



1. Application details

1.1. Permit application details

Permit application No.: 647/1
Permit type: Area Permit

1.2. Proponent details

Proponent's name: Chevron Texaco Australia Pty Ltd (Gorgon JV)

1.3. Property details

Property: CROWN RESERVE 11648 (BARROW ISLAND 6712)
Local Government Area:
Colloquial name: Gorgon JV - Barrow Island Section 91 License application (over L1H petroleum production license)

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.45		Mechanical Removal	Bore construction

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
Beard vegetation unit 667: Hummock grasslands, shrub-steppe; scattered shrubs over <i>Triodia wiseana</i> & <i>T.sp. indet. aff. angusta</i> . E.M. Mattiske & Associates (1993) described 34 vegetation types for the island. Two Mattiske (1993) vegetation types occur in the area proposed to be cleared: F1 - Hummock Grassland of <i>Triodia angusta</i> on red earth flats and drainage lines. L7 - Hummock Grassland of <i>Triodia wiseana</i> with dense pockets of <i>Melaleuca cardiophylla</i> on limestone ridges.	Each of the Mattiske (1993) vegetation types to be affected by the clearing have wide distributions on the island with F1 comprising 1567ha and L7 1586ha. Previous clearing of these vegetation types are known to be 2.8% and 3.3% respectively. The proposal will clear approximately 0.27ha of F1 and 0.18ha of L7 vegetation types (Mattiske, 1993). A vegetation survey was conducted by RPS-BBG 14 March 2005. The vegetation at each well site location was described to a finer level of detail. MW01 <i>Acacia bivenosa</i> Low Open Shrubland over <i>Triodia wiseana</i> Hummock Grassland Condition Good-Very Good. MW02 <i>Dodonaea lanceolata</i> var. <i>lanceolata</i> , <i>Acacia bivenosa</i> , <i>A. coriacea</i> ssp. <i>coriacea</i> Shrubland over <i>Scaevola cunninghamii</i> , <i>Hannafordia quadrivalvis</i> ssp. <i>recurva</i> Low Shrubland over <i>Triodia wiseana</i> Hummock Grassland. Condition: Good-Very Good. PB01 <i>Trichodesma zeylanicum</i> var. <i>grandiflorum</i> scattered Shrubs over <i>Acacia</i>	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	There is historical disturbance of vegetation over many parts of Barrow Island. All Mattiske vegetation types with the exception of the mangrove community have been impacted from between 0.5 to 21.7%. Although neither of the vegetation formations for this site are considered to be restricted in their distribution on Barrow Island as recorded by Mattiske, recent survey work by Astron (2004) for ChevronTexaco further described the L7 formation into three associations (L7a, L7b and L7c). Astron considers that these associations be afforded careful consideration in any proposed clearing. Particularly a newly described association of L7 referred to as L7b. While the two surveys were undertaken by two different botanists, confirmation as to which association occurs at PB02 site is not possible from documentation and interpretation from expert was sought. However the key elements appear to be present. Two of the five proposed well pads occur in the L7 vegetation. One of these PB02 contains the key species <i>Scaevola cunninghamii</i> . According to Astron (2004) <i>Scaevola cunninghamii</i> is typically found on coastal sands, on the landward side of foredunes, hind dunes and remnant dunes. It has been found on near coastal limestone hill slopes with sandy soils on the western side of Cape Range. Limestone with skeletal soil is not believed to be common habitat for the species. The association (not the species itself) is believed to be regionally restricted, possibly to Barrow Island and Cape Range. Astron (2004) recommended that until its abundance and frequency on Barrow Island (and the mainland) can be confirmed, it should be treated as having high conservation value also on a local scale. Discussions with Astron (V. Long pers.comm) confirmed that the vegetation at PB02 is not L7b. However the surrounding vegetation may be L7d as described in the Gorgon documentation (Astron, 2003) which is also considered to be of conservation significance.

bivenosa Open Low
Heath/Open Heath over
Triodia wiseana Closed
Hummock Grassland.
Condition: Degraded-Good.

PB02 Acacia coriacea ssp.
coriacea scattered Tall
Shrubs over Diplopeltis
eriocarpa, Scaevola
cunninghamii, Acacia
gregorii Low Open
Shrubland over Triodia
wiseana Hummock
Grassland. Condition:
Degraded- Good.

PB03 Codonocarpus
cotinifolius scattered Low
Trees over Acacia coriacea
ssp. coriacea scattered
Shrubs over Acacia
bivenosa Low Shrubland
over Triodia wiseana
Closed Hummock
Grassland.
Condition: Good-Very
Good.

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 recognised internationally as a unique biodiversity repository. Barrow Island Nature Reserve has an area of about 23000ha and is the second largest island off the WA coast. It is best known for its abundant mammals, and has a rich bird and reptile fauna, unique and valuable assemblage of subterranean animals and valuable vegetation communities. It has not been impacted by grazing by introduced stock or feral predators (CCWA, 2003). The area of the island already affected by clearing is considered significant by the Conservation Commission of WA (2003), totalled 657ha at the end of 2001 (ChevronTexaco, 2003) or 2.8% of the island area. Progressive rehabilitation of areas cleared has also occurred (approx. 400ha). The impact of any additional clearing on the biodiversity of the site needs to be seen in this cumulative context. In addition to this application and the historical clearing there are four other known proposals to clear on Barrow Island. Some of this clearing would be rehabilitated. If these are approved, this would bring the total area known to have been cleared on Barrow Island to 4.6% of the reserve.

Although neither of the vegetation formations for this site are considered to be restricted in their distribution on Barrow Island as recorded by Matiske, recent survey work by Astron (2004) for ChevronTexaco further described the L7 formation into three associations (L7a, L7b and L7c). Astron considers that these associations be afforded careful consideration in any proposed clearing. Particularly a newly described association of L7 referred to as L7b. While the two surveys were undertaken by two different botanists confirmation as to which association occurs at PB02 site is not possible from documentation. However the key elements appear to be present. Two of the five proposed well pads occur in the L7 vegetation. One of these PB02 contains the key species *Scaevola cunninghamii*. According to Astron (2004) *Scaevola cunninghamii* is typically found on coastal sands, on the landward side of foredunes, hind dunes and remnant dunes. It has been found on near coastal limestone hill slopes with sandy soils on the western side of Cape Range. Limestone with skeletal soil is not believed to be common habitat for the species. The association (not the species itself) is believed to be regionally restricted, possibly to Barrow Island and Cape Range. Astron (2004) recommended that until its abundance and frequency on Barrow Island (and the mainland) can be confirmed, it should be treated as having high conservation value on a local scale.

Discussions with Astron (V. Long pers.comm) confirmed that the vegetation at PB02 is not L7b. However the surrounding vegetation may be L7d as described in the Gorgon documentation (Astron, 2003) which is also considered to be of conservation significance. ChevronTexaco has recognised the importance of the *Hakea lorea* and *Melaleuca cardiophylla* elements of the surrounding vegetation and moved the location of disturbance accordingly. It is recommended that there be minimal disturbance of the surrounding vegetation.

Methodology Astron 2004
CCWA 2003
ChevronTexaco 2003

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

Comments **Proposal may be at variance to this Principle**

CALM (2004) lists species that are specifically protected under the Wildlife Conservation Act (S1, Rare or is

likely to become extinct)

- Barrow Island Golden Bandicoot (*Isodon auratus barrowensis*),
- Boodie (Barrow Island (*Bettongia lesueur* unnamed subspecies),
- Barrow Island Spectacled Hare-wallaby (*Lagorchestes conspicillatus conspicillatus*),
- Barrow Island Euro (*Macropus robustus isabellinus*),
- Black-flanked Rock-wallaby (*Petrogale lateralis lateralis*),
- Barrow Island Mouse (*Pseudomys nanus ferculinus*),
- Barrow Island Black and White fairy-wren (*Malurus leucopterus edourdi*),
- Blind Gudgeon (*Milyeringa veritas*);
- Barrow Island Bogidomma (*Bogidomma australis*),
- Barrow Island Liagoceradocus (*Liagoceradocus subthalassicus*),
- *Nedsia fragilis*,
- *Nedsia humphreysi*,
- *Nedsia hurberti*,
- *Nedsia macrosculptilis*,
- *Nedsia sculptilis*,
- *Nedsia straskraba*,
- *Nedsia urifimbriata*,
- Barrow Island *Draculoides* (*Draculoides bramstokeri*),
- Barrow Island Millipede (*Speleostrophus nesiotis*)

In addition there are three priority species including:

- Ramphotyphlops longissimus (P2)
- Water-rat (Rakali) (*Hydromys chrysogaster*) (P4),
- Eastern Curlew (*Numenius madagascariensis*) (P4)

The biological survey undertaken (ChevronTexaco 2005) identified the presence of shrubs such as *Melaleuca cardiophylla* which is significant for the Barrow Island Black and White fairy-wren (*Malurus leucopterus edourdi*). The well site locations were adjusted in order to avoid direct impact on the shrubs. It is not known if there were nests of the fairy wren in the adjacent shrubs and if they would be affected by any nearby disturbance.

Methodology CALM 2004
ChevronTexaco 2005

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

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

Sites PB02 and MW01 both contain the small Priority 3 shrub *Corchorus interstans*. There are three *Corchorus interstans* specimens in the SE corner and 2 specimens in the NW corner of PB02 and on the proposed access track to this site. There are two specimens of *Corchorus interstans* just inside the northern boundary of MW01.

ChevronTexaco (2005) state that the loss of a small number of individual *Corchorus interstans* plants is not considered significant in the context of the broad distribution of this taxon on Barrow Island and the high level of representation in the area surrounding the well pads. *Corchorus interstans* regenerates successfully after disturbance and is likely to recolonise the well pads.

Taking this into account it is considered that the clearing of 0.45ha is not likely to have a deleterious effect on either the local or regional distribution of this species.

Methodology ChevronTexaco 2005
CALM 2004

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

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

A flora and vegetation survey of the area does not indicate that there are any significant ecological communities likely to be affected by the clearing (ChevronTexaco, 2005). The DoE GIS system indicates that there are no known Threatened Ecological Communities on Barrow Island.

Methodology ChevronTexaco 2005
GIS Layer: Threatened Ecological Communities CALM

(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

There is one Pre-European vegetation type within the proposed area (Hopkins et al 2001, Shepherd et al. 2001):

- Vegetation association 667: Hummock grasslands, shrub-steppe: scattered shrubs over *Triodia wiseana* & *T. sp. indet. aff. angusta* of which 100% remains with 100% in IUCN Class I-IV Reserves and

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

The Beard Vegetation mapping only indicates one vegetation type occurring over the proposed clearing site and only two for the entire island. More detailed vegetation mapping survey undertaken in 1993 (Mattiske 1993) identified 34 vegetation types.

Mattiske E.M. & Associates (1993) identified 34 vegetation types on Barrow Island. Two Mattiske vegetation types occur on the proposed site - F1 (0.24ha) and L7 (0.16ha). The proposed clearing will impact on 0.015% and 0.01% of these vegetation types respectively. This brings the total clearing of these vegetation types on Barrow Island to 2.82 and 3.46% respectively.

This leaves over 95% of each vegetation type remaining which is considered to be adequate for the retention and conservation of these vegetation communities.

Methodology Mattiske 1993
Hopkins 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 likely to be at variance to this Principle**
There are no known wetlands or watercourses located within or nearby the areas of clearing.

Methodology GIS Layer: Hydrography, linear - DoE 01/02/04

(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**
From previous DAWA advice (2004) for clearing on Barrow Island, it is considered that the clearing of 0.45ha will not result in appreciable on-site or off-site land degradation.

Clearing will be carried out in accordance with the ChevronTexaco Earthworks Procedures to reduce risks associated with erosion.

Methodology DAWA 2004

(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**
Barrow Island is an A class nature reserve for the protection of flora and fauna including two priority flora species, fauna declared Specially Protected, and Priority listed fauna under the Wildlife Conservation Act.

The proposed clearing is at variance with this principle. The clearing is part of pre-approval investigative works for the Grogon Gas Development, if the proposal is not approved then all clearing associated with the investigative works will be rehabilitated to the satisfaction of CALM.

Methodology CALM (2004)
CCWA (2003)

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

Comments **Proposal is not likely to be at variance to this Principle**
The proposed clearing is minor and localised and will have a negligible impact on groundwater. There may be a small amount of increased recharge as a result of the clearing but this is not considered detrimental to water quality.

Methodology GIS layer Hydrography, linear - DoE 01/02/04

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

Comments **Proposal is not likely to be at variance to this Principle**
 The area is not prone to flooding under normal climatic conditions however Barrow Island is located in a cyclone region.

Surface water flow/flooding are unlikely to be different as a result of the proposed vegetation clearing.

The amount of clearing is localised and incidental and the proposal is not likely to be at variance with this clearing principle.

Methodology DoE Site visit
 DoE GIS layers: Isohyets - BOM 09/98
 Evaporaton Isolpleths - BOM 09/98
 Topographic contours - DOLA 12/09/02
 Hydrography, linear - DoE 01/02/04

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

Comments

The following issues were raised in a submission, responses in parentheses:
 - that comprehensive and appropriately timed flora and fauna surveys of the site be conducted before a decision on this application is made. Such surveys should consider issues including:

1. the biodiversity of the site, including in terms of fungi (clearing principle (a));
 (Floristic diversity is an important component of terrestrial biodiversity on Barrow Island. Botanical surveys were conducted to identify possible rare and endangered plant species within the proposed Development areas. The application to clear contains a discussion on rare/threatened/priority species recorded. Fungi specifically was not surveyed. The relative small area to be cleared along with the commonality of many of the vegetation associations in the area would suggest that impacts to fungi, along with flora would not be significant.)
2. the significance of the site for fauna, including invertebrates (clearing principle (b)); and
 (A number of invertebrate surveys have been conducted as part of the Gorgon Draft EIS/ERMP over a range of Barrow Island sites. The invertebrate taxa collected from these sites are expected to be widely distributed on the island because the habitats from which they were collected are widespread on the island. Once again, the small area to be disturbed is unlikely to represent a significant portion of the known habitat for invertebrate species. Melaleuca cardiophylla is known as a habitat for the White Winged Fairy Wren and the sites were chosen to avoid this species.
3. whether the site contains Declared Rare Flora (clearing principle (c)).
 (no DRF but Priority Flora described)

Consideration of the application to clear should also involve:

- i. A report on the existing environment at the site, including the topography, soil mapping; etc.;
- ii. Written description and mapping of the condition of vegetation on the site, using a recognised vegetation condition scale;
- iii. An indication of the commonality (or otherwise) of the vegetation community at the site with respect to surrounding vegetation communities;
- iv. A management plan for remaining vegetation; (Not relevant to Gorgon as they have no title or rights to areas other than where they are directly applying to clear)
- v. A management plan covering key environmental issues such as:
 - weed control; (Weed control is undertaken by Barrow Island via a CALM agreed Weed Control Plan).
 - proposed nutrient monitoring (including plant tissue analysis etc.); and
 - information on possible Aboriginal / European Heritage issues associated with the site. (Not relevant to clearing application. But cultural heritage sites have been mapped for the Island and there are none in the vicinity of the drilling sites)

Methodology

4. Assessor's recommendations

Purpose	Method	Applied area (ha)/ trees	Decision	Comment / recommendation
Bore construction	Mechanical Removal	0.45	Grant	Construction of drill pads and access tracks for abstraction/reinjection wells (to assist in development of Water Supply Strategy to support the Gorgon Development)

5. References

- AGPS (2001) The national objective and targets for biodiversity conservation 2001-2005. Commonwealth of Australia, Canberra.
- Astron Environmental (2003) Preliminary Vegetation and Flora survey of proposed Gorgon Development Barrow Island. Appendix F in Environmental, Social and Economic Review of the Gorgon Gas Development. ChevronTexaco, 2003.
- Astron Environmental Pty Ltd (2005) CO2 Data Well - Barrow Island Environmental Survey March 2005. Report to RPS Bowman Bishaw Gorham. Ref. 2715-RV-01. TRIM IN20905 ADD.
- CALM 2004 Declared Rare and Priority Flora List. Department of Conservation and Land Management.
- CALM Land clearing proposal advice. Advice to A/Director General, Department of Environment (DoE). Department of Conservation and Land Management, Western Australia. DoE TRIM ref 17983.
- CCWA (2003) Biodiversity Conservation Values on Barrow Island Nature Reserve and the Gorgon Gas Development. Advice to Government from the Conservation Commission of Western Australia (July 2003).
- ChevronTexaco (2003) Environmental, Social and Economic Review of the Gorgon Gas Development on Barrow Island.
- ChevronTexaco (2005) Gorgon Development Hydro-geological Assessment. Application to Clear Native Vegetation - Supporting Information. ID G0- TE-000-REPX006.
- DAWA Land degradation assessment report. Office of the Commissioner of Soil and Land Conservation, Department of Agriculture Western Australia. DoE TRIM ref 17913
- 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.
- 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

Term	Meaning
CALM	Department of Conservation and Land Management
DAWA	Department of Agriculture
DEP	Department of Environmental Protection (now DoE)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DoE)