



1. Application details

1.1. Permit application details

Permit application No.: 1506/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Western Areas NL

1.3. Property details

Property: Exploration Licence 70/2148
Local Government Area: Shire of Lake Grace
Colloquial name: Exploration Licence 70/2148 - Lake King Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.1		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 The vegetation within the proposed clearing area has been mapped at 1:250000 as Beard Vegetation Association 125 (Bare Areas - Salt Lakes) and 511 (Medium Woodlands; salmon gum and morrel) (Shepherd et al, 2001).

The proposed clearing area was surveyed in November 2005 by Armstrong (2005) who identified 8 plant communities. Armstrong divided the communities into those occurring on Nickel Hill and those occurring on the shores of Nickel Hill Lake (sic) due to significant differences in their floristic composition.

NICKEL HILL

Armstrong (2005) identified four plant communities within the Nickel Hill area. These are:

1) Mallee-woodlands on the upper slopes: Upper stratum of *Eucalyptus salmonophloia* and *E. salubris*, over scrub consisting of *Melaleuca eleuterostachya*, *M. adnata*, *M. pauperiflora* and *M. uncinata*, over an understorey of *Acacia erinacea*, *Atriplex vesicaria* ssp. *appendiculata*, *Cryptandra myrtifolia*, *Dodonaea stenozyga*, *Grevillea huegelii* and *Olearia muelleri*.

2) Shrublands on rocky ridges: Upper stratum of *Allocasuarina acutivalvis* ssp. *acutivalvis*, *Allocasuarina campestris* with emergent *Eucalyptus flocktoniae*, over an understorey stratum of *Cryptandra myrtifolia* ssp. *myrtifolia*.

3) Shrublands adjacent to the lakebed: Upper stratum of Open Mallee of species unidentifiable due to recent fire history, over shrub stratum of *Acacia acuta*, *Allocasuarina campestris*, *Cryptandra myrtifolia* ssp. *myrtifolia*, *Dodonaea lobulata*, *Frankenia sessilis*, *Melaleuca adnata* and *M. acuminata* ssp. *acuminata*.

4) Low shrubs fringing the western lake edge: Dwarf scrub stratum of *Halosarcia halocnemoides* ssp. *halocnemoides* and *Disphyma crassifolium*, over understorey of *Disphyma crassifolium*, *Halosarcia halocnemoides* ssp. *halocnemoides*, *Sonchus oleraceus* and *Ursinia anthemoides*.

NICKEL HILL LAKE.

Armstrong (2005) identified four communities within the Nickel Hill Lake area. These are:

1) Halosarcia flats: Upper stratum of *Halosarcia halocnemoides* ssp. *halocnemoides* with understorey of same.

2) Low shrubs on lake fringe: Upper stratum of *Halosarcia halocnemoides* ssp. *halocnemoides* with understorey of *Frankenia sessilis* and *H. halocnemoides* ssp. *halocnemoides* and herb layer of *Hydrocotyle hexaptera* and *Isotoma scapigera*.

3) Low shrubs on dunes: Upper stratum of low heath and dwarf scrub dominated by *Atriplex vesicaria* ssp. *appendiculata* with exotic *Trifolium* sp. with occasional *Pittosporum angustifolium*, over understorey of *Arctotheca calendula*, *Atriplex vesicaria* ssp. *appendiculata*, *Avena barbata*, *Disphyma crassifolium*, *Frankenia cinerea* and *Trifolium* sp.

4) Open Woodlands: Upper stratum of *Eucalyptus kondininensis* ssp. *kondininensis* over understorey of *Atriplex vesicaria* ssp. *appendiculata*, *Arctotheca calendula*, *Avena* sp. and *Trifolium* sp.

Clearing Description

The proposal is for the clearing of 0.1 ha of vegetation for the purpose of mineral exploration within Exploration Licence 70/2148. The proposed clearing is within the Lake King Nature Reserve, an A-class reserve listed on the Register of National Estate for its natural values. This reserve is also listed within 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002' (CALM, 2002) as being of subregional significance due to its gypsophilous communities being floristically different from elsewhere and extensive stands of lowland woodlands and mallees. The Department of Environment and Conservation's (DEC) Biodiversity Coordination Section (BCS) notes that both District and Environmental Management Branch staff have previously provided informal advice to the proponent prior to the proposal being formally assessed by the Department of Industry and Resources (DoIR) Native Vegetation Assessment Branch as a clearing application. Taking this into account BCS concurs with this previous advice that "provided the proponent undertakes the required flora survey and implements their commitments to avoid any disturbance to significant flora and the proposal is deemed to be acceptable. Based on the flora survey report it appears that this commitment has been accomplished" (DEC, 2006a).

Vegetation Condition

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994) to Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

Comment

The condition of the vegetation surveyed by Armstrong (2005) varied from Very Good at Nickel Hill and on the shores of the Nickel Hill Lake, to Degraded on the dunes and plains away from the lake, where weed species had invaded from adjacent farmland and rubbish had been dumped.

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 occurs within the Lake King Nature Reserve. This reserve is an A class nature reserve and is listed on the Register of National Estate for its natural values. It is a very large reserve at approximately 40000 hectares, and combined with Dunn Lake Nature Reserve to the South, creates an area of over 67000 hectares of remnant vegetation, making it an extremely important reserve for flora and fauna conservation. It is also important for maintaining ecological functions on a regional scale (DEH, 2006), particularly given the large scale clearing that has occurred throughout the wheatbelt.

The Wheatbelt is one of the most botanically rich provinces in Australia, with high speciation and endism. This is due to the transition from the wetter southwest to the semi-arid interior, the many changes that have occurred to the landscape due to changes in sea level and the presence of ancient ranges providing refuge of gondwanan relics. Lake King is home to some of these primitive species such as the Common Scaly Foot Legless Lizard (*Pygopus lepidopodus*), a gecko species (*Diplodactylus granariensis*) and the Western Pygmy Possum (*Cercatetus concinnus*) (DEH 2006).

The reserve is also significant for being home to several rare and priority flora species, as well as the fringing vegetation around the lake. Vegetation surrounding lakes is not uniform between lakes, particularly on gypsum dunes, and varies between topography and substrate. For instance, a gypsum dune is more likely to support vegetation which is unlikely to be common within the lake system and may be unique to that lake (DEH, 2006). Several priority flora species occur within the application area (Armstrong, 2005) but are not located within exploration gridlines proposed by Western Areas (2006).

The areas surrounding the lake are subject to salinity and rising water tables, which can effect remaining vegetation. Other threats to native vegetation include grazing by rabbits and adjoining land uses (herbicide drift, weed invasion) (DEH, 2006).

The vegetation communities of Nickel Hill as described by Armstrong (2006) are common within other areas of uncleared vegetation within the Mallee Bioregion. However, the vegetation communities described by Armstrong (2006) next to the lake margin cannot be given a value on a regional scale given the variability of Halophytic communities fringing salt lakes.

There is no information available to suggest that the vegetation within the reserve is more biodiverse than other remnant vegetation within the bioregion. There is no information available to suggest that the vegetation within the proposed clearing area is more biodiverse than vegetation within the remainder of the reserve.

However, the application area is certainly more biodiverse than the cleared agricultural land surrounding the nature reserve. In fact, the Shire of Lake Grace is 91.2% cleared for agriculture (Shepherd et al, 2001).

The Biodiversity Coordination Section of the Department of Environment and Conservation have provided advice (DEC, 2006a) that the principle may be at variance to this principle.

Given all of the above, the proposed clearing may be at variance to this principle. Conditions have been placed on the permit requiring the permit holder to rehabilitate and revegetate the cleared area within 6 months of the completion of clearing, and to clean all vehicles and machinery of soil and vegetative material prior to entering the areas to be cleared.

Methodology Armstrong (2005)
DEC (2006a)
DEH (2006)
Western Areas (2006)
Shepherd et al (2001)

(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 Western Australian Museum's Faunabase website by the assessor within the coordinates 32.9 S 119.1 W and 33.8 S 119.7 W (WAM, 2006) identified the Heath Rat (*Pseudomys shortridgei*), Recherche Cape Barren Goose (*Cereopsis novaehollandiae grisea*), Peregrine Falcon (*Falco peregrinus*), Malleefowl (*Leipoa ocellata*), Carnaby's White Tailed Black Cockatoo (*Calyptrorhynchus latirostris*) and South West Carpet Python (*Morelia spilota imbricata*) as species of conservation significance that could potentially occur within Lake King Nature Reserve and surrounds.

The Heath Rat is known from the Ravensthorpe Range, Fitzgerald River National Park, Dragon Rocks and Lake Magenta Nature Reserves. It is known to occupy scrub mallee and mixed scrub with Banksia on loamy soils, unburnt for at least 30 years. The most likely cause of its decline is the extensive clearing in the Wheatbelt combined with predation by introduced predators (DEC, 2006b). It is unlikely that the species would be found within the application area due to the lack of predator control and the recent burn in the only habitat it is likely to be able to utilise. Therefore its conservation is not likely to be significantly impacted by the proposed clearing.

The Recherche Cape Barren Goose is restricted to the Archipelago of the Recherche and occasionally the mainland opposite (Garnett et al, 2000). It is extremely unlikely to have been observed within the search area and is either an error or a very rare sighting when a lake within the area has been full. It is extremely unlikely to be found within the application area and the proposed clearing will have no impact on the species conservation.

The Peregrine Falcon has a widespread distribution and is able to utilise a wide variety of habitats. It is likely to be an occasional visitor to the application area and is not likely to be significantly impacted by the proposed clearing.

The Malleefowl is restricted to mallee eucalypt woodland and scrub as well as dry forest dominated by other eucalypts, mulga and other *Acacia* spp. Birds require a sandy substrate with leaf litter in order to be able build nest mounds (Garnett et al, 2000). The application area does not have habitat that is likely to support Malleefowl and therefore it is unlikely that the species conservation will be significantly impacted by the proposed clearing.

Carnaby's White Tail Black Cockatoo forage in woodland and heath that is dominated by proteaceous species. They nest in hollows of large eucalypts, usually Salmon Gum and Wandoo. The species has severely declined between the 1970's and the present due mainly to extensive land clearing, shooting and nest robbing (DEC, 2006b). The species may be an occasional visitor to the application area and is likely to utilise the area for feeding when food is available. It is unlikely that the species conservation will be significantly impacted by the proposed clearing.

The South West Carpet Python is widespread throughout the south west from Northampton to Kalgoorlie to Esperance. It is able to utilise a wide variety of habitats from semi-arid coastal and inland habitats, Banksia woodland, eucalypt woodlands and grasslands, where it occurs at low densities (DEC, 2006b). The vegetation within the application area is of a type that may support populations of carpet python. However, the loss of 0.1 hectares of suitable habitat is not likely to significantly impact the conservation of this species.

The Lake King Nature reserve is an important refuge for wildlife in an area that has been extensively cleared for agriculture. At approximately 40000 hectares it is a substantial nature reserve in terms of size, although approximately half of this area is salt lake. Nevertheless, the loss of only 0.1 hectares represents an extremely small fraction of the vegetation within the reserve.

Whilst the application area contains habitat that may be utilised by species of conservation significance, and is a refuge for wildlife in general, it is not expected that the proposed clearing will have a significant impact.

The Biodiversity Coordination Section of the Department of Environment and Conservation have provided advice (DEC, 2006a) that the proposed clearing is not likely to be at variance to this principle.

Given all of the above, the proposed clearing is not likely to be at variance to this principle.

Methodology DEC (2006a)
DEC (2006b)
Garnett et al (2000)
WAM (2006)

(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

No rare or priority flora species were previously known to exist within the application area. The nearest known population of rare or priority flora, *Stylidium pulviniforme* (Priority 3) is approximately 7.5 km to the south of the application area (GIS Database).

Western Areas NL requested Paul Armstrong and Associates to conduct a flora survey in November 2005 over an area within Lake King Nature Reserve that was of interest for exploration. The survey consisted of a desktop survey of available databases and literature as well as a vegetation survey and rare flora search in the field. The survey and subsequent report adequately meet the requirements of Guidance Statement 51 - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004).

The survey was conducted prior to a geophysical survey and was based on gridlines of 500 m in length and would have resulted in the clearing of 1.3 hectares if the exploration program had used these 500m transects. Following the geophysical survey, the area of interest to Western Areas is greatly reduced and only 0.1 hectares has been applied for.

A database search by Armstrong (2005) prior to the survey identified 178 flora species of conservation significance of which 19 species have been recorded within 12 km of the survey area. 26 ephemeral species of flora were noted during the database search and were considered unlikely to be encountered during the field survey.

The vegetation survey and rare flora search was conducted in November 2005 (Armstrong, 2005). Three species of priority flora as listed by the Department of Environment and Conservation (DEC) were observed. These are *Frankenia drummondii* (P3), *Hydrocotyle hexaptera* ms (P1), and *Gyrostemon sessilis* (P2). Some ephemerals were noted within the survey area but were too mature to be identified.

Frankenia drummondii is a low prostrate shrub growing to 2cm tall with a spread up to 30 cm (Armstrong, 2005). The flora survey found six individual plants growing on a scree slope of a breakaway. Armstrong (2005) recommended that the proposed gridline be moved 10-20m to the south to avoid this population and the breakaway. Armstrong (2005) also found 10-20 plants growing in a raised area adjacent to a shallow clay/salt pan. However, the gridlines proposed by Western Areas following the geophysical survey will not effect either population of *F. drummondii* as the gridlines will not intersect with the recorded populations.

Gyrostemon sessilis is a shrub growing to 1 m tall. Armstrong (2005) located one specimen adjacent to the lake, growing in an area that had been burnt within the last three to five years. This record is an extension of its previous known range. *G. sessilis* is dependant on fire for regeneration, and has a short life cycle. Armstrong (2005) suggests that this plant is the lone survivor from a population that would have occurred after fire. There is likely to be a seed bank in the soil, which will germinate following the next fire. However, the gridlines proposed by Western Areas following the geophysical survey will not effect the population of *G. sessilis* as the gridlines will not intersect with the recorded population.

Hydrocotyle hexaptera is a small herb growing to 20 mm tall with a spread up to 50 mm in diameter (Armstrong, 2005). Armstrong (2005) recorded two sub populations totalling many hundreds of plants and suggested that the impact to the population would not be significant and could be lessened further if boards are placed over the population to lessen soil disturbance. However, the gridlines proposed by Western Areas following the geophysical survey will not effect the population of *H. hexaptera* as the gridlines will not intersect with the recorded populations.

The Biodiversity Coordination Section of the Department of Environment and Conservation have provided the following advice (DEC, 2006a) "DEC's BCS notes that both District and Environmental Management Branch staff have previously provided informal advice to the proponent prior to the proposal being formally assessed by the Department of Industry and Resources Native Vegetation Assessment Branch as a clearing application. Taking this into account, BCS concurs with this previous advice that provided the proponent undertakes the required flora survey and implements their commitments to avoid any disturbance to significant flora and the proposal is deemed to be acceptable. Based on the flora survey report it appears that this commitment has been accomplished".

DEC (2006a) have also provided advice that the proposed clearing is not likely to be at variance to this

principle.

Given all of the above, the proposed clearing is not likely to be at variance to this principle.

Methodology Armstrong (2005).
DEC (2006a)
GIS Database: Declared Rare and Priority Flora List - CALM 01/07/05

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

Comments **Proposal is not likely to be at variance to this Principle**
There are no known populations of Threatened Ecological Communities within 50km of the application area.

A flora survey conducted by Paul Armstrong and Associates over the application area did not identify any threatened ecological communities. This survey involved a desktop analysis of available databases and literature, as well as a vegetation survey and rare flora search in the field. No TEC's are recorded within 50 km of the application area (Armstrong 2005).

The Biodiversity Coordination Section of the Department of Environment and Conservation have provided advice (DEC, 2006a) that the proposed clearing is not likely to be at variance to this principle

Given all of the above, the proposed clearing is not likely to be at variance to this principle.

Methodology Armstrong (2005)
DEC (2006a)
GIS Database: Threatened Ecological Communities - CALM 12/4/05

(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**

	Pre-European area (ha)	Current extent (ha)	Remaining %	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Mallee	7395902*	4017868*	54.3*	Least Concern***	17.9 (31.3)*
IBRA SubBioregion – Western Mallee	3981720*	1307541*	32.8*	Depleted***	9.8 (25.4)*
Shire of Lake Grace	167411**	14725**	8.8*	Endangered***	unknown
Beard veg assoc. (state)					
- 125	3485651*	3287669*	94.3*	Least Concern***	6.9 (5.2)*
- 511	700414*	493992*	70.5*	Least Concern***	14.1 (18.9)*

* Shepherd et al. (2001a) updated 2005

** Shepherd et al. (2001)

*** 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

Explanation:

At a regional level, the Mallee IBRA Region remains at 54.3% of its pre-european vegetation extent (Shepherd et al, 2001a). According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002), these values give the region a Conservation Status of 'Least Concern'.

The application area falls within the Shire of Lake Grace. Lake Grace has only 8.8% of its pre-european vegetation extent remaining (Shepherd et al, 2001). The Shire is 100% within the Intensive Land Use Zone (ILZ) and has been extensively cleared for agriculture. The conservation status of the Shire is therefore 'Endangered' according to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002). The Shire of Lake Grace falls within the Western Mallee Sub-Bioregion which remains at approximately 33% of its pre-european vegetation extent (Shepherd et al, 2001a), with over three quarters of the subregion occurring within the ILZ.

Statewide, the vegetation associations as described by Beard (125 and 511) remain at 94.3% and 70.5% of their pre-european vegetation extent respectively (Shepherd et al, 2001a). According to the 'Bioregional Conservation Status of Ecological Vegetation Classes' (Department of Natural Resources and Environment, 2002), these values give the vegetation type a Conservation Status of 'Least Concern'.

Due to extensive land clearing in the region due to agriculture, the percentage of vegetation within IUCN reserves in the region has nearly doubled since European settlement. This increase suggests that the vegetation within reserves is of great importance in the overall region.

However, the loss of 0.1 hectares of vegetation is not likely to significantly decrease the percentage of either Beard Vegetation Association, the amount of vegetation in IUCN reserves or the amount of vegetation within the Bioregion and Sub-Bioregion.

Given all of the above, the proposed clearing is not likely to be at variance to this principle.

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al (2001)
Shepherd et al (2001a) updated 2005

(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 may be at variance to this Principle

The application area overlaps with the margins of Lake King. A map supplied by Western Areas NL (2006) shows that drill pad's RC7 and RC9 are most likely to impact the vegetation in the margins of Lake King. Only a fraction of the 0.1 hectares applied for is likely to be within the *Halosarcia sp.* community described by Armstrong (2005). The bulk of the clearing is in vegetation not associated with the lake. This small fraction is insignificant compared to the large amounts of this habitat type found in the Lake King area. Samphire species are disturbance opportunists and as such recovers well from disturbances. The loss of vegetation is therefore likely to be temporary.

This area has also been subject to historic exploration in the form of costeans that have not been rehabilitated. Soil and rocks have been left on the lake surface. Western Areas NL (2006) have suggested that this disturbed area be used as a site for sumps, and the previously excavated material used to build berms rather than deep sumps to contain any water encountered during drilling. The area would then be rehabilitated, thereby clearing up the old disturbance as well as the new. This will offset the loss of lake fringing vegetation, which will be temporary due to the ability of samphire to respond to disturbance.

Given all of the above, the proposal may be at variance to this principle. A condition has been placed on the permit requiring the permit holder to rehabilitate those areas cleared within 6 months of clearing.

Methodology Armstrong (2005)
Western Areas NL (2006)

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

Comments Proposal may be at variance to this Principle

Western Areas (2006) have supplied information as to the soil types encountered within the application area.

The North West side of Nickel Hill is dominated by thin latosols (iron, aluminium or silica rich soils) over residual laterite duricrust. To the South East and South, soils are dark brown skeletal lithosols (shallow soils lacking well-defined horizons) which have minor pedogenic carbonate development over the rock fragments (Western Areas, 2006). This type of soil is prone to water erosion.

Away from the hill soils become thicker and exhibit yellow brown aeolian (wind driven) sand mixing. The salt lake shores are bordered by coarse yellow sands, usually gypsiferous (Western Areas, 2006). These soils are not prone to erosion.

As only very small areas are intended to be cleared, the likelihood of increased waterlogging is very minimal. The area close to the lake shore is already hypersaline and the proposed clearing is not likely to increase salinity levels.

Given all of the above, the proposed clearing may be at variance to this principle (erosion) if vegetation is cleared during wet weather conditions. Under the conditions imposed on the permit, the Permit holder will be required to limit the vegetation removal to dry weather conditions and to rehabilitate the cleared area within 6 months of clearing.

Methodology Western Areas (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 is not likely to be at variance to this Principle

The application area occurs within Lake King Nature Reserve. The Lake King Nature reserve is an important reserve for flora and fauna conservation in an area that has been extensively cleared for agriculture, as well as maintaining existing ecological functions at a regional scale. It is listed on the Register of National Estate for its natural values. At approximately 40000 hectares it is a substantial nature reserve in terms of size, although approximately half of this area is salt lake. Lake King is also listed in 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002' (CALM, 2002) as a wetland of regional significance.

Nevertheless, the loss of only 0.1 hectares represents an extremely small fraction of the vegetation within the reserve.

The Biodiversity Coordination Section of the Department of Environment and Conservation have advised (DEC, 2006a) that the proposed clearing is not likely to be at variance to this principle.

Given all of the above, the proposed clearing is not likely to be at variance to this principle.

Methodology CALM (2002)
DEC (2006a)
DEH (2006)

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

Comments Proposal may be at variance to this Principle

Western Areas (2006) has advised that the water table is at the surface on the margins of the salt lake, and gets progressively deeper higher up the landscape (Nickel Hill). According to available databases (GIS database) groundwater salinity levels within the proposed clearing area are hypersaline with TDS approximately 35000 – 100000 mg/L. The removal of 0.1 hectares of vegetation is not likely to cause groundwater levels to rise or deteriorate. As clearing will take place close to the lake edge, run off during rainfall events may cause small amounts of sediments to be deposited into the lake.

Given all of the above, the proposal may be at variance to this principle. A condition has been placed on the permit to create a berm or other impediment to surface run-off to prevent sediments being deposited into the lake. A condition has also been placed on the permit to rehabilitate the cleared area within 6 months of clearing by placing removed vegetation over the clearing to trap sediments.

Methodology GIS database: Groundwater Salinity, Statewide - 22/02/00
250K Map Series, Groundwater Salinity - WRC 02/08/02
Western Areas (2006)

(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

According to the nearest Bureau of Meteorology recording station at Hyden, the application area receives annual rainfall of approximately 344.5 mm/year (BOM, 2006), which falls mostly in the winter months. The proposed clearing area is situated both on raised ground near a salt lake and on the margins of a salt lake (Western Areas, 2006). The salt lake is likely to be inundated during the winter months and mostly dry during the summer months. However, the loss of just 0.1 hectares is not likely to lead to an increase in flood peak height or duration.

Given the above, the proposal is not likely to be at variance to this principle.

Methodology BOM (2006).
Western Areas (2006)

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

Comments

According to the GIS database the application area is not subject to any known native title claims and there are no known aboriginal sites of significance recorded. 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.

Under a Memorandum of Understanding established between the Department of Industry and Resources (DoIR) and the Environmental Protection Authority (EPA), in 2004, where a proposal falls within the Department of Environment and Conservation (DEC) managed areas, DEC will advise DoIR if EPA referral is required. DEC (2006c) has advised that after discussions between DEC and Western Areas NL, the project is acceptable as commitments have been made to avoid disturbance to significant flora species. For this reason, the assessing officer has not referred the proposal to the EPA.

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 by a direct interest party was received during the advertisement period. However, the initial issues raised by the respondent are not relevant to the clearing of native vegetation and as such have not been addressed in this assessment.

Methodology DEC (2006c)
Direct Interest Party (2006)
GIS Database: Native Title Claims - DLI 7/11/05
Aboriginal Sites of Significance – DIA

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Exploration	Mechanical Removal	0.1	Grant	<p>The proposal has been assessed against the clearing principles and the proposal has been found to be not likely to be at variance to principles b, c, d, e, f, h, and j and may be at variance to principles a, f, g and i.</p> <p>The assessing officer therefore recommends that the permit be granted subject to the following conditions:</p> <ol style="list-style-type: none"> 1. When undertaking any clearing, revegetation and rehabilitation, or other activity pursuant to this Permit the Permit Holder must take the following steps to minimise the risk of the introduction and spread of weeds: (i) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared; (ii) ensure that no weed-affected road building materials, mulch, fill or other material is brought into the area to be cleared; and (iii) restrict the movement of machines and other vehicles to the limits of the areas to be cleared. 2. The Permit Holder shall stockpile the vegetative material and topsoil removed by clearing in accordance with this permit and use in rehabilitation under condition 5. 3. The permit holder must create berms or other water and sediment impediment devices downslope of any area cleared under this permit. 4. The Permit Holder shall not clear whilst it is raining on site. 5. The Permit Holder shall rehabilitate each area cleared under this permit within 6 months after the Permit Holder completes exploration activities on that area by filling in sumps, re-distributing topsoil, ripping drill pads and temporary access tracks and spreading vegetation removed under this permit over each area so rehabilitated. 6. The Permit Holder shall record the following for each instance of clearing: (i) the location of where the clearing occurred, expressed as grid coordinates using the Geocentric Datum of Australia 1994 coordinate system; (ii) the size of the area cleared in hectares; (iii) the dates on which the area was cleared; and (iv) the area rehabilitated in hectares. 7. The Permit Holder shall provide a report to the Director, Environment, Department of Industry and Resources by 31st January each year for the life of the permit setting out the records required under condition 6 of this permit in relation to clearing carried out between 1st January and 31st December the previous year.

5. References

- Armstrong, P. (2005). Botanical Survey and Rare Flora Search at Lake King, Conducted November 2005. Unpublished report prepared for joint venture between Western Areas NL and Swan Oak Holding.
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6. Glossary

Acronyms:

BCS	Biodiversity Coordination Section
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.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
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.