kundip area) (Craig, 2007). Eleven plants were found alongside the existing access track to Ironclad prospect, while another 14 plants were recorded on exploration line 1 (Craig, 2007). These records form part of the larger population encountered within the Elverdton-Desmond area. Within the application area it grows on shallow, coarse sand over granite that occurs on low rises through Mining Lease 74/163. Distribution is patchy, with as few as one or up to 100 plants within a 50 metre radius. *Eucalyptus desmondensis* shows good regeneration after disturbance, as was observed around old mine workings and on old tracks (Craig, 2007). The proposed clearing is unlikely to impact on the conservation status of *Eucalyptus desmondensis*; however, several individuals may be directly impacted by the proposed clearing activities.

Advice received from the Department of Environment and Conservation (DEC) (2006) states that the application area is extensively disturbed from historical mining activities, and that the current proposal will provide an opportunity to rehabilitate the site once associated activities have ceased.

Based on the above, the proposed clearing may be at variance to this Principle. However, considering the relatively small area to be cleared, and dispersed nature of the clearing, it is not likely to significantly compromise the diversity of the application area.

Methodology

Australian Heritage Database (2011)
CALM (2002)
Craig (2005)
Craig (2007)
DEC (2006)

Pioneer Nickel Ltd (2006)
GIS Database:
- Clearing Regulations - Environmentally Sensitive Areas
- IBRA WA (Regions - subregions)
- Ravensthorpe 1.4m Orthomosaic 2002
- Register of National Estate

(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 search of the Department of Environment and Conservation (DEC) and Commonwealth Department of Environment and Heritage databases conducted by the proponent, found that 17 species of Fauna of Conservation Significance have the potential to occur in the application area, based on known distributions (Pioneer Nickel Ltd, 2007; Pioneer Nickel Ltd, 2006).

A further five species listed as migratory species under the *Environment Protection and Biodiversity Conservation Act 1999* may occur in the project area, however, the proposed exploration activities are unlikely to impact critical feeding or breeding habitat for any migratory species (Pioneer Nickel Ltd, 2006).

The vegetation within the project area is ecologically important as it forms part of a narrow corridor which links the Fitzgerald River National Park to the expansive Crown lands of the interior (Craig, 2005). However, given the small amount of clearing (0.8 hectares), and that rehabilitation of cleared vegetation will be undertaken progressively, it is unlikely that the proposed clearing will impede the use of this corridor by fauna.

DEC previously provided advice to Pioneer Resources Ltd that it does not consider it necessary for the company to conduct a comprehensive fauna assessment in support of this exploration proposal given the scale and nature of the activities (DEC, 2006). DEC (2006) considers the proponent has undertaken an adequate desktop assessment of the potential impacts on conservation significant fauna.

Management strategies identified by the proponent to minimise the impact of exploration activities on habitat which may be significant for fauna indigenous to Western Australia include:
- minimising impact by avoiding large trees, shrubs and their root zones;
- retaining trees (especially those with hollows) for bird, bat and reptile habitat where possible;
- re-vegetating impacted areas;
- avoiding habitats such as Malleefowl nests;
- implementing feral animal control where required in conjunction with local landowners; and
- ensuring all staff and contractors are subject to the Pioneer Nickel Elverdton-Desmond project area environmental induction (Pioneer Nickel Ltd, 2006).

Pioneer Nickel Ltd (2006) states that all efforts will be taken to minimise clearing, and to progressively rehabilitate areas cleared so that any fauna of conservation significance and significant fauna habitat in the area are not impacted upon by the proposed activities.

Based on the above, the proposed clearing is not likely to be at variance to this principle. The application area is not likely to provide significant habitat for fauna species indigenous to Western Australia, particularly as parts of the application area have been degraded by previous disturbance from mining activities and given the low impact and localised nature of the proposed clearing activities, the proposed clearing is unlikely to significantly impact on fauna habitats in the area, or cause significant habitat fragmentation in the local area.

Methodology

Craig (2005)
DEC (2006)
Pioneer Nickel Ltd (2006)
Pioneer Nickel Ltd (2007)

(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 GIS databases there are no known records of Declared Rare Flora (DRF) within the application area (GIS Database).

A flora survey was conducted over the application area by Craig in March and April 2007 (Craig, 2007). No DRF or species listed under the *Environment Protection and Biodiversity Conservation Act 1999* were recorded within the application area (Craig, 2007).

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

Methodology

Craig (2007)

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

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database).

The nearest TEC is located approximately 57 kilometres south west of the application area (GIS Database). At this distance there is little likelihood the application area is necessary for the maintenance of the TEC.

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

Methodology

GIS Database:
- Threatened Ecological Sites Buffered

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

Comments

Proposal is not at variance to this Principle

The application area is within the Interim Biogeographic Regionalisation of Australia (IBRA) Esperance Plains bioregion (GIS Database). According to Shepherd (2009) there is approximately 51.31% of the pre-European vegetation remaining in the Esperance Plains bioregion which places it as 'Least Concern' according to the Department of Natural Resources and Environment (2002).

The application area falls within the Shire of Ravensthorpe (GIS Database). The Shire of Ravensthorpe is within the Intensive Land Use Zone of the south-west of Western Australia which has been largely cleared. Approximately 62.13% of the pre-European vegetation extent remains within the Shire of Ravensthorpe (Shepherd, 2009). This places the Shire of Ravensthorpe at 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

There is approximately 54.75%, 68.77% and 83.40% of the pre-European vegetation remaining of Beard vegetation association 516 remaining in the State, bioregion and subregion respectively (Shepherd, 2009). Approximately 24.07% of this vegetation type is represented in International Union for Conservation of Nature (IUCN) Class I-IV Reserves within the State (refer to table below). There is approximately 77.91%, 97.52% and 97.52% of the pre-European vegetation remaining of Beard vegetation association 691 remaining in the State, bioregion and subregion respectively (Shepherd, 2009). Approximately 65.82% of this vegetation type is represented in International Union for Conservation of Nature (IUCN) Class I-IV Reserves within the State (refer to table below). This places these vegetation types at 'Least Concern' according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002). The National Objective and targets for Biodiversity Conservation recognise target retention of 30% or more of the pre-1750 clearing extent of each ecological community (Department of Environment and Heritage, 2001). Below this threshold species extinction is believed to occur exponentially at an ecosystem level (EPA, 2000).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion - Esperance Plains	2,899,950	1,488,030	~51.31%	Least Concern	~28.40% (~53.69%)
IBRA Subregion - Fitzgerald	1,570,678	876,154	~55.78%	Least Concern	~27.69% (~48.76%)
Local Government - Ravensthorpe	982,191	610,239	~62.13%	Least Concern	~19.47% (~30.46%)
Beard vegetation associations - State					
516	607,402	332,576	~54.75%	Least Concern	~24.07% (~43.46%)
691	45,589	35,520	~77.91%	Least Concern	~65.82% (~83%)
Beard vegetation associations - Bioregion					
516	318,747	219,187	~68.77%	Least Concern	~28.38% (~40.79%)
691	35,490	34,609	~97.52%	Least Concern	~84.46% (~85.18%)
Beard vegetation associations - subregion					
516	219,038	182,678	~83.40%	Least Concern	~37.95% (~44.91%)
691	34,490	34,609	~97.52%	Least Concern	~84.46% (~85.18%)

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

Options to select from:	Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)
Presumed extinct	Probably no longer present in the bioregion
Endangered*	<10% of pre-European extent remains
Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

Regionally, the surrounding areas have previously been cleared for agriculture, mining and associated infrastructure. However, based on the figures above, the proposed clearing is not considered to be a significant remnant of native vegetation within an extensively cleared area.

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

Methodology

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

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

Comments

Proposal is at variance to this Principle

According to available GIS Databases, there are no permanent wetlands or watercourses within the application area; however there are several minor non-perennial drainage lines within the application area (GIS Database).

Based on vegetation mapping conducted by Craig (2007) one vegetation association found within the application area is associated with drainage lines.

***Eucalyptus sporadica* association:** a creekline flows north-west through the application area (Ironclad Prospect) and is vegetated by a narrow band of thicket, with occasional trees of Yate *Eucalyptus occidentalis* and the closely-related *E. sporadica*; hybrids between these two species are evident. Other common species are *Callitris drummondii, Acacia* sp. Cape Arid (AS Weston 8164), *A. saligna, Calothamnus quadrifidus,*

Melaleuca cuticularis, M. elliptica, the grass *Spartochloa scirpoidea* and sedge *Chrorizema multiarticulatal* (Craig, 2007).

The riparian vegetation of the application area may be disturbed due to the clearing of vegetation for the purpose of mineral exploration activities. However, the drainage lines have suffered previous disturbance as an access track currently crosses the drainage line as well as previous mineral exploration activities to the east (GIS Database).

Based on the above, the proposed clearing is at variance to this Principle. However, the proposed clearing is not likely to significantly impact on the conservation of vegetation growing in association with permanent watercourses or wetlands due to the absence of these within the application area. The proposed clearing of 0.8 hectares of native vegetation is unlikely to significantly impact on vegetation communities growing in association with the drainage channels within the application area. Should the watercourse be disturbed the proponent should liaise with the Department of Water to determine whether a Bed and Banks permit is necessary for the proposed works.

Methodology Craig (2007)
GIS Database:
- Ravensthorpe 1.4m Orthomosaic 2002
- Geodata, Lakes
- 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 Department of Agriculture and Food Western Australia (DAFWA) (2006) describes the landscape and soils of the 'Ravensthorpe Zone' as rolling hills on greenstone (mafic and ultramafic) with alkaline sandy duplex soils with some clays, sands and gravel. Pioneer Nickel Ltd (2006) describes the soil within the application area as generally sandy and clayey with some areas of ironstone gravels.

Pioneer Resources Ltd has applied to clear up to 0.8 hectares of native vegetation for the purpose of mineral exploration. Pioneer Nickel Ltd (2006) advised that to minimise clearing, existing tracks will be used and any cleared areas will be rehabilitated in accordance with existing guidelines. Furthermore the minimisation of land degradation will be achieved by applying best practice clearing and rehabilitation methods.

DAFWA (2006) identified the Ravensthorpe area as having a moderate to high salinity risk. The proposed clearing activities are not likely to result in large areas of disturbed or open land. Given the nature and scale of the proposed activities, the clearing is not likely to result in appreciable land degradation. Furthermore, at the cessation of mineral exploration activities the mining lease conditions applied under the *Mining Act 1978* require the area to be rehabilitated back to native vegetation. This would reduce issues of prolonged land degradation through wind and water erosion.

There is no known occurrence of *Phytophthora cinnamomi* (dieback) within the application area (DEC, 2006; DEC 2007). The Ravensthorpe area is recognised as being at risk to the introduction of dieback. Potential dieback impacts as a result of the proposed clearing may be minimised by the implementation of a dieback management condition.

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

Methodology DAFWA (2006)
DEC (2006)
DEC (2007)
Pioneer Nickel Ltd (2006)

(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 may be at variance to this Principle

The Fitzgerald River National Park is located approximately 20 kilometres south west of the application area, and is one of the richest flora conservation areas in Western Australia (Pioneer Nickel Ltd, 2006; GIS Database). The Fitzgerald River National Park has a very high biodiversity value containing a high proportion of geographically restricted and rare plants, with around 250 species considered to be of high conservation value (Pioneer Nickel Ltd, 2006). Some of these plants are also found outside the National Park in the Ravensthorpe Range and it is possible that some exist around the application area.

The application area is located within the Elverdton-Desmond area. The Elverdton-Desmond area and surrounding areas are one of the three areas of highest flora endemism in Western Australia, with more than 60 endemic species with a range of less than 30 kilometres (Pioneer Nickel Ltd, 2006).

The application area forms part of the Ravensthorpe Range Area, recognised as an Environmentally Sensitive Area (ESA), and listed by the Australian Heritage Council on the Register of National Estate, due to its high level of botanical diversity (GIS Database; Australian Heritage Database, 2011). The Ravensthorpe Range Area is an important vegetation remnant as it is one of the few access ways for the movement of flora and fauna between the Fitzgerald River National Park and the inland bush areas of central Australia (Craig, 2005). The long term sustainability and viability of this corridor will largely depend on maintaining the vegetation in excellent condition (Craig, 2005). Secondary impacts such as spread of dieback, weeds, erosion and drainage effects, can impact an area far in excess of the immediate project area (Craig, 2005).

The application area lies in the eastern sector of the Fitzgerald Biosphere which is a part-tenured management concept recognised by United Nations Educational, Scientific and Cultural Organisation (UNESCO), as well as State and Commonwealth Governments (Craig, 2005). The concept includes a core area (the Fitzgerald River National Park), a buffer zone (Crown land and some unvested reserves) and a zone of co-operation (private freehold farmland). Mining, subject to sound environmental management practices, is one of many human impacts acceptable in the zone of cooperation (Pioneer Nickel Ltd, 2006). The Fitzgerald Biosphere is recognised as being one of the world's 34 global biodiversity hotspots (Conservation International, 2007). The flora of the Ravensthorpe Ranges area is recognised as being very rich, and containing many species not known from the surrounding areas (Conservation Through Reserves Committee, 1974). A number of the species are endemic, and others are common in the Range, but rare elsewhere. The area is a focal point for species of *Eucalyptus*, with over 20 taxa occurring in the area (Australian Heritage Database, 2011).

Based on the above, the proposed clearing may be at variance to this Principle. However, the small area proposed to be cleared is unlikely to significantly impact on the environmental values of the surrounding areas. Potential impacts to the environmental values of the Ravensthorpe Range Area as a result of the proposed clearing may be minimised by the implementation of a weed management condition and a dieback management condition. At the cessation of mineral exploration activities the mining lease conditions applied under the *Mining Act 1978* require the area to be rehabilitated back to native vegetation. This would reduce issues of prolonged land degradation through wind and water erosion.

Methodology

Australian Heritage Database (2011)
Conservation International (2007)
Conservation through Reserves Committee (1974)
Craig (2005)
Pioneer Nickel Ltd (2006)
GIS Database:
- Clearing Regulations - Environmentally Sensitive Areas
- DEC Tenure
- Register of National Estate

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

Comments

Proposal is not likely to be at variance to this Principle

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Ravensthorpe Catchment Area which is located approximately 4 kilometres west of the application area. Given the distance separating the application area and the Ravensthorpe Catchment Area, the small scale of the proposed clearing and the low impact nature of the proposed activities, the proposed clearing is unlikely to impact on the water quality of the Ravensthorpe Catchment Area.

There are no permanent watercourses or water bodies within the application area (GIS Database; Pioneer Nickel Ltd, 2006). The Phillips River occurs approximately 20 kilometres to the south west of the application area (GIS Database). Due to the distance between the proposed clearing and this water body it is unlikely the clearing of native vegetation associated with this proposal will cause a deterioration in surface water quality.

Groundwater within the area under application is saline, between 7,000 - 14,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). The proposed clearing is unlikely to have an impact on regional groundwater considering the size of the area to be cleared, and the magnitude of the Yilgarn-Southwest groundwater province, which is in excess of 24,600,000 hectares in area (GIS Database).

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

Methodology

Pioneer Nickel Ltd (2006)
GIS Database:
- Groundwater Salinity, Statewide
- Groundwater Provinces
- Hydrographic Catchments - Catchment
- Hydrography, Linear (Hierarchy)
- Public Drinking Water Source Areas (PDWSA)

(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

Given the size of the proposed clearing (0.8 hectares) in relation to the large size of the Jerdacttup River catchment (173,928 hectares) (GIS Database), it is unlikely to cause an incremental rise in the frequency or duration of flooding. In addition, the application area has a slight relief with no wetlands or watercourses (GIS Database).

Pioneer Nickel Ltd (2006) has outlined the following management procedures to minimise the effects of exploration activities on the risk of flooding:
- Engineering drainage;
- Utilising existing creek crossings where possible;
- Locating stream crossings where natural conditions provide for minimal bed and bank disturbance; and
- The cleared areas will be rehabilitated to further minimise the risk of flooding.

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

Methodology

Pioneer Nickel Ltd (2006)
GIS Database:
- Hydrographic Catchments - Catchments
- Hydrography, linear
- Topographic Contours, Statewide

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

Comments

There are two native title claims (WC96/109 and WC98/70) over the area under application (GIS Database). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

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

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

Methodology

GIS Database
- Aboriginal Sites of Significance
- Native Title NNTT

4. References

Australian Heritage Database (2011) http://www.environment.gov.au (Accessed 17 May 2011).

CALM (2002) Biological Summary of the 2002 Biodiversity Audit for Western Australia, A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002, ed. N.L McKenzie, J.E May and S. McKenna, Government of Western Australia, Perth, Western Australia.

Conservation International (2007) Biodiversity hotspots. [online http://www.conservation.org/xp/CIWEB/regions/priorityareas/hotspots.xml] Conservation International.

Conservation through Reserves Committee (1974) Conservation reserves in Western Australia. Department of Conservation and Environment, Perth.

Craig, G.F. (2005) Elverdton - Desmond MLA74/163 Declared Rare and Priority Flora Survey. Prepared for Pioneer Nickel Ltd, Western Australia.

Craig, G.F. (2007) FED Prospect - P74/306 Ironclad Prospect - M74/163: Declared Rare and Priority Flora Survey. Prepared for Pioneer Nickel Ltd, Western Australia.

DAFWA (2006) Department of Agriculture and Food Western Australia - Resource Management Technical Report 311: Ravensthorpe Area Catchment Appraisal 2006. Compiled by Angela Massenbauer for the Esperance-Ravensthorpe Catchment Support Team, September 2006. Department of Agriculture and Food Western Australia.

DEC (2006) Department of Environment and Conservation - Biodiversity Coordination Section Biodiversity Advice for Land Clearing Application 1575/1 Pioneer Nickel. Email advice to the Department of Industry and Resources, dated 22 November 2006.

DEC (2007) Department of Environment and Conservation - Biodiversity advice for land clearing application. Advice to Assessing Officer, Native Vegetation Assessment Branch, Department of Industry and Resources (DoIR) and the Environmental Protection Authority, received 19 April 2007, Ravensthorpe DEC branch.

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.
EPA (2000) Environmental Protection of Native Vegetation In Western Australia, Position Statement No. 2, Environmental Protection Authority, December 2000.
Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
Pioneer Nickel Ltd (2006) Additional information to accompany the application for a clearing permit (purpose permit): Native Vegetation Management Plan. Pioneer Nickel Limited, Perth.
Pioneer Nickel Ltd (2007) Additional information to accompany the application for a clearing permit (purpose permit). Pioneer Nickel Limited, Perth.
Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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