



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose permit number:	CPS 123/2
Permit holder:	Chevron Australia Pty Ltd
Purpose of clearing:	Clearing for <i>infrastructure maintenance, pipelines, minor works and emergency</i>
Duration of permit:	12 June 2006 – 12 June 2011
Location:	Barrow Island Crown Reserve 11648

TABLE OF CONTENTS

PART I : TYPE OF CLEARING AUTHORISED	3
1. CLEARING FOR INFRASTRUCTURE MAINTENANCE AUTHORISED	3
2. OTHER CLEARING AUTHORISED	4
3. EMERGENCY	4
PART II: VEGETATION DISTURBANCE ASSESSMENT PROCEDURE	5
4. ASSESSMENT PROCEDURE	5
5. APPLICATION FOR PERMIT TO WORK CERTIFICATE	5
6. INSPECTION AND SURVEY BY <i>ENVIRONMENTAL SPECIALIST</i>	5
7. ASSESSMENT PROCESS	6
8. GUIDELINES FOR ASSESSMENT	7
9. ASSESSMENT REPORT	8
10. ISSUING PERMIT TO WORK CERTIFICATES	8
11. REHABILITATION	9
12. GENERAL RESTRICTIONS ON CLEARING	9
PART III: RECORD KEEPING, REPORTING AND AUDITING	10
13. GEOGRAPHIC INFORMATION SYSTEM AND ENVIRONMENTAL SENSITIVITY MAPPING DATABASE	10
14. REPORTING	11
15. PERMIT HOLDER TO RETAIN RECORDS	12
16. AUDITING	12
17. RECORDS AND REPORTS TO BE MADE AVAILABLE TO THE CEO UPON REQUEST	12
PART IV: SPECIAL CONDITIONS FOR CLEARING FOR PIPELINES	13
18. CLEARING FOR PIPELINES AUTHORISED	13
19. SPECIAL RESTRICTIONS AND CONDITIONS ON CLEARING FOR PIPELINES	13
PART V: INTERPRETATION & DEFINITIONS	14
20. INTERPRETATION	14
21. SEVERANCE	14
22. INCONSISTENCY	14
23. DEFINITIONS	14

ANNEXURE 1

MATTISKE VEGETATION UNITS (1993)

ANNEXURE 2

ENVIRONMENTAL CRITERIA FOR GIS MODELLING OF PRIORITY AREAS FOR BARROW ISLAND

ANNEXURE 3

SIGNIFICANT VEGETATION COMMUNITIES ON BARROW ISLAND

ANNEXURE 4

ADDITIONAL SIGNIFICANT VEGETATION COMMUNITIES ON BARROW ISLAND

ANNEXURE 5

FLORA OF CONSERVATION SIGNIFICANCE ON BARROW ISLAND

ANNEXURE 6

BWI ROAD AND MAINTENANCE TRACK NETWORK

Purpose permit number:	CPS 123/2
Permit holder:	Chevron Australia Pty Ltd
Purpose of clearing:	Clearing for <i>infrastructure maintenance, pipelines, minor works and emergency</i>
Duration of permit:	12 June 2006 – 12 June 2011
Location:	Barrow Island Crown Reserve 11648

The permit holder is authorised to clear native vegetation on Barrow Island Crown Reserve 11648 for the above stated purpose, subject to the conditions of this Permit, including as amended or renewed.

PART I : TYPE OF CLEARING AUTHORISED

1. Clearing for Infrastructure Maintenance Authorised

In accordance with this Permit, the Permit Holder may clear *previously disturbed* vegetation without complying with Part II (Vegetation Disturbance Assessment Procedure) for the purposes of:

- (a) maintaining and operating existing production, waterflood and watersource wells, cathodic cabinets and cables, roadside bollards, main camp infrastructure, sewage lines, airport perimeter beacons, airport perimeter fencelines and other similar infrastructure, other than *pipelines*¹;
- (b) providing safety buffers around the infrastructure referred to in sub-condition (a);
- (c) replacing and upgrading infrastructure referred to in sub-condition (a) in the same location;
- (d) maintaining and grading existing graded roads;
- (e) operating and carrying out works within *hard stand areas*;
- (f) driving on *access tracks*; and
- (g) accessing power poles for repair and maintenance provided that the distance traversed from a graded road or *access track* to the power pole is less than 50 metres in total in one direction;
- (h) *active rehabilitation* carried out in accordance with condition 11 (rehabilitation);
- (i) assessing, monitoring and removal of dead vegetation at leak sites to allow for rehabilitation; and

¹ See Part IV of this Permit.

- (j) clearing areas for maintenance of conduits passing under road crossovers

and the clearing described in this condition 1 is not restricted by the 105 hectare limit on total clearing that otherwise applies to this Permit.

2. Other Clearing Authorised

In accordance with this Permit, the Permit Holder may clear up to 105 hectares of native vegetation, whether *previously disturbed* vegetation or not, to the extent reasonably necessary (including necessary safety buffers) for the purposes of:

- (a) installing road side bollards;
- (b) taking material at borrow pits;
- (c) reducing fire risk around oilfield facilities;
- (d) installation and modification of infrastructure at the central processing facility for the *produced water reinjection project*;
- (e) accessing any infrastructure;
- (f) bore construction for carrying out environmental investigations and groundwater monitoring relating to environmental investigation activities and remediation and rehabilitation works;
- (g) biodiversity monitoring;
- (h) *active rehabilitation* carried out in accordance with condition 11 (rehabilitation);
- (i) clearing from the base of overhead powerlines; and
- (j) installing, constructing, replacing, maintaining and operating airport perimeter beacons, water source wells and other similar minor works necessary for the maintenance, operation or upgrade of existing infrastructure other than *pipelines*.

3. Emergency

The Permit Holder may clear native vegetation:

- (a) for the purpose of preventing danger to human life or health or irreversible damage to a significant portion of the environment; or
- (b) to prevent or reduce imminent damage to infrastructure in response to the impact of a destructive natural event such as a storm, lightning strike, fire or flood; or

- (c) where reasonably necessary to immediately respond to an accident such as a leak, fire or medical emergency or to repair damage caused by vandalism

and may carry out this clearing without complying with the Vegetation Disturbance Assessment Procedure set out in Part II and such clearing shall not be restricted by the 105 hectare limit on total clearing that otherwise applies to this Permit.

PART II: VEGETATION DISTURBANCE ASSESSMENT PROCEDURE

4. Assessment procedure

The Permit Holder shall undertake the assessment procedure detailed in Part II for all clearing activities, other than those authorised by conditions 1 (infrastructure maintenance) and 3 (emergency), in order to minimise the amount and impacts of clearing within the permitted area.

5. Application for Permit to Work Certificate

- (a) Prior to carrying out any clearing, or any activity likely to involve clearing, an application for a Permit to Work Certificate for Offroad/Vegetation Disturbance (“*PWC Application*”) shall be prepared describing the proposed activity, the *location* of the proposed activity, the likelihood that clearing will occur and the kind of clearing that is likely to occur.
- (b) The *PWC Application* shall be considered by an officer of the Permit Holder responsible for coordinating works and if it is reasonably likely that the proposed activity will involve or result in clearing of native vegetation, the *PWC Application*, together with information recorded on a global positioning system device relating to the *location* and extent of the proposed activity or clearing, shall be submitted to the *Environmental Specialist*.

6. Inspection and Survey by *Environmental Specialist* or *Environmental Technician*

- (a) An *Environmental Specialist* or *Environmental Technician* shall refer to the environmental sensitivity mapping database and determine whether the area to be

cleared is classified as P1, P2, P3 or P4 and, except where the area to be cleared is P4, the *Environmental Specialist* or *Environmental Technician* shall walk, inspect and survey all locations (except those walked by a *qualified botanist*) at which any proposed activity or clearing is to be undertaken or in respect of which a *PWC Application* has been submitted, prior to the activity or clearing being undertaken.

- (b) The *Environmental Specialist* or *Environmental Technician* shall document the inspection and survey including:
 - (i) the proposed activity and method of clearing;
 - (ii) the *location* and extent of the proposed activity and clearing on a global positioning system device;
 - (iii) whether the area is classified as P1, P2, P3 or P4 on the environmental sensitivity mapping database;
 - (iv) the vegetation and fauna habitat present at the *location* of the proposed activity or clearing;
 - (v) observations about preferred routes or locations for the proposed clearing, taking into account information from the inspection and information on the environmental sensitivity mapping database.
- (c) The data collected by the field inspection and survey required under this condition shall be recorded into the Permit Holder's geographic information system incorporating the environmental sensitivity mapping database.

7. Assessment Process

The *Environmental Specialist* shall undertake an assessment of the proposed activity or clearing in each case taking into account:

- (a) the survey and inspection report and any *qualified botanist's* report that relates to the area to be cleared;
- (b) the information on the environmental sensitivity mapping database, including the proportion of each vegetation type set out in **Annexure 1** that remains prior to and after the proposed clearing, expressed as a percentage of the areal extent of these vegetation types as identified in Mattiske (1993);
- (c) the nature and extent of the proposed activity or clearing;
- (d) the environmental implications of the proposed activity or clearing for vegetation and fauna habitat, taking into account the guidelines set out in condition 8 below;

(e) any other relevant information;

and shall determine whether the vegetation or areas to be affected by the proposed activity or clearing should be considered to be P1, P2, P3 or P4 as described in **Annexure 2**.

8. Guidelines for Assessment

The *Environmental Specialist* shall have regard to the following guidelines when assessing a *PWC Application*:

- (a) Clearing of vegetation or areas classified as P1 in **Annexure 2** is least preferred and where possible clearing should occur in vegetation or areas classified as P4 in preference to P3, in P3 in preference to P2, and P2 in preference to P1.
- (b) A Permit to Work Certificate should not be issued if there is a reasonable alternative means to carry out the proposed activity or works that does not involve clearing.
- (c) Subject to condition 8(a) above, a Permit to Work Certificate should be made subject to conditions that minimise the overall extent of clearing.
- (d) In the event that the vegetation or area that is proposed to be cleared is classified as P1 in **Annexure 2**, any Permit to Work Certificate shall not be issued unless the clearing is absolutely necessary and no other reasonable alternative to clearing the vegetation or area exists.
- (e) A decision to issue a Permit to Work Certificate shall be made, and any conditions on a Permit to Work Certificate shall be imposed, having regard to the following:
 - (i) clearing and activities in the area shall be restricted wherever possible to existing tracks or *previously disturbed* areas;
 - (ii) disturbance to topsoil or rootstock shall be avoided wherever possible;
 - (iii) blading outside areas required to be *hardstand areas* shall be avoided wherever possible;
 - (iv) no slashing of *known priority flora*, *significant vegetation communities* (**Annexure 3**), *additional significant vegetation communities* (**Annexure 4**), or *flora of conservation significance* (**Annexure 5**) shall be undertaken, unless there is no other reasonable alternative; and
 - (v) where offroad vehicle access is approved, significant collections of trees, shrubs or habitat must be avoided and the number of vehicle movements along the offroad alignments must be restricted to the absolute minimum practicable.

9. Assessment Report

The *Environmental Specialist* shall document the assessment undertaken in making the decision to grant or refuse a Permit to Work Certificate, including:

- (a) whether or not any vegetation or areas classified as P1, P2, P3 or P4 in **Annexure 2** are likely to be affected by the proposed activity or clearing;
- (b) whether or not any *identified priority flora, significant vegetation communities (Annexure 3), flora of significant conservation value (Annexure 5) or vegetation comprising significant or unique fauna habitat* is likely to be affected by the proposed activity or clearing;
- (c) the areal extent that the clearing of each vegetation type set out in **Annexure 1** would represent, expressed as a percentage of the areal extent of each vegetation type as identified in Mattiske (1993);
- (d) the areal extent that the vegetation remaining after the clearing would represent, in relation to each vegetation type set out in **Annexure 1**, expressed as a percentage of the areal extent of each vegetation type as identified in Mattiske (1993); and
- (e) information demonstrating consideration of the guidelines set out in condition 8 above.

10. Issuing Permit to Work Certificates²

- (a) A copy of the Permit to Work Certificate with any vegetation disturbance management conditions will be issued to the person carrying out the activity or clearing prior to the commencement of the activity or clearing.
- (b) The Permit to Work Certificate shall specify:
 - (i) the method of clearing approved;
 - (ii) the purpose for which the activity or clearing may be carried out;
 - (iii) the extent of the clearing approved;
 - (iv) the *location* of the approved activity or clearing; and
 - (v) other relevant conditions or restrictions regarding the carrying out of the proposed activity or clearing.

- (c) The Permit Holder shall comply with the conditions of the Permit to Work Certificate and any directions given by the *Environmental Specialist*.

11. Rehabilitation

- (a) Clearing involving the removal of vegetation from leak sites to allow for regeneration, and clearing for the purposes of carrying out *active rehabilitation*, shall not form part of the 105 hectares of clearing that is authorised by this Permit.
- (b) 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.
- (c) Subject to compliance with this Permit, rehabilitation shall be carried out in accordance with the rehabilitation plan.

12. General Restrictions on Clearing

- (a) The Permit Holder shall not clear for vehicle turnarounds except where the extent of vegetation disturbance will be less by turning around and traversing back to the access road than proceeding forward to the next access road.
- (b) The Permit Holder shall not clear for temporary laydown areas.
- (c) The Permit Holder shall not stockpile cleared vegetation on any other native vegetation.
- (d) The Permit Holder is not authorised by this Permit to clear for any purposes related to the Gorgon Gas Development on Barrow Island and offshore North West Shelf (Shire of Ashburton) proposal, which was referred to the Environmental Protection Authority by ChevronTexaco Australia Pty Ltd on behalf of the Gorgon Joint Venture.

² Note: A Permit to Work Certificate issued by an Environmental Specialist does not give any authorisation not given by this Permit or allow clearing that is otherwise restricted or prohibited by this Permit.

PART III: RECORD KEEPING, REPORTING AND AUDITING

13. Geographic Information System and Environmental Sensitivity Mapping Database

- (a) The Permit Holder shall maintain an electronic geographic information system incorporating an environmental sensitivity mapping database of Barrow Island that stores and allows search and recovery of spatial environmental information in data layers which will include a visual representation overlaid on an electronic map of:
- (i) vegetation distribution (areal extent) of each vegetation type as set out in **Annexure 1**;
 - (ii) *previously disturbed areas*;
 - (iii) areas cleared that, at the date of issue of this Permit are not *previously disturbed*, and the method by which they were cleared;
 - (iv) landform, geomorphology (including caves) and topography;
 - (v) all recorded sites of *significant or unique fauna habitat*;
 - (vi) all recorded sites of *rare flora* and *priority flora*;
 - (vii) all recorded sites of *significant vegetation communities* (**Annexure 3**);
 - (viii) all recorded sites of additional *significant vegetation communities* (**Annexure 4**); and
 - (ix) all vegetation types containing *recorded flora of conservation significance* (**Annexure 5**).
- (b) The Permit Holder shall update the geographic information system incorporating the environmental sensitivity database annually with the following information:
- (i) information contained in reports given by *qualified botanists* during the term of this Permit that identifies new locations of vegetation and any other features referred to in condition 13(a) above; and
 - (ii) all locations of vegetation communities identified in a *qualified botanist's report* provided during the term of this Permit which are identified in that report as suffering low regeneration rates after site disturbance.
- (c) Upon the issuing of any Permit to Work Certificate, the resulting disturbance approved under that Permit to Work Certificate shall be recorded and entered into the geographic information system incorporating the environmental sensitivity mapping database and this shall include:
- (i) the method of clearing;
 - (ii) the area cleared in square metres (e.g. for vehicle tracks, length by width of the vehicle's tracks, and for *pipelines*, the length by width of the actual pipe plus other related clearing) by each clearing method and for each purpose;
 - (iii) the *location*, extent and method of clearing any *identified* vegetation of the vegetation types listed in **Annexure 3**, **Annexure 4**, or **Annexure 5**; and
 - (iv) the *location*, extent and method of clearing any *identified* vegetation or areas of the vegetation types or areas set out in **Annexure 2**.

14. Reporting

The Permit Holder shall provide to the CEO, by 30 September of each year, a report including:

- (a) for all clearing, other than clearing under condition 1 where the vegetation has been *previously disturbed*, a record of the extent, location and method of clearing carried out under this Permit; and
- (b) for clearing under condition 2, an additional summary of the extent, location and method of this clearing by reference to vegetation or area types referred to in **Annexure 2, Annexure 3, Annexure 4 or Annexure 5** and the reasons why such clearing was required;
- (c) in relation to clearing for *pipelines*,
 - (i) the type of *pipelines* involved;
 - (ii) the *location*, extent and method of clearing in each case;
 - (iii) the *location*, extent and method of clearing of any *identified* vegetation or areas of the vegetation types or areas described in **Annexure 2, Annexure 3, Annexure 4 or Annexure 5** that were cleared;
 - (iv) the reasons why such clearing was required;
- (d) the *location*, extent and method of any clearing carried out in accordance with condition 3 (emergency);
- (e) the *location*, extent and method of any clearing occurring as a result of unplanned events or accidents such as leakages and fire;
- (f) the areal extent of each vegetation type set out in **Annexure 1**, that has been:
 - (i) cleared in that year;
 - (ii) that is remaining on Barrow Island;expressed as a percentage of the areal extent of those same vegetation types as identified in *Mattiske (1993)*;
- (g) a list of all reports provided by qualified botanists as required by this Permit in relation to Barrow Island;
- (h) the location, extent and method of any active rehabilitation carried out in relation to Barrow Island;
- (i) audit reports required under condition 16 below; and
- (j) a copy of the environmental sensitivity mapping database in an electronic form.

15. Permit holder to retain records

- (a) The Permit Holders shall retain a separate record of all documentation produced in relation to each *PWC Application* including:
- (i) the *PWC Application* and all supporting material;
 - (ii) a record of the relevant information obtained from the Environmental Sensitivity Database;
 - (iii) any reports from a *qualified botanist*;
 - (iv) documentation produced by the *Environmental Specialist* relating to the inspection, survey and assessment;
 - (v) any Permit to Work Certificate issued; and
 - (vi) a written record that the Permit to Work Certificate was issued to the person supervising the work.

16. Auditing

The Permit Holder shall conduct an audit of one new Permit to Work Certificate that has been issued in each two month period after the commencement of this Permit to determine whether the clearing carried out under the Permit to Work Certificate was in accordance with the Permit to Work Certificate and this Permit. The Permit Holder shall create a report detailing the findings of such an audit and the nature, extent and reason for any non-compliance and shall include the results of each audit in the annual report described in condition 14 above.

17. Records and reports to be made available to the CEO upon request

The Permit Holder shall, upon receipt of written request from the *CEO* or an authorised officer, make all records and reports required by this Permit, all reports of *qualified botanists* required by the permit provided to the Permit Holder during the term of this Permit and the geographical information system incorporating the environmental sensitivity mapping database available to the *CEO* for the purposes of auditing compliance with the conditions of this Permit.

PART IV: SPECIAL CONDITIONS FOR CLEARING FOR PIPELINES

18. Clearing for Pipelines Authorised

Subject to complying with Part I and Part II of these conditions, including conditions 4, 5, 6, 7, 8, 9 and 10 (vegetation disturbance assessment process) the Permit Holder may clear for the installation, replacement, maintenance and decommissioning of *pipelines* in accordance with this Part IV of this Permit.

19. Special Restrictions and Conditions on Clearing for Pipelines

- (a) The Permit Holder shall not clear more than 20 metres in width for multiple parallel *pipelines*, except in areas within 20 metres of manifolds where *pipelines* converge.
- (b) The Permit Holder shall not remove root stock when clearing native vegetation for *pipelines*, except where creating pipeline road crossings and installing pipe supports.
- (c) The Permit Holder shall not clear native vegetation by driving vehicles over *known significant vegetation communities (Annexure 3)*, *additional significant vegetation communities (Annexure 4)*, or *flora of conservation significance (Annexure 5)* when installing, replacing or decommissioning *GRE pipelines*, except where such *GRE pipelines* are of 80mm or more in diameter.
- (d) Where *GRE pipelines* are to be installed over a distance of less than 100m between two existing access tracks, the *GRE pipeline* shall be installed without using vehicles to drive along the route that that section of the pipeline will traverse, unless the pipes to be installed are 80mm or more in diameter.
- (e) The Permit Holder shall not dispose of residual pipe contents on native vegetation.
- (f) Prior to the installation of any pipeline in a location where a previous pipeline was not located in the six (6) months prior to the installation, a *qualified botanist* shall walk the proposed route for the new pipeline, having regard to the clearing guidelines set out in condition 8 of this Permit, make and document recommendations for preferred clearing methodology, preferred locations and route for any clearing and conditions or restrictions that should be imposed on the work or activity.
- (g) The *qualified botanist* shall record the location of the route on a global positioning system device.

PART V: INTERPRETATION & DEFINITIONS

20. Interpretation

The following rules of interpretation apply to this Permit:

- (a) a reference to any *written law* includes a reference to that *written law* as amended, repealed or replaced from time to time;
- (b) if a word or phrase is defined, other parts of speech and grammatical forms of that word or phrase have corresponding meanings.

21. Severance

It is the intent of these conditions that they shall operate so that, if a condition or part of a condition is beyond the *CEO's* power to impose, or is otherwise ultra vires or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the *CEO's* power to impose and are not otherwise ultra vires or invalid.

22. Inconsistency

- (a) The *EP Act* prevails to the extent of any inconsistency between its provisions and the conditions of this Permit.
- (b) Subject to condition 22(a), this Permit prevails to the extent of any inconsistency between its conditions (including its Schedules), and the provisions of any other document referred to in this Permit.

23. Definitions

The following meanings are given to terms used in this Permit:

access tracks means the tracks identified in Annexure 6 on the plan marked *BWI Road and Maintenance Track Network* attached to this Permit;

active rehabilitation means rehabilitation involving earthworks, clearing of vegetation to facilitate regeneration, erection of structures to facilitate regeneration of vegetation, applying soil conditions, seeding, planting and other similar works;

additional significant vegetation communities means vegetation types and associations on Barrow Island set out in **Annexure 4**;

Block means the blocks identified in Annexure 6 marked *BWI Road and Maintenance Track Network* attached to this Permit;

CEO means the Chief Executive Officer of the Department of Environment;

Environmental Specialist means a person who is employed by the Permit Holder and who has an environmental qualification, diploma or degree and a capability, through specific training and access to on-site reference materials, to identify flora and fauna habitat of conservation significance on Barrow Island and assess environmental impacts of the Permit Holders activities;

Environmental Technician means a person who is employed by the Permit Holder and who has a capability, through specific training and access to on-site reference materials, to identify flora and fauna habitat of conservation significance on Barrow Island and assess environmental impacts of the Permit Holders activities;

flora of conservation significance means flora described in **Annexure 5**;

GRE pipeline means a pipe or pipeline constructed of glass reinforced epoxy;

hardstand areas means a graded road, well pad or other operational area that, at the time of granting this Permit, has been cleared of all vegetation (whether or not vegetation has regrown in the area) and which is required to be maintained for the safe operation of oilfield facilities;

identified in relation to vegetation or environmental features means vegetation or environmental features that are required by this Permit to be recorded on the Permit Holder's geographic information system incorporating the environmental sensitivity mapping database;

known means that which is known, or which should reasonably be known, by the Permit Holder;

location means the location expressed and recorded using Geocentric Datum Australia 1994;

Mattiske (1993) means the vegetation types described in Flora and Vegetation of Barrow Island E.M. Mattiske & Associates November, 1993 WAP003/58/93;

pipelines means pipelines for the movement of oil, gas and water necessary for carrying out oilfield operations and operations incidental thereto and includes electrical cabling;

previously disturbed means, in relation to vegetation or an area, known to be previously cleared, driven over or otherwise impacted or interfered with by human activity;

priority flora means priority flora as identified in the Declared Rare and Priority Flora List for Western Australia as published by the Department of Conservation and Land Management from time to time;

produced water reinjection project means the replacement and upgrade of the produced formation water processing facilities at the Central Processing Facility to provide for filtration of produced formation water and its recycling into the Permit Holder's waterflood system;

PWC Application means the Permit Holder's application form for a Permit to Work Certificate for Offroad/Vegetation Disturbance;

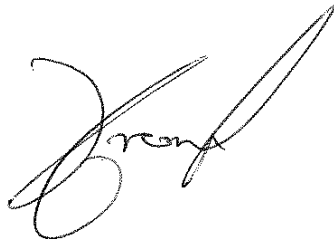
qualified botanist means a person with a botanical qualification, diploma or degree and at least 5 years prior employment regularly identifying or surveying Western Australian flora;

rare flora means flora that have been declared to be rare flora under the *Wildlife Conservation Act 1950*;

recorded means identified in *Mattiske (1993)*;

significant or unique fauna habitat means a range of habitats and refugia important to the terrestrial fauna of Barrow Island and includes termite mounds, cliffs, gorges and rock piles, boodie warrens, caves and subterranean limestone cavities, dense vegetation, particularly of the higher profile shrubs such as clumps of *Ficus* and *Melaleuca*;

significant vegetation communities means vegetation types and associations on Barrow Island set out in **Annexure 3**.



Fred Tromp
Director, Natural Resource Management, Department of Environment and Conservation.
Officer delegated under Section 20
of the Environmental Protection Act 1986

26 October 2006

ANNEXURE 1

Mattiske Vegetation Units (1993)

Annexure 1 Mattiske Vegetation Units (1993)

- C1 Coastal complex dominated by *Spinifex longifolius* on white foredunes; including Coastal Complex of *Ipomoea pes-caprae* ssp. *brasiliensis* and *Spinifex longifolius* on strand line foredunes.
- C2 Open Shrub of *Acacia coriacea* - *Rhagodia preisii* ssp. *obovata* – *Olearia dampieri* ssp. *dampieri* on elevated dunes on fringes of island.
- C3 Hummock Grassland of *Triodia pungens* with dense shrubs, including *Acacia bivenosa* on back slopes of foredunes.
- C4 Mixed Hummock Grassland of *Triodia angusta* – *Triodia pungens* with dense shrubs, including *Acacia bivenosa* on back-slopes of foredunes.
- C5 Low Mixed Shrubland of *Frankenia pauciflora* and *Hedyotis crouchiana* on exposed cliff faces around edge of island.
- C6 Hummock Grassland of *Triodia pungens* with dense pockets of *Melaleuca cardiophylla* on sandy valley systems in south-western corner of island.
- C7 Hummock Grassland of *Triodia pungens* with dense pockets of *Olearia dampieri* ssp. *dampieri* on sandy soils behind foredunes in south-western corner of island.
- D1 Mixed Hummock Grassland of *Triodia angusta* with pockets of dense shrubs along major creek lines.
- D2 Hummock Grassland of *Triodia angusta* along minor creek lines and drainage lines.
- D3 Hummock Grassland of *Triodia angusta* along minor creek lines with emergent *Santalum murrayanum*.
- F1 Hummock Grassland of *Triodia angusta* on red earth flats and drainage lines.
- F2 Hummock Grassland of *Triodia angusta* with emergent *Acacia synchronicia* on red earth flats.
- F3 Hummock Grassland of *Triodia angusta* with emergent shrubs of *Gossypium robinsonii* on red earth flats.
- F4 Hummock Grassland of *Triodia angusta* – *Triodia* spp. with emergent pockets of *Erythrina vespertilio* on flats.
- F5 Mixed Hummock Grassland of *Triodia pungens* – *Triodia angusta* on fringes of main red earth flats and drainage lines.
- F6 Hummock Grassland of *Triodia pungens* on slopes of escarpments on fringes of red earth flats.
- F7 Hummock Grassland of *Triodia pungens* – *Triodia angusta* - *Triodia wiseana* on slopes of escarpments on fringes of red earth flats.

- L1 Hummock Grassland of *Triodia wiseana* with *Ficus platypoda* var. *platypoda* on central limestone ridges.
- L2 Hummock Grassland of *Triodia wiseana* with *Ficus virens* var. *virens* on escarpments on west coast and southern edge of limestone ridges.
- L3 Hummock Grassland of *Triodia wiseana* with low mixed shrubs including *Acacia gregorii* on limestone ridges.
- L4 Hummock Grassland of *Triodia wiseana* with dense emergent shrubs of *Acacia pyrifolia*, *Acacia gregorii* and *Petalostylis labicheoides* on limestone ridges.
- L5 Hummock Grassland of *Triodia wiseana* with emergent *Hakea suberea* on limestone ridges.
- L6 Hummock Grassland of *Triodia wiseana* with emergent *Grevillea pyramidalis* on limestone ridges.
- L7 Hummock Grassland of *Triodia wiseana* with dense pockets of *Melaleuca cardiophylla* on limestone ridges.
- L8 Hummock Grassland of *Triodia wiseana* with pockets of *Eucalyptus patellaris* on limestone ridges.
- L9 Hummock Grassland of *Triodia wiseana* – *Triodia angusta* with emergent *Sarcostemma viminali* ssp. *australe* and *Ficus platypoda* var. *platypoda* on coastal limestone flats and low ridges with localised pockets of *Frankenia pauciflora*.
- L10 Hummock Grassland of *Triodia pungens* – *Triodia angusta* with emergent *Hakea suberea* on exposed small limestone hills on southern coastal area.
- M1 Aquatic complex supporting stands of *Avicennia marina* and *Ruppia maritima* on the fringes of the island.
- S1 Mixed Herbfield and Grassland of *Eragrostis xerophila*, *Eriachne flaccida* and *Sporobolus virginicus* on clay pans.
- S2 Mixed Herbfields with *Streptoglossa bubakii* and *Pterocaulon sphacelatum* on fringes of tidal Halophytic areas and flood channels on clay soils near coast.
- T1 Halophytic Complex dominated by *Halosarcia halocnemoides* and *Halosarcia indica* on tidal flats.
- T2 Mixed Chenopod and Halophytic Complex with low *Frankenia pauciflora* shrubs on high tide areas usually associated with stands of *Avicennia marina*.
- V1 Hummock Grassland of *Triodia wiseana* with mixed emergent shrub species on valley slopes.
- V2 Hummock Grassland of *Triodia wiseana* with *Pentapeltis trichodesmoides* on southern escarpment.

ANNEXURE 2

Environmental Criteria for GIS Modelling of Priority Areas for Barrow Island

**Annexure 2 Environmental Criteria for GIS Modelling
of Priority Areas for Barrow Island**

Criterion	P1 Exclusion Zone	P2 High Impact	P3 Moderate Impact	P4 Low Impact Vegetation
Vegetation Distribution, regenerative abilities and landform stability	Vegetation described in Annexures 3, 4 and 5 of this Permit, containing floristic components of particular vulnerability and/or with high sensitivity to disturbance (eg coastal dunes)	Vegetation described in Annexures 3, 4 and 5 of this Permit with lower sensitivity to disturbance, or where important floristic components are highly visible, widely distributed vegetation types containing components with particular importance to fauna and/or low ability to regenerate (eg Melaleuca)	Widely distributed vegetation not being vegetation described in Annexures 3, 4 and 5 of this Permit.	Very widely distributed vegetation or widely distributed vegetation and with high regeneration capacity, not being vegetation described in Annexures 3, 4 and 5 of this Permit.
Fauna Habitat and fauna susceptibility to impacts	Area immediately surrounding important habitat to protected fauna sensitive to disturbance, including Bettong warren polygon +100m Bettong warren point +150m Brahminy kite nest +50m Sea-eagle/Osprey nests + 70m Stygofauna in caves/sinkholes +100m			
Heritage Sites	Areas immediately			

	surrounding important heritage sites: Anthropological sites +100m Fossil sites +100m			
Landform Susceptibility to impacts	Areas at elevated risk from indirect impacts (leaks/spills); Caves, fissures soak wells +100m			

ANNEXURE 3

Significant vegetation communities on Barrow Island

Annexure 3 Significant vegetation communities on Barrow Island

- C4 Mixed Hummock Grassland of *Triodia angusta* – *Triodia pungens* with dense shrubs, including *Acacia bivenosa* on back-slopes of foredunes.
- C5 Low Mixed Shrubland of *Frankenia pauciflora* and *Hedyotis crouchiana* on exposed cliff faces around edge of island.
- C6 Hummock Grassland of *Triodia pungens* with dense pockets of *Melaleuca cardiophylla* on sandy valley systems in south-western corner of island.
- C7 Hummock Grassland of *Triodia pungens* with dense pockets of *Olearia dampieri* ssp. *dampieri* on sandy soils behind foredunes in south-western corner of island.
- D1 Mixed Hummock Grassland of *Triodia angusta* with pockets of dense shrubs along major creek lines.
- D3 Hummock Grassland of *Triodia angusta* along minor creek lines with emergent *Santalum murrayanum*.
- F2 Hummock Grassland of *Triodia angusta* with emergent *Acacia synchronicia* on red earth flats.
- F3 Hummock Grassland of *Triodia angusta* with emergent shrubs of *Gossypium robinsonii* on red earth flats.
- F4 Hummock Grassland of *Triodia angusta* – *Triodia* spp. with emergent pockets of *Erythrina vespertilio* on flats.
- F6 Hummock Grassland of *Triodia pungens* on slopes of escarpments on fringes of red earth flats.
- L2 Hummock Grassland of *Triodia wiseana* with *Ficus virens* var. *virens* on escarpments on west coast and southern edge of limestone ridges.
- L5 Hummock Grassland of *Triodia wiseana* with emergent *Hakea suberea* on limestone ridges.
- L6 Hummock Grassland of *Triodia wiseana* with emergent *Grevillea pyramidalis* on limestone ridges.
- L8 Hummock Grassland of *Triodia wiseana* with pockets of *Eucalyptus patellaris* on limestone ridges.
- L10 Hummock Grassland of *Triodia pungens* – *Triodia angusta* with emergent *Hakea suberea* on exposed small limestone hills on southern coastal area.
- M1 Aquatic complex supporting stands of *Avicennia marina* and *Ruppia maritima* on the fringes of the island.

- S2 Mixed Herbfields with *Streptoglossa bubakii* and *Pterocaulon sphacelatum* on fringes of tidal Halophytic areas and flood channels on clay soils near coast.
- T1 Halophytic Complex dominated by *Halosarcia halocnemoides* and *Halosarcia indica* on tidal flats.
- T2 Mixed Chenopod and Halophytic Complex with low *Frankenia pauciflora* shrubs on high tide areas usually associated with stands of *Avicennia marina*.
- V2 Hummock Grassland of *Triodia wiseana* with *Pentapeltis trichodesmoides* on southern escarpment.

ANNEXURE 4

Additional significant vegetation communities on Barrow Island

Annexure 4 Additional significant vegetation communities on Barrow Island

Vegetation descriptions follow Mattiske 1993 and more recently described by Long 2001, 2002

- L7b Open Low Shrubland (2-10%; 0.5-1m) of *Melaleuca cardiophylla* over Dwarf Shrubland (10-30%; -0.5m) of *Acacia gregorii* and *Scaevola cunninghamii* over Hummock Grassland (30-70%) of *Triodia wiseana*.
- L11 Dwarf to semi-prostrate *Acacia bivenosa* (glabrous or pruinose) Shrubland (10-30%) to Heath (30-40%; 0-0.5m) over Closed Hummock Grassland (70-100%) of *Triodia wiseana* with scattered <2% *Petalostylis labicheoides*/*Stylobasium spathulatum*. Occurs on limestone valley or hill slopes.

A small community (not mapped individually) of *Scaevola aff. spinescens* with *Capparis spinosa* located near "B" Block, GPS 50K 0331748 7694946.

ANNEXURE 5

Flora of conservation significance on Barrow Island

Annexure 5 Flora of conservation significance on Barrow Island

**As per Mattiske & Associates (1993) 'State of knowledge on vegetation, Barrow Island,'
report prepared for West Australian Petroleum Pty Ltd, Perth.**

Abutilon otocarpum

Acacia cowleana

Acacia inaequilatera (dwarf form)

Acacia synchronicia

Cassutha capillaris

Cullen patens

Dicanthium sericeum subsp. *humilius*

Dysphania kalpari

Erythrina vespertilio

Eucalyptus xerothermica ms

Euphorbia sp.A

Ficus opposita var. *aculeata*

Ficus virens var. *virens*

Gossypium australe

Grevillea pyramidalis var. *leucadendron*

Hakea lorea subsp. *lorea* (ex *suberea*)

Halosarcia indica subsp. *julacea*

Hibiscus sturtii var. *platychlamys*

Hybanthus aurantiacus

Isotropis atropurpurea

Mallotus dispersus

Melaleuca cardiophylla

Santalum murrayanum

Sida micracantha

Sporobolus mitchelli

Stemodia glabella

Whitechloa airoides

As per Chevron Texaco (2004) Environment Plan. Barrow Island Oilfield Production Flowlines Replacement Project. Report No. C04329 Rev. A.

Dolichandrone heterophylla

Clerodendrum tomentosum var. *lanceolatum*

Jasminum calcarium

All species identified in a *qualified botanist's* report required by this Permit as suffering low regeneration rates after site disturbance influenced by soil availability, type of soil available, rainfall, exposure of disturbed area, presence of naturally invasive species in the surrounding area and whether the area has been cleared, bladed, crushed or compacted.

ANNEXURE 6

BWI Road and Maintenance Track Network



BWI Road and Maintenance Track Network

