Government of Western Australia
Department of Mines and Petroleum

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3033/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Latent Petroleum Limited**

1.3. Property details

Property: Pipeline Licence 80 (PL80)
Local Government Area: Shire of Coorow & Shire Of Dandaragan
Colloquial name: Warro Gas Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
16.2		Mechanical Removal	Gas pipeline construction, temporary gas processing plant, maintenance road and associated activities

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Vegetation within the application area has been mapped at a 1:250,000 scale as the following Beard vegetation association (Shepherd et al., 2001; GIS Database); **- 946:** Medium woodland; wandoo ; and **- 1031:** Mosaic: Shrublands; hakea scrub-heath / Shrublands; dryandra heath. An initial flora survey of the application area was carried out by Botanica Consulting and Keith Lindbeck and Associates between 13 and 17 November 2007 to collect flowering material from the vegetation groups within the application area. An additional vegetation survey was conducted by Botanica Consulting and Keith Lindbeck and Associates between 5 and 7 December 2007 to identify the major vegetation groups within the application area (Keith Lindbeck and Associates, 2009). Targeted flora surveys were undertaken by a local flora specialist (Mr Don Williams) between May and October 2009 (Keith Lindbeck and Associates, 2009). The vegetation surveys identified a total of 15 vegetation communities within the application area (Keith Lindbeck and Associates, 2009). **Kwongan** **K1 -** Dense low (<1m) Kwongan heath dominated by *Adenanthos cygnorum*, *Allocasuarina humilis*, *Banksia candolleana* and *Banksia sphaerocarpa* over duplex sands. **K2 -** Mid dense Kwongan heath dominated by *Banksia strictifolia* and *Banksia sclerophylla* over grey clay and laterite outcrop. **K3 -** Low Kwongan heath (regrowth) over *Banksia candolleana*, *Banksia sphaerocarpa, Banksia carlinoides* and *Daviesia daphnoides* over deep grey-yellow sands. **K4 -** Tall Kwongan heath dominated *by Banksia sessilis* var *flabellifolia, Eremaea beaufortioides, Adenanthos cygnorum* and *Jacksonia floribundum*	Latent Petroleum Limited has applied to clear up to 16.2 hectares of native vegetation within an application area of 100 hectares for the development of a gas pipeline, temporary gas processing plant, maintenance road and associated activities. The proposed clearing will occur within an application area that is 33.1 kilometres in length and 30 metres wide. Of the 33.1 kilometre proposed pipeline route, only 16.2 hectares is proposed to be cleared - approximately 9.22 hectares comprises of remnant vegetation and 6.98 hectares of regrowth native vegetation. The remaining area within the application area comprises of agricultural land. The proposed clearing will be restricted to a width of 20 metres through areas of remnant native vegetation and 30 metres through areas on agricultural land (Keith Lindbeck and Associates, 2009). The vegetation will be cleared using blade down clearing techniques. Topsoil and vegetative material will be stockpiled within the application area and progressive rehabilitation will be completed as soon as practicable (Keith Lindbeck and Associates, 2009). Following the rehabilitation, Keith Lindbeck and Associates (2009) has advised that a total of 3.22 hectares (1.80 hecatares on regrowth farmland, and 1.42 hectares in remnant vegetation) will remain cleared for a 5 metre wide maintenance track along the pipeline route.	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994). to Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).	Vegetation condition was provided by Keith Lindbeck and Associates (2009).

over deep yellow sands.

Shrubland

S1 - Dense *Allocasuarina campestris* shrubland.

Woodland

W1 - Open low *Eucalyptus todtiana* and *E.wandoo* woodland over tall Kwongan dominated by *Jacksonia sternbergiana, Lachnostachys eriobotrya* and *Xylomelum angustifolium* over grey, yellow and red loam.
W2 - *Eucalyptus todtiana* scattered low trees over tall Kwongan dominated *by Banksia attenuata, B. burdettii, B. candolleana, B. sessilis* var *flabellifolia* and *Xylomelum angustifolium*.
W3 - Low Banksia and *Xylomelum angustifolium* woodland over Kwongan heath dominated by Banksia species, *Hibbertia subvaginata* and *Petrophile macrostachya*.

Disturbed

KD1 - Grazed areas of Kwongan vegetation over duplex sands and some breakaway.
KD2 - Degraded areas of kwongan vegetation over shallow duplex sand, gravel exposed.
KD3 - Kwongan regrowth (~4 yrs) over deep grey-yellow sands.
WD1 - Parkland cleared - Isolated *Eucalyptus wandoo* trees.
D1 - Cleared agricultural land with isolated *Eucalyptus loxophleba* and *E. gittinsii* trees over breakaway.
D2 - Cleared agricultural land with isolated *Eucalyptus todtiana*, *Banksia candolleana, Nuytsia floribunda* and agricultural species.
D3 - Cleared agricultural land with isolated individual *Eucalyptus falcata, Hibbertia hypericoides, Lomandra hastilis* and *Mesomelaena stygia* with agricultural species.

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 within the Lesueur Sandplain sub-region of the Geraldton Sandplains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The vegetation within the Lesueur Sandplain sub-region exhibits extremely high floristic endemism, with over 250 species of sandplain flora endemic to the sub-region (Desmond and Chant, 2001). The area is known Australia-wide and internationally as having particularly high floristic diversity and levels of endemism (Desmond and Chant, 2001).

Keith Lindbeck and Associates (2009) conducted a flora and vegetation survey over the entire application area, and demonstrated that the application area comprises of fragmented areas of cleared agricultural land, remnant vegetation and regrowth areas (Keith Lindbeck and Associates, 2009).

A total of 15 vegetation communities were identified within the 33.1 kilometre application area (Keith Lindbeck and Associates, 2009). Of these, eight vegetation communities were identified within the application area as remnant and the vegetation condition of these communities has been described as 'Excellent' to 'Good' (Keith Lindbeck and Associates, 2009). Seven vegetation communities were identified 'Disturbed' as these comprised of either regrowth or degraded areas from agricultural activities (Keith Lindbeck and Associates, 2009).

Keith Lindbeck and Associates (2009) recorded a total of 206 native flora species from 89 genera and 38 families with the application area. No Declared Rare Flora were recorded within the application area, however, ten Priority Flora species were recorded within the proposed pipeline route (Keith Lindbeck and Associates, 2009). The areas of remnant or regrowth vegetation are considered to demonstrate high floristic diversity.

Twenty-two non-native species were recorded within the application area, and these were predominately recorded on cleared agricultural areas (Keith Lindbeck and Associates, 2009). Cleared agricultural areas were devoid of any native vegetation apart from isolated *Eucalyptus* species, and are considered to comprise of low biological diversity (Keith Lindbeck and Associates, 2009). Clearing of farmland will not impact on an area of high biological diversity.

Non-native species have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. The disturbance of soil may promote weed growth, and there is a risk that the movement of contaminated soil and clearing equipment throughout the project areas may cause the spread of weed species. The assessing officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of weed management.

Although the application area comprises of high floristic diversity it should be recognised that over 39,944 hectares of intact vegetation remains within Watheroo National Park which is located immediately west of the eastern end of the application area (GIS Database; Keith Lindbeck and Associates, 2009). In addition, over 8,000 hectares of intact vegetation occurs within the Coomallo Nature Reserve which is situated immediately west of the western end of the application area. A large number of distinct, species rich and geographically restricted communities occur in the Coomallo area (Desmond and Chant, 2001). The surrounding areas of remnant vegetation, including the vegetation within Watheroo National Park and Coomallo Nature Reserve, are likely to demonstrate similar if not higher floristic diversity.

A fauna assessment of the application area revealed that three species of frogs, 36 species of herpetofauna, three mammals and 193 species of birds may potentially occur within the application area (Keith Lindbeck and Associates, 2009). The results from the fauna assessment suggest that the application area is potentially diverse in bird species.

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

Methodology

Desmond and Chant (2001)
Keith Lindbeck and Associates (2009)
GIS Database:
- Interim Biogeographic Regionalisation of Australia (subregions)
- Interim Biogeographic Regionalisation of Australia

(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

Latent Petroleum Limited commissioned Keith Lindbeck and Associates (2009) to undertake a fauna assessment of the vegetation within the application area. A desktop survey of the *Environmental Protection and Biodiversity Conservation Act 1999* Protected Matters Tool, Department of Environment and Conservation's (DEC) Threatened and Priority Fauna Database and the Western Australia Museum Specimen Database were undertaken to identify fauna species that may potentially occur within the application area. A reconnaissance survey was undertaken on 28 February and 15 April 2008 to:

- Verify the broadscale mapping and vegetation condition;
- Identify any habitats of particular conservation significance for fauna;
- Determine the potential sensitivity of the vegetation to impacts from the proposed pipeline installation, Temporary Gas Processing Plant and associated disturbances; and
- Determine the potential for species of conservation significance to be present or to utilise the area.

The desktop survey revealed that three species of frogs, 36 species of herpetofauna, three mammals and 193 species of birds may potentially occur within the application area (Keith Lindbeck and Associates, 2009). Of these, a total of seven species of conservation significance may occur within the application area. These are:

- Chuditch (*Dasyurus geoffroii*), Schedule 1 (Fauna that is rare or is likely to become extinct) of the *Wildlife Conservation (Specially Protected Fauna) Notice 2008(2)*; listed as 'Vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999*;
- Western Brush Wallaby (*Macropus irma*), listed DEC Priority 4;
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Schedule 1 (Fauna that is rare or is likely to become extinct) of the *Wildlife Conservation (Specially Protected Fauna) Notice 2008(2)*; listed as 'Endangered' under the *Environment Protection and Biodiversity Conservation Act 1999*;
- White-tailed Black Cockatoo (*Calyptorhynchus* sp.), Schedule 1 (Fauna that is rare or is likely to become extinct) of the *Wildlife Conservation (Specially Protected Fauna) Notice 2008(2)*; listed as 'Vulnerable' under the *Environment Protection and Biodiversity Conservation Act 1999*;
- Grey Falcon (*Falco hypoleucos*), listed DEC Priority 4;
- Australian Bustard (*Ardeotis Australis*), listed DEC Priority 4;
- Rainbow Bee-eater (*Merops ornatus*), migratory.

Keith Lindbeck and Associates (2009) identified three main fauna habitat types within the application area:

1. Kwongan heath;
2. Banksia woodland; and
3. Eucalypt (wandoo) woodland.

Extensive areas along the proposed application area are devoid of native vegetation and have been cleared for

agricultural purposes. These areas are considered to have little or no habitat value for fauna. The fauna habitats described by Keith Lindbeck and Associates (2009) relates to the vegetated areas within the application area. The fragmented areas of native vegetation within the application area comprise of 9.2 hectares of remnant native vegetation and 6.98 hectares of regrowth native vegetation (Keith Lindbeck and Associates, 2009).

The vegetation types identified by Keith Lindbeck and Associates (2009) and the results from the database searches indicate the potential for critical habitat for Carnaby's Black Cockatoo and another *Calyptorhynchus* species (potentially Baudins Black Cockatoo (*Calyptorhynchs baudinii))*. Two Cockatoo specialists from the Western Australian Museum were commissioned to conduct targeted surveys to assess the vegetation on the proposed pipeline route, identify breeding, feeding and roosting habitat for Carnaby's Black Cockatoo and to make recommendations for management (Keith Lindbeck and Associates, 2009). The targeted surveys were undertaken on 16 June, 18 July, 18 August and 5 September 2008.

A total of seven hollows were identified during the survey, however, Latent Petroleum Limited has designed the pipeline route to avoid these identified trees. All of these habitat trees are now located outside of the application area and will not be impacted on by the proposed clearing activities.

The survey confirmed that areas of Banksia woodland and heath are considered important foraging habitat for the Carnaby's Black Cockatoo. The proposed clearing in areas of remnant native vegetation has the potential to impact on foraging habitat. However, Keith Lindbeck and Associates (2009) has advised that the proposed clearing within any areas of remnant vegetation will be restricted to a maximum width of 20 metres, thereby minimising disturbance and the width of fragmentation to the remnant vegetation by the clearing.

It should be recognised that over 39,944 hectares of intact vegetation remains within Watheroo National Park which is located immediately west of the eastern end of the application area (Keith Lindbeck and Associates, 2009), and over 8,000 hectares of intact vegetation occurs within the Coomallo Nature Reserve which is situated immediately west of the western end of the application area (GIS Database; Keith Lindbeck and Associates, 2009). These areas are likely to comprise of additional foraging habitat available for Carnaby's Black Cockatoo.

Cockatoo specialists confirm that the additional record for *Calyptorhynchus* sp. within the application area is most likely Carnaby's Black Cockatoo as the application area is considered too far north for Baudin's Black Cockatoo (Keith Lindbeck and Associates, 2009).

Based on the vegetation types recorded within the application area and the large scale clearing that has occurred adjacent to the application area for agricultural purposes, the vegetation within the application is not considered to represent critical habitat for the Chuditch, Western Brush Wallaby, Australian Bustard. Whilst the Grey Falcon and Rainbow Bee-eater may utilise the vegetation within the application area, the proposed clearing is not likely to impact on significant habitat for these species.

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

Methodology

Keith Lindbeck and Associates (2009)
GIS Database:
- Badgingarra 50cm Orthomosaic - Landgate 2006
- CALM Managed Lands and Waters
- Hill River 50cm Orthomosaic - Landgate 2006
- Interim Biogeographic Regionalisation of Australia (subregions)
- Pre-European Vegetation

(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 datasets no species of Declared Rare Flora (DRF) have been recorded within the application area. Datasets indicate the DRF species *Banksia serratulodides* subsp. *perissa*, *Spirogardnera rubescens*, *Thelymitra apiculata*, *Eucalyptus lateritica*, *Hakea megalosperma* and *Acacia wilsonii* have been recorded within 2 kilometres of the application area (GIS Database).

Keith Lindbeck and Associates (2009) have undertaken a flora and vegetation survey of the application area. The flora survey comprised of (Keith Lindbeck and Associates, 2009):

- An initial flora survey to collect flowering material from different vegetation groups between 13 and 17 November 2007;
- A vegetation survey to identify the major vegetation groups along the proposed pipeline route between 5 and 7 December 2007; and
- Targeted flora surveys between May and October 2008.

No Declared Rare Flora was recorded or identified within the application area (Keith Lindbeck and Associates, 2009). The nearest recorded DRF species was *Spirogardnera rubescens* which was recorded opportunistically

approximately 70 metres south of the application area (Keith Lindbeck and Associates, 2009). The DRF species will not be impacted on by the proposed clearing.

Ten Priority Flora species and one undescribed taxa were recorded by Keith Lindbeck and Associates (2009) during the flora and vegetation survey of the application area (see table 1 below).

Species Name	Conservation status	No. of populations	No. of populations impacted	No. plants recorded	No. of plants impacted
Drosera marchantii subsp. *prophylla*	P3	2	1	220	10
Banksia cypholoba	P3	1	1	4	2
Banksia fraseri subsp. *cerebra*	P3	5	3	56	6
Banksia splendida subsp. *macrocarpa*	P3	5	4	~7,000	6
Desmocladus elongates	P3	5	4	~10,000	430
Hensmania stoniella	P3	1	1	5	1
Phlebocarya pilosissima subsp. *pilosissima*	P3	1	1	5	1
Banksia chamaephyton	P4	1	1	1	1
Banksia platycarpa	P4	4	4	~3,150	123
Banksia sclerophylla	P4	4	3	~1,800	130
Banksia undescribed sp	Undescribed	-	-	~10,000	10

Drosera marchantii subsp. *prophylla* occurs from Eneabba to Badgingarra. The proposed clearing will impact on 10 individuals of this species which represents approximately 4.5% of the population at this location (Keith Lindbeck and Associates, 2009). The proposed disturbance to this species is not likely to impact on the conservation of this species.

Banksia cypholoba was recorded in low numbers within the application area. This species is known from Enebba, Coorow, Tathra National Park, Alexander Morrison National Park, Big Soak Plain and Watheroo National Park (Keith Lindbeck and Associates, 2009). The removal of 2 individual plants is not likely to impact on the conservation of this species.

Banksia fraseri subsp. *cerebra* are known from large populations in Lesueur National Park, Alexander National Park, Coomallo Nature Reserve and Big Soak Plain. Only six individuals of this species will be impacted by the proposed clearing activities. The proposed clearing is not likely to impact on the conservation or habitat required for this species.

Banksia splendida subsp. *macrocarpa* is known from Eneabba and Tathra in the north to Badgingarra in the south. The species occurs in Tathra National Park, Alexander Morrison National Park, Big Soak Plain and West Watheroo National Park (Keith Lindbeck and Associates, 2009). Approximately 7,000 individual plants were recorded during the flora survey, however this site occurs approximately 200 metres north of the application area (Keith Lindbeck and Associates, 2009; GIS Database). This conservation of *Banksia splendida* subsp. *macrocarpa* will not be impacted by the proposed clearing.

Desmocladus elongates has been recorded from Eneabba to Cataby with a north-south distribution covering a length of 128 kilometres (Keith Lindbeck and Associates, 2009). The species was recorded as one continuous population on Lot 10168 on which the pipeline will occur. Keith Lindbeck and Associates (2009) estimate this population size to be in excess of 10,000 individuals. The proposed clearing will require the removal of a maximum of 400 individual plants which represents approximately 4% of this population. The conservation of this species is not likely to be placed at risk by the proposed clearing activities.

Hensmania stoniella is known from a wide area that includes Jurien Bay, Eneabba and Badgingarra, and is well represented in Alexander Morrison National Park, Big Soak Plain and West Watheroo National Park (Keith Lindbeck and Associates, 2009). The proposed clearing will require the removal of one individual plant (Keith Lindbeck and Associates, 2009). The conservation significance of *Hensmania stoniella* is not likely to be impacted on by the proposed clearing activities.

Phlebocarya pilosissima subsp. *pilosissima* is a poorly described species that appears to be common on white or grey sands and lateritic gravels. Keith Lindbeck and Associates (2009) advise that the species appears to be locally common in the Alexander Morrison National Park, Big Soak Plain area and West Watheroo National Park. Only one individual plant will require removal for construction of the pipeline and this is not likely to impact on the conservation of this species.

Banksia chamaephyton is common in the Moora district, and occurs north of Eneabba to south of Cataby (Keith Lindbeck and Associates, 2009). Large, dense populations occur in the adjoining Big Soak Plain (Keith Lindbeck and Associates, 2009). The removal of one individual is not likely to impact on the conservation of this species.

Banksia platycarpa is widespread and is known from north of Eneabba to Mogumber (Keith Lindbeck and Associates, 2009). Large numbers of this species have been recorded in Watheroo National Park and Big Soak Plain. The proposed clearing of 123 individuals represents approximately 3.9% of the total plants recorded during this survey. The conservation of this species is not likely to be impacted on by the proposed clearing activities.

Banksia sclerophylla occurs in Lesueur National Park, Alexander Morrison National Park, Big Soak Plain, Coomallo Nature Reserve and West Wateroo National Park (Keith Lindbeck and Associates, 2009). The proposed clearing will result in the removal of a maximum of 130 individual plants which represents approximately 7.2% of the total number of plants recorded during the survey. The proposed clearing is not likely to impact on the conservation of this species.

An undescribed *Banksia* species was recorded during the flora survey of the application area (Keith Lindbeck and Associates, 2009). This species has been noted in Coomallo Nature Reserve, Badgingarra National Park, Big Soak Plain and several areas of private property (Keith Lindbeck and Associates, 2009). This species was recorded on Lots 10168 and 10323 during the flora survey, and additional survey work in the area has recorded additional populations. The population size at these locations is estimated to be in excess of 10,000 plants. Approximately 10 plants will be removed during the clearing for the proposed pipeline, and this is not likely to impact on required habitat for this species.

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

Methodology Keith Lindbeck and Associates (2009)
Western Australian Herbariam (1998 – 2009)
GIS Database:
- Declared Rare and Priority Flora List

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

Comments **Proposal is not likely to be at variance to this Principle**
There are no known Threatened Ecological Communities (TEC's) within the application area (GIS database). No TEC's were identified during the flora and vegetation survey of the application area (Keith Lindbeck and Associates, 2009). The nearest known TEC's are located approximately 16 kilometres west-north-west and 18 kilometres east-north-east of the application area (GIS database). The proposed clearing is unlikely to impact on the conservation of those TEC's.

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

Methodology Keith Lindbeck and Associates (2009)
GIS Database:
- Threatened Ecological Communities

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

Comments

Proposal is not likely to be at variance to this Principle

The clearing application area is located within the Leseur Sandplain sub-region of the Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA) bioregion. Approximately 40.9% of the pre-European vegetation remains (see table) (GIS database; Shepherd et al., 2001).

The vegetation of the clearing application area has been mapped as Beard vegetation associations 946: Medium woodland; wandoo, and 1031: Mosaic: Shrublands; hakea scrub-heath / Shrublands; Banksia (formerly dryandra) heath (GIS Database, Shepherd et al., 2001).

According to Shepherd et al., (2001) approximately 21.3% and 27.4% of Beard vegetation association 946 remains at both the state and sub-regional level respectively (see table), and approximately 34.9% and 36.2% of Beard vegetation association 1031 remains at both the state and sub-regional level respectively (see table).

According to the Bioregional Conservation Status of Ecological Vegetation Classes, the conservation status for the Leseur Sandplain sub-region and for Beard vegetation association 1031 at both the state and sub-region is 'Depleted'. The conservation status for Beard vegetation association 946 at both the state and sub-regional level is 'Vulnerable' as less than 30% of pre-European vegetation exists.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Subregion – Leseur Sandplain	1,171,805	478,987	~40.9	Depleted	17.7
Beard veg assoc. – State					
946	53,227	11,321	~21.3	Vulnerable	2.9
1031	269,505	93,976	~34.9	Depleted	13.5
Beard veg assoc. – Subregion					
946	2,980	817	~27.4	Vulnerable	0.0
1031	241,394	87,398	~36.2	Depleted	14.8
Shire					
Dandaragan	668,507	326,283	~48.8	Depleted	No information available
Coorow	424,583	164,895	~38.8	Depleted	No information available

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

The "threshold level" below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being at a level of 30% of the pre-clearing extent of the vegetation type (Environmental Protection Authority, 2000). A significant consideration towards the clearing of native vegetation under this proposal is to ensure that the clearing does not impact on remnant vegetation communities with less than 30% remaining, or reduce the extent of pre-European vegetation communities below the "threshold level".

Keith Lindbeck and Associates (2009) have mapped the vegetation units within the application area and it is evident that the majority of proposed disturbance associated with the construction of the pipeline occurs on cleared farmland which comprises of no remnant native vegetation communities. The proposed clearing is made up of approximately 6.98 hectares on regrowth farmland, and 9.22 hectares in remnant vegetation (Keith Lindbeck and Associates, 2009).

As demonstrated above, less than 30% of Beard vegetation association 946 remains at both the state and sub-regional level. Analysis of a Geographic Information System (GIS) pre-European vegetation extent dataset indicates that two small portions of Beard vegetation association 946 intercept the application area on Lot 10367 (at approximately 357956E 6657329N and 360800E 6657908N) (GIS Database). Aerial imagery indicates that the eastern-most area has historically been cleared for agricultural purposes (GIS Database), and this has been confirmed by Keith Lindbeck and Associates (2009) who advise that there is no native vegetation remaining. The western-most area has been mapped and described by Keith Lindbeck and Associates (2009) as **WD1:** Parkland cleared with isolated *Eucalyptus wandoo* trees and degraded. Site photographs and a description of this vegetation confirm that there are scattered *Eucalyptus wandoo* trees with no understorey species present (Keith Lindbeck and Associates, 2009). Due to the narrow width of the pipeline corridor only a few wandoo trees are likely to require removal during pipeline construction (Keith Lindbeck and Associates, 2009). This vegetation group is not regarded as a significant remnant of native vegetation.

The remaining vegetation units within the application area occur in an area mapped as Beard vegetation association 1031 (GIS Database). Approximately 34.9% and 36.2% of Beard vegetation association 1031 remains at both the state and sub-regional level respectively (Shepherd et al. 2001). Of the vegetation units within this area, Keith Lindbeck and Associates (2009) have mapped eight vegetation types as areas of remnant vegetation, and the remainder as regrowth or disturbed vegetation. The proposed clearing of up to 9.22 hectares of remnant vegetation represents approximately 0.001% of the remaining remnant vegetation for Beard vegetation association 1031 for both the state and sub-region. The proposed clearing is unlikely to significantly reduce the extent of Beard vegetation association 1031 remaining at both the state and sub-regional level. The clearing of regrowth vegetation is not considered to impact on an area of remnant native vegetation.

The extent of native vegetation in the Shire of Dandaragan and Shire of Coorow is above the 30% threshold (see table) (Shepherd et al., 2001), and as a result the clearing is not likely to significantly reduce the extent of remnant vegetation remaining with the shires.

Keith Lindbeck and Associates (2009) has advised that clearing within areas of remnant vegetation will be restricted to a maximum 20 metre right of way. A maximum of 3.22 hectares will remain cleared following the construction for a 5 metre wide access/maintenance road.

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

Methodology

Department of Natural Resources and Environment (2002)
Environmental Protection Authority (2000)
Keith Lindbeck and Associates (2009)
Shepherd et al. (2001)
GIS Database:
- Badgingarra 50cm Orthomosaic - Landgate 2006
- Hill River 50cm Orthomosaic - Landgate 2006
- Interim Biogeographic Regionalisation of Australia (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 wetlands or watercourses within the application area, however, Boothendarra Creek and Dewar Creek cross the proposed pipeline application area (GIS Database; Keith Lindbeck and Associates, 2009). Analysis of Geographic Information System (GIS) hydrology data indicates that Boothendarra Creek intercepts the creekline in one location, whilst Dewar Creek crosses the application in two locations.

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

Keith Lindbeck and Associates (2009) has advised that the application area crosses Boothendarra Creek in an area of land that has been historically cleared for agricultural purposes, and this is supported by aerial imagery of the application area (GIS Database). In addition, the vegetation adjacent to the cleared area (immediately south) is not water dependent and is not considered riparian vegetation (Keith Lindbeck and Associates, 2009).

A site inspection of Dewar Creek failed to identify this creek line (Keith Lindbeck and Associates, 2009). Analysis of aerial imagery shows no evidence of any defined drainage channels in locations where it is indicated that Dewar Creek crosses the application area (GIS Database). No culverts were identified in this area under the Marchagee Track and the vegetation in the area is not considered to be riparian (Keith Lindbeck and Associates, 2009).

Methodology

Keith Lindbeck and Associates (2009)
GIS Database:
- Badgingarra 50cm Orthomosaic - Landgate 2006
- Hill River 50cm Orthomosaic - Landgate 2006
- Hydrography, linear_1
- Hydrography, linear (hierarchy)

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

Comments

Proposal may be at variance to this Principle

The soils within the application area are predominately deep sands, with sandy gravels and breakaway areas comprising some sections of the route (Keith Lindbeck and Associates, 2009). Sandy soils are characterised by poor soil strength, and as a result sandy soils within the application area are considered susceptible to wind erosion should the vegetative material be removed. There is a lower risk of wind erosion for areas

characterised by sandy gravels and breakaways.

The application area experiences average annual rainfall of 546.9 millimetres, with little surface water runoff during normal season rainfall events (Keith Lindbeck and Associates, 2009). Given the porosity of sandy soils, it is likely that majority of rainfall that occurs on site will infiltrate to the soil or evaporate. The absence of any overland flows within or adjacent to the application area will minimise the risk of water erosion.

Groundwater salinity within and adjoining the application area has been measured in the range between 500 to 1,000 milligrams per litre Total Dissolved Solids (GIS Database). The proposed clearing will be linear and narrow (restricted to 20 metres through areas of remnant native vegetation and 30 metres through areas of agricultural farmland) across the length of the proposed pipeline route (Keith Lindbeck and Associates, 2009). Vast areas adjoining the application area have historically been cleared for agricultural purposes. The proposed clearing is unlikely to significantly increase infiltration which may otherwise lead to a rise in groundwater. The proposal is not likely to increase salinisation within the application area or adjoining areas.

To minimise the risk of soil erosion and further land degradation within the application area, the assessing officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of rehabilitation.

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

Methodology Keith Lindbeck and Associates (2009)
GIS Database:
- Groundwater Salinity, Statewide

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

Comments

Proposal is not likely to be at variance to this Principle

The application area is not located within a Department of Environment and Conservation (DEC) managed conservation area (GIS Database). However, the eastern end of the application area is located approximately 300 metres west of Watheroo National Park which is classified as an A Class Reserve (24991), and the western end is located immediately south (approximately 50 to 100 metres) of Coomallo Nature Reserve which is a C Class Reserve (41933).

A Phytopthera (dieback) assessment of the application area was undertaken during the May to October flora survey (Keith Lindbeck and Associates, 2009). Keith Lindbeck and Associates (2009) report that dieback indicator species were observed to be healthy. If present or introduced into the application area, the spread of dieback has the potential to impact on the conservation values and biodiversity of nearby conservation areas. The assessing officer recommends that should the permit be granted, conditions be imposed on the permit for the purpose of dieback control and weed management.

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

Methodology Keith Lindbeck and Associates (2009)
GIS Database:
- CALM Managed Lands and Waters

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

Comments

Proposal is not likely to be at variance to this Principle

There are no permanent wetlands or watercourses within or adjacent to the application area (GIS Database; Keith Lindbeck and Associates, 2009). The application area receives an average annual rainfall of 546.9 millimetres, and with soil within and adjacent to the application area comprised predominately of deep sands there is likely to be little surface water flow in the area during normal season rainfall events (Keith Lindbeck and Associates, 2009). The proposed clearing is not likely to cause deterioration in the quality of any surface water in the local area.

The application area is not located within a Public Drinking Water Supply Area (PDWSA) (GIS Database). The nearest PDWSA's are Badgingarra Water Reserve situated approximately 20 kilometres south, Jurien Water Reserve situated approximately 27 kilometres west and Watheroo Water Reserve situated approximately 27 kilometres south-east of the application area (GIS Database). The proposed clearing of 16.2 hectares of native vegetation will occur within a linear and narrow application area which covers a distance of 33.1 kilometres (Latent Petroleum Limited, 2009; Keith Lindbeck and Associates, 2009; GIS Database). The proposed clearing is not likely to significantly increase groundwater recharge in the local area. Given the distance separating the application areas and the nearest PDWSA's, the proposed clearing is unlikely to impact on the water quality of these water reserves.

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

Methodology Latent Petroleum Limited (2009)
Keith Lindbeck and Associates (2009)
GIS Database:
- Hydrography, linear_1
- Hydrography, linear (hierarchy)
- 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 located within the Hill River catchment which covers an area of approximately 370,465 hectares (GIS Database). Soils within the application area are predominately deep sands, with sandy gravels and breakaway areas (Keith Lindbeck and Associates, 2009). The application area experiences average annual rainfall of 546.9 millimetres, with little surface flow during normal season rains. The proposed clearing will be restricted to a width of 20 metres through areas of native vegetation and 30 metres across agricultural areas (Keith Lindbeck and Associates, 2009). The proposed clearing is not likely to impact on the drainage characteristics of the Hill River catchment, or cause or exacerbate flooding in the local area.

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

Methodology Keith Lindbeck and Associates (2009)
GIS Database:
- Hydrographic Catchments - Catchments

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

Comments

There is one Native Title Claim over the area under application (WC97/071). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the tenement 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 Sites of Aboriginal Significance within the area applied to clear (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

Keith Lindbeck and Associates on behalf of the proponent Latent Petroleum Limited referred the proposal to the Environmental Protection Authority (EPA) on 20 May 2008. The EPA provided the following recommendation on 21 July 2008 – "Not Assessed Managed under Part V of the Environmental Protection Act 1986."

Two submissions were received during the public submissions period stating no objection to the proposal.

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 licence or approvals are required for the proposed works.

Methodology GIS Database
- Native Title Claims
- Sites of Aboriginal Significance DIA

4. Assessor's comments

Comment

The clearing principles have been addressed and the proposed clearing is at variance to Principle (f), may be at variance to Principle (a), (b) and (g), is not likely to be at variance to Principle (c), (d), (e), (h), (i) and (j).

Should a clearing permit be granted, it is recommended that conditions be imposed on the permit for the purposes weed management, retaining vegetative material and topsoil, staged clearing, record keeping and permit reporting.

5. References

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.

Desmond and Chant (2001). Geraldton Sandplain (GS3 – Lesueur Sandplain subregion).). In a Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management, pp 293-313.

Environmental Protection Authority (2000). Environmental Protection of Native Vegetation in Western Australia, Clearing of Native Vegetation, With Particular Reference to the Agricultural Area, Position Statement No. 2, Prepared by the 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.

Keith Lindbeck and Associates (2009). Latent Petroleum Limited Warro Gas Project – Gas Pipeline and Temporary Gas Processing Plant, Supporting Document for Clearing Permit Application, Prepared for Latent Petroleum Limited, Prepared by Keith Lindbeck and Associates, March 2009.

Latent Petroleum Limited (2009). Application for a Clearing Permit (Purpose Permit), Prepared by Latent Petroleum Limited, March 2009.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001). Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

Western Australian Herbarium (1998-2009). Florabase - The Western Australia Flora, A search for *Drosera marchantii* subsp. *prophylla, Banksia cypholoba*, *Banksia fraseri* subsp. *cerebra, Banksia splendida* subsp. *macrocarpa*, *Desmocladus elongates, Hensmania stoniella, Phlebocarya pilosissima* subsp. *pilosissima*, *Banksia chamaephyton, Banksia platycarpa* and *Banksia sclerophylla* Department of Environment and Conservation, accessed 29 May 2009, <http://florabase.calm.wa.gov.au.html>.

6. Glossary

Acronyms:

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

Definitions:

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

P1 **Priority One - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P2 **Priority Two - Poorly Known taxa**: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

P3 **Priority Three - Poorly Known taxa**: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.

P4 **Priority Four – Rare taxa**: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

R **Declared Rare Flora – Extant taxa** *(= Threatened Flora = Endangered + Vulnerable)*: taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

X **Declared Rare Flora - Presumed Extinct taxa**: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

the prescribed criteria.

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