



1. Application details

1.1. Permit application details

Permit application No.: 849/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Chevron Australia Pty Ltd - Gorgon Development

1.3. Property details

Property: Production Licenses L1HR1, TL/9, L10 and TP/8R3
Local Government Area:
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
2		Cutting	Miscellaneous

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>The proposed area of clearing onshore is located within Beard Vegetation Unit 667: Hummock Grasslands, Shrub Steppe; scattered shrubs over <i>Triodia wiseana</i> and <i>Triodia</i> sp. indet aff. <i>Angusta</i> (Shepherd et al. 2001).</p> <p>Mattiske and Associates (1993) mapped and described 34 vegetation types on Barrow Island, four of which occur within the area under application. These include: V1 - Hummock grassland of <i>Triodia wiseana</i> with mixed emergent shrub species on valley slopes; L7 - Hummock grassland of <i>Triodia wiseana</i> with pockets of <i>Melaleuca cardiophylla</i> on limestone ridges; F1 - Hummock grassland of <i>Triodia angusta</i> on red earth flats and drainage lines; and, D2 - Hummock grassland of <i>Triodia angusta</i> along minor creeklines and narrow drainage lines. Astron Environmental (2002) further refined these to create 83 mapping units within the proposed development areas. Six occur in the area under application: F8a, L3f, L3i, L7b, V1k, and V1m. The dominant communities within this proposed onshore clearing area are V1m, F8a and L3i.</p> <p>Benthic primary producer (plants and corals) habitats in the areas of proposed clearing offshore include: macroalgae-dominated intertidal limestone reef platform; subtidal limestone reef platform with macroalgae and scattered corals; reef platform/sand with scattered seagrass; and, coral habitats. (Although comprised of animal colonies, corals are primary producers due to the photosynthesis of microalgae living in their cells) (Chevron Australia 2005c).</p> <p>The dominant macroalgae on the east coast platforms are <i>Sargassum</i> spp., <i>Cystoseira trinodis</i>, <i>Caulerpa</i> spp. and <i>Halimeda</i> spp. Sparse ephemeral <i>Halophila</i> seagrass meadows and seapens occur on deeper pavement reef buried under sand. Macroalgal turfs which are widespread on the intertidal reef, comprise red algae such as <i>Laurencia</i> spp., <i>Chondria</i> spp., <i>Ceramium</i> spp., <i>Centroceras clavulatum</i>, <i>Gelidiopsis</i> spp. and <i>Hypnea</i> spp. (Chevron Australia 2005a).</p>	<p>The area of proposed clearing is 2 ha in total with approximately 1.5 ha on Barrow Island, and 0.5 ha offshore. The clearing is for the purpose of geotechnical investigations (drilling) as preliminary work for the proposed Gorgon Gas Development currently undergoing formal assessment by the EPA.</p> <p>The onshore clearing activities will involve clearing of approximately 50 drilling-pads, each around 10 m x 12 m in area, and some short vehicular access tracks which extend off existing access tracks. All clearing is to be located within the boundary shown in the attached plan, which approximates the boundary of the proposed gas processing facility at Town Point (on the east side of the island), and comprises approximately 150 ha.</p> <p>Clearing for drilling is also proposed offshore, to the east of Town Point. Around 100 drilling sites are proposed but not all occur in vegetated habitats.</p>	<p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994). Most of the vegetation in the proposed Gorgon Development area on Barrow Island is in excellent-to-pristine condition, with little apparent disturbance. Exceptions are along main tracks and seismic lines (Chevron Australia 2005d). Around 0.6% of the proposed gas processing facility area has been previously disturbed (Chevron Australia 2005a). The small sample area observed during a field visit appeared to be in good condition. No introduced plant species have been recorded in the proposed gas processing facility area (Chevron Australia 2005d).</p>	<p>According to Shepherd et al. (2001), approximately 100% of Beard Vegetation Unit 667 remains intact. However, the scale of Beard's mapping is broad and previous clearing on Barrow Island has not been captured in these reports. Mattiske and Associates (1993) and Astron Environmental (2002) described and mapped 34 and 83 vegetation units respectively. However, surveys and mapping by Astron Environmental (2002) did not extend across the entire island. Chevron Australia engaged RPS Bowman Bishaw Gorham (2003) to survey marine benthic habitats in the proposed development areas to assist in the formal assessment of the environmental implications of the proposed Gorgon Development. Intertidal habitats in the vicinity of the proposed site of clearing near Town Point were surveyed during January and May 2004. The surveys also covered adjacent supratidal habitats (Chevron Australia 2005a). Le Provost Environmental Consultants (1991) also surveyed intertidal habitats around the island in 1990 (cited in Chevron Australia 2005d).</p>

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 at variance to this Principle

Barrow Island is an A Class Nature Reserve that is recognised internationally for its extremely high biodiversity conservation values. With an area of about 23 000 ha, it is the second largest island off the Western Australian coast. It is best known for its abundant mammals and is recognised as an important refuge for numerous native mammal species that have either declined in numbers or become extinct on the mainland. It also has a rich bird and reptile fauna, a unique and valuable assemblage of subterranean animals, and valuable vegetation communities. Barrow Island is probably the largest island in Australia and one of the largest land masses in the world that has no introduced animals. Consequently, its vegetation has not been impacted by grazing by introduced stock or feral animals, and introduced predators have not affected its animal assemblages. Thus, the island provides a benchmark against which changes to mainland ecosystems can be measured following introductions (Conservation Commission of Western Australia [CCWA] 2003).

The vegetation of Barrow Island is atypical of the islands on the North-West Shelf (CCWA 2003). The flora of Barrow Island is regionally significant because there are species or taxa that: appear to be restricted to the island; represent the southern limit of plants of the Kimberley Region; represent the western limit of plants of the Pilbara Region, and; represent the northern limit of the plants of the Cape Range and southwards (Chevron Australia 2005d).

The marine plants (macroalgae meadows and scattered sea grass) and corals off the east coast of Barrow Island are important of benthic primary producers in the tropical marine ecosystems surrounding Barrow Island and the mainland Pilbara coast (Chevron Australia 2005c). The marine habitats around Barrow Island support a diverse marine fauna, many of which have conservation significance. This marine area also has significance due to the presence of several marine fauna species at or close to the limits of their geographical distribution (DEH 2000).

Approximately 1050 ha or 4.46% of Barrow Island (onshore) has previously been cleared for the development of infrastructure for existing oilfield operations. An additional 172 ha (0.72%) has been disturbed for seismic operations and installation of flow lines, bringing the total to 5.18% (Chevron Australia 2005c). The CCWA (2003) considers the area of the island already affected by clearing as significant. CCWA has stated that in the long term, an inevitable series of cumulative impacts of proposed developments associated with the Gorgon Development will substantially diminish the biodiversity conservation values of Barrow Island Nature Reserve and the marine ecosystems offshore. The impacts of any additional clearing needs to be seen in this cumulative context and is considered to be at variance with this principle.

Methodology

CCWA (2003)
Chevron Australia (2005c)
Chevron Australia (2005d)
DEH (2000)

(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

Barrow Island is recognised as an important refuge for native mammal species that have either declined in numbers or become extinct on the mainland. Six are listed as threatened under the *Wildlife Conservation Act 1950*. Thirty-two of the 110 bird species recorded on the island are known to breed there. The Barrow Island Black-and-White Fairy Wren (*Malurus leucopterus edouardi*) occurs nowhere else and is also listed under the Act as a threatened species. The rich subterranean fauna comprising stygofauna and troglifauna includes a further twelve species listed as threatened (CCWA 2003). Significant reptile species include a blind snake *Ramphotyphlops longissimus* which is priority listed by CALM (P2), and the Leopard Skink *Ctenotus pantherinus* subsp. *acripes*, both of which occur nowhere else. Two other priority listed fauna species include the Water Rat *Hydromys chrysogaster* (P4) and the Eastern Curlew *Numenius madagascariensis* (P4). Along with the Water Rat and the Leopard Skink, other non-listed significant fauna described by Chevron Australia (2005c) as key receptors (evolutionary significant units) include: the land snail *Rhagada* sp.; the scorpion *Urodacus* sp. nov. barrow; the Northern Brushtail Possum *Trichosurus vulpecular amhemensis*; termites *Nasutitermes triodia*; mygalomorph spiders; the Spinifex bird *Eremiomis carteri*, and; the Perentie *Varanus giganteus*.

Due to their subterranean location, stygofauna are unlikely to be directly affected by the proposed clearing. CALM monitoring has found that, with the exception of the Black-flanked Rock Wallaby which do not occur in the proposed clearing area, all of the terrestrial fauna on Barrow Island are abundant and in secure populations (Burbidge et al. 2003: cited in Chevron Australia 2005c). Terrestrial fauna habitats within the proposed clearing area are well represented elsewhere on the island and there is no indication that these habitats are of critical importance to terrestrial fauna. Trapping and spotlighting data from both CALM and monitoring for the Gorgon Development indicate similar densities of most mammals across the island. The reptiles, birds and invertebrates also appear to be widely distributed across the island, or at least within areas of similar habitat (Chevron Australia 2005d). While a disproportional amount of White-winged Fairy Wren habitat occurs in the proposed gas processing facility area near Town Point, approximately 2% of the total population of these wrens on the

island is expected to be affected by that 150 ha proposal (Chevron Australia 2005c). The terrestrial clearing proposed under this application is for one hundredth of this area (1.5 ha) and, therefore, is likely to affect in the order of 0.02% of the wren population on the island.

Only one active Bettong warren lies within the proposed gas processing facility footprint but this will be avoided by at least 50 m during the clearing and drilling activities proposed under this application. Chevron Australia has committed to implementing management measures to avoid and mitigate impacts to terrestrial fauna associated with clearing and earthworks on Barrow Island. Three that are directly relevant to the clearing proposed under this application are: enforcement of the requirement for additional fauna surveys prior to site selection for clearing; establishment of buffer zones around important fauna habitats, and; application of strict controls during operations to ensure clearing and earthworks remain restricted to pre-designated, surveyed areas (Chevron Australia 2005c).

The marine habitats around Barrow Island support a diverse marine fauna, many of which have conservation significance. Chevron Australia (2005c) lists fourteen marine animal taxa as key receptor species for assessing the risk posed by operations associated with the proposed Gorgon Development, such as dredging. Many of the species are listed under either the *Wildlife Conservation Act 1950* or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and are representative of additional listed or unlisted species. However, the key receptor fauna species are either highly mobile and/or widespread enough for their populations to avoid being significantly impacted by the 0.5 ha of offshore drilling operations proposed under this application.

The vegetation in the proposed area of offshore clearing is predominantly macroalgae, dominated by Sargassum species and Halimeda species. Sargassum species are among the more important benthic primary producers in the region and dense Sargassum beds provide shelter, food and substrate for a diverse array of fauna, including invertebrates and fish (Chevron Australia 2005a). However, if all the offshore clearing proposed under this application (0.5 ha) occurred within the macroalgae-dominated intertidal limestone reef platform habitat described within Chevron's offshore management units for Barrow Island (1002 ha) (Chevron Australia 2005c), the 0.5 ha would constitute less than 0.05% of that habitat. Given that this type of macroalgae-dominated habitat extends beyond the management units, this would leave in excess of 95% of the habitat intact. Subtidal limestone reef platform with macroalgae has a much greater extent within the combined management areas (18997 ha).

The seagrasses in the proposed Gorgon Development areas comprise species such as Halophila and Halodule. The plants are small and the meadows are too sparse to provide habitat for the fauna usually associated with high-density seagrass meadows. These seagrasses are unlikely to be of high importance to local dugong or sea turtle populations (Chevron Australia 2005d). Chevron has committed to several management measures for the impacts of sea bed disturbance, among them is locating marine infrastructure to avoid sensitive habitats (Chevron Australia 2005c). Chevron Australia has stated that no coral bombooras or reefs will be impacted by the 0.5 ha of offshore clearing proposed under this application (Damian Williams pers. comm. 2005).

Chevron Australia (2005a) stated that the invertebrate assemblages recorded in areas of proposed developments around Barrow Island are associated with habitats that are widely distributed in adjacent areas of the coast and regionally, and consider that none of these assemblages are of high conservation significance.

CALM (2005) has advised that the proposed clearing of up to 2 ha on and offshore is considered as minor and preliminary in the context of the proposed Gorgon Development as a whole. CALM is familiar with this form of operation and is of the view that such programs can be appropriately managed and made to be environmentally acceptable through established Petroleum Act processes (CALM 2005).

Methodology CALM (2005)
CCWA (2003)
Chevron Australia (2005a)
Chevron Australia (2005c)
Chevron Australia (2005d)

(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

No Declared Rare Flora species listed under the *Wildlife Conservation Act 1950*, or protected plant taxa listed under Section 179 of the *Environment Protection and Biodiversity Conservation Act 1999*, have been located during surveys of, or are known to occur on Barrow Island or in the waters off Barrow Island (GIS database; Chevron Australia 2005d).

Two Priority flora species have been collected on Barrow Island: *Corchorus interstans* and *Helichrysum oligochaetum* (Priority 1). *Corchorus interstans* has been renamed *Corchorus congener* and is no longer priority listed. This species is widespread on Barrow Island and is has been found in a number of locations in the Pilbara Region (Florabase, CALM 2005). It has also been observed to regenerate successfully on rehabilitated sites (Astron Environmental 2002: cited in Chevron Australia 2005d). *Helichrysum oligochaetum* has been recorded on the flats south of the proposed gas processing facility and north of the current ChevronTexaco

camp, but not within the proposed clearing area (Mattiske and Associates 1993).

Species that tend to be restricted to creek beds and gullies on Barrow Island are considered to be of conservation significance due to historical loss of this habitat through anthropogenic disturbance. The taxa associated with these habitats include *Abutilon otocarpum*, *Dysphania kaipari*, *Euphorbia* sp. A, *Gossypium australe* and *Hybiscus sturtii* var. *platyklamys* (Chevron Australia 2005d). The proposed gas processing facility area, within which the clearing proposed under this application occurs, was selected to avoid drainage zones which contain restricted vegetation communities (Chevron Australia 2005c).

Three of the 23 flora species that have been reported as restricted in their distribution on Barrow Island occur within the proposed gas processing facility and, potentially, within the clearing area proposed under this application. These are *Hakea lorea* subsp. *lorea*, *Dicanthium sericeum* subsp. *humilis*, and *Hybanthus aurantiacus*. Although widespread in the Pilbara Region, *Hakea lorea* subsp. *lorea* was previously only located in scattered populations in the central part of the island. However, it is now known to occur in a range of vegetation communities on the island. While the annual grass *Dicanthium sericeum* subsp. *humilis* has only been recorded from two locations within the proposed gas processing facility during post-cyclonic rain surveys, and among the Chenopod fringes of the Island, this subspecies is common throughout the Pilbara and Kimberley Regions and is expected to be more widely distributed on the island than currently recorded. *Hybanthus aurantiacus* occurs within the area of the proposed gas processing facility and in the wider study area referred to by Chevron Australia (2005d). It is also located on a disturbed site in the northern part of Barrow Island, and its range extends through the Pilbara and Kimberley Regions.

Another 17 species requiring further identification are potentially restricted on Barrow Island and additional studies are required to determine whether or not these species are restricted to the island. Of these, two have been recorded in the proposed Gorgon Development areas and could potentially occur within the area of clearing proposed under this application. These are: an unidentified *Isolepis* sp. which has been recorded in the southwest corner of the proposed gas processing facility after post cyclonic rains, and at two locations outside this area, and; *Acacia bivenosa* (elongate phyllode variant) (Chevron Australia 2005d). The locations of these plants and appropriate buffers around them have been incorporated into the Barrow Island GIS Environmental Sensitivities Layer by Chevron Australia, to ensure that they are conserved and maintained in the future.

The marine plant and coral assemblages in the waters surrounding Barrow Island are dominated by tropical and subtropical species that are widely distributed within the Montebello/Lowendal/Barrow Island region and across the Rowley Shelf (Chevron Australia 2005c). At least 132 macroalgal taxa occur in marine habitats around Barrow Island and most of these area believed to be distributed widely in the Indo-Pacific region (J. Huisman pers. Comm. 2005: cited in Chevron Australia 2005c).

It is therefore unlikely that the proposed clearing will impact on rare or significant flora.

Methodology Chevron Australia (2005c)
Chevron Australia (2005d)
Florabase, CALM December 2005
GIS Database: Declared rare and priority flora list y CALM 01/07/05.

(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 DoE GIS database indicates that there are no known threatened ecological communities on Barrow Island or in marine areas around the island. No known threatened ecological communities have been identified in surveys or are known to exist in or near the proposed clearing areas (Chevron Australia 2005a). Therefore the proposed clearing is unlikely to be at variance to this principle.

Methodology Chevron Australia (2005a)
GIS database: Threatened Ecological Communities - CALM 12/04/05

(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 State Government is committed to the National Objectives and Targets for Biodiversity Conservation, which includes a target that prevents clearance of ecological communities with an extent below 30% of the present pre-European settlement (Department of Natural Resources and Environment 2002, EPA 2000).

There is one Pre-European Beard vegetation type within the proposed onshore clearing area. It is Beard Vegetation Association 667: Hummock grasslands, shrub-steppe: scattered shrubs over *Triodia wiseana* and *Triodia* sp. indet. aff. *angusta*. Hopkins et al. (2001) and Shepherd et al. (2001) reported that 100% is remaining with 100% in IUCN Class I-IV Reserves.

	Pre-European area (ha)	Current extent (ha)	Remaining %*	Conservation status**	% in other reserves/CALM-managed land
IBRA Bioregion: Pilbara	17,944,694	17,944,694	100	Least concern	0
Beard Veg Association: 667	19,949	19,949	100	Least concern	0

However, more detailed survey and mapping by Mattiske and Associates (1993) identified 34 vegetation types across Barrow Island, four of which occur within the area under application: V1, L7, F1 and D2. Each of these communities has an extent of greater than 1000 ha on the island. Environment Australia (2004) uses a total of 1000 ha as an indicative threshold for identifying terrestrial vegetation communities with small distributions as very restricted.

Astron Environmental (2002) further refined these vegetation types to create 83 vegetation communities within the proposed development areas alone (i.e. this work did not encompass the entire island). Six of these vegetation communities occur in the area under application: F8a, L3f, L3i, L7b, V1k, and V1m. None of these vegetation communities or the vegetation types described by Mattiske and Associates (1993) have been classified as "significant vegetation communities with restricted distribution or threatened or restricted species", or are among the communities listed as "requiring further investigation". However, vegetation type L7 is classed as an "otherwise significant vegetation community" because it contains *Melaleuca cardiophylla*, which is significant for supporting a restricted endemic bird, the White-winged Fairy Wren. In its Environmental Criteria for GIS modelling of priority areas for Barrow Island, Chevron has classed vegetation type L7 as Priority 2 high impact. Prior to the operation, further surveys will be conducted and clearing sites will be located so as to avoid any active nesting sites (Chevron Australia 2005a).

If the Gorgon Development, which is currently under formal assessment by the EPA, is approved, the 1.5 ha of onshore clearing proposed under this application will be included in the proposed gas processing facility footprint and will not be additional to the 300 ha of clearing being assessed by the EPA. Currently around 5.2 % or 1223 ha of the vegetation on Barrow Island has been disturbed for the development and operation of existing oilfield activities (Chevron Australia 2005a). The clearing proposed under this application will disturb around 1.5 ha of onshore vegetation which represents approximately 0.006% of the total vegetation of the Island. The remaining extent of vegetation is considered adequate for the retention and conservation of the island's vegetation communities.

In the shallow waters off Barrow Island, all areas with exposed or seasonally exposed, hard substrate support macroalgae. Macroalgae are very common components of marine environments in the shallow waters of the Pilbara, and CALM (2004) estimate that macroalgae meadows make up 40% of the benthic habitats of the Montebello/Barrow Islands Marine Conservation reserve (cited in Chevron Australia 2005d). Chevron Australia (2005d) claims that the Sargassum-dominated macroalgal beds on both the west and east coasts of Barrow Island are of low conservation significance because they are widely distributed and recover rapidly from disturbance. These beds undergo large seasonal biomass fluctuations each year and are adapted to an environment that is periodically buried with sand and thus naturally undergo cycles of loss and recolonisation (Chevron Australia 2005d).

Chevron Australia (2005b) stated that there are no significant seagrass meadows present in the proposed Gorgon Development area around Barrow Island and that no regionally significant coral communities will be directly impacted. The coral reefs of the subtidal pavement adjacent to Barrow Island are locally significant because they represent a benthic habitat with restricted distribution around the island. Chevron Australia (2005d) stated that individual coral bombores are of low conservation significance as they are widely distributed along the east coast of the island. However, Chevron Australia have committed to avoiding disturbance of coral bombores and reefs in the clearing proposed under this application (Damian Williams pers. comm. 2005).

No available references are known for estimating the complete existing and pre-European extent of marine habitats in this region. However, consistent with the EPA Guidance Statement No. 29, Chevron Australia (2005c) have defined 11 management units for use in assessing cumulative impacts to benthic primary producer habitats within the proposed Gorgon Development area. The total estimated areas of each habitat type within these combined management units are:

Macroalgae-dominated intertidal limestone reef platform - 1002 ha
 Subtidal limestone reef platform with macroalgae and scattered corals - 18997 ha
 Reef platform/sand with scattered seagrass - 27089 ha
 Coral habitat (confirmed and unconfirmed) - 3171 ha

If all the offshore clearing proposed under this application (0.5 ha) occurred within the most under-represented habitat in the management units off Barrow Island - the macroalgae-dominated intertidal limestone reef platform (1002 ha) - it would constitute less than 0.05% of that area. While some clearing of marine habitat has occurred in the region, little clearing has been conducted in the intertidal and subtidal areas around Barrow Island to date. Therefore, it is considered highly likely that well over 30% of the pre-European extent of these benthic primary producer communities currently remain intact, and that the extent remaining is adequate for their retention and conservation.

Chevron Australia (2005a)
Chevron Australia (2005b)
Chevron Australia (2005c)
Chevron Australia (2005d)
Department of Natural Resources and Environment (2002)
Environment Australia (2004)
EPA (2000)
Hopkins et al. (2001)
Mattiske and Associates (1993)
Shepherd et al. (2001)

(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 at variance to this Principle

The *Environmental Protection Act 1986* defines a wetland as an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary. As the proposed offshore clearing area occurs in marine rather than terrestrial habitat, this clearing principle is not considered applicable to that part of the proposal.

The proposed onshore clearing will not be located on any watercourses. The only permanent water sources on Barrow Island occur in freshwater seeps. The two known permanent seeps both occur on the west coast of the island well away from the area of proposed clearing. Other seeps are ephemeral and generally only appear after rain events (Chevron Australia 2005c). The numerous drainage channels that traverse Barrow island are highly ephemeral and are usually dry, running only after significant rainfall events. Vegetation occurring in these drainage lines is typically dominated by *Triodia angusta*, a colonising species, rather than a riparian species that is specially adapted to the storage or flow of water. Therefore the proposed clearing will not be at variance to this Principle.

Methodology Chevron Australia (2005a)

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

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

The proposed clearing of vegetation will only involve slashing and topping techniques which will allow topsoil to remain in place and not be impacted by erosion or runoff (Chevron Australia 2005a). The proponent has committed to the rehabilitation of onshore disturbed areas, such as any drill pads and access tracks that won't form part of the Gorgon Development construction disturbance, in accordance with the approved Environmental Management Plans and Barrow Island rehabilitation procedures. This commitment has been reinforced through the conditions attached to the permit. Management measures to which the proponent has committed also include the minimisation of pooling of water from road runoff through appropriate design of cleared areas and roads. No introduced plant species have been recorded in the proposed gas processing facility area, within which the proposed clearing is located (Chevron Australia 2005d).

Offshore drill holes will be backfilled with a grout plug on completion (unless cavities and joints in the rock formation render this to be impractical) (Chevron Australia 2005a). Chevron Australia (2005c) has stated that benthic primary producers in the region have the ability to recover from major impacts such as cyclones, as long as substrates remain suitable for recolonisation.

The Department of Agriculture (DAWA) does not provide land degradation advice for offshore (marine) areas or terrestrial areas under 15 ha in size. However, based on DAWA advice provided for other proposals to clear vegetation on Barrow Island, it is considered unlikely that the clearing proposed under this application would result in appreciable on-site or off-site land degradation.

Methodology Chevron Australia 2005a
Chevron Australia (2005c)
Chevron Australia (2005d)
DAWA (2005)

(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 at variance to this Principle

The proposed onshore clearing areas are located on Barrow Island which is an A class Nature Reserve that has extremely high biodiversity conservation values (Conservation Commission 2003). It is vested in the Conservation Commission of Western Australia and reserved for the purposes of flora and fauna conservation in order to protect these values. It is managed by CALM.

The proposed offshore clearing areas are located within the Barrow Island Port Area and within 5 km of the Barrow Island Marine Management Area (Class A) which surrounds the port area. The marine management area is vested in the Marine Parks and Reserves Authority and is principally managed by CALM. It is recognised for both commercial and conservation values and is zoned as multiple-use (CALM 2004). The proposed clearing area also lies within the Barrow Island Marine Area listed on the Register of National Estate (DEH 2000). Barrow Island Marine Park (Class A), a Sanctuary Zone vested in the Marine Parks and Reserves Authority and managed by CALM, is located on the other side of the island (CALM 2004).

CALM (2005) has reviewed the clearing permit application and provided the following comments: The nearshore proposed investigative geotechnical drilling associated with this clearing application could be judged to be minor and preliminary in the context of the whole Gorgon Development proposal. CALM is familiar with this form of operation on Barrow Island and is of the view that such programs can be appropriately managed and made to be environmentally acceptable through established Petroleum Act processes. CALM has previously provided similar advice for geotechnical applications through the former Notice of Intent to Clear process administered under the *Soil and Land Conservation Act 1945*.

In a letter to the applicant, the EPA stated that the proposed investigative works associated with this clearing application are subject to the regulatory control of DoIR and CALM and that a detailed, program-specific Environmental Management Plan will be submitted for their evaluation. These mechanisms will be capable of ensuring an appropriate level of environmental management is applied and that the work will not have a significant environmental impact (EPA 2005).

However, the proposed clearing is considered to be at variance to this principle.

Methodology Conservation Commission (2003)
CALM (2004)
CALM (2005)
DEH (2000)
EPA (2005)

(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

Given the extent and nature of the clearing proposed onshore, it is not expected that it would affect the quality of surface or underground water. There is no permanent water in the many drainage channels that traverse Barrow Island. These contain water only after cyclones. The amount of increased recharge that could potentially result from the proposed clearing is considered negligible and would not be detrimental to underground water quality.

The proposed offshore clearing is located on the sea bed which is naturally inundated and subject to some natural disturbance during cyclones. In addition, the vegetation in the proposed clearing areas comprises macroalgal beds which naturally undergo large seasonal biomass fluctuations. Given the relatively small area of offshore clearing proposed (0.5 ha), it is not considered likely to cause deterioration in the quality of the sea water in which it occurs.

Methodology

(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 proposed offshore clearing, of approximately 0.5 ha, occurs in a naturally flooded marine habitat and this clearing principle is not considered applicable to that part of the proposal.

Onshore clearing sites will not be located near any watercourses. While the area of proposed clearing onshore is not prone to flooding under normal climatic conditions, Barrow Island is located in a cyclone region and temporary flooding could occur as a result of cyclonic rains. However, natural surface water flows and flooding are unlikely to be altered as a result of the proposed vegetation clearing. The area of clearing proposed onshore is relatively small (approximately 1.5 ha) and the proposal is not likely to be at variance with this principle.

Methodology

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

Comments

The proposed clearing is for geotechnical investigations that are related to the Gorgon Development proposal currently being assessed by the EPA. The applicant has provided a letter from the EPA (dated 21 September 2005) stating that the EPA considers that the proposed work outlined in this application is minor or preliminary and that it consents to this work being undertaken according to the provisions of section 41A(3) of the *Environmental Protection Act 1986*.

The Gorgon Development has a current operating licence (4467) granted in accordance with the *Environmental Protection Act 1986*. The license area encompasses the area of proposed clearing. The proposed clearing is not at variance to this licence, and no amendment to the licence will be required. A Works Approval is not required for the proposed geotechnical investigation. According to DoE advice, there is no inforce groundwater or surface water license for this area. *The Rights in Water and Irrigation Act (1914)* does not have any jurisdiction in offshore water use and a Water Allocation is not required for the offshore geotechnical investigation (DoE 2005).

A submission was received with copies of three appeals attached relating to previous clearing permits granted on Barrow Island, and requesting that the contents of these appeals be considered to constitute the submission. The contents of the appeals were given consideration in assessing the application to clear against the ten clearing principles. However, a detailed response to the issues raised in the appeals is not considered appropriate here, as these issues were raised specifically in reponse to other permits granted.

There are no native title claims over the offshore area under application (GIS database).

The following Registered Indigenous Heritage Site occurs in the area of the proposed clearing: Barrow Island art site (site ID 8951, No. P03542) (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.

Methodology DoE (2005)
 EPA (2005)
 GIS database: Native Title Claims - DLI 7/11/2005.
 GIS database: Aboriginal Sites of Significance - DIA 28/02/2003.

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Petroleum Exploration	Cutting	2	Grant	<p>The assessable criteria have been addressed and the clearing as proposed is at variance with Principles (a) (biodiversity) and (h) (conservation reserve).</p> <p>For Principles (a) and (b) - Barrow Island is an A Class Nature Reserve that is recognised internationally for its extremely high biodiversity conservation values, and which is reserved to protect it against other land uses. It is managed by CALM.</p> <p>However, the applicant has established a process to assess and minimise the impact of clearing using an environmental sensitivity database developed for Barrow Island. Drilling sites and access tracks will be located so as to minimise impacts on significant biodiversity, fauna and flora values. In addition, both CALM (2005) and the EPA (2005) have advised that the proposed clearing of up to 2 ha on and offshore is considered as minor and preliminary in the context of the proposed Gorgon Development as a whole. CALM is familiar with this form of operation and is of the view that such programs can be appropriately managed and made to be environmentally acceptable through established Petroleum Act processes (CALM 2005).</p> <p>Therefore the assessing officer recommends that the permit be granted subject to the following conditions:</p> <ol style="list-style-type: none"> 1. The Permit Holder shall, within 12 months of completing the onshore clearing in accordance with this Permit, rehabilitate the areas cleared. 2. Prior to carrying out active rehabilitation, the Permit Holder shall prepare a rehabilitation plan in relation to each area to be rehabilitated which shall specify the method of rehabilitation, when such work will be carried out, and provide for a process of review and remediation of rehabilitation. 3. Rehabilitation shall be carried out in accordance with the rehabilitation plan. 4. Condition 1 ceases to have effect if future clearing of the areas cleared under this application is approved for the purpose of implementation of the proposed Gorgon Development currently under assessment by the Environmental Protection Authority. 5. The Permit Holder shall record the following for each instance of clearing: <ol style="list-style-type: none"> (a) the location where clearing occurred, expressed as grid coordinates using the Geocentric Datum of Australia 1994 coordinate system; (b) the area cleared in square meters; (c) the method of clearing; (d) the purpose of clearing; and (e) the area rehabilitated in square meters. 6. The Permit Holder shall provide a report to the Director, Environment, DoIR by 29 August 2007 setting out the records required under condition 5 of this permit in relation to clearing carried out. 7. The Permit Holder shall record the information collected under condition 5 of this permit in the Gorgon Project Vegetation Clearing Database, which shall be added to the Chevron Barrow Island Environmental Sensitivities Layer located in the Chevron

5. References

- Astron Environmental (2002) Preliminary vegetation and flora survey of the proposed Gorgon Development Barrow Island, October 2002. Report prepared for Gorgon joint Venture, Perth Western Australia.
- Bowman Bishaw Gorham (2003) Barrow Island marine and intertidal environmental survey Gorgon Gas Development. Unpublished report R02119 to Chevron Texaco Australia Pty Ltd by Bowman Bishaw Gorham, January 2003. Perth, Western Australia.
- CALM (2004) More marine parks for Western Australia. News Release, Department of Conservation and Land Management. Perth, Western Australia.
- CALM (2005) Land clearing proposal advice. Advice to Program Manager, Native Vegetation Assessment Branch, Department of Industry and Resources. Department of Conservation and Land Management. Perth, Western Australia.
- Chevron Australia (2005a) Application to clear native vegetation: Investigatory works. Report to the Native Vegetation Assessment Branch, Department of Industry and Resources. Perth, Western Australia.
- Chevron Australia (2005b) Draft Environmental Impact Statement/Environment Review and Management Programme for the proposed Gorgon Development: Executive Summary. Chevron Australia, Perth, Western Australia.
- Chevron Australia (2005c) Draft Environmental Impact Statement/Environment Review and Management Programme for the proposed Gorgon Development: Main Report. Chevron Australia, Perth, Western Australia.
- Chevron Australia (2005d) Draft Environmental Impact Statement/Environment Review and Management Programme for the proposed Gorgon Development: Technical Appendices. Chevron Australia, Perth, Western Australia.
- Conservation Commission (2003) Biodiversity values on Barrow Island Nature Reserve and the Gorgon Gas Development. Advice to the Government from the Conservation Commission of Western Australia. Perth, Western Australia.
- DAWA (2005) Land degradation assessment advice. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture Western Australia.
- DEH (2000) Barrow Island Marine Area, Barrow Island, WA. Australian Heritage Database. Department of Environment and Heritage, Canberra, Australian Capital Territory.
- 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.
- DoE (2005) Water Allocation/License Advice. Department of Environment, Western Australia.
- Environment Australia (2004) Listings on Environmental Protection and Biodiversity Conservation Act web site. www.ea.gov.au/biodiversity/threatened/species.
- EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority.
- EPA (2005) Land clearing proposal advice. Advice to Chevron Australia regarding EPA consent to Gorgon Development investigative works. Environmental Protection Authority. Perth, Western Australia.
- Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) A database on the vegetation of Western Australia. Stage 1. CALMScience after J. S. Beard, late 1960's to early 1980's Vegetation Survey of Western Australia, UWA Press.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske & Associates (1993) 'State of knowledge on vegetation, Barrow Island,' report prepared for West Australian Petroleum Pty Ltd, Perth.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

6 Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAWA	Department of Agriculture, Western Australia.
DA	Department of Agriculture, Western Australia.
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), Western Australia.
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia.
DoE	Department of Environment, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity 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.

