



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 4055/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Peter Scott Connolly

1.3. Property details

Property: Mining Lease 04/439
Local Government Area: Shire of Broome
Colloquial name: Broomecrete Mine

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 31 March 2011

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>Vegetation within the application area has been mapped at a 1:250,000 scale as Beard Vegetation Associations (Shepherd 2009; GIS Database):</p> <p>750: Shrublands, pindan; <i>Acacia tumida</i> shrubland with Grey Box (<i>Eucalyptus tectriflora</i>) and Cabbage Gum (<i>Corymbia grandiflora</i>) medium woodland over Ribbon Grass (<i>Chrysopogon spp.</i>) and Curly Spinifex (<i>Tridia pungens</i>).</p> <p>Bioscience undertook a flora and vegetation survey over tenements M04/208, M04/209 and M04/439 between 22 and 24 May 2008. However Bioscience (2008) notes that the survey was restricted to the flowering plants (angiosperms).</p> <p>One broad scale vegetation unit was recorded within the application area that reflects the underlying soil type (Bioscience, 2008). At a finer scale, this unit forms a mosaic wherein the relative numbers and size of different flora species vary (Bioscience, 2008).</p> <p>Pindan Unit: This is a mosaic of low woodland to low open woodland of mainly <i>Acacia platycarpa</i> and <i>Acacia tumida</i> with less closed common taller trees including <i>Corymbia opaca</i>, <i>Corymbia polycarpa</i>, <i>Persoonia falcata</i> and <i>Hakea chordophylla</i>, over open shrubland of mainly <i>Crotalaria</i>, <i>Senna</i> and <i>Cleome</i> over closed grassland.</p> <p>The Pindan sub-units within the application area have been described by Bioscience (2008) as:</p>	<p>Peter Scott Connolly originally applied to clear 20 hectares for the purpose of mineral sand production (Connolly, 2010), however, the application area has now been reduced to 5.58 hectares (Connolly, 2011a). The original clearing application area of 20 hectares was determined by the applicant on the basis of the clearing required over the life of the mine operation and not the term of the clearing permit. The proposed programme will extract Pindan sand (unscreened for base fill) and white sands (screened for inert fill and as a bulking agent for concrete) (Bioscience, 2008) by way of shallow pits.</p> <p>Clearing will be undertaken by mechanical means and done in segments of 0.5 hectare to 1 hectare. Most large paperbark or white gums trees will not be cleared where possible and the area underneath the canopy is to be left untouched (Connolly, 2010).</p>	<p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p> <p>To</p> <p>Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).</p>	<p>The clearing application area is located approximately 20 metres from the townsite boundary of Broome and is approximately 2 kilometres from the coastline (GIS Database).</p> <p>The vegetation condition within the application area has been determined by Bioscience (2008). Most of the vegetation within the application area appears to be in excellent condition. However, vegetation disturbed within the application area such as tracks are in a completely degraded condition.</p> <p>Weed and/or introduced species identified included but are not limited to: <i>Aerva javanica</i> (Kapok bush); <i>Calotropis gigantean</i> (Calotrope); <i>Cenchrus ciliaris</i> (Buffel grass); <i>Hyptis suaveolens</i> (Hyptis) and; <i>Passiflora foetida</i> (Wild passionfruit) (Bioscience, 2008).</p> <p>The assessing officer notes that these species identified within the flora survey do not appear to be listed as declared weeds by the Western Australian Department of Agriculture and Food (WA).</p>

P1 Pindan Wattle Unit, closed low woodland;
and

P2 Pindan Wattle Unit, open low woodland
with *Corymbia/Hakea/Melaleuca* open
woodland.

Bioscience (2008) also notes that the Pindan
units have been subject to recent fire activity
which has reduced the number of trees and led
to a thicker low woodland of wattle
(Bioscience, 2008).

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 Dampierland Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, and the Pindanland (IBRA) subregion (GIS Database).

The Pindanland IBRA subregion comprises of sandplains of the Dampier Peninsula and western part of Dampier Land, including the hinterland of Eighty Mile Beach and the vegetation is described primarily as Pindan (Graham, 2001). Graham (2001) describes the biodiversity values (landscape ecosystem, species and genetic values) which comprise of rare features such as:

- Numerous patches of rainforest found predominantly behind the coastal primary dune system with a structure unique to the Dampier Peninsula;
- The extensive mudflats of Roebuck Bay and Eighty Mile Beach resulting from two major paleoriver systems;
- The enormous numbers of migratory birds found at Roebuck Bay and Eighty Mile Beach;
- *Keraudrenia exastia* and *Pandanus spiralis* var. *flammeus* are both declared rare flora species;
- The vast grasslands of the Roebuck Plains;
- Coastal swamps adjacent to Eighty Mile Beach; and
- Claypans support populations of the uncommon aquatic plant *Nymphaea indica*.

Rainforest patches provide for large centres of endemism, as well as high species and ecosystem diversity (Graham, 2001). Mangroves, Riparian Zones and Springs also provide dry season refuges (Graham, 2001).

While there is a flat sedgeland on the clay flats to the west of application area (Bioscience, 2008), the rare features such as claypans as described by Graham (2001) are unlikely to occur within the application area. From review of the Bioscience (2008) report and aerial imagery, it would appear that the application area does not support the above rare features as described by Graham (2001).

A flora and vegetation survey was undertaken within Mining Leases 04/208, 04/209 and 04/439 by Bioscience in May 2008. The application area is within Mining Lease 04/439. One broad scale vegetation unit was recorded within the application area that reflects the underlying soil type (Bioscience, 2008). At a finer scale, this unit forms a mosaic wherein the relative numbers and size of different flora species vary (Bioscience, 2008).

Pindan Unit: This is a mosaic of low woodland to low open woodland of mainly *Acacia platycarpa* and *Acacia tumida* with less closed common taller trees including *Corymbia opaca*, *Corymbia polycarpa*, *Persoonia falcata* and *Hakea chordophylla*, over open shrubland of mainly *Crotalaria*, *Senna* and *Cleome* over closed grassland.

The Pindan sub-units within the application area have been described by Bioscience (2008) as:

- P1 Pindan Wattle Unit, closed low woodland; and
- P2 Pindan Wattle Unit, open low woodland with *Corymbia/Hakea/Melaleuca* open woodland.

Bioscience (2008) also note that the Pindan sub-units have been subject to recent fire activity which has reduced the number of trees and led to a thicker low woodland of wattle. The vegetation condition within the application area has been determined by aerial imagery (GIS database). Most of the vegetation within the application area appears to be in excellent condition. However, vegetation disturbed within the application area such as tracks is in a completely degraded condition.

The flora survey of the application area recorded 42 species from 30 genera (Bioscience, 2008). From review of the flora survey it would appear that species diversity could be considered low to moderate. However, the survey was restricted to the flowering plants (angiosperms) and as the survey was undertaken at the end of the wet season, some ephemeral species may have finished flowering (Bioscience, 2008), it would therefore be reasonable to expect that species diversity would be higher. No Declared Rare Flora (DRF) or Priority flora

species were recorded within the application area during the flora survey (Bioscience, 2008).

There were five weed species identified within the flora survey: *Aerva javanica* (Kapok bush); *Calotropis gigantea* (Calotrope); *Cenchrus ciliaris* (Buffel grass); *Hyptis suaveolens* (Hyptis) and; *Passiflora foetida* (Wild passionfruit) (Bioscience, 2008). The assessing officer notes that these species identified within the flora survey do not appear to be listed as declared plants by the Western Australian Department of Agriculture and Food (WA). The application area is adjacent to a landfill facility managed by the Shire of Broome, and this may also provide a potential seed source for weed species (GIS Database). Care must be taken to ensure that the proposed clearing activities do not spread or introduce any weed species to non infested areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed control condition.

The applicant has provided a search of the Department of Environment and Conservation's Threatened Fauna Database for fauna that may occur within 10 kilometre radius of the application area (Connolly, 2011a). The search identified 7 avian, 3 mammalian and 2 reptilian species (Connolly, 2011a). In addition, a search was undertaken by the assessing officer of the DEC Naturemap online database for fauna that may occur within a 25 kilometre radius of the application area. The search identified 7 amphibian, 387 avian, 29 mammalian and 62 reptilian species (Department of Environment and Conservation, 2009). From this information the local area appears to be potentially diverse in avian and reptilian species.

Given the number of vegetation units, flora species and landform features that have been identified within the application area, the biodiversity of the application area could be considered moderate. Vegetation present within the application area has been identified as common and widespread across the Dampierland bioregion (Bioscience, 2008).

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

Methodology Bioscience (2008)
Connolly (2011a)
Department of Environment and Conservation (2009)
Graham (2001)
Shepherd (2009)
GIS Database
-IBRA Australia
- IBRA WA (Regions - Sub Regions)

(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

The applicant has provided a search of Department of Environment and Conservation's (DEC) Threatened Fauna Database for fauna that may occur within 10 kilometre radius of the application area (Connolly, 2011a). The search identified 7 avian, 3 mammalian and 2 reptilian species (Connolly, 2011a). The following conservation significant species were identified:

- Erythura gouldiae* (Gouldian Finch) Endangered, Migratory, *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999*;
- Diomedea chrysostoma* (Grey-headed Albatross) Vulnerable, Marine and Migratory, *EPBC Act 1999*;
- Rostratula benghalensis subsp.australis* (Painted Snipe Australian) Vulnerable, Marine and Migratory, *EPBC Act 1999*;
- Macrotis lagotis* (Bilby, Dalgite) listed Schedule 1 under the *Wildlife Conservation Act 1950*;
- Falco peregrinus* (Peregrine Falcon) listed Schedule 4 under the *Wildlife Conservation Act 1950*;
- Wyulda squamicaudata* (Scaly-tailed Possum) listed DEC Priority Three;
- Burhinus grallarius* (Bush Stone-curlew) listed DEC Priority Four;
- Falco hypoleucos* (Grey Falcon) listed DEC Priority Four;
- Mesembriomys macrurus* (Golden-backed Tree rat) listed DEC Priority Four;
- Numenius madagascariensis* (Eastern Curlew) listed DEC Priority Four; and
- Polytelis alexandrae* (Princess Parrot) listed DEC Priority Four.

A flora and vegetation survey was undertaken within Mining Leases 04/208, 04/209 and 04/439 by Bioscience in May 2008. The survey identified the Pindan unit vegetation type is a mosaic of low woodland to low open woodland of mainly *Acacia platycarpa* and *Acacia tumida* with less closed common taller trees including *Corymbia opaca*, *Corymbia polycarpa*, *Persoonia falcata* and *Hakea chordophylla*, over open shrubland of mainly *Crotalaria*, *Senna* and *Cleome* over closed grassland (Bioscience, 2008).

A search from the DEC Threatened Fauna Database, for the Eastern Curlew, Peregrine Falcon, Bush-Stone curlew, Princess Parrot are relatively recent (predominantly post 1995) (Connolly, 2011a). The most recent record for the Bilby is 1998 and is located approximately 6 kilometres north-east of the application area (Connolly, 2011a).

The Bush Stone-curlew is known to inhabit lightly wooded country (Johnstone and Storr, 1998). This species may occur within the application area, however, given the widespread distribution of this species (Johnston and Storr, 1998), it is not likely the Bush Stone-curlew is dependent on the vegetation within the application area for its continued existence at the local level.

Given the large home range (20-50 square kilometres) of the Peregrine Falcon (Fourth Crossing Wildlife, 2011) the application area may only be used as part of this species home range. It is likely that several mobile species will be able to readily move quickly from the area upon clearing to adjacent vegetated areas.

Fauna that may utilise the application area is difficult to quantify with the limited amount of information provided by the applicant and the 'general paucity of information on conservation significant fauna in this region' (Department of Environment and Conservation, 2010a). Nevertheless, the vegetation sub-units within the application area are likely to be well represented within the Dampierland bioregion given the extent of pre-European vegetation remaining is approximately 100% (Department of Natural Resources and Environment, 2002; Shepherd 2009). Vegetation condition is predominantly in 'excellent condition' (Bioscience, 2008). Given the Dampierland bioregion remains relatively uncleared (Graham, 2001) it is likely that equal or higher quality vegetation and fauna habitats would exist throughout the surrounding area.

Aerial imagery demonstrates that the application area is adjacent to highly disturbed areas which include a mine operation to the west and a waste management facility to the east (GIS Database). The proximity to existing mine and waste management infrastructure could also be considered to act as a deterrent to many native fauna species. This would therefore minimise the potential for fauna species frequenting the area and the vegetation being used as core habitat.

The proposed clearing is not likely to have a significant impact on biological diversity given the size and incremental nature of the clearing. Furthermore, the application area does not appear to provide significant fauna habitat (Connolly, 2011b).

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

Methodology Bioscience (2008)
Connolly (2011a)
Connolly (2011b)
Department of Environment and Conservation (2010a)
Department of Natural Resources and Environment (2002)
Fourth Crossing Wildlife (2011)
Graham (2001)
Johnstone and Storr (1998)
Shepherd (2009)
GIS Database
- Broome 50cm Orthomosaic Landgate 2007

(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 is no recorded Declared Rare Flora (DRF) within the application area (GIS Database).

Keraudrenia exastia (*Sterculiaceae* family) has been identified in a search of the Department of Environment and Conservation's (DEC) Naturemap online database for flora as potentially occurring occur within a 10 kilometre radius of the application area (Department of Environment and Conservation, 2009). This plant is found on red sand in Pindan in coastal sites and relic desert dune swale (Department of Environment and Conservation, 2009). This plant was not identified during the study and as the site comprises mainly of white sands (Bioscience, 2008), it would be highly unlikely that this species is present.

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

Methodology Bioscience (2008)
Department of Environment and Conservation (2009)
GIS Database
- Declared Rare and Priority Flora List

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

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

The application area is located within several Threatened Ecological Communities (TECs) buffer zones, these being: the 'Roebuck Bay mudflats' (Roebuckcn 262) and 'Vine Thickets' (vine08 578) (Department of Environment and Conservation, 2010a). Advice has been obtained from the Department of Environment and Conservation's (DEC) Environmental Management Branch to determine if the application area is located within the TEC itself. There are no known TEC's within the application area (Department of Environment and Conservation, 2010b). The nearest mapped TEC is located approximately 850 metres away from the application area and the risk to threatened ecological communities from the proposed activities is considered low (Department of Environment and Conservation, 2010b).

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

Methodology Department of Environment and Conservation, (2010a)
 Department of Environment and Conservation (2010b)
 GIS Database
 - Threatened Ecological Sites Buffered

(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 Dampierland Interim Biogeographic Regionalisation of Australia (IBRA) bioregion within which approximately 99.64% of the Pre-European vegetation remains (see table) (Shepherd, 2009; GIS Database).

The vegetation of the application area has been mapped as;

-Beard Vegetation Association 750: Shrublands, pindan; *Acacia tumida* shrubland with Grey Box (*Eucalyptus tectriflora*) and Cabbage Gum (*Corymbia grandiflora*) medium woodland over Ribbon Grass (*Chrysopogon spp.*) and Curly Spinifex (*Tridia pungens*) (Shepherd 2009; GIS database).

According to Shepherd (2009), the Pre-European extent for Beard Vegetation Association 750 remains at approximately 99.75% at the State level and 99.82% at the 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.

While a nil to small percentage of the vegetation type within the Dampierland bioregion is adequately protected within conservation reserves, the bioregion remains largely uncleared. As a result, the conservation of vegetation association within this bioregion is not likely to be impacted by this application.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Dampierland	8,345,178	8,316,458	~99.64	Least Concern	1.0
Beard veg assoc. – State					
750	1,231,155	1,228,017	~99.75	Least Concern	2.3
Beard veg assoc. – Bioregion					
750	27,935	27,846	~99.82	Least Concern	2.3

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

Methodology Department of Natural Resources and Environment (2002)
 Shepherd (2009)
 GIS Database
 - IBRA WA (Regions - Sub Regions)
 - 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 not likely to be at variance to this Principle

Bioscience (2008) describes the geomorphology of the application area as essentially flat, with a very minor relief sloping generally from the east to the west.

There are no watercourses (Connolly, 2010) or wetlands within the application area (GIS Database), however, there is an area immediately to north and north-east of the application area that is subject to inundation (GIS Database). Most rainfall occurs over the December to March period (Bureau of Meteorology, 2010) therefore in significant summer rainfall events it is likely that some of the application area in the north will experience some inundation. No clearing is to be undertaken during this rainfall period (Connolly, 2010).

The coastline is located approximately 2 kilometres west of the application area and the Dampier Creek is located approximately 2 kilometres south-west of the application area (GIS Database). A RAMSAR and ANCA classified wetland 'Roebuck Bay' is located approximately 3 kilometres to the south-east of the application area (GIS Database). Given the distance from the clearing of native vegetation within the application area to these waterbodies, there is unlikely to be any impact.

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

Methodology Bioscience (2008)
Bureau of Meteorology (2010)
Connolly (2010)
GIS Database
- Hydrography, linear
- ANCA, Wetlands
- RAMSAR Wetlands

(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 located within the Phanerozoic Canning Basin of the West Kimberley, a large formation which covers much of central and north. The application area contains depositional regolith sands which have been formed by eolian sands (Bioscience, 2008). Three soil units are present: the eastern sections being of Permian eluvial plain of 'Pindan', a fine, iron-clay rich, well sorted, medium texture grading sand; the section west is a Quaternary sand plain unit of relict beach dunes comprising medium to fine white quartz sand with subdued relief dune/swale varying about 1 metre, and; against the western border a clay pan comprising white to light grey silt (Bioscience, 2008). This clay pan area will not be cleared or mined (Connolly, 2008).

Geomorphologically the site is essentially flat, with a very minor relief sloping from east to west (Bioscience, 2008). There are no watercourses or wetlands within the application area (Connolly, 2010; GIS Database).

Significant summer rainfall events occur from December to March (Bureau of Meteorology, 2010). There is an area immediately to the north and north-east of the application area that is subject to inundation (GIS Database), therefore it is highly likely that the application area will experience seasonal inundation during significant summer rainfall events. Erosion is likely to occur during these flooding events.

To minimise the potential impacts of surface erosion no clearing is to be undertaken during the months from December to March (Connolly, 2010). Native vegetation clearing is also to be undertaken in 0.5 hectare to 1.0 hectare segments. Topsoil will be harvested and the cleared areas mined to a maximum depth of 6 metres (Connolly, 2010). Once these segments have been mined rehabilitation is intended to be undertaken within six months (Bioscience, 2008). The potential impacts of soil erosion as a result of the proposed clearing may be minimised by the implementation of a condition restricting clearing from the period December to March each year.

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

Methodology Bioscience (2008)
Bureau of Meteorology (2010)
Connolly (2010)
GIS Database
- Evaporation Isopleths
- Soils, Statewide

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

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

According to available databases, the application area is not located within a conservation area or Department of Environment and Conservation DEC managed land (GIS Database). The nearest known conservation area is the Broome Wildlife Centre located approximately 2 kilometres south-west of the application area (GIS Database). The reserve purpose is for the care and rehabilitation of wildlife, wildlife veterinary clinic and wildlife education (GIS Database). Given the distance between the application area and the reserve, the proposed clearing is not likely to impact on the environmental values of the conservation reserve.

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

Methodology GIS Database
- DEC Tenure (Category)

(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

According to the GIS Database the application area is located within the Roebuck sub-area of the Broome Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914*. The nearest Public Drinking Water Source Area, the Broome Water Reserve that consists of P1 and P3 protection zones is located approximately 5 kilometres south-east of the application area (GIS Database). The application area is located approximately 2 kilometres west of the coastline and approximately 2 kilometres south-east of the Dampier Creek (GIS Database).

Groundwater salinity within the application area is fresh at <500 milligrams per Litre Total Dissolved Solids (GIS Database). The average annual evaporation rate of 3200 millimetres (GIS Database) is over five times the average annual rainfall, this being 575 millimetres (Connolly, 2007). Therefore it is unlikely that the proposed clearing will result in increased groundwater recharge causing raised saline water tables.

Prior to mining, topsoil will be stockpiled and subsequently respread over the cells when the cells are rehabilitated within six months of mining (Connolly, 2010).

There is an area immediately to the north and north-east of the application area that is subject to inundation (GIS Database). Most rainfall occurs over the December to March period (Bureau of Meteorology, 2010), therefore in significant summer rainfall events it is likely that at least some of the application in the north will experience inundation. Some surface water quality may be affected by minor sedimentation, however, no clearing is to be undertaken by the proponent during the higher rainfall months from December to March (Connolly, 2010).

Given the distances between the application area and the water source areas it is unlikely that clearing will impact on the groundwater quality of the Broome Water Reserve, or the surface water of the Dampier Creek.

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

Methodology Connolly (2007)
Connolly (2010)
Bureau of Meteorology (2010)
GIS Database
- Evaporation Isopleths
- Groundwater Salinity
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSA's)
- RIWI Act, Groundwater Areas

(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

Climatic conditions in the region are described as semi-monsoonal. The prevailing winds consist of easterly winds in the winter and westerly winds in the summer (Connolly, 2010).

The application area is essentially flat, with a very minor relief sloping from east to west (Bioscience, 2008). An area adjacent to the northern part of the application area is subject to inundation (GIS Database), therefore it is likely that heavy rainfall patterns during the summer may result in sheet flooding reporting to this area. Given an average annual rainfall of 575 millimetres (Connolly, 2007) and an average annual evaporation rate of 3200 millimetres (GIS Database), any surface water resulting from normal rainfall events is likely to be relatively short lived.

The application area is within the Cape Leveque Coast Basin catchment area which covers 2,393,394 hectares (GIS Database). Given the size of the area to be cleared (5.58 hectares) in relation to the size of the catchment area, 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 Bioscience (2008)
Connolly (2007)
Connolly (2010)
GIS Database
- Evaporation Isopleths
- Hydrographic Catchments - catchments
- Hydrography, linear

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

Comments

The clearing permit application was advertised on 8 November 2010 by the Department of Mines and Petroleum inviting submissions from the public. Two submissions were received in relation to the application. Both submissions objected to the proposed clearing.

Submission 1: Concerns were raised in relation to: native title rights and interests; and land tenure and zoning. A response from the Department of Mines and Petroleum was forwarded to this Direct Interest party on 17 December 2010.

Submission 2: Concerns were raised in relation to: dust management; proximity to the Broome North subdivision, Shire of Broome waste facility, Energy Development Limited Gas Facility; impacts to Threatened Ecological Communities (TEC) (Mangrove thickets); and groundwater impacts. The original clearing application area of 20 hectares has now been reduced to 5.58 hectares. As a result distances to the subdivision, waste and gas facilities have been increased and the application area is more central within Mining Lease 04/439 boundaries. The nearest mapped TEC is located approximately 850 metres away from the application area and the risk to threatened ecological communities from the proposed activities is considered low (Department of Environment and Conservation, 2010b).

There is one native title claim (WC99_023) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure 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 two registered 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 through 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.

Under the Memorandum of Understanding (MOU) between the Department of Mines and Petroleum and the Environmental Protection Authority (EPA) a potential referral was considered under MOU criteria 5 and 8 given the proposal area is located within approximately 2 kilometres of the coastline and that the proposed clearing may have an indirect effect on the townsite of Broome. Informal advice was obtained from the OEPA on 6 January 2011 that the proposed clearing is not considered to be a significant proposal (Office of the Environmental Protection Authority, 2011).

Methodology Department of Environment and Conservation (2010b)
Office of the Environmental Protection Authority (2011)
GIS Database
- Aboriginal Sites of Significance
- Native Title Determined

4. References

- Bioscience (2008) Environmental Report, Mining Tenements M04/208, M04/209, M04/439.
- Bureau of Meteorology (2010) BOM Website - Climate Averages by Number, Averages for Broome Airport . Available http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=2010&p_stn_num=003003 accessed on 17 November 2010.
- Connolly, E.M. (2007) Land Clearing Assessment Information Report for Mining Tenements M04/208 and M04/209. Broome, WA.
- Connolly, E.M. (2010) Land Clearing Assessment Information Report for Clearing Purpose Permit, for mining tenement M04/439. E.M Connolly.
- Connolly, P (2011a) Correspondence received (CD) from Peter Connolly on 1 March 2011.
- Connolly, P (2011b) Correspondence received (on CD) from Peter Connolly 23 March 2011.
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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), 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 (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
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 Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

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.

