



1. Application details

1.1. Permit application details

Permit application No.: 1549/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: Iluka Resources Limited

1.3. Property details

Property: AM70/267
Local Government Area: Shire Of Carnamah
Colloquial name: Mining Lease 267SA (AM 70/267) Mineral Sands (Eneabba) Agreement Act 1975-1988

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
25		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	Clearing Description	Vegetation Condition	Comment
<p>The vegetation found within the proposed clearing area is part of two vegetation associations (called Beard vegetation associations) which were defined at a scale of 1:250,000 from aerial photography and interpretation of satellite imagery by Shepherd et al (2001). Those vegetation associations have been mapped for the whole of Western Australia and are useful to look at vegetation extent in a regional context. The two Beard vegetation associations located within the areas proposed to be cleared are:</p> <p>379: Shrubland: Scrub Heath on lateritic sandplain in the Central Geraldton Sandplain Area and</p> <p>49: Shrublands; mixed heath (Shepherd et al 2001).</p> <p>Five types of vegetation communities were mapped at a scale of 1:10,000 by Woodman (2005) within the proposed clearing area:</p> <p>W8: Very open low woodland of <i>Eucalyptus</i></p>	<p>The proposed clearing is for the purposes of mining mineral sands. The proposed clearing is located within an area called the Adamson area which was in part previously mined in the 1980's. The majority of the mining will be within an old mine path mostly rehabilitated to pasture (37 hectares) and tree shelter belt (9 hectares). A portion of the ore body is located under native vegetation and the clearing of 25 hectares of that vegetation is sought to enable the mining of part of the ore body. The proposed clearing of native vegetation is located either side of the area of pasture which follows the previous minepath. The area proposed to be cleared will be rehabilitated to native vegetation using techniques that have been followed for previous rehabilitation by Iluka at Eneabba (Iluka Resources Ltd 2006). An area of 13.5 hectares called Adamson 'A' adjacent to the current proposal called Adamson 'B' was approved to clear subject to conditions (Clearing Permit CPS 716/1, 2005).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)</p> <p>To</p> <p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)</p>	<p>Woodman Environmental Consulting described the vegetation condition (based on the Keighery 1994 scale) within the broader Adamson area as being in very good condition with minor areas of disturbance around the edges of the north mine (Woodman Environmental Consulting Pty Ltd 2005a). Some weed invasion due to the proximity of agricultural land was noted near a creek line on the eastern side of the surveyed area. No weed invasion was noted within or on the edges of the area proposed to be cleared.</p> <p>No evidence of dieback affected vegetation occurs within or adjacent to the Adamson 'B' area. 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 implemented at Eneabba. 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 Eneabba. 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 and previous site visits carried out by the assessor do not indicate any serious issues in relation to weed or dieback management arising from current practices at the Eneabba operations.</p> <p>An annual report on environmental protection and management measures undertaken on approved proposals is a requirement under clause 8 of the <i>Mineral Sands (Eneabba) Agreement Act 1975</i>. 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) inspects the Eneabba operation on an annual basis.</p>

totiana and *Eucalyptus pleurocarpa* on grey sands.

W10: Open low woodland of *Eucalyptus pleurocarpa* over low shrubs dominated by *Eramea beaufortioides* var *beaufortioides*, *Ecdeiocola monostachya* and *Daviesia nudiflora* on grey sands.

S11: Dense shrubland with occasional *Eucalyptus pleurocarpa* on grey sand with some lateritic gravel.

S17: Low Shrubland dominated by myrtaceous species on grey sands in a drainage line.

LH6: Low heath dominated by *Dryandra* spp. on laterite.

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 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. A vegetation survey conducted within the larger Adamson area found a total of 206 plant species within 846 hectares. Fifteen separate plant communities were mapped within the Adamson area (Woodman Environmental Consulting Pty 2005a). Five plant communities were found within the smaller 25 hectare Adamson 'B' area proposed to be cleared; W8, W10, S11, S17 and LH6 (Iluka 2006). Vegetation community LH6 has high local conservation significance as it contains a high number of priority species in a small area (Woodman Environmental Consulting 2005a). No Declared Rare Flora (DRF) plant species and ten Priority listed flora species are known to occur within Adamson 'B' (Iluka Resources Ltd 2006).

Based on the high level of plant species diversity, relatively high number of priority listed species and the presence of a small area of a locally significant vegetation type within Adamson 'B' the proposal may be at variance to this principle.

Advice received from Department of Environment and Conservation (DEC) received on the 23rd November 2006 advised that the proposal has the potential to be at variance to this principle. The long term impacts should be minimised however with careful management particularly to prevent the spread of weeds and *Phytophora cinnamomi* and successful rehabilitation of the site (DEC 2006b).

Following the cessation of mining operations at Adamson 'B' the area will be fenced to protect from stock and rehabilitated to native vegetation in accordance with existing procedures at Eneabba (Iluka Resources Limited 2006). Iluka Resources have been implementing dieback management for many years and have a number of permanent wash down stations set up at Eneabba. Weed management is part of the rehabilitation process on site and previous site visits carried out by the assessor do not indicate any serious issues in relation to weed or dieback management arising from current practices at the Eneabba operations.

Methodology

DEC (2006b)
Desmond and Chant (2001)
GIS Database:
IBRA (subregions) EA 18/10/00
Iluka Resources Ltd (2005)
Iluka Resources Ltd (2006)
Woodman Environmental Consulting Pty Ltd (2005a)

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

Comments Proposal is not likely to be at variance to this Principle

A review of the fauna information that has been gained from previous studies at Iluka's operations at Eneabba was undertaken in 2005 (Bamford and Bancroft 2006). This review included a one day site inspection 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 Department of Environment and Conservation 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, Western Australian Museum 2003). Bamford and Bancroft (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. 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 Department of Environment and Conservation 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 Department of Environment and Conservation (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 proposal is unlikely to be at variance to this principle.

Methodology Bamford and Bancroft (2006)
CALM (2005)
DEC (2006b)
HGM (2001)
Iluka Resources Ltd (2005)
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

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 *Tetradthea 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 50 metres south of the closest extent of the proposed clearing area (Woodman Environmental Consulting Pty Ltd 2006). A buffer of 50 metres has been set between the location of that record and the clearing permit boundary.

Eucalyptus jonsoniana 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 Adamson 'B' area.

The DRF species *Paracaleana dixonii* has been located within the Adamson area approximately 1.5 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* could potentially occur in the proposed clearing area based on the presence of vegetation type W8, however that species is thought to flower in response to fire and given that the area has not been burnt for many years 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 proposal 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 cinnamoni* with a DEC approved Dieback Management Plan, and with continuing high standards of rehabilitation, these clearing impacts should be minimised (DEC 2006b).

Based on the above the proposal is not likely to be at variance with the principle.

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 not finalised at this stage. Two clearing permit conditions have been stipulated for this permit in view of the comments provided on the draft Dieback Management Plan by DEC to Iluka Resources Ltd.

Methodology DEC (2006b)
GIS Database:
Declared Rare and Priority Flora List CALM 01/07/2005
Iluka Resources limited (2006a)
Woodman Environmental Consulting Pty Ltd (2006)

(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, 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.

Woodman Environmental Consulting Pty Ltd noted that plant community LH6 of which approximately 4.5

hectares are proposed to be cleared has high local conservation significance because of its limited occurrence and high number of priority flora species found in that community type (Woodman Environmental Consulting 2005a). It should be noted that plant community LH6 has not been recognised as a TEC or as a Priority TEC to date.

Small areas of plant community type LH6 totalling approximately 104 hectares have been recorded to date within Iluka's leases (Iluka Resources Ltd 2006). The extent of community type LH6 outside of Iluka's leases and within the existing conservation estate is not known because of the lack of detailed vegetation mapping of the conservation estate in the Eneabba region (Woodman Environmental Consulting Pty Ltd 2005a).

Considering the area will be rehabilitated to native vegetation post mining and the success that Iluka has achieved in previous rehabilitation, it is unlikely that the proposed clearing will impact the conservation status of plant community type LH6.

Based on the above it is not likely that the clearing will be at variance with this principle.

Methodology DEC (2006b)
GIS Database:
Threatened Ecological Communities CALM 12/4/05
Iluka Resources Ltd (2006)
Woodman Environmental Consulting Pty Ltd (2005a)

(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 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 40.5% 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 (38.7 %) of remaining native vegetation is found within the Shire of Carnamah.

The vegetation associations present within the Adamson 'B' area are classified as number 379 and 49 (GIS Database). Approximately 26.7 % and 37% respectively remain of their pre European extent (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, 2001a).

Woodman Environmental Consulting Pty Ltd have recorded five vegetation communities types (W8, W10, S11, S17 and LH6) in the area proposed to be cleared. The percentage of those vegetation types that are proposed to be cleared varies between 0.4% to 4.3% of the known remaining extent on Iluka's leases to date. The area of those vegetation types remaining outside of Iluka's leases including areas that may be represented within the existing conservation estate is not known because that level of vegetation survey has not been carried out outside of Iluka's leases. Woodman Environmental Consulting has stated that community type W8 is likely to be present within the South Eneabba and other Nature Reserves (Woodman Environmental Consulting Pty Ltd 2002, 2005a & 2005b).

Based on the national Objective Targets for Biodiversity Conservation 2001-2005, the extent of vegetation type 379 left within the Lesueur Sandplain IBRA Subregion is less than 30% and classified as vulnerable (Department of Natural Resources and Environment, 2002).

Based on the above the proposal is considered at variance with principle (e).

Methodology Department of Natural Resources and Environment (2002).
GIS Database:
Interim Biogeographic Regionalisation of Australia (subregions) EA 18/10/00
Pre European Vegetation DA 01/01
Shepherd et al (2001)
Shepherd et al (2001a)
Woodman Environmental Consulting Pty Ltd (2005).

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

Comments Proposal is at variance to this Principle

The proposed clearing will result in the clearing of approximately 0.3 hectares of vegetation type S17 which is associated with drainage lines (Iluka Resources Ltd 2006, Woodman Environmental Consulting Pty Ltd 2005a). Approximately 30 metres of the upper reaches of a minor non perennial creekline will be affected (GIS Database). Approximately 104 hectares of vegetation type S17 has been mapped to date within Iluka's leases (Iluka Resources Ltd 2006). The remaining extent of vegetation community type S17 outside of Iluka's leases is

unknown but likely to be significant. None of the other vegetation types occurring in Adamson 'B' are growing in or are associated with wetlands or watercourses.

The groundwater is situated below the level of the mining operation and dewatering is not required (Iluka resources Ltd 2006). Drainage mechanisms are put in place during operations and rehabilitation to control water flows (Iluka Resources Ltd 2006). The Adamson 'B' proposal is unlikely to affect any wetland or watercourse communities other than the clearing mentioned above.

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 28/11/06).

Considering that the clearing will result in the clearing of a vegetation type associated with a watercourse the proposal is at variance to principle f.

Methodology GIS Database:
Hydrography linear DoE (1/2/2004).
Iluka Resources Limited (2006)
(Iluka 28/11/06).
Woodman Environmental Pty Ltd (2005a).

(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 'B' 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 Limited currently implements a number of measures to manage water and wind erosion as part of their operations (Iluka triennial report 2003-2007) 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 28/11/06).

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.

Department of Agriculture and Food Western Australia (DAFWA) advice received on the 28th November 2006 indicates that the assessment carried out by DoIR for the 716 permit adjacent (Adamson 'A') also applies to the Adamson 'B' area. DAFWA advised that the proposal is unlikely to be at variance to principle g (DAFWA 2006).

Given the above the proposed clearing is unlikely to be at variance to this principle.

Methodology DAFWA (2006)
GIS Database:
DOLA , Statewide Topographic Contours 2002
Iluka Resources Ltd 2005.
Iluka (28/11/06).
Iluka triennial report 2003-2007

(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 3 kilometres to the west of the area proposed to be cleared (GIS Database). The proposed clearing area does not form a buffer nor does it contribute an ecological linkage to that reserve.

DEC in their advice has stated that it would appear unlikely that the proposal would be seriously at variance to any of the biodiversity principles (DEC 2006b).

Based on the above the proposal is not likely to be at variance with this principle.

Methodology DEC (2006b)
GIS Database:
CALM Managed Lands and Waters - CALM 1/07/05
Eneabba 1.2m Orthomosaic - DOLA 98

(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. 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 proposal is not likely to be at variance with this principle.

Methodology GIS Database:
Public Drinking Water Source Areas DoE 7/2/2006
Potential Groundwater Dependant Ecosystems DoE 2004
Statewide Topographic Contours DOLA 19/09/2002.
Salinity Risk LM 25m DOLA 2000
Iluka Resources Ltd 2005

(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 nearest watercourse to the area is a minor non perennial watercourse located approximately 400 metres to the North East (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).

Given its location in the landscape and the fact that the local area has not been extensively cleared, the proposed clearing is not likely to lead to an increase in peak flood height or duration.

Based on the above the proposal is not likely to be at variance with this principle.

Methodology GIS Database:
DoE FMD ARI Floodway and Floodfringe Areas 2003.
DoE Hydrography 2004

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

Comments

Mining at Eneabba 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*.

The Adamson B proposal was referred by Iluka Resources to the Environmental Protection Authority (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 Shire of Carnamah in a letter dated 18 October 2006 expressed no objection to this clearing permit application.

There is a Native Title Claim over the area under application (GIS Database). However, the mining lease has been granted, and the clearing is for a purpose consistent with the lease, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are no known Aboriginal Sites of Significance located within the clearing permit area (GIS Database). It is the proponent's responsibility to ensure compliance with the *Aboriginal Heritage Act 1975* and to ensure that no Aboriginal Sites of Significance are disturbed as a result of the clearing process.

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 Eneabba 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 Department of Environment and Conservation and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

Methodology

DEC (2006a)
 GIS Database:
 Aboriginal Sites of Significance DIA
 Native Title Claims-DLI 19/12/04

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Mineral Production	Mechanical Removal	25	Grant	<p>The proposal is at variance to principles f and e. The proposal may be at variance to principle a. The proposal is unlikely to be at variance to principles b,c,d,g,h,i and j.</p> <p>The area to be cleared is relatively small and is located on the edge of an existing mine path. Post mining these areas will be rehabilitated to locally native vegetation as set under the Permit Conditions and the <i>Mineral Sands (Eneabba) Agreement Act 1975</i>. The assessing officer has visited the Eneabba site a number of times as part of the annual MSAARC meetings of government regulatory agencies. Previous rehabilitation efforts have proven successful and there is no reason to believe that the proposed clearing area cannot be successfully rehabilitated using the existing methods used by Iluka Resources. The Department of Environment and Conservation (DEC) in their advice have expressed the view that they would like to see the final copy of Iluka's Dieback Management Plan as a matter of priority. While DEC has had the opportunity to view a draft document a final version was not available for viewing at this stage. The assessor has recommended conditions 4 and 5 after reviewing the advice that DEC provided back to Iluka Resources in relation to the draft Dieback Management Plan.</p> <p>The assessor therefore recommends that the clearing permit be granted subject to the following conditions:</p> <ol style="list-style-type: none"> 1. The Permit Holder shall retain the vegetative material and topsoil removed by clearing in accordance with this Permit. 2. The permit holder shall rehabilitate the areas cleared under this permit to locally native vegetation. 3. As part of the rehabilitation of the areas cleared, the Permit Holder shall take the following measures: <ol style="list-style-type: none"> a) Selectively remove or kill all plant species that are not native within the cleared site. b) Sow the cleared site with a seed mixture consisting of local native species found within a 15 km radius of the site. The seed mixture shall be spread at a minimum rate of 1 kilogram per hectare. c) Ensure that livestock shall be excluded from the area crossed hatched yellow by means of a stock proof fence and shall not cause or permit stock to enter or

remain within the area.

4. The permit holder shall not allow any external soils, road base or vegetation on site unless tested free of *Phytophthora cinnamoni* contamination or sourced from a known *Phytophthora cinnamoni* free source.

5. All machinery and vehicles used during the clearing shall be cleaned of material that may be a source of *Phytophthora cinnamoni* contamination prior to entering the areas approved to clear

5. References

- Bancroft W.J. & 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).
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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.
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.

DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
IBRA	Interim Biogeographic Regionalisation for Australia.
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

Definitions:

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

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

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

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

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

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need

of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

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

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

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

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

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

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

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

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