



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3549/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Reed Industrial Minerals Pty Ltd**

1.3. Property details

Property: M15/717
M15/1000
Local Government Area:
Colloquial name: Mining Lease 15/1000

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
150		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>Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation extent in a regional context. One Beard Vegetation Association is located within the proposed clearing area (GIS Database):</p> <ul style="list-style-type: none"> - Beard Vegetation Association 221: Medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E. le souffii</i>). <p>A vegetation survey of the application area was undertaken by Recon Environmental in September 2009. Consequently, the following vegetation associations were recorded within the application area (Recon Environmental, 2009):</p> <ul style="list-style-type: none"> -PEXW: Plain Eucalypt eremophila-chenopod woodland: consisted of an open <i>Eucalyptus lesouefii</i> woodland with <i>E. longicornis</i> and <i>E. salmonophloia</i> over <i>Eremophila interstans</i> subsp. <i>interstans</i> with <i>Exocarpos aphyllus</i>, above <i>Senna artemisioides</i> subsp. <i>filifolia</i>, <i>Maireana georgei</i>, <i>M. trichoptera</i>, <i>Atriplex nummularia</i>, <i>Sclerolaena drummondii</i>, <i>Eremophila caerulea</i> subsp. <i>caerulea</i>, <i>E. parvifolia</i> subsp. <i>auricampa</i>, and <i>Acacia erinacea</i>. -GNEW: Greenstone, non-halophytic eucalypt woodland: characterised by the presence of <i>Eucalyptus torquata</i> growing on greenstone hills. While <i>E. torquata</i> may not always be dominant in terms of cover, there is an open low woodland beneath which is found a diverse shrub layer. -PEMW: Plain, <i>Melaleuca pauperiflora</i> woodland: occurs on the undulating lower slopes between the hills and plains in the Mt Marion project area. The upper canopy is generally dominated by <i>Eucalyptus longicornis</i> over <i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i> above scattered low shrubs. -RHSH: Rocky hillslope, shrubland: tall to medium shrubland dominated by <i>Dodonaea lobulata</i> with <i>Eremophila oppositifolia</i>, <i>Trymalium myrtillus</i>, <i>Scaevola spinescens</i>, <i>Dodonaea mirozyga</i> subsp. <i>acrolobata</i>, and scattered <i>Acacia tetragonophylla</i>, <i>Eremophila alternifolia</i>, <i>Acacia erinacea</i>, <i>Olearia muelleri</i> with emergent <i>Eucalyptus</i> 	<p>Reed Industrial Minerals Pty Ltd have applied to clear 150 hectares within a 371 hectare purpose permit boundary. The purpose for the clearing is for the establishment of the Mt Marion Lithium Mine, infrastructure will include; an open pit, borrow pits, two waste dumps, tailings storage facility, workshop, office and haul road (Newland Consulting, 2009).</p> <p>Vegetation clearing will be undertaken via mechanical means. Cleared topsoil and vegetation will be retained for future rehabilitation works (Newland Environmental, 2009).</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994) .</p> <p>To</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>	<p>The application area is located approximately 36 kilometres south of Kalgoorlie on mining tenements Mining Leases 15/717 and 15/1000.</p>

torquata shrubland on steep rocky slopes.

-PEEW: Plain, *Eucalyptus eremophila* woodland: consists of open *Eucalyptus lesouefii* woodland with *E. ravida* over *Eremophila interstans* subsp. *interstans* and *E. alternifolia* above *Dodonaea lobulata*, *Senna artemisioides* subsp. *filifolia*, *Acacia erinacea*, *Olearia muelleri*, and mixed shrubs in red/brown clay loam soils.

-SCJS: Stony closed jam shrubland: characterized by *Acacia acuminata* in the tall shrub layer with *Acacia quadrimarginea* and *Melaleuca uncinata* over *Prostanthera semiteres* subsp. *semiteres* and *Dodonaea microzyga* subsp. *acrolobata* with *Mirbelia granitica* and *Cryptandra aridicola* in the low shrub layer.

-GRHS: Granite hill mixed shrubland: tall to medium shrubland dominated by *Acacia quadrimarginea* with *A. acuminata*, *Eremophila granitica*, *Prostanthera semiteres* subsp. *semiteres*, *Philotheca brucei* subsp. *Brucei*, *Dodonaea microzyga* subsp. *acrolobata*, and *Pimelea microcephala* subsp. *microcephala* with occasional emergent *Eucalyptus websteriana* subsp. *websteriana* shrubland.

-PMXS: Plain mallee mixed shrubland: consists of scattered trees (*Eucalyptus lesouefii* with *E. moderata*) amongst *Eucalyptus griffithsii* with *E. Celastroides* subsp. *celastroides*, above *Eremophila oppositifolia*, *E. oldfieldii*, with *Acacia acuminata*, above *Dodonaea lobulata*, *Senna artemisioides* subsp. *filifolia*, *Eremophila caerulea* subsp. *caerulea*, *Scaevola spinescens*, *Acacia erinacea*, *Olearia muelleri*, and *Westringia rigida*.

-PELM: Plain *Eucalyptus longicornis* woodland with *Melaleuca*: occurs on the undulating lower slopes between the hills and plains in the Mt Marion project area. The upper canopy is generally dominated by *Eucalyptus longicornis* with *E. lesouefii*, over *Melaleuca sheathiana*, above *Senna artemisioides* subsp. *filifolia*, *Atriplex nummularia*, *Scaevola spinescens*, over scattered *Acacia erinacea*, *Olearia muelleri*, *Westringia rigida* and *Eremophila parvifolia* subsp. *auricampa*.

-EWLS: *Eucalyptus* woodland over low shrubs on undulating slopes: Open woodland with *Eucalyptus lesouefii*, *E. salmonophloia*, *E. celastroides* subsp. *celastroides* and *E. ravida* over scattered low shrubs dominated by *Eremophila caerulea* subsp. *caerulea* with *Olearia muelleri*, *Acacia erinacea* and *Maireana georgei*. This habitat tends to occur mid slope on low hills in the Mt Marion project area.

-SCAS: Stony closed *Allocasuarina* shrubland: tall *Allocasuarina eriochlamys* subsp. *grossa* (Priority 3) shrubland with *Acacia acuminata* and *A. Quadrimarginea* over *Prostanthera semiteres* subsp. *Semiteres*, and *Hybanthus floribundus* subsp. *Curvifolius* on stony hillslopes.

-ECLS: *Eucalyptus celastroides* over low shrubs: consists of an open *Eucalyptus celastroides* subsp. *celastroides* shrubland over the low shrub *Diocirea acutifolia* (Priority 3). ECLS appears to occupy a narrow band on the lower slopes between low hill and plain habitats.

Recon Environmental (2009) have stated that the most common vegetation associations recorded in the application area were PEXW and GNEW.

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 application area is located within the Eastern Goldfields subregion of the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). At a broad scale, vegetation can be described as Mallees, *Acacia* thickets and shrub-heaths on sandplains with diverse *Eucalyptus* woodlands occurring around salt lakes, on ranges and in valleys (Cowan, 2001). The dominant land uses of the subregion include crown

reserves, grazing-native pastures-leasehold, freehold, conservation and mining leases (Cowan, 2001).

A flora and vegetation survey was undertaken by Recon Environmental in September 2009. As a result, a total of 133 taxa from 68 genera and 39 families were recorded in the application area (Recon Environmental, 2009). The most common genera were *Eremophila* (14 taxa), Myoporaceae (14 taxa), Asteraceae (14 taxa) and Mimosaceae (11 taxa). This level of flora taxa is indicative of a moderate level of diversity for this region (Recon Environmental, 2009).

Three introduced weed species were noted as occurring in the survey area: two grasses (*Pentaschistis airoides*, *Rostraria pumila*) and one Primulaceae (*Anagallis arvensis* var. *caerulea*). The proposed vegetation clearing has the potential to introduce further weed species into the local area should adequate hygiene practices not be put in place. Weeds can affect biodiversity in a number of ways, including out competing native species for resources and increasing the fire risk. Standard weed management protocols can manage the risks posed by the introduction and spread of weeds.

The application area is located within the Karramindie pastoral station and there is evidence of historic grazing and clear felling throughout the site (Recon Environmental, 2009). Recon Environmental (2009) have stated that many of the vegetation associations have a reduced understory from grazing pressure, and large eucalypts within the application area have been cleared. On this basis, the proposed clearing area is not likely to exhibit a higher level of floristic diversity than other areas in the bioregion.

A fauna survey of the application area was undertaken by Rapallo in March 2010. Consequently, there were 32 birds and four reptiles recorded within the application area. The assessing officer considers this not to be a high level of fauna diversity. Habitat features such as litter coverage and fallen logs, both of which can drive fauna diversity, were generally lacking (Rapallo, 2010). The fauna diversity is further limited due to the presence of feral cats and dogs and the disturbance associated with exploration activities in the past (Rapallo, 2010).

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

Methodology Cowan (2001).
Rapallo (2010).
Recon Environmental (2009).
GIS Database:
-IBRA WA (Regions - Sub Regions).
-IBRA Australia.

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

Comments Proposal may be at variance to this Principle

A fauna survey of the application area was undertaken by Rapallo in March 2010. The fauna survey included a detailed desktop study and a reconnaissance survey. As a result of the fauna survey, the following fauna habitats were recorded within the application area (Rapallo, 2010):

- Greenstone Hills;
- Thickets of *Acacia*, *Senna*, *Eremophila* and *Exocarpos* formed under open mallee woodlands along shallow drainage gullies and washout zones;
- Exposed granite hills supported thickets of *Acacia*, *Exocarpos*, *Santalum*, *Eremophila* and *Olearia* under an open mallee woodland;
- Open woodlands over a dominant ground cover of *Dioceria acutifolia* with sparse *Melaleuca*, *Eremophila* and *Exocarpos*;
- Jam (*Acacia acuminata*) woodland; and
- Open Woodland with a dominant Boree (*Melaleuca pauperiflora*) midstory; and *Allocasuarina* woodland adjacent to exposed granite hills.

All habitats located in the application area were mallee woodland based systems with varying mid and understoreys (Rapallo, 2010). A large portion of the open mallee woodland systems contained mid-storeys comprised of a series of *Eremophila* and *Acacia* species. In general, there were no significant habitat features such as heavy leaf litter, rocky overhangs, tree hollows or permanent water holes (Rapallo, 2010). Some of the habitat types such as the exposed granite hills showed signs of disturbance from previous exploration activities.

Of interest are the small areas of Jam (*Acacia acuminata*) woodland which were dotted throughout the application area (Rapallo, 2010). The Jam formed dense thickets in some areas and provided suitable habitat for a variety of bird species. But more importantly these thickets provide suitable habitat for the Malleefowl

(listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* and **Schedule 1 'Fauna that is rare or likely to become extinct', Wildlife Conservation (Specially Protected Fauna) Notice 2010**). Rapallo (2010) have stated that Malleefowl would have historically utilised this habitat and this is evident by the presence of extinct Malleefowl mounds which were sighted in this habitat type. However, there were signs of the Feral Cat and Dog recorded within the application area which is likely to have reduced the probability that extant populations of Malleefowl use this habitat type currently (Rapallo, 2010). Malleefowl have not been sighted during any of the flora or fauna surveys in the application area, or by Reed Industrial Minerals Pty Ltd staff who regularly frequent the site. Recon Environmental (2009) have stated that higher quality nesting habitat occurs to the north of the application area in a series of ranges which are relatively undisturbed. Based on this, it is unlikely the removal of this habitat type will significantly impact the overall conservation status of the Malleefowl.

Rapallo (2010) noted one other important finding from the fauna survey; which was the discovery of five snail records which represent three morpho-species of snail. Two of these specimens were identified as possibly being Short Range Endemics (SRE's) and were sent to the Western Australian Museum for identification. Due to the degraded nature of the shells, only the genus could be identified (*Bothriembryon* sp.), with species type still unknown (Recon Environmental, 2010).

Recon Environmental (2010) conducted a desktop survey of the area to determine the extent of the granite hill habitat (habitat where *Bothriembryon* sp. shell samples were collected) within the area. This habitat type appears to be variable in appearance across its distribution due to factors such as soil depth; climate variability across the area; and the extent of habitat interzonal grading between granite and greenstone (Recon Environmental, 2010). While there is an amount of habitat variability across the landscape, the common aspects of the habitat include tall acacia shrubland, generally dominated by *Acacia quadrimarginea* group, frequently with *A. acuminata* group, and associated with granite and granite based soils (Recon Environmental, 2010). The survey identified that whilst the granite hill habitat is not a dominant habitat type in the landscape, it does appear to be relatively common across a widespread area (Recon Environmental, 2010), hence the snails are likely to occur in areas outside of the proposed disturbance footprint.

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

Methodology Rapallo (2010).
Recon Environmental (2009).
Recon Environmental (2010).

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

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

According to available databases, there are no known Declared Rare Flora (DRF) species within the proposed clearing area (GIS Database)

A level one flora and vegetation survey of the application area was undertaken by Recon Environmental in September 2009. This involved a detailed database search of the application area and an on ground survey to document and describe the presence of flora species, vegetation associations and species of conservation significance in the application area (Recon Environmental, 2009).

As a result of the flora and vegetation survey three Priority flora taxa were identified within the application area, these were: *Austrostipa blackii* (Priority 3), *Allocasuarina eriochlamys* subsp. *grossa* (Priority 3) and *Diocirea acutifolia* (Priority 3). No Declared Rare Flora were identified within the application area (Recon Environmental, 2009).

Austrostipa blackii is described as a tufted grass-like or herb-like perennial grass, growing to 1 metre in height, flowering from September to November. This species was recorded once in the granite hill mixed shrubland vegetation association (Recon Environmental, 2009). This species will not be impacted upon as Reed Industrial Minerals have committed to avoid this species as part of their flora management commitments.

Allocasuarina eriochlamys subsp. *grossa* is described as a dioecious or monoecious shrub (1-3 metres) occurring in stony loam, laterite clay and granite outcrops. It is known from numerous locations in the region, including; Bullabulling, Coolgardie, Norseman, Kambalda and the Zanthus/Cocklebidy areas. There were three populations recorded in the application area (Recon Environmental, 2009). Reed Industrial Resources have realigned their haul road to avoid the population in the west of the application area, whilst two populations adjacent to the pit will also be avoided (Newland Environmental Pty Ltd, 2009). Based on this, it is unlikely there will be any significant impacts to the conservation status of this species from the proposed clearing.

Diocirea acutifolia is described as a low multi-stemmed shrub 0.4 - 0.6 metres in height. This species is only known from a few locations within the Coolgardie Botanical District - where it dominates the shrubby ground layer (Recon Environmental, 2009). This species formed the dominant shrub layer in the *Eucalyptus celastroides* over low shrubs vegetation association. According to Recon Environmental (2009) two populations in the western end of the application area were recorded in a narrow band on the lower slopes between low hill and plain habitats. Reed Industrial Minerals (2010) have stated that two individuals will be required to be cleared

for the proposed haul road. However, Reed Industrial Minerals have realigned their haul road to avoid the two significant populations which were recorded within the application area. Based on the flora commitments outlined above, it is unlikely that the conservation status of this species will be greatly impacted from the removal of two specimens.

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

Methodology Newland Environmental Pty Ltd (2009).
Recon Environmental (2009).
Reed Industrial Minerals (2010).
GIS Database:
- Declared Rare and Priority Flora List.

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

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

There are no known Threatened Ecological Communities (TECs) in the application area (GIS Database).

The nearest known TEC to the application area is Mount Belches which is located approximately 70 kilometres to the east of the application area. There were no TECs or Priority Ecological Communities identified during the flora and vegetation survey of the application area (Newland Environmental Pty Ltd, 2009). Given the distance from the proposed clearing, it is unlikely that the conservation values of this TEC would be compromised by the proposed clearing.

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

Methodology Newland Environmental Pty Ltd (2009).
GIS Database:
- Threatened Ecological Sites.

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

Comments Proposal is not at variance to this Principle

The application area falls within the Coolgardie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion within which approximately 98.42% of the Pre-European vegetation remains (see table overleaf) (GIS Database; Shepherd, 2007).

The vegetation of the application area has been mapped as Beard Vegetation Association 9: Medium woodland, coral gum.

According to Shepherd (2007) approximately 99.7% of Beard Vegetation Association 9 remains at both a state and bioregional level. Therefore, the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

Whilst only a small percentage of the vegetation types within the Coolgardie bioregion are adequately protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of vegetation associations within the bioregion is not likely to be impacted by this proposal.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves (and post clearing %)
IBRA Bioregion - Coolgardie	12,912,204	12,707,619	~98.4%	Least Concern	~10.9%
Beard vegetation associations - State					
9	240,509	239,895	~99.7%	Least Concern	~1.3%
Beard vegetation associations - Coolgardie Bioregion					
9	240,442	239,835	~99.7%	Least Concern	~1.3%

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

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

Methodology Department of Natural Resources and Environment (2002).
Shepherd (2007).
GIS Database:
- Pre-European Vegetation.
- IBRA Australia.

(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 may be at variance to this Principle

There are no permanent watercourses or wetlands within the application area (GIS Database).

There are two minor, non-perennial watercourses which intersect the north west of the application area (GIS Database). Newland Environmental Pty Ltd (2009) have stated that the proposed haul road will intersect both of these drainage areas.

Recon Environmental (2009) have stated that there are no riparian vegetation associations recorded within the application area. The drainage line areas are noted as being:

- PREXW: Plain Eucalypt Eremophila Chenopod woodland areas.

According to Recon Environmental (2009) the drainage lines in question are not defined drainage lines but rather areas which concentrate minimal water flow and then pan out to sheet flow in lower lying areas.

Analysis of aerial photography indicates that ephemeral drainage lines are a common feature both locally (within a 50 kilometre radius) and regionally (within the Coolgardie bioregion) (GIS Database).

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

Methodology Newland Environmental Pty Ltd (2009).
Recon Environmental (2009).
GIS Database:
- Badja 1.4M Orthomosaic.
- Hydrography, linear.

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

Comments Proposal may be at variance to this Principle

The application area is composed of the Granites, Gumland and Moriarty land systems (Newland

Environmental Pty Ltd, 2009).

The Gumland land system is described as depositional surfaces, broad shallow valley plains with restricted areas of slightly more elevated stony surface and central drainage tracts (occasionally with shallow channels) receiving more concentrated through flow (Pringle et al., 1994). The drainage tracts are slightly susceptible to soil erosion if perennial scrub cover is substantially reduced, as are the stony plain areas of this land system.

The Graves land system is described as deeply weathered, low rounded hills and rises, very gently inclined footslopes with pebble mantles and narrow alluvial tracts receiving tributary flow off higher land units (Pringle et al., 1994). This land unit is susceptible to water erosion where perennial shrub cover is substantially reduced or the soil surface is disturbed.

The Moriarty land system is described as low rises to 20 metres relief, locally with ferruginous duricrust, gently undulating lower plains with pebble mantles and level to very gently inclined loamy plains; poorly defined, sparse drainage patterns (Pringle et al., 1994). Within this land system narrow drainage zones are moderately susceptible to water erosion, particularly if perennial shrub cover is substantially reduced or the soil surface is disturbed.

The majority of the application area in its current form is protected from erosional forces as it is vegetated with perennial shrub cover and in some areas protected by a stony mantle. However, the removal of this perennial shrub cover and stony mantle is likely to generate some temporary erosion as the land systems of the application area are moderately susceptible to erosional forces. Based on this, Reed Industrial Minerals (2010) have stated that a number of mitigation measures will be implemented to combat erosion, including:

- sedimentation sumps and discharge structures;
- perimeter bunds around waste dumps and tailings facilities;
- spoon drains on haul roads where drainage is intersected; and
- water containment windrows with collection sumps from the laydown and processing areas.

Given the risk of erosion occurring within the application area, the proposed clearing may be at variance to this Principle. However, the mitigation measures outlined above should adequately manage the risk of significant soil erosion occurring if successfully implemented.

Methodology Newland Environmental Pty Ltd (2009).
Pringle et al., (1994).
Reed Industrial Minerals (2009).

(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 known conservation area to the application area is Yallari Timber Reserve, which is situated approximately 5.2 kilometres to the west (GIS Database). Based on this distance, it is unlikely the environmental values of Yallari Timber Reserve (or any other conservation area) will be compromised by the proposed clearing.

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

Methodology GIS Database:
- CALM Managed Lands and Waters.

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

Comments Proposal may be at variance to this Principle

According to available databases, the proposed clearing area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

The average annual rainfall within the proposed clearing area is 260 millimetres and the average annual evaporation rate is 2,200 millimetres (BoM, 2010; GIS Database). Therefore, during normal rainfall events surface water in the proposed clearing area is likely to evaporate quickly. However, during substantial rainfall events erosion may occur in cleared areas resulting in a higher sediment load. It is possible that some temporary erosion may result from clearing; especially where the haul road intersects two minor drainage line areas. This may result in the temporary sedimentation of the two drainage lines mentioned. Reed Industrial Minerals (2010) have committed to implement the following management measures:

- sedimentation sumps and discharge structures;
- perimeter bunds around waste dumps and tailings facilities;
- spoon drains on haul roads where drainage is intersected; and

- water containment windrows with collection sumps from the laydown and processing areas.

It is likely the management measures outlined above should adequately manage the risk of significant erosion occurring and minimise the impacts to surface water.

The proposed clearing area is characterised by saline groundwater of between 30,000 to 40,000 milligrams/Litre TDS (GIS Database). The water table is below 100 metres depth in the northern part of the application area and below 70 metres in the southern areas of the application area (Newland Environmental Pty Ltd, 2009). Given the groundwater is already hypersaline, and the depth of groundwater, it is unlikely that the removal of 150 hectares of native vegetation will have a significant impact on groundwater quality or depth.

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

Methodology BoM (2010)
Newland Environmental Pty Ltd (2009).
Reed Industrial Minerals (2010).
GIS Database:
- Evapotranspiration, Point Potential
- Groundwater Salinity, Statewide
- Hydrography, linear (medium scale)
- Public Drinking Water Source Areas (PDWSAs)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

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

The climate of the region is described as arid to semi-arid with hot summers and cool winters. The average annual rainfall is 260 millimetres, with rains occurring in winter from cold fronts from the west, whilst in summer thunderstorms can produce heavy localised falls in short periods (BoM, 2010). Based on an average annual evaporation rate of 2,600 millimetres (GIS Database), any surface water resulting from rainfall events is likely to be relatively short lived. It should also be noted that the application area is surrounded by uncleared vegetation and it is likely that a large proportion of runoff is likely to be absorbed by this natural environment (GIS Database).

The clearing of native vegetation is likely to result in an increase in surface water runoff; however, the proposed clearing is not likely to increase the incidence or intensity of flooding.

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

Methodology BoM (2010).
GIS Database:
- Evapotranspiration, Point Potential
- Western Australia ETM 25m 543.

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

Comments

There is one native title claim over the area under application: WC98/027 (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenements have 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*.

According to available databases, there are no Aboriginal Sites of Significance within the application area (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged throughout the clearing process.

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

The clearing permit application was advertised on 8 February 2010 by the Department of Mines and Petroleum inviting submissions from the public. There was one public submission received during the public submission period which stated that there was no objection to the proposal.

Methodology GIS Databases:
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

The application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*, and the proposed clearing may be at variance to Principles (b), (g) and (i), is not likely to be at variance to Principles (a), (c), (d), (f), (h), and (j), and is not at variance to Principle (e).

5. References

- BoM (2010) Climate of Kalgoorlie - Boulder URL: <http://www.bom.gov.au/weather/wa/kalgoorlie/climate.shtml>
- Cowan, M (2001) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Coolgardie 3 (COO3 - Eastern Goldfields subregion).
- 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.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Newland Environmental Pty Ltd (2009) Reed Industrial Minerals Pty Ltd - Supporting information for a native clearing permit application. December 2009.
- Pringle, H.J.R., Van Vreeswyk, A.M.E., & Gilligan, S.A. (1994) An inventory and condition survey of rangelands in the north-eastern Goldfields, Western Australia. Department of Agriculture. South Perth.
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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.
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.