



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 2969/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Shark Bay Resources Pty Ltd

1.3. Property details

Property: Shark Bay Solar Salt Industry Agreement Act 1983
Mining Lease 260SA (AM 70/260)
Local Government Area: Shire of Shark Bay
Colloquial name: Salt Washery Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
7		Mechanical Removal	Mineral Production and Associated Infrastructure

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

Vegetation within the application area has been mapped at a 1:250,000 scale as the following Beard vegetation association (Shepherd et al., 2001; GIS Database);

- **1100:** Hummock grassland; dwarf shrub Steppe; mixed ericoid shrubs & spinifex.

Mattiske Consulting Pty Ltd undertook flora and vegetation survey of the *Shark Bay Solar Salt Industry Agreement Act 1983* Mining Lease 260SA from 29 July to 2 August 1996. The flora and vegetation survey included the area under application. The vegetation within the lease area was defined and mapped at a scale of 1:25,000.

A total of 17 vegetation associations were recorded during the survey of the mining lease area. One vegetation association was identified and described for the application area (Mattiske Consulting, 1996).

- **Association 9:** Low Closed to Open shrubland with occasional emergent *Acacia ligulata* over *Triodia plurinervata* and/or *Triodia bromoides* on red sand dunes, occasionally with limestone pebbles larger than 20 centimetres, on the lower to upper slopes above birridas.

Clearing Description

Shark Bay Resources Pty Ltd propose to clear up to 7 hectares of native vegetation within an application area of 15 hectares for the purpose of constructing a new salt washery facility, access roads, brine recirculation ponds and other associated infrastructure (Shark Bay Resources Pty Ltd, 2009). Shark Bay Resources Pty Ltd has advised that up to 1 hectare of the 7 hectares applied to clear will be used for future infrastructure upgrades and for a new site salvage yard (Shark Bay Resources Pty Ltd, 2009).

The vegetation will be cleared by a grader and bulldozer. The vegetation and topsoil will be collected and stockpiled for the use in future rehabilitation of other areas where similar vegetation communities are likely to occur on the mining lease area (Shark Bay Resources Pty Ltd, 2009). Shark Bay Resources Pty Ltd has stated that rehabilitation of the application area is not possible in the foreseeable future as the salt washery facility and recirculating ponds will be used for the on-going salt production process (Shark Bay Resources Pty Ltd, 2009).

Vegetation Condition

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

to

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

Comment

Mattiske Consulting (1996) notes that the vegetation association of the application area (Association 9) was common in the northern lease area and also common off the lease area.

The vegetation condition of the application area was assessed from photographs submitted with the application, Mattiske Consulting (1996) and from a site inspection on 1 May 2008.

The Assessing Officer notes that in Mattiske Consulting (1996) *Triodia bromoides* was originally referred to as the Declared Rare Flora species *Plectrachne bromoides*. The Assessing Officer viewed Florabase on 17 April 2009 and discovered that *Plectrachne bromoides* is a nomenclatural synonym of *Triodia bromoides* and that the conservation status of the species has been downgraded to Priority four (Western Australian Herbarium, 1998-2009).

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 Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA) region which encompasses an area of 3,140,478 hectares (Shepherd et al., 2001; GIS Database). Approximately 42.24% of the pre-European vegetation remains within the Geraldton Sandplains IBRA region (Shepherd et al. 2001). The vegetation of the Geraldton Sandplains IBRA region comprises mainly proteaceous scrub-heaths, rich in endemics on sandy earths. In terms of its flora and fauna, the area represents the interzone between the south-western bioregions of Western Australia and the Carnarvon bioregion (Desmond and Chant, 2001).

The application area is located within the Shark Bay Area Register of National Estate (RNE) Environmentally Sensitive Area and the marine area surrounding the application area is part of the Shark Bay Marine Park (Australian Heritage Database, 2008; GIS Database). The Shark Bay Marine Park boundary is located approximately 1.5 kilometres west of the application area at the closest point (GIS Database). The Shark Bay Area RNE and Shark Bay Marine Park have immense conservation value as they provide significant habitat for a high number of marine aquatic and terrestrial fauna species (Australian Heritage Database, 2008).

Mattiske Consulting (1996) surveyed the Shark Bay Resources State Agreement mining lease area and recorded a total of 185 vascular plants species from 124 genera and 54 families. The floristic diversity of the vegetation that has been identified across the mining lease area would be considered high. The vegetation within the application area was identified and described as Association 9: Low closed to open shrubland with occasional emergent *Acacia ligulata* over *Triodia plurinervata* and/or *Triodia bromoides* on red sand dunes, occasionally with limestone pebbles larger than 20 centimetres, on the lower to upper slopes above birridas (Mattiske Consulting, 1996). Mattiske Consulting (1996) commented that Association 9 was common in the north of the lease area and also off the mining lease area.

The application area is located within a section of the Shark Bay Resources State Agreement mining lease that has been impacted on by mining activities over a long period of time. It was evident from a site visit to the application area by the Assessing Officer on 1 May 2008 that the majority of the vegetation within the application area has been significantly disturbed by past and present mining activities. The areas within the vicinity of the existing wash plant, conveyor belt and access roads were either un-vegetated or comprised of sparse and stunted vegetation cover. The Assessing Officer considers the vegetation condition to range from good to degraded.

The previous disturbances that have occurred within the application area and nearby mining activities are likely to have impacted on the biodiversity of the area, which would otherwise be quite high. The proposed clearing of vegetation within an area that is considered disturbed minimises the risk of impacting on areas of intact vegetation that are likely to demonstrate higher biodiversity conservation values, especially considering the area lies within the Shark Bay Area Register of National Estate. Given the widespread distribution of higher quality vegetation throughout and off the mining lease area (Mattiske Consulting, 1996), the vegetation within the application area is unlikely to be considered an area of outstanding biodiversity.

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

Methodology

Australian Heritage Database (2008)
Desmond and Chant (2001)
Mattiske Consulting (1996)
Shepherd et al. (2001)
GIS Database:
- CALM Managed Lands and Waters
- Interim Biogeographic Regionalisation of Australia
- Register of National Estate

(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 application area is located within the Shark Bay Resources mine site at Useless Loop (Shark Bay Resources Pty Ltd, 2009; GIS Database). The mine site operates within the Shark Bay Area Register of National Estate which has been noted for its importance as it provides significant marine and terrestrial fauna habitat for native fauna species, particularly habitats associated with steep salinity gradients in the bay and undisturbed refugial areas on isolated islands and peninsulas (GIS Database; Australian Heritage Database, 2008). The area under application is located on the Heirisson Prong within the Edel subregion and has been described by Desmond and Chant (2001) as a refuge for endangered mammals and reptiles. The subregion is also known to be a centre of high endemism for reptiles (Australian Heritage Database, 2008).

A site inspection of the application area was undertaken by the Assessing Officer on 1 May 2008. The application area was located west of a salt crystallisation pond and comprised of areas that are being currently

utilised for an existing wash plant, conveyor belt and access roads. It was evident during the site visit that the areas adjacent to the existing wash plant, conveyor belt and access roads were either unvegetated or comprised of sparse and stunted vegetation cover. The Assessing Officer considers the vegetation condition to range from good to degraded. It was observed that the diversity of landforms within the application area is low in terms of ranges, ridges, outcrops or caves suitable to provide habitat for fauna. The significant disturbance that has resulted from past and present mining activities is likely to have significantly reduced the habitat value for the area.

The vegetation within the application area has been described by Matiske Consulting (1996) as low closed to open shrubland with occasional emergent *Acacia ligulata* over *Triodia plurinervata* and/or *Triodia bromoides* on red sand dunes, occasionally with limestone pebbles large than 20 centimetres, on the lower to upper slopes above birridas. Matiske Consulting (1996) stated that the vegetation association of the application area was common in the north of the mining lease area and that the vegetation association is common off the lease area. It was evident during the site visit that larger areas of intact and higher quality vegetation occur outside of the application and throughout the mining lease area. As the vegetation and landforms within the application area are common throughout the surrounding lease area and adjoining areas, it would be considered likely that most fauna would be able to relocate into these surrounding areas if present within the application area upon the commencement of clearing.

Given that the application area has been disturbed by past and present mining activities and that larger areas of higher quality vegetation exist throughout and adjacent to the Shark Bay Resources mining lease area, it is unlikely that the vegetation within the application area would be considered as significant habitat for fauna.

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

Methodology Australian Heritage Database (2008)
Desmond and Chant (2001)
Matiske Consulting (1996)
Shark Bay Resources Pty Ltd (2009)
GIS Database:
- Register of National Estate
- Shark Bay 1.4m Orthomosaic - Landgate 2002

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

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

According to available datasets there are no known records of Declared Rare Flora (DRF) or Priority flora species within the application area (GIS database). The nearest recorded population of DRF is located approximately 72 kilometres south-east of the application area (GIS Database).

Matiske Consulting Pty Ltd carried out a flora and vegetation survey of Shark Bay Resources mining lease area (Matiske Consulting, 1996). The flora and vegetation survey included a search of the Department of Conservation and Land Management's (now the Department of Environment and Conservation) Threatened (Declared Rare) Flora databases for DRF and Priority flora species, a field survey to define and map the vegetation communities within the survey area and a search for the existence of conservation significant species (Matiske Consulting, 1996).

Matiske Consulting (1996) identified the vegetation within the application area as Association 9 - Low Closed to Open shrubland with occasional emergent *Acacia ligulata* over *Triodia plurinervata* and/or *Triodia bromoides* on red sand dunes, occasionally with limestone pebbles larger than 20 centimetres, on the lower to upper slopes above birridas. Matiske Consulting (1996) reported that Association 9 comprised of the DRF *Triodia bromoides*.

The Assessing Officer reviewed Florabase on 17 April 2009 and notes that *Triodia bromoides* has been reclassified as a Priority 4 species (Western Australian Herbarium, 1998-2009). Given the vegetation type of the application area, *Triodia bromoides* is likely to be present within the application area. Matiske Consulting (1996) stated that *Triodia bromoides* is common in many areas of the south-eastern and southern parts of the Shark Bay Resources mining lease area and that Association 9 was common on and off the lease area. The Assessing Officer notes that it was evident from a site visit, that the vegetation within the application area was sparse and vegetation condition varied from good to degraded. If present within the application area, the proposed clearing may impact on a small number of individuals of *Triodia bromoides*. Given that *Triodia bromoides* is common in many areas of the south-eastern and southern parts lease area, the proposed clearing is unlikely to significantly impact on the conservation of this species.

Other Priority species that were identified by Matiske Consulting (1996) on the Shark Bay Resources Pty Ltd Mining Lease area include *Abutilon* sp. Hamelin (Priority 2), *Melaleuca huegelii* subsp. *pristicensis* (Priority 2), *Olearia occidentissima* (Priority 2), *Rhodanthe oppositifolia* subsp. *ornata* (Priority 2) and *Stenanthemum divaricatum* (Priority 3). All of these Priority 2 or Priority 3 species were identified within different vegetation associations to that of the application area (Matiske Consulting Pty Ltd, 1996). As a result, it would be considered unlikely that these species would occur within the application area.

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

Methodology Mattiske Consulting (1996)
Western Australian Herbarium (1998-2009)
GIS Database:
- Declared Rare and Priority Flora List

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

Comments **Proposal is not likely to be at variance to this Principle**
There are no known Threatened Ecological Communities (TEC's) within the application area (GIS database; Shark Bay Resources Pty Ltd, 2009). The nearest known TEC is located approximately 77 kilometres east, south-east of the application area (GIS database). Given the distance between the proposal and the nearest known TEC, the proposed clearing is unlikely to impact on the conservation of that TEC.

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

Methodology Shark Bay Resources Pty Ltd (2009)
GIS Database:
- Threatened Ecological Communities

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

Comments **Proposal is not likely to be at variance to this Principle**
The clearing application area is located within the Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 42.2% of the pre-European vegetation remains (see table below) (GIS database; Shepherd et al. 2001).

The vegetation of the clearing application area has been mapped as Beard vegetation association 1100: Hummock grassland; dwarf shrub Steppe; mixed ericoid shrubs & spinifex (GIS Database). According to Shepherd et al., (2001) approximately 98.3% of Beard vegetation association 1100 remains within the State (see table below).

There is no information available to indicate the extent of Beard vegetation association 1100 remaining within the Geraldton Sandplains IBRA region. According to the Bioregional Conservation Status of Ecological Vegetation Classes the conservation status for Beard vegetation association 1100 for the state is of "Least Concern" (Department of Natural Resources and Environment, 2002).

According to the Bioregional Conservation Status of Ecological Vegetation Classes the conservation status for the Geraldton Sandplains Bioregion is "Depleted". With approximately 42.2% of the pre-European vegetation remaining, the conservation status of the Geraldton Sandplains IBRA region is unlikely to be considered at risk of becoming listed as "Vulnerable" (Department of Natural Resources and Environment, 2002).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-european % in IUCN Class I-IV Reserves
IBRA Bioregion – Geraldton Sandplains	3,136,277	1,324,440	~42.2	Depleted	15.3
Beard veg assoc. – State					
1100	37,474	35,870	~98.3	Least Concern	3.8
Beard veg assoc. – Bioregion					
No information available					

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes
(Department of Natural Resources and Environment 2002)

Presumed extinct Probably no longer present in the bioregion
Endangered* <10% of pre-European extent remains
Vulnerable* 10-30% of pre-European extent exists
Depleted* >30% and up to 50% of pre-European extent exists

Least concern >50% pre-European extent exists and subject to little or no degradation over a majority of this area
*** or a combination of depletion, loss of quality, current threats and rarity gives a comparable status**

* Shepherd et al. (2001)

** Department of Natural Resources and Environment (2002)

A public submission was received in relation to the cumulative impact of clearing on Mining Lease 260SA. The submission referred to the potential for up to 27.07 hectares of native vegetation being cleared on Mining Lease 260SA should approval of clearing permit application CPS 2969/1 be obtained.

Shark Bay Resources Pty Ltd holds two native vegetation clearing permits within Mining Lease 260SA – Clearing Permit CPS 2594/1: 4.5 hectares; and Clearing Permit CPS 2719/1: 10.9 hectares (GIS Database). In addition, Shark Bay Resources Pty Ltd holds Clearing Permit CPS 2379/1 over Special Lease 3116/9187. Special Lease 3116/9187 covers the Useless Loop town site and is situated immediately adjacent to Mining Lease 260SA (GIS Database).

With consideration to the amount of vegetation authorised to be cleared under Clearing Permits CPS 2379/1, 2594/1 and 2719/1, there is the potential that up to 27.4 hectares of native vegetation may be cleared should approval be obtained under this application area. However, for clearing permits CPS 2594/1 and 2719/1 conditions have been placed on the permits that require Shark Bay Resources Pty Ltd to revegetate and rehabilitate any areas that are cleared under those permits so that the species composition, structure and density is similar to that of pre-clearing vegetation types in those areas. Under the requirement of these conditions a total of 14.5 hectares of native vegetation will be revegetated or rehabilitated on Mining Lease 260SA.

The Assessing Officer notes that Mining Lease 260SA was issued to Shark Bay Resources Pty Ltd on 22 December 1983 under the *Shark Bay Solar Salt Industry Agreement Act 1983*. The area on Mining Lease 260SA within the proximity of Useless Loop has had a long history of salt production, and as a result the area has been subject to a high degree of disturbance from mining activities over a long period of time. A site visit of the application was undertaken on 1 May 2008 and photographs submitted with the application demonstrate that the vegetation within the application has been considerably disturbed from historic mining activities as well as current site infrastructure. Portions of this application area associated with the access roads, existing salt washery and conveyor appear unvegetated whilst the condition of the remaining remnants of vegetation ranges from good to degraded. The proposed clearing for the purpose of constructing a new salt washery, associated roads, brine circulation ponds and other associated infrastructure is not likely to impact on an area of high quality and intact remnant vegetation.

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd et al. (2001)
GIS Database:
- Clearing Instruments
- Interim Biogeographic Regionalisation of Australia
- Mining Tenements
- 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**
According to available databases, there are no watercourses or drainage lines within the application area (GIS Database). A site visit to the application area by the Assessing Officer on 1 May 2008 indicated that the vegetation within the application area is not growing in association with a wetland or watercourse (GIS Database; Shark Bay Resources Pty Ltd, 2009)

No groundwater dependent ecosystems are known to occur in or near the application area (GIS Databases).

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

Methodology Shark Bay Resources Pty Ltd (2009)
GIS Database:
- Geodata, Lakes - GA 28/06/02
- Hydrography, Linear - DoE 1/2/04
- Shark Bay North 1.4m Orthomosaic - DLI 02
- Potential Groundwater Dependant Ecosystems - DoE 2004
- Rivers

(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

According to the Department of Agriculture in Technical Bulletin No 73 "An inventory and condition survey of rangelands in the Carnarvon Basin, Western Australia", the application area is located within the Edel Land System.

The Edel Land System consists of four land units (Payne et al., 1987). These are:

- **Unit 1:** Longitudinal dunes: Longitudinal dunes and dune-like sandy crests over limestone ridges with soils consisting of reddish brown calcareous sands;
- **Unit 2:** Stony rises and plains: Restricted limestone plains and rises which are densely strewn with pebbles, cobbles or boulders. Soils are variable but include very shallow sand, loamy or clayey sand and red, reddish-brown or yellow-brown sand;
- **Unit 3:** Undulating sandy plains: Swales and undulating plains, sparsely to moderately strewn with limestone gravels. Soils consist of yellow-red or red-brown sands or loamy sands; and
- **Unit 4:** Saline sands: Low-lying saline plains, lightly to moderately strewn with limestone cobbles or pebbles. Soils consist of very shallow grey loamy sands with calcareous inclusions (Payne et al., 1987).

The Assessing Officer visited the Shark Bay Resources Pty Ltd State Agreement Mining Lease 260SA on 1 May 2008 to undertake a site visit in relation to Shark Bay Resources Pty Ltd Clearing Permit CPS 2377/1. Whilst on site the Assessing Officer did observe the landforms within the application area and after careful analysis of the Department of Agriculture in Technical Bulletin No 73 it is considered most likely that the application area is located within Edel landform Unit 3 - Undulating sandy plains.

Edel landform Unit 3 has a mild susceptibility to wind erosion if the vegetative cover is removed (Payne et al., 1987). Due to its coastal location, the application area is likely to be exposed to prevailing onshore westerly winds, as well as offshore easterly winds that blow across Denham Sound. There is likely to be a moderate risk of wind erosion occurring within the application area if the vegetative cover is cleared.

Photographs submitted with the clearing permit application indicate that the vegetation and surface mantles within the application area have been considerably disturbed from historic mining activities as well as current site infrastructure. Portions of the application area associated with the access roads, existing salt washery and conveyor appear unvegetated whilst the condition of the remaining remnants of vegetation ranges from good to degraded. The proposed clearing for the purpose of constructing a new salt washery, associated roads, brine circulation ponds and other associated infrastructure is unlikely to cause any additional wind or water erosion issues.

Shark Bay Resources Pty Ltd (2009) has advised that the southern-most portion of the application area has been historically used as a borrow pit. This area is approximately 0.92 hectares in size and is known to comprise of high soil salt concentration (Shark Bay Resources Pty Ltd, 2009). Photographs indicate that the area comprises of hard pan soils with stunted or no vegetation cover (Shark Bay Resources Pty Ltd, 2009). Shark Bay Resources Pty Ltd has identified this area as a possible location for a new site dump and salvage yard. Given that this site has been significantly degraded by historic mining activities, the proposed clearing is unlikely to cause any additional wind or water erosion issues.

The application area is located at Useless Loop which experiences mean annual rainfall of 300 millimetres and mean annual evaporation of approximately 2,600 millimetres (Mattiske Consulting Pty Ltd, 1996; GIS Database). Due to the sandy nature of the soils within the application area, it would be expected that any runoff from normal season rainfall events would infiltrate into the soil which would thereby minimise the risk of water erosion or water logging occurring.

Groundwater salinities within the application area have been measured in the range of 3,000-7,000 milligrams/Litre Total Dissolved Solids (GIS Database). The area under application is situated adjacent to several salt crystallisation ponds which would be considered as hyper-saline. Topographic information indicates that the application area is located at a vertical elevation ranging between 0-10 metres above the crystallisation ponds (GIS Database). Given the elevation of the application area from the salt crystallisation ponds as well as the low rainfall to high evaporation rate of the Shark Bay area, the proposed clearing is unlikely to increase land salinisation on or off site.

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

Methodology Mattiske Consulting (1996)
Payne et al., (1987)
Shark Bay Resources Pty Ltd (2009)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity

(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 Department of Environment and Conservation (DEC) managed land is Friday Island Nature Reserve which is located approximately 4 kilometres north-west of the application area (GIS Database). Friday Island is listed as an 'A' Class nature reserve and is an important guano deposit and rookery for Cormorants. Given its isolation and distance from the application area, it is unlikely that the proposed clearing will have an impact on Friday Island Nature Reserve or the Cormorants that reside on the island.

The application area is located within the Shark Bay Area Register of National Estate (RNE) and the marine area surrounding the application area is part of the Shark Bay Marine Park (Australian Heritage Database, 2008; GIS Database). The Shark Bay Marine Park boundary is located approximately 1.5 kilometres west of the application area at the closest point (GIS Database). The Shark Bay Area RNE and Shark Bay Marine Park have immense conservation value as they provide significant habitat for a high number of marine aquatic and terrestrial fauna species (Australian Heritage Database, 2008). The application area is located within the operational Shark Bay Resources mine site and as a result the vegetation has been subject to a considerable degree of disturbance over many years. Given the disturbance that has occurred, it is likely that the conservation value of the area has been reduced. Taking into consideration the relatively small scale of the proposed clearing activities, it is unlikely that the conservation value of the Shark Bay Area RNE or Shark Bay Marine Park would be adversely impacted by the proposed clearing.

The Heirisson Prong Biosphere Project situated approximately 7.5 kilometres north-west of the application area is of conservation significance as the project aims to re-establish rare and endangered mammals on a mainland peninsula at Shark Bay, Western Australia (Wildlife Research and Management Pty Ltd, 2005). The area north of the predator proof fence is managed by the Useless Loop Community Biosphere Project Group Inc (ULCBPG) under a management agreement signed in 1990 between the ULCBPG and SBSJV (Richards et al. 2000). Because of the distance between the Heirisson Prong Biosphere Project and the application area, it is unlikely that the proposed clearing will have a detrimental impact to the conservation values of the area.

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

Methodology Australian Heritage Database (2008)
Richards et al. (2000)
Wildlife Research and Management Pty Ltd (2005)
GIS Database:
- CALM Managed Lands and Waters

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

Comments **Proposal is not likely to be at variance to this Principle**
A site inspection by the Assessing Officer indicated that there are no permanent wetlands or watercourses within the application area (GIS Database). The application area is situated adjacent to several salt evaporation ponds which are used by Shark Bay Resources for the production of salt. The quality of surface water within the salt evaporation ponds is likely to be considered hyper-saline. The application area is characterised by low rainfall, high evaporation and sandy porous soils (Short, 2000; GIS Database). Given the small scale of the proposed clearing and the porosity of the soils, the proposal is unlikely to cause water erosion or subsequent sedimentation and turbidity in nearby water bodies.

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Carnarvon Water Reserve which is located approximately 145 kilometres north, north-east from the application area (GIS Database). Given the distance separating the application area and the nearest water supply area, the proposed clearing is unlikely to impact on the quality of the Carnarvon Water Reserve.

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

Methodology Short (2000)
GIS Database:
- Hydrography, linear_1
- Rainfall, Mean Annual
- Public Drinking Water Source Areas (PDWSAs)

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

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

The application area is characterised by low rainfall, high evaporation and sandy porous soils (Short, 2000; GIS Database). As a result, it would be expected that there would be little surface flows during normal season rains. A site inspection was undertaken on 1 May 2008 by the Assessing Officer and it was evident that the application area was not located near any low-lying drainage areas. No permanent or ephemeral water bodies are located within the application area (GIS Database). Due to the sandy nature of the soils within the application area, it would be expected that the majority of the volume from normal season rainfall would infiltrate the soil. The proposed clearing is unlikely to exacerbate or increase the incidence of flooding in the area.

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

Methodology Short (2000)

GIS Database:

- Hydrography, linear_1
- Geodata, Lakes
- Rainfall, Mean Annual
- Evaporation Isopleths

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

Comments

There is one Native Title claim over the area under application (WC98/017). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There is one Aboriginal Site of Significance within the application area (Site ID: 6610) which intercepts the area applied to clear (GIS Database). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Aboriginal Significance are damaged through the clearing process.

The application area covers a portion of land that Shark Bay Resources Pty Ltd applied to clear under clearing permit application CPS 1149/1 on 15 February 2006 (GIS Database). The Department of Industry and Resources (DoIR) (now known as Department of Mines and Petroleum) were notified by Shark Bay Resources Pty Ltd on 24 April 2006 that the area applied to clear under clearing permit application CPS 1149/1 had been cleared prior to a decision being made by DoIR. The Department of Environment and Conservation inspected the site and notified DoIR that the Local Environmental Enforcement Group had decided to deal with this incident through a letter of warning. DoIR conducted an inspection of the cleared area on 1 May 2008 whereby it was recorded that 0.89 hectares of native vegetation had been cleared for a conveyor belt. The Department of Mines and Petroleum has excised this area from the application area.

One direct interest submission was received in relation to the protection of Sites of Aboriginal Significance and consideration towards the cumulative impact of clearing on Mining Lease 260SA (AM70/260). The issues raised within the submission have been addressed under Principle (e) and under the section titled 'Planning instrument, Native Title, Previous EPA decision or other matter'.

It is the proponent's responsibility to liaise with the DEC and the DoW to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licence or approvals are required for the proposed works.

Methodology GIS Database

- Clearing Instruments
- Native Title Claims
- Sites of Aboriginal Significance DIA

4. Assessor's comments

Comment

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

Should the permit be granted, it is recommended that conditions be imposed on the permit for the purposes of retention of topsoil and vegetation, recording areas cleared and permit reporting.

5. References

- Australian Heritage Database (2008). Shark Bay Area, Shark Bay, WA, Australia. Department of Environment, Water, Heritage and the Arts, Australian Government, <http://www.environment.gov.au/heritage/places/world/shark-bay/information.html>, report produced 31 July 2008.
- 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.
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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
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.