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

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 1657/3
Permit type: Area Permit

1.2. Proponent details

Proponent's name: **Iluka Resources Ltd**

1.3. Property details

Property: *Mineral Sands (Eneabba) Agreement Act 1975*
Mining Lease 267SA (AM 70/267)
Local Government Area: Shire of Carnamah
Colloquial name: Adamson Area 'B'

1.4. Application

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

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The areas proposed to be cleared were part of a previous mine path. The southern part of the areas proposed to be cleared consists of non locally native *Eucalyptus* trees that were planted as tree shelter belts from a land care/agricultural perspective in keeping with the surrounding land use. The understorey of the tree shelter belt areas is composed of pasture grasses and is likely to have some weeds present. The tree shelter belt areas total approximately five hectares. Two areas at the northern end of the clearing permit application consist of small isolated areas (approximately 130 and 150 square metres that may be remnant native vegetation) and a larger area of locally native vegetation that has resulted from Iluka Resources Ltd rehabilitation activities in 1997 and 1998. The areas composed of locally native vegetation total approximately four hectares. The applicant has informed the Native Vegetation Assessor that there are some weeds present amongst the areas rehabilitated to native locally native vegetation. Based on prior site visits by the assessor such weeds are likely to include African Lovegrass *Eragrostis curvula*, the Veldt Grasses *Ehrharta calcina* (perennial veldt grass) and *E longiflora* (annual veldt grass) as well as various pasture species.

None of the areas described above were mapped during botanical surveys carried out in the Adamson area (Woodman 2005). Based on the information provided to the Native Vegetation Assessor by Iluka Resources the locally native vegetation present within the clearing permit area appears to be similar to the vegetation type S11 (Dense shrubland with occasional *Eucalyptus pleurocarpa* on grey sand with some lateritic gravel) and S14 (Low Shrubland, with occasional emergent *Eucalyptus todtiana* and *Eucalyptus pleurocarpa*, on grey sands) mapped at a scale of 1:10000 located in nearby intact native vegetation (Woodman 2005).

The Beard vegetation associations (Pre European Vegetation type Associations) that are located within the areas proposed to be cleared are:

379: Shrubland: Scrub Heath on lateritic sand plain in the Central Geraldton Sandplain Area and

49: Shrublands; mixed heath (Shepherd et al 2001).

Clearing Description

The proposed clearing is for the purpose of mining mineral sands. The proposed clearing is located within an area called the Adamson B area which was in part previously mined in the 1980's. The areas proposed to be cleared were part of the previous mine path. The areas proposed to be cleared consist of *Eucalyptus* trees that were planted as tree shelter belts from a landcare/agricultural perspective and locally native vegetation that has resulted from Iluka's rehabilitation activities in 1997 and 1998 on the previously disturbed areas. Both types of vegetation are considered to be native vegetation under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 of the Environmental Protection Act 1986.

The Adamson B area was the subject of a clearing permit application for 25 hectares (CPS 1549/1) which was granted subject to conditions on the 7th of December 2006. The 9 hectares that are the subject of this application were described as tree shelter belt and not included in the CPS 1549/1 application. The proposed clearing areas are located within the areas that were assessed in the CPS 1549/1 application, however they were not part of that application and not approved to clear as a result. A portion of the ore body is located under the proposed clearing

areas and the clearing of the nine hectares of that vegetation is sought to enable the mining of part of the ore body. The area proposed to be cleared will be rehabilitated to native vegetation (locally native vegetation resulting from rehabilitation activities) or pasture (tree shelter belt areas) using techniques that have been followed for previous rehabilitation by Iluka Resources Ltd at the Eneabba operations (Iluka Resources Ltd, 2006). An area of 13.5 hectares called Adamson A adjacent to Adamson B and this clearing proposal was approved to clear subject to conditions in 2005 (Clearing Permit CPS 716/1, 2005).

Following discussions in January 2007 between the Iluka Resources Ltd Environmental Advisor and the DoIR Native Vegetation Assessor post mining rehabilitation outcomes will result in the rehabilitation of approximately seven hectares of the areas proposed to be cleared to locally native vegetation and two hectares to a tree shelter belt in the middle of the existing pasture area.

This outcome will result in a net gain of three hectares of native vegetation rehabilitation and a loss three hectares of tree shelter belt areas compared to the existing situation.

Vegetation Condition

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

To

Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).

Comment

The vegetation condition is based on information provided to the assessor by Iluka Resources as well as from previous site visits.

No evidence of dieback affected vegetation occurs within or adjacent to the Adamson (B) area which includes the areas proposed to be cleared. The nearest dieback affected site is located approximately 600 metres south west of the proposed clearing area. That site is not expected to be affected by the proposed clearing and mining operation. A dieback management strategy and plan is currently implemented at the Eneabba operations. The dieback management plan was reviewed in 2005 with implementation to take place in 2006 (Iluka Resources Ltd, 2006). Iluka Resources have been implementing dieback management for many years and have a number of permanent wash down stations set up at the Eneabba operations. Regular dieback site interpretation occurs with new disease extent maps produced in 2005 and further mapping planned for 2006. Weed management is part of the rehabilitation process on site. Previous site visits carried out by the assessor in 2005 and 2006 do not indicate any serious issues in relation to weed or dieback management arising from current practices at the Eneabba operations.

An annual report on environmental protection and management measures undertaken on approved proposals is a requirement under clause 8 of the *Mineral Sands (Eneabba) Agreement Act 1975*. This report is reviewed by the various regulatory agencies administering environmental approvals at Eneabba. The Mineral Sands Agreement Rehabilitation Coordination Committee (MSARCC) which includes officers from Department of Industry and Resources (DoIR), Department of Environment and Conservation (DEC), Department of Water (DOW) inspect the Eneabba operations on an annual basis.

Clearing permit CPS 1657/1 for the Adamson (B) project was originally granted on 7 December 2006. This clearing permit was amended on 24 December 2008 to extend the expiry date of the permit, from 6 January 2009 to 15 March 2010. The clearing permit is now being further amended to extend the expiry date of the permit, from 15 March 2010 to 15 March 2012.The amount of clearing and clearing boundary that was approved to clear under clearing permit CPS 1657/2 will remain unchanged.

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing area is located in the Lesueur Sandplain GS3 IBRA (Interim Biogeographic Regionalisation of Australia) subregion (GIS Database). The biodiversity values of that area have been summarised by Desmond and Chant (2001). The Lesueur Sandplain subregion is known Australia wide and internationally for its high floristic diversity and levels of endemism.

The vegetation proposed to be cleared comprises of non-locally native tree species (shelter belt areas) and locally native vegetation. Some of the locally native vegetation may represent two isolated very small remnants of native vegetation (approximately 130 and 150 square metres each). The majority of the locally native vegetation is composed vegetation that has occurred as a result of relatively recent post mining rehabilitation in 1997 and 1998. All areas are affected by weeds due to their close proximity to pasture areas. Those areas do not represent areas of high biological diversity in comparisons to other areas of intact native vegetation or completed native rehabilitation located nearby.

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

Methodology

Desmond and Chant (2001)
GIS Database:

Hill River Arrowsmith 1.4m Orthomosaic
Interim Biogeographic Regionalisation of Australia (subregions)

(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

Advice provided by the Department of Environment and Conservation (DEC) has indicated that the clearing assessment provided in relation to the Adamson B proposal (CPS 1549/1) located adjacent to this proposal and involving larger areas of vegetation with greater environmental values was applicable to the assessment of CPS 1657/1. That clearing assessment is stated below.

A review of the fauna information that has been gained from previous studies at Iluka Resources Ltd operations at Eneabba was undertaken in 2005 (Bamford and Bancroft, 2006). This review included a one day site inspection by Bamford and Bancroft which occurred in October 2005. Trapping and surveys for vertebrate species have occurred at Eneabba since 1981 and studies focussing on invertebrates as an indicator of rehabilitation success since 1980. The Eneabba area has a long history of fauna investigations and the vertebrate fauna of the area has been well documented from various studies carried out as part of Iluka's operations or environmental approval requirements (Bamford and Bancroft, 2006). Similarly the studies of the invertebrate fauna in the area are among the most extensive in Western Australia.

From previous studies and known records of fauna of conservation significance 30 species of vertebrates that are of conservation significance may occur in the Eneabba area. Of those 30 vertebrate species two that are either listed on the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* or on the DEC Priority list are most likely to be impacted by the proposed clearing.

Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), listed in schedule 1 (fauna that is rare or likely to become extinct) of the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* has been recorded in the vicinity of the Adamson area (Iluka Resources Ltd, 2005 and Western Australian Museum, 2003). Bamford (2006) has stated that there appears to be no suitable breeding habitat either on the Iluka leases or sufficiently close for the breeding birds to rely on the lease for foraging. There are large areas of suitable foraging habitat in the local area and it is unlikely that the proposed clearing would significantly impact that species.

The Rufous Fieldwren *Calamanthus campestris montanellus* (Priority 4, taxa in need of monitoring) was recorded in 2001 on an Iluka lease (HGM, 2001). It is likely that Adamson B represents an area of suitable habitat for that species.

Information which was not available at the time that CPS 1549/1 was being assessed states that the Rufous Field Wren has been found to recolonise rehabilitated area (Bamford in Iluka, 2006c).

DEC advice received with regards to the Rufous Field Wren stated that: the proposed clearing is unlikely to impact the conservation status of the species in view of the mining and disturbance that is already occurring in the area (DEC 2006b). Rufous fieldwrens are known to breed between July and November (Pizzey and Knight, 1997). The proposed clearing is most likely to occur in early 2007 and potential disturbance to breeding birds is unlikely as a result.

The DEC has recorded two invertebrates of conservation significance within 10 kilometres of the Adamson area (CALM advice, 2005). They are the Shield-Backed Trapdoor Spider *Idiosoma nigrum* (Schedule 1), Cockroach-like Mecopteran *Austromerope poultoni* (Priority 2, taxa with few, poorly known populations on conservation lands). Bamford and Bancroft (2006) have suggested that investigations into where these two significant invertebrate species might occur could be considered as part of ongoing mine expansion approvals.

Previous advice provided by the DEC (formerly CALM) for the nearby Adamson A proposal stated that:

It is unlikely that the Shield-Backed Trapdoor Spider and *Austromerope poultoni* would be significantly impacted as a consequence of the proposed clearing based on the habitat availability in the local area, size and extent of proposal and available knowledge of these taxa in the local area (CALM, 2005).

Provided the clearing is carried out in an incremental manner and actively rehabilitated directly after the cessation of mining activities, the proposal is unlikely to have a major impact on the local fauna (CALM advice, 2005). DEC has advised the advice given in relation to the two invertebrates of conservation significance for Adamson A also applies to Adamson B (DEC, 2006b).

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

Methodology

Bamford and Bancroft (2006)
CALM (2005)
DEC (2006b)
HGM (2001)

Iluka Resources Ltd (2005)
Iluka Resources Ltd (2006c)
Pizzey and Knight (1997)
Western Australian Museum faunabase database (2003)

(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

Advice provided by the Department of Environment and Conservation has indicated that the assessment provided in relation to the Adamson B proposal (CPS 1549/1) located adjacent to this proposal and involving larger areas of vegetation with greater environmental values was applicable to the assessment of CPS 1657/1. That assessment is stated below.

"Eleven Declared Rare Flora (DRF) species are known to occur in the Eneabba region and four have been previously located within the Eneabba mining area (Iluka 2006). They are *Eucalyptus johnsoniana*, *Leucopogon obtectus, Paracaleana dixonii* and *Tetratheca nephelioides* ms (Iluka Resources Ltd 2006a). Following surveys in April and November 2005 two locations of DRF were located in the Adamson area by Woodman Environmental Consulting Pty Ltd (2006).

The closest recorded DRF occurrence to the Adamson B area is one *Eucalyptus jonsoniana* tree located approximately 550 metres west of the closest extent of the proposed clearing area (Woodman Environmental Consulting Pty Ltd, 2006).

Eucalyptus johnsoniana is a tall conspicuous plant species and given the intensity of the surveys carried out in 2005 it is likely that further specimens would have been recorded if present within the proposed clearing permit area.

The DRF species *Paracaleana dixonii* has been located within the Adamson area approximately 2.2 kilometres from the proposed clearing area. Approximately seventeen *Paracaleana dixonii* plants were located within an area 300 X 100 metres (Woodman Environmental Consulting Pty Ltd, 2006). That orchid species is associated with vegetation type W8 which covers 7.6 hectares of the areas proposed to be cleared. Approximately 394 hectares of vegetation type W8 is known to occur within Iluka's leases surveyed to date (Iluka Resources Ltd, 2006a). A detailed search of Adamson (B) in April and November 2005 failed to locate any DRF species within Adamson (B).

Paracaleana dixonii is thought to flower in response to fire and given that the area has not been burnt since rehabilitation occurred the likelihood of locating that species is very low.

Following the 2005 flora surveys 24 priority plant species were recorded within the Adamson area of which ten were recorded within Adamson (B).

Nine of those priority species are known to re-occur following rehabilitation (Iluka Resources Ltd, 2006). The priority 4 listed *Eucalyptus macrocarpa* subsp *elechantha* has not been recorded by Iluka in previous rehabilitation and was recorded within vegetation type LH6 and W8 within the proposed clearing area (Woodman Environmental Consulting Pty Ltd, 2006). This species has been recorded in another five locations within the Adamson area outside of the proposed clearing permit area (Woodman Environmental Consulting Pty Ltd, 2006). Three of those records are in vegetation types (S12 and SH7) which are not being cleared under this proposal and were not cleared under the Adamson A permit. It is likely that further habitat suitable for this species occurs outside of the areas mapped within Iluka's leases and it is unlikely that the proposed clearing will impact on the conservation status of that species.

The proposed clearing area is not necessary for the continued in situ existence of significant habitat for the ten priority species listed above.

It is unlikely that any DRF will be impacted by the proposal or that significant habitat necessary for the continued existence of priority listed flora species will be affected by the proposed clearing of Adamson B.

The Department of Environment and Conservation in their general advice on this proposal has stated: that it is unlikely that this principle would be at variance to any of the biodiversity principles. There will be some loss of biodiversity values arising directly from the proposed clearing but with careful management, particularly with respect to control and spread of *Phytophthora* with a DEC approved Dieback Management Plan, and with continuing high standards of rehabilitation, these clearing impacts should be minimised (DEC, 2006b)."

An approved DEC Dieback Management Plan exists for all of Iluka's operations at Eneabba. A revised version of that document aiming to incorporate current best practices has been reviewed by the DEC and has not been finalised at this stage. Two clearing permit conditions have been stipulated for this permit in view of the comments on the draft Dieback Management Plan provided by DEC to Iluka Resources Ltd.

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

Methodology DEC (2006b)
Iluka Resources Ltd (2006a)
Woodman Environmental Consulting Pty Ltd (2006)
GIS Database:
Declared Rare and Priority Flora

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

Comments

Proposal is not likely to be at variance to this Principle

The closest known Threatened Ecological Community (TEC) is the State listed type 72 Ferricrete floristic community (Rocky Springs type) located approximately 6.5 kilometres south west of the proposed clearing area (GIS database and DEC 2006b).

Woodman Environmental Consulting Pty Ltd (2005a and 2005b) states that no current or proposed TEC was observed during their vegetation survey conducted within the Adamson area surrounding the areas proposed to be cleared.

The distance between the TEC and the areas proposed to be cleared is such that detrimental effects resulting from the proposed clearing are unlikely.

The vegetation proposed to be cleared comprises of either non locally native tree species (shelter belt areas) or very small remnants of native vegetation or relatively recent rehabilitation that are affected by weeds due to their close proximity to pasture areas. Such vegetation types are not likely to constitute significant ecological communities.

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

Methodology DEC (2006b)
Woodman Environmental Consulting Pty Ltd (2005a)
Woodman Environmental Consulting Pty Ltd (2005b)
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 may be at variance to this Principle

The Adamson (B) area is situated within the GS3 Lesueur Sandplain IBRA (Interim Biogeographic Regionalisation of Australia) subregion (GIS database). Approximately 40.9% native vegetation cover remains within this subregion (Shepherd et al., 2001) and the clearing of Adamson (B) will not reduce the remaining native vegetation cover to less than 30% within the IBRA subregion.

A similar percentage (39.4 %) of remaining native vegetation is found within the Shire of Carnamah.

The vegetation associations present within the Adamson (B) area are classified as Beard vegetation associations 49 and 379 (GIS Database). Approximately 37.0% of Beard vegetation association 49 remains of its pre-European extent, while only 26.7% of Beard vegetation association 379 remains within the IBRA subregion (Shepherd et al., 2001). Of the remaining extent 18.7% or 18475 hectares (379) and 22.2% or 2724 hectares (49) of their current remaining extent are protected within reserves in the Lesueur Sandplain IBRA subregion (Shepherd et al., 2001).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Geraldton Sandplains	3,136,277	1,324,440	~42.2	Depleted	15.3
IBRA Subregion – Lesueur Sandplains	1,171,805	478,987	~40.9	Depleted	17.7
Local Government – Carnamah	287,493	113,136	~39.4	Depleted	N/A
Beard veg assoc. – State					
49 379	52,494 547,767	23,802 113,427	~45.3 ~20.7	Depleted Vulnerable	40.2 22.4
Beard veg assoc. – Bioregion					
49 379	39,721 546,586	12,916 113,268	~32.5 ~20.7	Depleted Vulnerable	7.6 5.0
Beard veg assoc. – Subregion					
49 379	33,141 370,097	12,273 98,744	~37.0 ~26.7	Depleted Vulnerable	9.1 (22.2) 5.5 (18.7)

* Shepherd et al. (2001) updated 2005

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

The assessor considers that the area has been extensively cleared. However, the small size of the individual areas involved, their location within the old mine path and the nature of the vegetation proposed to be cleared (approximately 5 hectares of non local *Eucalyptus* tree shelter belts and approximately 4 hectares of relatively recent native vegetation resulting from rehabilitation activities) suggests that these areas are unlikely to represent significant remnants of native vegetation.

Methodology

Shepherd et al. (2001)
Department of Natural Resources and Environment (2002)
GIS Database:
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

A minor non perennial creekline is present in the southern portion of the areas proposed to be cleared (GIS Database). Approximately 70 metres of that creekline occurs within the clearing permit application area.

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

Information provided by Iluka Resources shows that the vegetation in that area comprises a shelter belt of non local Eucalypt species with a pasture understorey. Iluka Resources Ltd also states that the creekline only contains water during significant rainfall events and has not had any water for several years. In the event that water flows did occur any surface water flows would be contained within the disturbance area (Iluka 2006b).

The groundwater is situated below the level of the mining operation and dewatering is not required (Iluka Resources Ltd, 2006a). Drainage mechanisms are put in place during operations and rehabilitation to control water flows (Iluka Resources Ltd, 2006a).

The watercourse mentioned above has not been identified nor is it likely to have significant environmental values based on its location and associated vegetation type within the proposed clearing permit area.

It is unlikely that the vegetation located in the vicinity of that watercourse within the proposed clearing area offers a significant buffer to that watercourse given its nature.

Methodology Iluka Resources Ltd (2006a)
Iluka Resources Ltd (2006b).
GIS Database:
Hydrography linear

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

Comments

Proposal is not likely to be at variance to this Principle

The area to be cleared rises gently from west to east with a maximum gradient of about 2.5 % (GIS Database). The soils are grey sands and the area is subject to strong sea breezes in the summer time. Guidelines developed by the former Department of Agriculture (Wells and King, 1989) with regards to soil erosion caused by water indicate that the Adamson area has a capability class of II or high capability and that with careful planning soil erosion can be successfully managed.

Guidelines with regards to soil erosion caused by wind (Wells and King, 1989) indicate that this area has a capability class of IV which allows clearing with wind protection. Careful planning will be required to avoid wind erosion problems at the site. To minimise the potential for wind erosion as well as minimise the potential for dust issues to occur topsoil stockpiles and other open areas are routinely stabilised by Iluka Resources using vegetation such as rye grass, native vegetation mulch, glue on or gravel. The process of clearing native vegetation involves the cutting of the vegetation above ground level (native vegetation mulching) leaving the plants root systems in place. Such a technique minimises the potential for wind erosion to occur. The mulched vegetation is then immediately used to cover recently reinstated areas and is an important component of the native vegetation rehabilitation process carried out on site.

Iluka Resources Ltd currently implements a number of measures to manage water and wind erosion as part of their operations (Iluka Resources Ltd, 2003) and compliance under the *Mineral Sands (Eneabba) Agreement Act 1975.* Drainage mechanisms are put in place during operations and rehabilitation to control water flows (Iluka Resources Ltd 2005). Drainage design is considered in mine planning and controls include bunding cleared areas to ensure water runoff from disturbed areas is contained. Drainage design is also considered in rehabilitation and measures such as contour banks are installed as required.

The creekline present in the south eastern corner of the application area only contains water during significant rainfall events. It has not had any water for several years, however in the event that water did occur any surface water flows would be contained within the disturbance area (Iluka Resources Ltd, 2006b).

As part of its reporting requirements under clause 8 of the *Mineral Sands (Eneabba) Agreement Act 1975* Iluka is required to submit detailed triennial reports that specifically address water quality, surface water discharge, rehabilitation plans and monitoring. Officers of DoIR, DEC, and DoW inspect the operation at least once a year as part of the Mineral Sands Agreement Rehabilitation Coordinating Committee (MSARCC) to review soil erosion and water management issue.

The Department of Agriculture and Food Western Australia (DAFWA) advised DoIR on the 28th November 2006 (DAFWA 2006).that the clearing assessment carried out by DoIR for permit CPS 716/1 (Adamson A) applies to the Adamson B area (CPS 1549/1). The Adamson B area encompasses this current proposal and therefore the advice provided by DAFWA for CPS 1549/1 is applicable to the proposed clearing subject to this assessment.

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

Methodology DAFWA (2006)
Iluka Resources Ltd (2003)
Iluka Resources Ltd (2005)
Iluka Resources Ltd (2006b)
Wells and King (1989)
GIS Database:
Statewide Topographic Contours

(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 nearest Conservation area (South Eneabba Nature Reserve) is situated three kilometres to the west of the area proposed to be cleared (GIS Database). The proposed clearing areas are located within a previous mine path that has been rehabilitated to pasture. The proposed clearing area does not form a buffer nor does it contribute an ecological linkage to that reserve.

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

Methodology

DEC (2006b)
GIS Database:
CALM Managed Lands and Waters
Hill River Arrowsmith 1.4m Orthomosaic

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

Comments

Proposal is not likely to be at variance to this Principle

The proposed clearing area is not located within a Public Drinking Water Supply Area (GIS Database).
The whole of the Eneabba operations are subject to Licence 5646/7 under Part V of the *Environmental Protection Act 1986.* The licence provides controls over groundwater and surface water runoff water quality by requiring an annual report on water quality, quantity and result monitoring against ANZECC guidelines and previous results. Condition W2(b) (i-v) defines discharge limits (pH, salinity, turbidity, erosion and impacts on surrounding vegetation).

Groundwater at Eneabba is situated below the ore bodies and is not impacted by mining operations (Iluka Resources Ltd, 2005).

As the area is located high in the landscape acid sulphate soils are unlikely to be present within the area (GIS Database).

The area is not classified as being in a Salinity risk area (GIS Database) therefore the proposed clearing is unlikely to increase land salinisation in the area.

The area does not lie within an area where potential Groundwater Dependant Ecosystems may occur (GIS Database).

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

Methodology

Iluka Resources Ltd (2005)
GIS Database:
Public Drinking Water Source Areas
Potential Groundwater Dependant Ecosystems
Statewide Topographic Contours
Salinity Risk LM 25m

(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

Approximately 70 metres of a minor non perennial watercourse is located within the clearing permit area (GIS Database). At 120 metres above sea level (GIS Database) the proposed clearing area does not fall within a designated floodway or flood fringe area (GIS database). The source of that creek is located approximately 170 metres to the west in the middle of the previous mine path now rehabilitated to pasture (GIS Database). The vegetation within the proposed clearing permit area near the creekline consists of narrow tree shelter belts with a pasture understorey. Information provided by Iluka Resources states that the creekline only contains water during significant rainfall events and has not had any water for several years. In the event that water did occur any surface water flows would be contained within the disturbance area (Iluka Resources Ltd, 2006b).

Given its location in the landscape as well as the amount and type of vegetation proposed to be cleared a significant increase in peak flood height or duration is unlikely.

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

Methodology

Iluka Resources Ltd (2006b)
GIS Database:

Floodway and Floodfringe Areas
Hydrography
Statewide Topographic Contours

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

Comments

There is one native title claim over the application area (GIS Database). This claim (WC99_057) has been registered with the National Native Title Tribunal on behalf of the claimant group (GIS Database). 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 known sites of Aboriginal significance in the vicinity of the application area (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.

A submission in relation to CPS 1662/1 dated 3rd January 2007 was received by the Department of Industry and Resources on 5th January 2007. The submission requested that the comments made also be considered in relation to clearing permit application 1657/1. The submission raised four points.

1. That the clearing does not interfere with any Aboriginal Sites and be undertaken in compliance with the *Aboriginal Act 1972.*

There are no registered Sites of Aboriginal Significance within the application area (GIS Database).

2. Native vegetation is used by Aboriginal people for bush tucker and medicine and the Eneabba area vegetation supports Emu populations which are hunted for sustenance. That those social and cultural uses of the land continue to this day and should be considered in the assessment because they fall within the definition of Environment under section 3(2) of the *Environmental Protection Act 1986*.

It is expected that food and medicine plants will return after the completion of rehabilitation projects.

3. That based on the previous clearing permit assessment for the adjacent Adamson B area (CPS 1549/1) that stated that the clearing was at variance to principle 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) the cultural and social use of the land including the use of the native vegetation and fauna should be considered when assessing the application.

The assessor has assessed this application and determined that based on the small size and nature of the vegetation proposed to be cleared (approximately 5 hectares of non local *Eucalyptus* tree shelter belts and approximately 4 hectares of relatively recent native vegetation resulting from rehabilitation activities) this proposal is unlikely to be at variance to principle e.

4. That a cumulative effects assessment be undertaken given the number of successive applications that have been lodged in this area and that consideration should be given to referring the whole proposal to the Environmental Protection Authority (EPA).

The nature of mineral sands operations is such that new or previously mined areas are cleared, mined and rehabilitated over a relatively short time period compared to other mineral extraction activities. The operations in the Adamson area do not involve a wet mining system and will not result in the formation of a permanent void or dredge pond. The rehabilitation activities carried out by Iluka at Eneabba are of a high standard and provided that such standards are maintained the likelihood of detrimental cumulative effects resulting from the clearing of native vegetation alone are unlikely or not likely to be significant in relation to the clearing principles.

Clearing Permit Applications have previously been referred to the EPA to set a level of assessment (CPS 716/1, 1549/1, South Tails Mining Proposal). The Adamson B proposal (involving the clearing of 25 hectares of remaining original native vegetation) which is adjacent to this proposal was referred by Iluka Resources Ltd to the EPA under section 38 of the *Environmental Protection Act 1986.* On the 20th November 2006 the EPA set the level of assessment as: "Not assessed, public advice given, assessed under Part V, clearing regulations'.

The areas proposed to be cleared for 1657/1 are located adjacent to the areas assessed by the EPA, are of lesser environmental values due to the nature of the vegetation present and the size of the areas involved. As a result the assessor did not consider it necessary to refer CPS 1657/1 to the EPA for assessment.

Advice provided by the Department of Environment and Conservation (DEC) in relation to the existing *Environmental Protection Act 1986* and water licenses that are currently in place at the Iluka Resources Ltd Eneabba operations site did not raise any issues in relation to this clearing permit application (DEC 2006a).

It is the proponent's responsibility to liaise with the DEC 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.

Mining at the Iluka Resources Ltd Eneabba operations is conducted under the *Mineral Sands (Eneabba) Agreement Act 1975*. This proposal has been referred for approval by the Minister for Resources under clause 7 of the *Mineral Sands (Eneabba) Agreement Act 1975*.

Clearing permit CPS 1657/1 for the Adamson (B) project was originally granted on 7 December 2006. This clearing permit was amended on 24 December 2008 to extend the expiry date of the permit, from 6 January 2009 to 15 March 2010. The clearing permit is now being further amended to extend the expiry date of the permit, from 15 March 2010 to 15 March 2012.The amount of clearing and clearing boundary that was approved to clear under clearing permit CPS 1657/2 will remain unchanged.

Methodology DEC (2006a)
GIS Database:
Aboriginal Sites of Significance
Native Title Claims

4. Assessor's comments

Comment

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

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of record keeping, permit reporting, rehabilitation, weed management and dieback management.

5. References

Bancroft W.J. and Bamford M.J. (2006) Fauna Review Eneabba, Unpublished report prepared by M.J. & A.R. Bamford Consulting Ecologists for Iluka Resources. Dated 15th February 2006.

CALM (2005) Land Clearing proposal advice. Advice to Director General, Department of Industry and Resources (DoIR). Department of Conservation and Land Management, Western Australia (18/8/05).

DAFWA (2006) Advice to the DoIR Native Vegetation Assessor, from the Department of Agriculture and Food Western Australia (email dated 28/11/06).

DEC (2006a) Advice provided by the DEC in relation to EP and Water Licences, (email dated 14/11/06).

DEC (2006b) Land Clearing proposal advice. Advice to the DoIR Native Vegetation Assessor, from the Biodiversity Coordination Section of the Department of Environment and Conservation, Western Australia (email dated 23/11/06).

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 A and Chant A (2001) Geraldton Sandplain 3 (GS3-Lesueur Sandplain subregion) in: A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. Report published by CALM, Perth, WA.

HGM (November 2001) Iluka Resources Limited Baseline Fauna Survey for IPL Central and IPL North.

Iluka Resources Ltd (2003) Midwest operations Environmental Management Program Triennial Report 2003-2007. Unpublished Report.

Iluka Resources Ltd (2005) Eneabba Mineral Sands Mine Adamson A proposal, June 2005. Unpublished report.

Iluka Resources Ltd (2006a) Eneabba and Narngulu Operations Environmental Management Program, Interim Report. Unpublished report dated 15 March 2006.

Iluka Resources Ltd (2006b) Advice provided by on 28/11/2006 email from Iluka's Environmental Advisor to the DoIR Native Vegetation Assessor in relation to soil erosion.

Iluka Resources Ltd (2006c) Application for Clearing Permit to Continue Rehabilitation Process- Mulch Harvesting

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

Pizzey, G.and Knight, F. (1997) The Graham Pizzey and Frank Knight Field Guide to the Birds of Australia. Angus and Robertson, Australia.

Shepherd, D.P. (2007). Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.

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.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001a) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia (updated 2005).

Wells, M.R. and King, P.D. (1989) Land Capability assessment methodology for rural residential development and associated agricultural land uses. Land resources Series No1. Department of Agriculture, Western Australia.

Western Australian Museum (2003), Faunabase search results for reptile, mammals and birds collected between latitude and longitude -29.7629, 115.3828 & -29.9633, 115.1636.

Woodman Environmental Consulting Pty Ltd (2005a) Flora and Vegetation Assessment, Adamson vegetation survey area,

May 2005. Unpublished report prepared for Iluka Resources Limited Eneabba Operations.
Woodman Environmental Consulting Pty Ltd (2005b) Significant Flora Assessment, Adamson Mining Area, July 2005. Unpublished report prepared for Iluka Resources Limited Eneabba Operations.
Woodman Environmental Consulting Pty Ltd (2006) Declared Rare and Priority Flora Survey and establishment of permanent plots in the Adamson area. Unpublished report prepared for Iluka Resources Limited Eneabba Operations dated 21/9/2006.

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, Western Australia.
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.