Protecting the marine environment — A guide for the petroleum industry
(update of Bulletin 679)

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Summary

Aims of this bulletin

This bulletin aims to:

- delineate Western Australian marine environments sensitive to oil pollution;
- present a planning strategy to protect these environments from oil pollution;
- outline the environmental assessment process that applies to offshore petroleum exploration or production proposals in sensitive marine environments;
- outline environmental management conditions likely to be attached to approvals of proposals;
- discuss the administrative process involved in oilspill response planning; and
- present general guidelines for the use of oil spill dispersants.

This document is a revised version of Bulletin 679, which was published as a discussion paper in April 1993. Bulletin 679 replaced Bulletin 104, published by the former Department of Conservation and Environment in 1984. This version of bulletin 679 has been revised to be consistent with Government's policy document *New horizons in marine management* released in November 1994. It also incorporates information from the APEA-sponsored independent scientific review of the environmental implications of offshore oil and gas development in Australia (XXXXX), and the report of the marine parks and reserves selection working group.(XXXXX). The objective of this revised bulletin is to use this improved information to achieve more efficient handling of proposals while increasing realistic levels of protection for sensitive marine environments.

Many of the concepts and principles discussed in this bulletin, although developed for the petroleum industry, are applicable to other types of marine activities.

This bulletin incorporates points raised in submissions on the Bulletin 679 discussion paper. The main issues raised in submissions relate to nomenclature of the zones, the purpose of the notification zone, access to marine parks and reserves, interaction with Government agencies during oilspill response, risks from shipping, and impacts from seismic surveys. They are summarised in Section 1.3 and detailed in Appendix D.

As in Bulletin 104, sensitive marine environments have been delineated by using a system based on the following criteria: areas of international, national, or State conservation/ecological significance; areas of high recreational use and attractiveness or of special educational and scientific interest; areas important for Aboriginal fisheries; and areas important for commercial or recreational fisheries.

The former system of offshore zones to protect sensitive marine environments has been simplified. There are now only three zones:

(1) Marine Nature Reserve or Marine Park;

(2) Environmentally Significant Area (ESA); and

(3) Notification zone.

Beyond the Notification zone are the open waters, which attract no special consideration.

The Environmental Protection Authority assesses proposals to ensure that sensitive marine environments are protected. The EPA's position on referral and assessment of petroleum proposals is:

- Seismic survey proposals which are within Marine Nature Reserves, Marine Parks or ESAs are required to be referred to the EPA either by the proponent or the Department of Minerals and Energy. Seismic proposals not in Marine Nature Reserves or Marine Parks will not normally need to be assessed unless located in particularly sensitive parts of the marine environment such as intertidal zones and coral reefs, in an important breeding area during the breeding season, or close to migrating whales. Seismic proposals would not normally require formal assessment.

- Exploration drilling proposals within Marine Parks, ESAs and the Notification zone are required to be referred to the EPA either by the proponent or the Department of Minerals and Energy. Drilling within all these zones except the Notification zone would normally require formal assessment (ie the preparation of an environmental impact assessment document for public review and submissions to assist the EPA in its assessment of the proposal).

- All development and production proposals are to be referred either by the proponent or the Department of Minerals and Energy and would require formal assessment.

A high level of environmental information has accrued in some areas as a result of earlier formal assessment of similar petroleum exploration proposals. In the Notification Zone or Environmentally Significant Areas the EPA may decide that further formal assessment of a subsequent proposal is unnecessary provided that the proponent accepted appropriate statutory environmental conditions and that the Department of Minerals and Energy imposed them under its legislation. Environmental information on the proposal would still need to be made available to all interested parties.

Environmental conditions likely to be applied to proposals recommended for approval would vary, depending on the kind of activity proposed, distance from sensitive marine environments and timing. They are discussed in Section 4 and presented in Appendix D.

The report discusses possible sources of marine oil spills that could affect Western Australia and the likelihood of their occurrence. The organisations responsible for decision making to combat a spill, and their interaction, are outlined.

The report discusses the Department's preferred response options to oil spills, which are to:

(1) contain and remove the oil wherever possible;

(2) if containment is not possible:
    - do nothing if the oil is moving away from sensitive marine environments;
    - where the oil is heading towards a particularly sensitive marine environment apply dispersant as soon as practicable, away from shore and in waters deeper than 20 metres ;
    - allow oil to beach if there is more harm likely to result from the use of dispersant in a sensitive environment. A decision would then need to be made on whether to physically remove the beached oil or to let it degrade naturally.

1. Introduction

1.1. Objectives

This report aims to:

- delineate sensitive parts of the marine environment;
- present a planning strategy to facilitate protection of sensitive parts of the marine environment, particularly from oil pollution;
- outline the environmental assessment process that applies to offshore petroleum exploration or production proposals in sensitive marine environments;
- outline environmental management conditions likely to be attached to approvals of proposals;
- discuss the administrative process involved in oilspill response planning; and
- present general guidelines for the use of dispersants.

The presentation of this material is not intended to be exhaustive and readers should refer to other documents for more thorough descriptions of particular technical aspects.

1.2. Historical context

This document is a revised version of Bulletin 679, the discussion paper which evolved from Bulletin 104, published by the Department of Conservation and Environment (now the

Department of Environmental Protection or DEP[#]) in 1984[1]. Bulletin 104 in turn was a revised version of a still earlier document, Bulletin 71.[2] Bulletin 104 listed 67 environmentally significant areas around the Western Australian coast and described procedures adopted in WA to prevent or minimise damage to the marine environment by oil spilt from shipping, petroleum exploration/production activities and other sources.

Over the past several years it became apparent that parts of Bulletin 104 are out of date. There is now more knowledge and experience of the behaviour of oil spills and of the means of protecting sensitive areas in Western Australian waters from oil spills. Environmental protection and assessment procedures have evolved to deal more effectively and efficiently with the increased offshore petroleum activity. As well, there are improvements in the understanding of Western Australia's coastal and offshore environmental features which have necessitated revisions to the previously published maps. This bulletin revises these issues, simplifies the zoning concept and hence supersedes Bulletin 104. Further information on the evolution of this bulletin from Bulletin 104 is included as Appendices A and B.

During the revision of this document close liaison has been maintained with the Marine Park Selection Working Group, co-ordinated by the Department of Conservation and Land Management. The task of that group has been to provide scientific advice to identify areas with potential for reservation as part of a system of Marine Parks and Marine Nature Reserves representative of the environments in Western Australian State waters. The report of the Marine Parks Selection Working Group was completed in 1994.

The oil industry and its consultants have contributed significantly to the environmental inventory of the North West Shelf area and are to be commended for their responsiveness to increasing public environmental awareness which has occurred over the past few years. The findings of the independent scientific review into the environmental implications of offshore oil and gas development in Australia were published in March 1994[3] and this report makes reference to some of its work where it is useful to a fuller understanding of impacts on the environment.

The Environmental Protection Authority recognises that non-petroleum activities such as trawling, tourism, mariculture, marine mining and some shore-based developments can have significant impacts on marine environments. Bulletins for such non-petroleum activities may be developed later. Meanwhile, this bulletin may also be used as a general guide for such activities.

1.3. Main issues raised in submissions on the first version of Bulletin 679

The first version of Bulletin 679 was released as a discussion paper for public comment in April 1993 and was open to comment for two months. During that period a public discussion day was held at the Department's offices.

The issues arising out of the paper and the discussion are detailed in Appendix D. Some of the main points are mentioned here.

• **ZONING**: *the role of the various zones and the terminology used to describe them are a source of some confusion. The maps of the ESA's should be at a more user-friendly scale.* Both Bulletin 679 and this one attempt to simplify the former system of zoning in Bulletin 104, which had six different zones, by substituting three in their place. The maps of the ESA's have been reproduced by the Department of Minerals and Energy at a larger scale on its graticular system and these will be used to determine where a proposal falls with respect to the ESA's.

• **ZONE**: *what is its significance in terms of permitted activities and what is the justification for the width of 30km? (some believe it is too wide, others that it is not wide enough). What are the implications of extending the notification zone beyond State waters?*

[#] Formerly known as the Environmental Protection Authority, the Department is the Government sector whilst the EPA is now the separate 5 person board, the Chair of which is appointed by the Governor

Although not restricting petroleum activities the Notification Zone serves to flag the ESA's within. Whilst this may have implications for some oilspill contingency management plans for proposals with the potential to impact the ESA the fact that the Notification Zone extends beyond the State boundary presents no problem. The width of 30km is defensible as the maximum distance an oil slick would be likely to move in a 24 hour period under the influence of a steady wind of 35km/h. This is 20km less than the cumulative size of the equivalent three zones in Bulletin 104 which were replaced in Bulletin 679 and this Bulletin by the Notification Zone. Creating a Notification Zone with a standard width was seen as a simpler alternative to attempting, in the absence of sufficiently detailed data, to tailor a specific width Notification Zone to each proposal. This tailored width would also vary depending on the season because of the change in the prevailing wind patterns.

• **MARINE PARKS**: *concern about "presumption against" activities in existing parks. Many saw a better alternative in creating multiple use areas in marine reserves, with only "core areas" being prima facie exclusion zones. Conservation groups recommended against allowing preliminary exploration activities where subsequent production would not be permitted.*

The Government has now released its policy on access into marine parks and reserves. This bulletin has been revised in line with Government's policy.

• **INTERACTIONS BETWEEN AGENCIES FOR OILSPILL RESPONSE**: *these , together with the specific need to address the use of dispersants, need to be clarified.*

These matters have been addressed in this bulletin in Sections 6 and 7.

• **SHIPPING**: *the main threat was seen as accidents from shipping.*

This matter is being addressed at the national and international levels by an ANZECC task force and is beyond the scope of this document.

• **IMPACTS FROM SEISMIC SURVEYS**: *earlier data are inconclusive; what do the APEA studies reveal? Until proven conclusively benign, surveys should be excluded from shallow prawn nurseries and during peak spawning times.*

The APEA review includes an exhaustive review of the effects of seismic surveys on marine animals. Major conclusions are in table 2. EPA policy on assessment of seismic survey proposals is given in section 4.1a.

2. Resource maps and delineation of sensitive marine environments

For the purpose of this bulletin the marine area of Western Australia includes all State coastal waters up to the limit of the highest tides. At a broad scale, the marine and coastal resources of Western Australia have been identified and sensitive marine environments defined. (Table 9.4 in the APEA Independent Scientific Review[3] also provides a summary of the character and environmental sensitivity to oilspills of Australia's offshore sedimentary basins)

In this bulletin Sensitive Marine Environments are marine or intertidal areas which have been classified according to the five broad criteria outlined below, any one of which is sufficient for an area to be classified as sensitive. These criteria are used as a guide rather than as an exhaustive list or a mandate for designation of an area as a Sensitive Marine Environment:

(I) Environments of international ecological / conservation significance

-internationally recognised protected areas such as World Heritage areas, Biosphere reserves, Ramsar wetlands and areas of significance for the conservation of internationally protected species;

(N) Environments of national or State ecological / conservation significance

-includes major coral / limestone reef, seagrass and mangrove ecosystems, as well as marine nature reserves, marine parks, aquatic reserves and may include the marine components of national parks and nature reserves.

(E) Environments where the biological resources are of major economic significance

- includes major commercial fisheries, important identified nursery areas for commercial species, mariculture leases.

(C) Environments of major cultural significance

- includes environments of major recreational and/or historical value, scenic beauty and areas known to be important to Aboriginal people; and

(S) Environments of major scientific and educational significance

- for example, Abrolhos Islands (major scientific significance) and / or areas of educational value close to major population centres.

Sensitive Marine Environments (SME's) encompass Marine Parks and Marine Nature Reserves, which have been given special administrative status for environmental protection, and Environmentally Significant Areas (ESA's), which do not have any administrative status at present (Figure 1). The SME's are listed in Appendix B and shown in Figures 2 and 3. They will be depicted in greater detail on 1:1,000,000 maps, to be printed and made available from the Department of Minerals and Energy. Detailed information will also be available in the coastal resource atlas being developed by the Department of Transport.

Comments on the most sensitive times for specific locations have been included. For example, coral and rock lobster spawning periods, whale and turtle breeding or sea bird nesting times, seasonal influxes of migratory wading birds or peak times for use of a bathing beach.

In addition to the environmental resources, details of hydrological, meteorological and coastline characteristics can be considered with the map during an oil spill to assist in assessing where, on the basis of current knowledge, dispersant application will be recommended or discouraged (see Section 7).

3. Protection of sensitive marine environments

The system of protection of sensitive marine environments described in Bulletin 104 has been revised and simplified to three zones, with open waters beyond:

- MARINE PARK and MARINE NATURE RESERVE;
- ENVIRONMENTALLY SIGNIFICANT AREA (ESA).

The above two zones are sensitive marine environments and are less likely to be affected from oilspills due to a third zone:

- NOTIFICATION ZONE.

The zoning in Bulletin 104 has been simplified by substituting one 30km wide notification zone for the three former divisions (Special Condition Zones-inner and outer zones-and the Immediate Protection Zone, total width 50km). The reduction of the notification zone from 50km to 30km does not mean that sensitive marine environments will be less protected than before. Improved understanding of oilspill dispersion under local conditions has shown that 30km is the maximum distance oil is likely to move in 24 hours. The rationale for the revised width of 30km is discussed in Section 3.3.

The highest protection goes to Marine Nature Reserves and Marine Parks, followed by ESA's and lastly the Notification zone. (There is nothing in the Notification zone that merits special protection; it is there to protect the more vulnerable parts of the environment delineated by ESA's, Marine Parks or Marine Nature Reserves). Waters outside these areas are known as Open Waters and attract no additional protection.

Figure 1 sets out the relationship of each of these zones to each other and their environmental sensitivity versus levels of special protection by virtue of the area's tenure and purpose under the Land Act (1933).

3.1. Marine nature reserves and marine parks

The Marine Park and Marine Nature Reserve system is being established in Western Australia largely by the concept of 'representative reserves', rather than 'whole-of-region' reserves. This will help reduce the potential for conflict with ocean users such as the petroleum industry, because the reserve size will generally be smaller. As a result, many sensitive marine environments which still have significant conservation, recreation, or fishery resource value will not have the protection of Marine Park or Marine Nature Reserve status. Instead they will be included in ESA's, where case-by-case evaluation of proposals and strict operating conditions will be required to protect the environment.

Areas known as Marine Nature Reserves and Marine Parks comprise existing and proposed* Marine Nature Reserves and Marine Parks. They are vested in the National Parks and Nature Conservation Authority (NP&NCA) and managed by the Department of Conservation and Land Management (CALM). Marine Nature Reserves are for: (a) conservation or restoration of the natural environment, (b) protection, care and study of the indigenous flora and fauna and (c) the preservation of any feature of archaeological, historical or scientific interest. Marine Parks have been established for any one or more of the criteria for Marine Nature Reserves, as well as for public recreation. Other activities consistent with park status, such as commercial fishing, have sometimes been permitted.

3.2. Environmentally significant areas (ESA's)

ESA's contain marine or near-coastal resources which are potentially sensitive to impacts from petroleum activities but which have not been given the statutory standing of marine parks or marine nature reserves. The purpose of these is to identify sensitive marine environments other than Marine Parks and Marine Nature Reserves to assist in decision making for the management and maintenance of their environmental qualities.

An ESA's boundaries are generally ecological. The boundaries may be determined by a Marine Park or Marine Nature Reserve contained within it to provide sympathetic management to maintain the ecological integrity of the Marine Park or Marine Nature Reserve (see Figure 1).

The Government policy document *New horizons in marine management* proposes a new category of marine protected area be established to be known as a "marine management area". These areas will be selected primarily on the basis of their biological and recreational values but will recognise their potential for supporting commercial activities such as petroleum production and commercial fishing - subject to environmental impact assessments referable under the Environmental Protection Act. Another Government initiative is to create "fish habitat protection areas" under the Fish Resources Management Act to protect habitats important as fish feeding, spawning or nursery areas. For the purposes of this bulletin, both marine management areas and fish habitat protection areas are considered to be equivalent to ESAs.

3.3. NOTIFICATION ZONE

The Notification zone is primarily designed to protect sensitive marine environments from oil spills by allowing time to manage a drifting oil spill before it reaches the sensitive marine environment.

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* Proposed to and endorsed by Cabinet

The size of the Notification zone is determined by the worst case scenario for potential drift of an oil spill over the first 24 hours. This period is the most critical, especially f[1]or the light crude oils typical of the North West Shelf. This is because most of the toxic fraction will evaporate or degrade to less toxic substances within 24 hours after a spill.

The width of the Notification zone is calculated as the distance an oil spill would move in 24 hours under a continuous wind of 35km/h (~19 knots). A 35km/h wind is held to be the critical wind speed which maximises the rate of oil drift for a given state of degradation of the spill. Up to this speed, winds increase the drift of a spill more than they contribute to its degradation. Above this speed, white-capping becomes significant. This greatly enhances mixing of the oil film with water, augments exposure of the oil to air, and leads to a three to five-fold increase in the rate of degradation of the oil. A rate of drift of oil of 3.5% of the wind speed is assumed on the basis of observations in the field. The Notification zone's width can thus be calculated as: 3.5% x 35km/hour x 24 hours = 29.4 km (rounded to 30km) or 19 miles.

The Notification zone often extends beyond State waters. The State will continue to work cooperatively with the Commonwealth to ensure sensitive marine environments will remain protected. Open Waters outside Marine Parks/Marine Nature Reserves, ESA's and their Notification zone retain the current protection under existing legislation and administrative procedures.

3.4. Seasonal sensitivity

The sensitivity of an environment may be seasonally dependent (for example turtle breeding beaches, times of coral spawning, commercial fish and prawn spawning areas, whale migration routes and mating/calving areas). A summary of seasonal sensitivities is given in Appendix C. More detailed information will be included in the coastal resources atlas being developed by the Department of Transport.

4. Referral and environmental assessment of proposals

Environmental damage may result from:

- more or less continuous low-level (chronic) pollutant inputs (such as from process or sewage outfalls);
- episodic pollutant discharge (oil and/or chemical spills, siltation),
- noise or artificial lights (which may disturb marine animals or disrupt their breeding); or,
- an increase in human recreational activities.

In determining the level of assessment for a proposal, the EPA takes into account both the type of activity proposed and the environmental sensitivity of the area. This is summarised in Table 1 below. Table 1 is based on previous EPA assessments of proposals published in Bulletins 504, 581, 582 and 654.

Note: The report of the Marine Parks and Reserves Selection Working Group (the 'Wilson report') was released in June 1994 and identifies a number of areas as possible future marine reserves. The EPA will not use this report for determining levels of assessment for proposals, but will use information in the report to assist in assessing possible impacts of proposals.

1

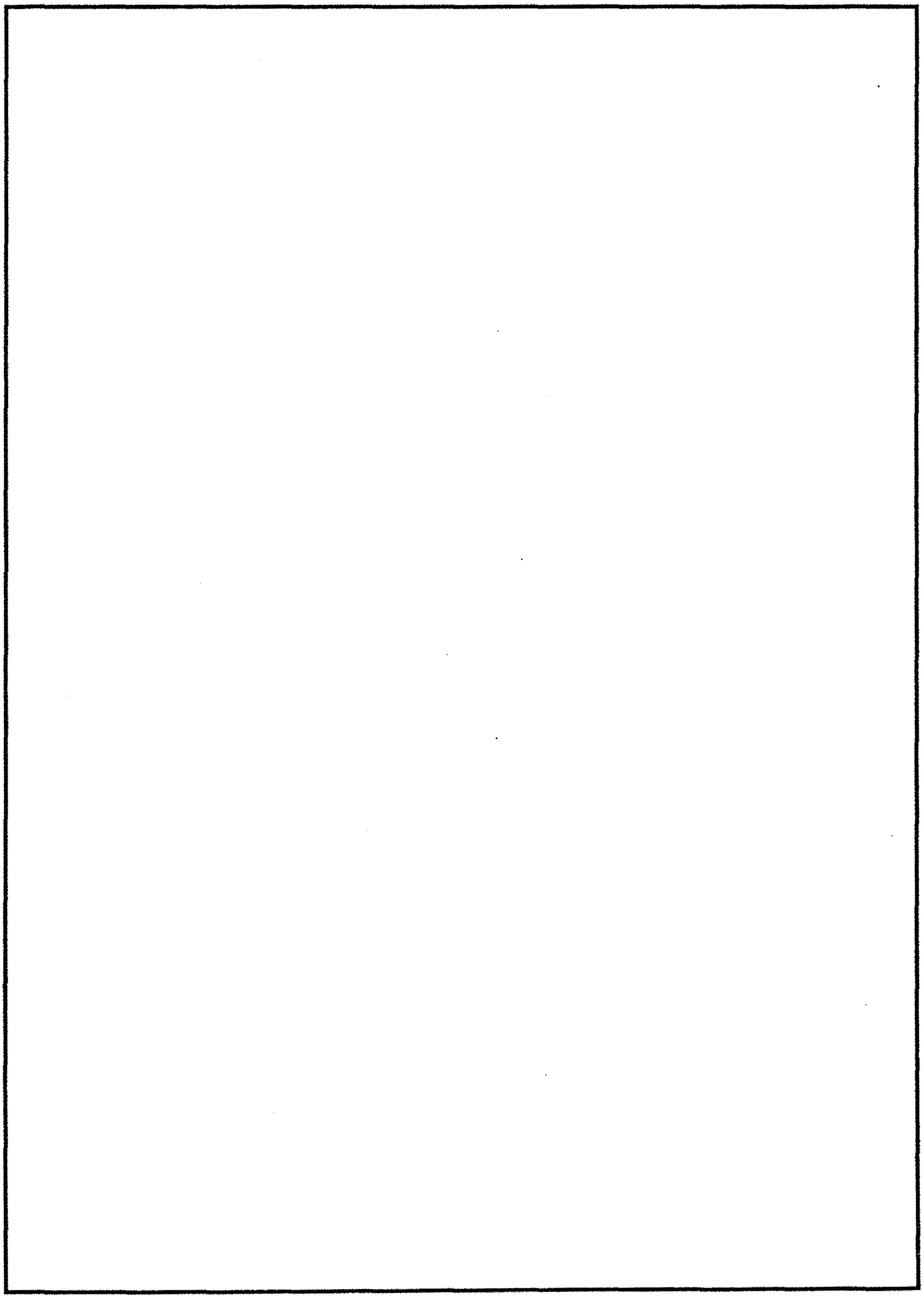

Figure 1: Arrangement and sensitivity of marine protection zones in WA

DRAFT

FIGURE 1
SENSITIVE MARINE ENVIRONMENTS OF WESTERN AUSTRALIA

(INCLUDES AREAS RECOMMENDED FOR RESERVATION IN THE REPORT OF THE MARINE PARKS AND RESERVES SELECTION WORKING GROUP - JUNE 1994)

114° 117° 120° 123° 126° 129°

13° 16° 19° 22° 25° 28° 31° 34°

50 0 100 200 300 400
KILOMETRES

ALBERS EQUAL AREA PROJECTION

DEPARTMENT OF MINERALS AND ENERGY WESTERN AUSTRALIA

Department of Environmental Protection

Compiled and produced by the Land Access Unit,
Department of Minerals and Energy (WA).
Data supplied by the Department of Environmental Protection (WA)

This map has been compiled from various data sources received from a number of agencies. No responsibility is accepted for any error or omission.

SEPTEMBER 1995

N

Humpback whales breed along the coast of NW Australia in winter months. Seismic surveys in enclosed bays such as Exmouth Gulf, Shark Bay or Admiralty Gulf at this time may be very disruptive Seismic surveys may be audible underwater up to 10 km off the NW coast. (Reference APEA Review)

(1) CAMBRIDGE GULF I.N.P.C.
(2a) CAPE LONDONDERRY AREA (N.F.C.)
(2b) ADMIRALITY GULF AND LONG REEF N.C.
(2c) CAPE VOLTAIRE TO KURI BAY / CHAMPAGNE ISLAND (I.N.F.C.S.)
(2d) KURI BAY TO KOOLAN ISLAND (N.F.C.S.)
(2e) BUCCANEER ARCHIPELAGO (N.F.C.)
(3) BROWSE ISLAND AND SURROUNDING REEFS (N)
(4a) SANDY ISLET-SCOTT REEF (N)
(4b) (SERINGAPATAM REEF (N)
(5) ADELE ISLAND AND SURROUNDING REEFS (N)
(6) CAPE LEVEQUE TO LOW SANDY POINT (N.C.)
(7) LACEPEDE ISLANDS AND IMMEDIATE SURROUNDING REEFS (N)
(8a) ROWLEY SHOALS (I.N.F.C.)
(8b) MERMAID REEF NATIONAL NATURE RESERVE I.N.C.S.
(9a) BROOME (N.C.S.)
(9b) ROEBUCK BAY (I.N.F.C.)
(10) CAPE VILLARET OFFSHORE AREA (F)
(11) LAGRANGE BAY (N.C.)
(12) CAPE MISSIESSY PEARL OYSTER GROUNDS (F)
(13) EIGHTY MILE BEACH AND CAPE KERAUDREN (I.N.C.)
(14) BEDOUT ISLAND (N)
(15) BREAKER INLET (N.C.)
(16) NORTH TURTLE ISLAND (N)
(17) LITTLE TURTLE ISLAND (N)
(18) PORT HEDLAND WEST (N.C.)
(19) CAPE THOUIN TO POINT SAMSON (N.F.C.)
(20) NICKOL BAY FORESHORE (N.C.)
(21a) DAMPIER ARCHIPELAGO (I.N.F.C.S.)
(21b) MONTE BELLO ISLANDS, LOWENDAL ISLANDS AND BARROW ISLAND SHELF (N.E.C.)
(21c) ROWLEY SHELF (I.N.F.C.)
(21d) EXMOUTH GULF (I.N.F.C.)
(22a) NINGALOO MARINE PARK AND CORAL REEF SYSTEM SOUTH TO RED BLUFF (I.N.F.C.S.)
(22B) NINGALOO MARINE PARK (COMMONWEALTH WATERS) (I.N.F.C.S.)
(23) SHARK BAY WORLD HERITAGE AREA AND SHARK BAY MARINE PARK (I.N.F.C.S.)
HAMELIN POOL MARINE NATURE RESERVE (I.N.S.)
(24) KALBARRI (E.C.)
(25) HOUTMAN-ABROLHOS ISLANDS (I.N.F.C.S.)
(26a) SEVEN MILE BEACH TO PORT KENNEDY (N.F.C.S.)
(26b) METROPOLITAN BEACHES AND REEFS (N.F.C.S.)
MARMION MARINE PARK (N.C.S.)
(26c) ROTTNEST ISLAND AQUATIC RESERVE (N.F.C.S.)
(26d) SWAN AND CANNING RIVER ESTUARIES (N.F.C.)
(26e) COCKBURN SOUND (N.F.C.S.)
(26f) SHOALWATER BAY AND WARNBRO SOUND (N.F.C.)
SHOALWATER ISLANDS MARINE PARK (N.C.S.)
(27) PEEL-HARVEY INLET (I.N.F.C.)
(28) LESCHENAULTE INLET (N.F.C.)
(29) GEOGRAPHE BAY (F.C.)
(30) LEEUWIN-NATURALISTE COAST (N.C.)
(31) BLACKWOOD RIVER ESTUARY (F.C.)
BLACK POINT (S.)
(32) WINDY HARBOUR (N.C.)
WARREN BEACH (S.)
(33) BROKE INLET (N.C.)
(34) NORNALUP INLET (N.C.)
(35) IRWIN INLET AND PEACEFUL BAY (C.)
(36) WILSON INLET (F.C.)
117° WEST CAPE HOWE
(37) KING GEORGE SOUND (N.F.C.S.)
(38) TWO PEOPLE BAY (N.S.)
(39) HASSELL BEACH (F.C.)
(40) BEAUFORT INLET (F.C.)
(41) BREMER BAY (C.)
(42) FITZGERALD RIVER NATIONAL PARK COASTLINE (I.N.C.)
(43) HOPETOUN (C.)
(44) THE RECHERCHE ARCHIPELAGO AND ESPERANCE (N.F.C.)
(45) TWILIGHT COVE (N.S.)

NOTE : MORE DETAILED INFORMATION IS AVAILABLE IN THE WA COASTAL RESOURCE ATLAS

Southern right whales breed in winter months along southern coast and may be disturbed by seismic survey noise at this time. Seismic survey sounds may be audible under water at distances up to 100 km in the Southern Ocean. (Reference APEA Review)

Legend

- State marine parks
- State marine nature reserves
- Commonwealth marine parks / nature reserves
- Environmentally sensitive areas

(I) International conservation significance
(N) National or State conservation significance
(F) Commercial fisheries or mariculture significance
(C) Cultural or recreational significance (includes areas important for Aboriginal subsistance fisheries)
(S) Scientific or educational significance

NORTHERN TERRITORY

SOUTH AUSTRALIA

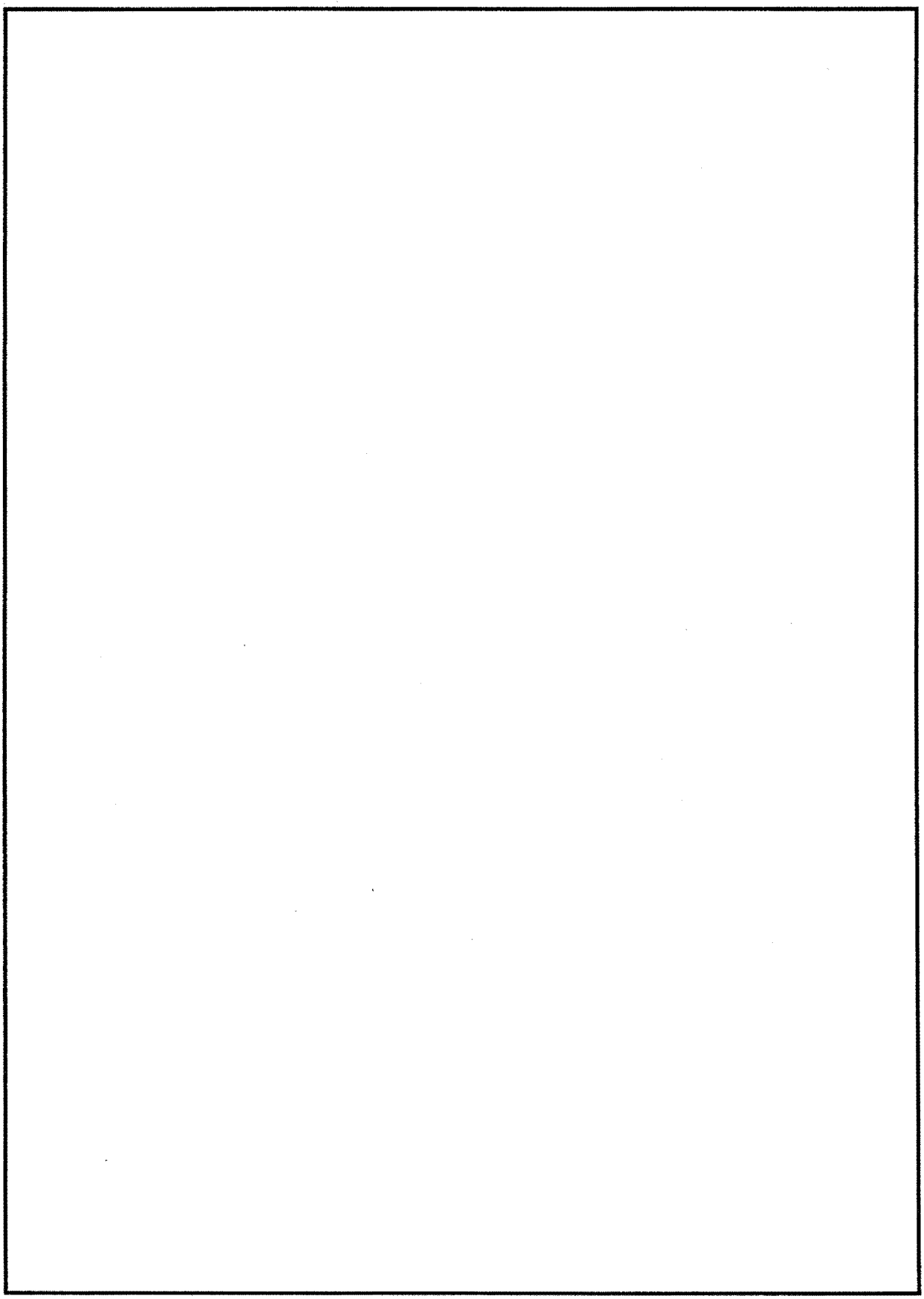

Figure 2 Sensitive marine environments of Western Australia

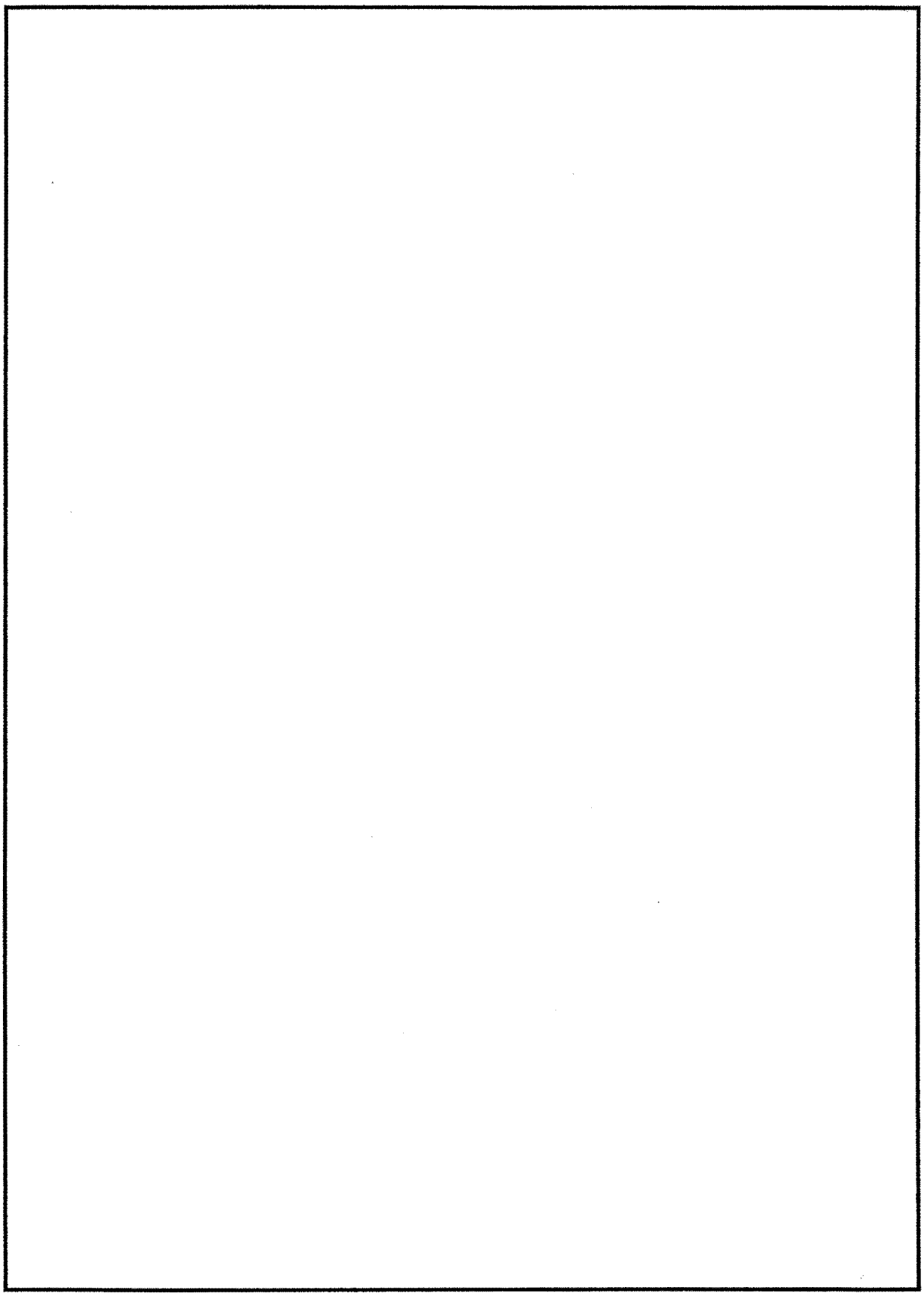

Figure 3: Sensitive marine environments in south-west region of Western Australia

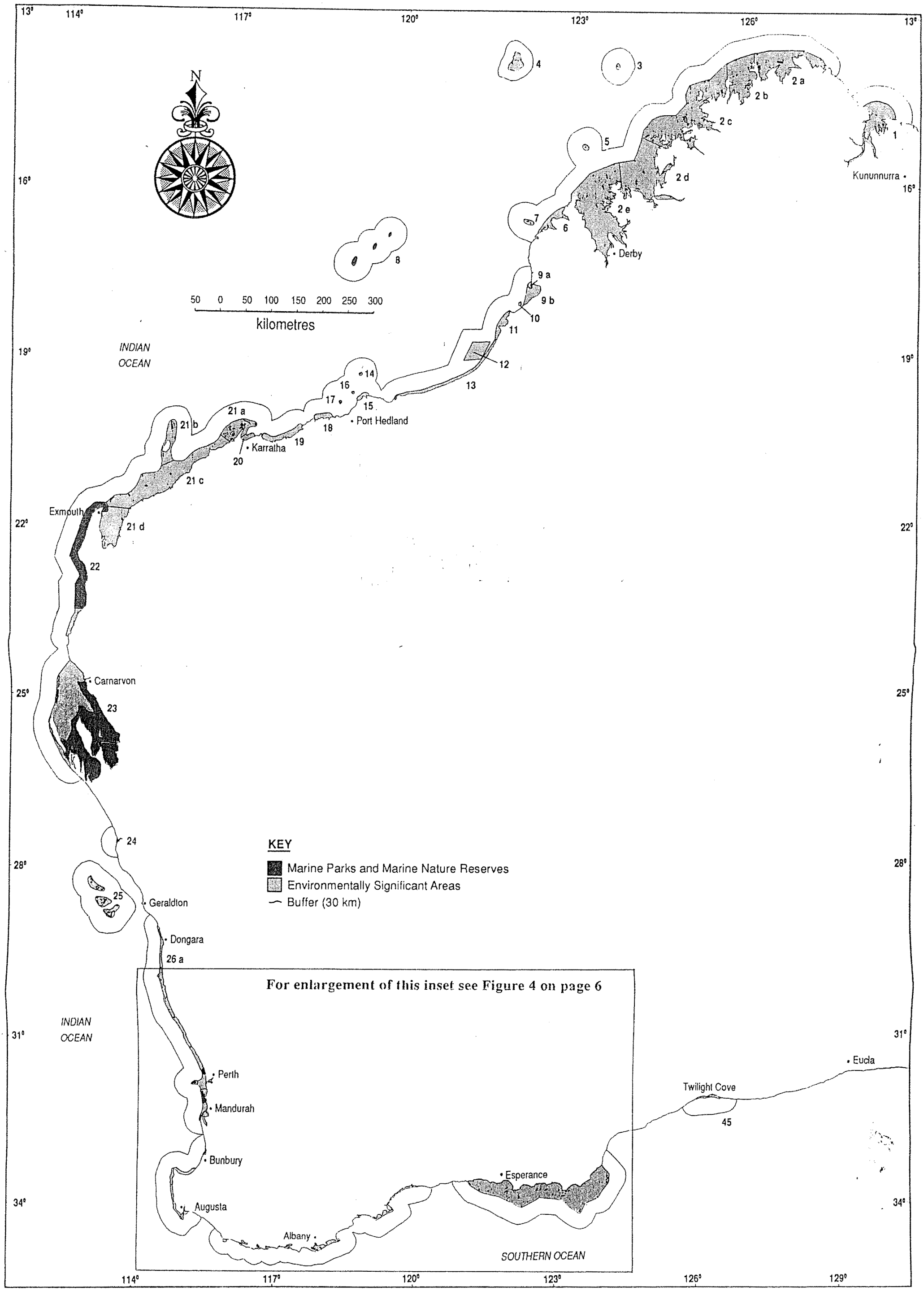

Figure 3: Sensitive marine environments in Western Australia (see Appendix B for locality number guide)

4.1 Petroleum exploration

A. Seismic surveying

A summary of the conclusions of the APEA review of the environmental impact of seismic surveys is given in Appendix . EPA policy on seismic surveys is as follows.

Seismic survey proposals which are within Marine Nature Reserves, Marine Parks, or ESAs are required to be referred to the EPA. Surveys are only permitted within Marine Nature Reserves or Marine Parks if it is clear the surveys centre on petroleum prospects which can be accessed from outside these areas.

Proposals outside of Marine Parks or Marine Nature Reserves will not normally be assessed unless located in particularly sensitive parts of the marine environment such as intertidal zones and coral reefs, in an important breeding area during the breeding season, or close to migrating whales.

Where surveys are proposed in Marine Parks or Nature Reserves or other particularly sensitive areas, environmental management plans for minimising potential impacts should be submitted to the DEP. Such proposals would usually be assessed informally with advice to the proponents from involved Government agencies.

B. Exploration Drilling.

The Environmental Protection Authority's position on petroleum exploration proposals, which has been stated in several assessments (EPA Bulletins 504, 581, 582 and 654), can be summarised as:

- in sensitive marine environments, proposals need to clearly demonstrate an effective contingency plan to respond to situations that could lead to environmental impacts, especially the possibility of oil (including diesel fuel) spills;
- proposals adjacent to Marine Parks and Marine Nature Reserves will be closely assessed for environmental acceptability on their merits;
- in line with Government policy, petroleum drilling is not permitted in Marine Nature Reserves, within Ningaloo Marine Park, or within recreation or sanctuary zones of other marine parks. Access to resources in in these areas from land-based rigs or by directional drilling may be environmentally acceptable;
- outside sensitive marine environments exploration proposals normally could proceed, subject to demonstration of an acceptable oil spill contingency plan.

Since 1990, the formal assessment process for petroleum exploration proposals has been refined to facilitate assessment of either specific geological structures likely to be drilled, or the entire permit area (permit-wide or program assessment), rather than one well at a time. The program could encompass any reasonable number of wells and approval would normally be given for five years. Assessment has usually been at the level of Consultative Environmental Review (CER). Typically a staged approach is used, where a permit-wide assessment is based initially on issues in generality, leading to a permit-wide approval on condition that specific environmental details are provided for each well site when these are defined later.

For a permit-wide approval the Consultative Environmental Review document is expected to describe the full spectrum of drilling and associated activities. It should define their anticipated zone of influence in the full range of environments in which they are likely to occur, and should consider the proper management of operational and accidental discharges in these areas. For the Environmental Protection Authority to be able to recommend approval the document must demonstrate that impacts can be restricted to an acceptably low level in sensitive parts of the marine environment.

For each proposed well, site-specific data (exact position, water depth, bottom conditions, distance to sensitive sites, characteristics of those sites, time taken for a spill to reach them, etc) and an appropriate management plan must be submitted for review and endorsement by the DEP before commencement of drilling. This may occur after permit-wide approval of the proposal

has been given, when exact locations have been pinpointed by seismic survey. Under unusual conditions and where areas of particularly high sensitivity are close to proposed well sites, the EPA may require a separate specific assessment. The aim is to facilitate detailed consideration of the particular proposal and its surrounding environment. It would require the preparation of a site-specific environmental management and oilspill contingency plan. This

Table 1. Summary of petroleum activities and assessment by EPA in sensitive marine environments

ZONE	ACTIVITY	ASSESSMENT BY EPA	COMMENTS
Marine Nature Reserve (MNR) or Marine Park (MP)	Seismic	(a) Formal (b) Informal*	Main prospect centred in and requiring access within MP or MNR. Presumption against being environmentally acceptable Main prospect is outside MP/MNR, or could be accessed from outside MP/MNR
	Exploration drilling	Formal	Presumption against drilling from marine areas but may be acceptable from terrestrial parts of MP/MNR, or if accessible by directional drilling from outside boundary. Must show environmental impacts to be acceptably low
	Production	Formal	Presumption against environmental acceptability unless on dry part
	Pipeline	Formal	Site and proposal-specific. If no reasonable alternative outside MP/MNR and no significant impacts to sensitive elements, may be environmentally acceptable.
ESA's	Seismic	Informal* usually or not assessed	Depends on proximity to sensitive nearshore or shallow environments AND proposed energy source
	(Permit-wide) exploration drilling	Formal	Appendix D presents most likely conditions if approved. Other arrangements may apply in well studied areas of lesser environmental sensitivity (see Sect. 4.1)
	Production	Formal	Site and proposal-specific
	Pipeline	Formal	Minimise impacts to sensitive elements
Notification zone	Seismic	Not assessed	Minimise potential for conflict with other users such as trawlers
	(Permit-wide) exploration drilling	Informal*/Not assessed	EPA may provide advice to DOME on specific environmental aspects
	Production	Formal	Site and proposal-specific
	Pipeline	Formal	Site and proposal-specific
Open Waters	Production/Pipeline	Formal	Only production proposals in open State waters would require referral to the EPA

* Informal with public advice

plan may discuss conditions under which prior approval for the use of dispersant is considered appropriate and for which permission is sought.

The programme assessment procedure has led to savings in time and resources for proponents, involved agencies, the public and the DEP while still providing for adequate environmental protection. A generic set of guidelines written to assist in the preparation of the environmental review document (in this case a CER) is included in Appendix D.

Under the system proposed in this bulletin, all drilling proposals in Sensitive Marine Environments and the Notification zone will continue to be referred to the EPA. This automatic referral is the safeguard for these areas but does not imply that proposals will automatically require formal assessment. Where the proposed activity clearly poses no significant threat to the environment (ie where the well site is a safe distance from the nearest environmentally sensitive reef, beach etc) and an acceptable oil spill contingency plan has been developed, the referral will simply function as a notification to alert the EPA and the public of activities in the area. The EPA would normally assess proposals within Sensitive Marine Environments. In areas of the highest sensitivity, proposals may not be considered environmentally acceptable unless it can be shown that the associated risks are small and any impacts manageable.

A critical part of the documentation that must be submitted is the Oilspill Contingency Plan. This outlines the steps to be taken in the event of an oilspill to minimise its effects on the environment. It requires the proponent to define the environmental sensitivity of the areas likely to be within the zone of potential impact from a spill, make people available and have adequate supplies of equipment for containing, collecting, transporting or dispersing the spilt oil. The Oilspill Contingency Plan should detail a clearly defined sequence of actions, assigned to responsible personnel, which are to be carried out for the above operations. This plan is reviewed by the EPA, the Department of Minerals and Energy and the State Committee for Combating Marine Oil Pollution (State Combat Committee), and is required to be of an acceptable standard before approval is given for drilling.

For exploration drilling proposals in some parts of an ESA or Notification zone where earlier projects have been assessed by the Environmental Protection Authority, and where the likely impacts are well understood, the EPA may consider, following referral, that further formal assessment is unnecessary, provided the proponent is willing to accept environmental approval with appropriate environmental conditions attached under the legislation of the Department of Minerals and Energy. Proposals would still need to be referred to the EPA at the outset and environmental information about the proposals and the conditions of approval would need to be readily available to the public from the Department of Minerals and Energy, the EPA and the proponent. Under the Environmental Protection Act the EPA may call in any proposal at any time. Hence, a proposal to drill a well in an exceptionally sensitive area could be reviewed if warranted.

Some frequently applied environmental conditions and proponent commitments for offshore drilling programmes are provided in Appendix E. It is important to note that the conditions and the commitments are accorded the same legally binding status once the proposal is approved.

4.2 Petroleum production

All production proposals in State waters and on islands must be referred to the EPA by the Department of Minerals and Energy and will be formally assessed.

There is a presumption against the environmental acceptability of production in the waters of Marine Parks and Marine Nature Reserves.

Assessment in areas outside of Marine Parks and Nature Reserves is on a case-by-case basis. Provided the proponent can demonstrate the proposal will not have an unacceptable environmental impact over time and that potential incremental developments would also be compatible, it will be found environmentally acceptable. Characterisation of the environment and its sensitivity to potential pollutants associated with the proposal is required. Environmental impact could arise from: oil or chemical spills or routine discharges of produced water and biocides/corrosion inhibitants; nutrient enrichment; suspended sediments; toxic

wastes; habitat modification (eg from dredging, or smothering by cuttings or drilling mud discharges); introduction of foreign organisms such as from the discharge of ballast waters; hot water discharges; and light from flares and electric lighting (which may disrupt turtle breeding). Protection or minimisation of impacts to sensitive elements of the environment, such as seagrass beds, coral reefs, intertidal areas, mangroves, and turtle and bird nesting areas is given a high priority.

5. Possible sources of marine oil spills off Western Australia

A total of 30 spills were reported in 1993 to the Department of Transport Marine and Safety Division (formerly the Department of Marine and Harbours) in Western Australia. Some were algae erroneously interpreted as oil slicks. They varied from under a litre to large enough to require cleanup action. Possible sources of oil spills are:

- **Terminal Operations**: only one refinery exists in WA, at Kwinana, 20km south of Fremantle, but tanker loading of crude oil occurs from Barrow Island, Withnell Bay, Thevenard Island, Airlie Island, Varanus Island and Broome. Unloading of refined petroleum products takes place at Fremantle, Port Hedland, Port Walcott, Dampier, Wyndham, and, to a lesser extent at other ports, while bunkering activities are considerable at the Port of Fremantle.

- **Marine Transport:** according to an estimate by the National Academy of Sciences[4], marine transportation, including terminal operations and bunkering, accounted for 45.2% of the total annual input of petroleum hydrocarbons globally to oceans around 1985. Some 48% of this resulted from tanker operations (discharge of ballast waters), while 27% came from tanker accidents.

  In 1990-91 about 960,593 tonnes (6.98 million barrels) of oil were carried to and from WA ports per month, of which about 53% was transported to and from Fremantle and Kwinana[5]. The oil varied from crude to refined, with specific gravity ranging from 1.03 to 0.66.

  Many vessels visiting WA ports, particularly the northern ore ports, may carry 3000 tonnes or more of heavy bunker fuel. Some of these fuels may have a specific gravity greater than 1 and therefore do not float. These oils will only afford a limited window (if any) of opportunity for treatment by chemical dispersion. A spill of heavy bunker oil from a ship could have a more serious impact than a spill of crude oil from a production facility.

  The State has very limited ability to control shipping movements. This aspect is largely outside the scope of this bulletin, except to the extent that it serves as a guide to the priority areas to be protected in the event of a spill. For example, special consideration will need to be given to where dispersants or chemicals may be used on oil spills (Section 7 and Appendix E).

- **Oil Exploration and Production:** A report by the International Petroleum Industry Environmental Conservation Association (IPIECA)[6] states that (globally) exploration and production account for only 2% of petroleum into the marine environment. Between 1968 (when the first Western Australian offshore well was drilled) and 30th June 1991,[UPDATE BEFORE FINALISED-DOME helping] a total of 390 exploratory and development wells had been completed off the WA coast. During the last five years the rate of offshore drilling has increased following a series of discoveries off the Pilbara coast.

Risk assessment of exploratory oil drilling operations overseas has identified three distinct categories of oil spillages[7], each with a different level of probability:

(a) minor spills up to about 20 tonnes. These are the most common type of spill and arise from handling mishaps, failure of seals, couplings, valves and lines, discharges from oil skimmer piles, drains left open on low pressure lines and operator error, during routine

operations, flow testing of a well, and fuel transfer operations. (The APEA review[3] (Appendix 1, Part 6) lists the causes of accidents from oil platforms in Commonwealth waters);

(b) moderate spills, 100-1500 tonnes. Much less frequently a blowout with partially controlled loss of crude petroleum may occur, requiring one to three days to bring under control. None has occurred in WA waters; and

(c) major spills from uncontrolled blowouts may take weeks to months to plug by drilling a relief well. These are extremely rare off Australia; only three have occurred offshore in Australian waters[8]. The only major incident happened in 1969 at the Petrel gas well off Northern Australia. Using today's technology it is unlikely that this would have occurred. There other two were lesser gas blowouts in Bass Strait in the Marlin field in 1968.

The National Plan has standardised on the terms Tiers 1,2 and 3, these being spills of 0-10 tonnes, 10-1000 tonnes and <10000 tonnes, respectively.

Several oil and gas developments exist in the North West Shelf area and more are proposed. Predictably with complex operations such as these, spills and leaks have occurred, giving rise in some instances to localised environmental damage to sensitive areas nearby. The largest reported spills were from the Talisman production well which lost 20 barrels (3 tonnes) and the SP4 Subsea pipeline, which also lost around 3 tonnes. With the latter an oil sheen was tracked for 24 hours but, due to its high rate of evaporation, was reported as having dissipated without damaging sensitive environments.

The risk of a major spill (>1000 tonnes) of oil from platforms in Australian waters is estimated by the Commonwealth Bureau of Transport and Communication Economics to be 67% over 20 years (APEA report[3] p 640), although the authors of that report believe that this figure is overly pessimistic. A further note of caution is sounded on page 538 of the APEA review. It notes that whilst Australia's safety record for offshore oil production is unequalled it points to the scenario offshore the United Kingdom (consisting of extensive production facilities) where, for reasons unexplained, oil pollution incidents continue to rise, with the single major source, accounting for 345 of the 791 reported incidents during 1990, being offshore oil exploration and production operations. Of these, at least 136 required cleanup operations.

6. Organisations in WA involved with oilspill policies

The body directly concerned in the event of an oil spill is the State Committee for Combating Marine Oil Pollution, (the National Plan State Committee). This committee has no statutory authority but provides an administrative arrangement for combating oil pollution incidents. It consists of three members: Director, Marine, from the WA Department of Transport Marine and Safety Division, who acts as coordinator and chairman; the Manager, Emergency Services of the Fremantle Port Authority; and the Regional Manager, Australian Maritime Safety Authority (AMSA).

The Combat Committee is assisted by a Technical Advisory Committee which has eight members. Represented are the Department of Fisheries, the Department of Conservation and Land Management, the Department of Environmental Protection, Department of Minerals and Energy, the State Emergency Service, the Dampier Port Authority, the Royal Australian Navy and the two Western Australian Regional Industry Controllers of the oil industry Marine Oil Spills Action Plan (MOSAP).

Both committees thus include representatives from Government and industry groups concerned with oil spills. The two committees work closely together and combined meetings are held regularly. They are concerned with aspects of oil pollution from all sources including transport, processing and offshore exploration activities.

Discharge of oil into Western Australian waters from ships or from land is controlled by the Prevention of Pollution of Waters by Oil and Noxious Substances Act (1987). This State legislation mirrors Commonwealth legislation, which controls discharge of oil from Australian ships on the high seas, and is administered by the Department of Transport (Marine and Safety

Division), except where this occurs within the limits of proclaimed ports, where it is administered by the appropriate Port Authority.

Exploration for and exploitation of petroleum resources in marine areas off the Western Australian coast is undertaken subject to:

- the Commonwealth *Petroleum (Submerged Lands) Act 1967,*
- the Western Australian *Petroleum (Submerged Lands) Act 1982,*
- the Western Australian *Petroleum Act 1967-81* and
- the Western Australian *Petroleum Pipelines Act 1969.*

The exercise of powers and performance of functions of these Acts is by means of an administrative agreement between the Commonwealth and State Governments. Under the joint legislation the State Minister for Mines or the Director of the Petroleum Division of the Department of Minerals and Energy is nominated as the "Designated Authority" and is responsible for administering the above arrangements. The Department of Minerals and Energy seeks technical advice from the National Plan State Committee before approving operators' oil spill contingency plans.

The National Plan to Combat Pollution of the Sea by Oil was established to cover oil pollution of the sea by ships. It provides for the maintenance of strategic centres around the Australian coast where anti-pollution equipment, funded by a levy on commercial shipping, is stockpiled[8]. Two of the centres are in Western Australia, at Fremantle and Port Hedland. In the event of a large oil spill the resources under this plan could also be called upon.

The National Plan underwent a major review in 1992-3 and, following acceptance of the Recommendations of the review by State and Federal Ministers of Transport, the National Plan organisation has been broadened to provide an integrated government/industry response to oil pollution in the marine environment from any source.

The Australian Institute of Petroleum has established a major oil spill response capability, together with a training facility, in Geelong, equipped to deal with spills up to 10000 tonnes (Tier 3). This facility, the Australian Oil Spill Centre (AMOSC), also administers the Marine Oil Spills Action Plan, an oil industry mutual aid arrangement. MOSAP comes into action when an oil company requires more than its own resources in a response and in Western Australia it is executed by two Regional Industry Coordinators and twelve Local Industry Coordinators. AMOSC states that spill response equipment is air transportable to anywhere in Australia within 24 hours.

The recently reviewed National Plan outlines the following division for lead agency responsibility in a response and this has been clarified in the State Plan to be:

- in the vicinity of oil exploration rigs, platforms and pipelines-the relevant oil company with assistance, as required, from the National Plan State Committee or AMSA depending on area of jurisdiction.

- in the case of a spill from an oil industry shore installation, including a spill from a pipeline at the first valve above the high water mark (where applicable)-the lead agency would be the relevant oil company, unless the necessary response is beyond the capability of its resources, in which case responsibility is transferred to the State via the National Plan State Committee, with assistance from AMSA as required.

- in ports (other than oil terminals) and within coastal waters (State Waters to three nautical miles from the baseline, and Inland Waters)-the responsible State or Port Authority would be both primary and lead agency, with assistance from the National Plan State Committee, industry and AMSA as required. The lead agency role may be delegated by prior arrangements to the relevant oil company.

• from other land-based sources- the relevant State primary agency would be the lead agency.

• beyond State (three nautical mile) coastal waters-the Commonwealth would be primary and lead agency) via AMSA except in those incidents close to shore when oil is likely to impact the shoreline. In these circumstances, the State via the National Plan State Committee will be the lead Authority for protecting the coastline while AMSA assumes responsibility for ship operational matters such as salvage. An exception to both of the above would be if the spill is from an exploration rig, platform or pipeline, when the operator of the facility would be the lead agency.

• in the case of a spill close to the State borders with the NT or SA the primary agency is the agency responsible for the waters where the spill occurred. The lead agency will be decided by consultation and will be the agency able to mount a credible response in the shortest time.

7. Oilspill response procedures

The Department of Minerals and Energy provides guidelines for the preparation of a company's Oilspill Contingency Plan and requires three copies of the completed plan. Information required in the plans includes:

- environmental resources, including priorities for areas needing protection against oil pollution;
- oilspill action flow chart;
- the type and quantity of dispersant carried; and
- a directory of key Government and industry personnel indicating the order in which they would be informed of an oilspill.

It is recognised that most Western Australian-produced crude oil is comprised of "light" crude, that is, made up of a mixture of less viscous petroleum compounds. Some characteristics of this type of crude oil are that it is more toxic than the "heavier" fractions, and that it tends to evaporate quickly, especially in the typically warm ambient conditions of the North West Shelf. Current data indicate that a slick of Western Australian light crude oil in the sea could be expected to have lost 70% or more of its original volume to the atmosphere after 24 hours[9]. This has implications for the type of response to a spill which is most appropriate.

As in the National Plan, the DEP's preferred method for treatment of oilspills is to attempt containment and removal of the oil (see Fig 4). This approach is favoured to minimise the toxic effect of the spill on marine organisms and to prevent as much as possible from escaping to the atmosphere from where it may impact on a nearby terrestrial environment. A summary of predicted oil effects on some marine environments is to be found in Table 7.7 of the APEA review[3]. It is recognised that containment booms, due to unfavourable weather conditions, may not always be able to be used. Nevertheless, they should be considered whenever possible in Sensitive Marine Environments to (a) facilitate successful recovery/dispersion/evaporation, or (b) to strategically divert oil from particularly sensitive coastal locations. (Table 8.12 of the APEA review[3] lists several options recommended by the American Petroleum Institute for the cleanup of different habitats.)

Under circumstances where containment is clearly impracticable and depending on:

- the position and direction of movement of the oil slick;
- the environmental resource at risk; and
- the environmental consequences and practical feasibility of later clean-up on land;

the best decision may be to do nothing, or to apply dispersants as soon as practicable, sufficiently distant from shore, and in waters of sufficient depth to ensure considerable dilution. Table 9.6 of the APEA report[3] provides a useful indication of the potential vulnerability of coastal environments to oil impacts.

It should be emphasised that, because of their inherent toxicity, use of dispersants is undesirable in shallow, highly productive environments. As a general rule in Western Australia dispersants should not be used within 8km of a shoreline or in waters less than 20m deep, including any reefs or banks rising to within 20m of the sea surface. (The change from 10m to 20m in this document recognises that waters around 10 metres deep are often close to near-surface coral reefs, and that horizontal wind and tidal movements can bring an oilspill into contact with these in a short time-see Fig 5). However, where it is clear that without intervention, spilt oil will significantly impact on a particularly sensitive environment such as a mangrove community, it may be beneficial for dispersant to be used. This may apply even in relatively shallow waters, but only where the dispersed oil is likely to be less harmful than the oil alone. When spilt oil occurs within these limits, the decision on whether or not to apply dispersants should be made in consultation with the National Plan State Committee, unless the DEP has already given prior approval to use dispersant in these circumstances.

Note that the above are intended for use as guidelines. Operationally the decisions will be made by the National Plan State Committee using the most current data available.

The DEP recommends that the least toxic formulations capable of effectively dispersing the slick are used. Where research information exists in-house or studies are proposed, the DEP seeks to review and comment on the applicability of the dispersant or the appropriateness of the studies proposed. Guidelines for the use of dispersants may be subject to a future comprehensive review aimed at developing criteria for specific environments and oil characteristics.

Appendix F contains a general guide to the use of dispersants on floating oil in Sensitive Marine Environments, although more specific regional guides may be applied on a case-by-case basis. In Western Australia, only dispersants which have passed the toxicity and efficiency tests prescribed by the Australian Maritime Safety Authority may be used. Those that have been approved are listed in the State Plan.

The State Plan should be referred to for:

- detailed arrangements for responding to oil pollution;
- information on oil pollution equipment available in WA; and
- advice on accessing National Plan equipment in other States and from industry. There are also arrangements for using international resources.

Acknowledgements

This report has been compiled, read and re-read by staff of the Department of Environmental Protection and other agencies, for the EPA members, and reflects the members' current position. Thank you Warren Tacey, Dr Chris Simpson and Jim Burt (DEP); Bill Carr and Jimmy Seow (DOME); Frank Batini (CALM); Captain David Oliver (DoT); and Dr Howard Jones (Department of Fisheries). The many detailed submissions received from members of the community, Government agencies and the petroleum industry are also gratefully acknowledged. Gary Whisson updated the list of sensitive marine environments around WA (Appendix B) and Doug Betts was responsible for the task of coordinating this report for the EPA.

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Appendix A

Links between this report and Bulletin 104

Purpose of the Report

Bulletin 104 was written with the petroleum industry specifically in mind. It provided the reaction framework for the State's oilspill contingency planning. This bulletin, which is the final version of the discussion paper for public comment, Bulletin 679, retains this function by reviewing areas of particular environmental and conservation significance and the characteristics of the significant environment, so as to assist in decision making, but is not as prescriptive as before. The bulletin recognises the need to review the impacts of any industry proposal in particularly sensitive parts of the marine environment.

Resource maps and zoning

For Bulletin 104 the marine resources of Western Australia were mapped by the Department of Fisheries to define environmentally significant areas (ESA's) and to enable informed decisions to be made in the likelihood of events, such as oil spills, which could threaten the marine environment. Bulletin 104 designated ESA's either as Environmentally Sensitive Localities (ESL's), which were considered to warrant more comprehensive environmental assessment, or Special Protection Localities (SPL's) which included, but did not distinguish between, Marine Parks and Marine Nature Reserves. ESA's are now termed Sensitive Marine Environments (SME's), into which Marine Parks, Marine Nature Reserves and ESA's are grouped in the current review. Adjustments to the boundaries of Sensitive Marine Environments have now been made in the light of increased scientific knowledge and experience, as well as to simplify the system of zoning.

Environmental assessments

For exploration wells proposed within the ESL and Immediate Protection Zone the requirements specified in Bulletin 104 were for a formal assessment at ERMP level for at least the first well. Within the SPL and surrounding Immediate Protection Zone the first well proposal required a Notice of Intent.

In the last five years as a result of the increased level of knowledge (both of the environment and of the specific impacts of exploration drilling proposals) gained from previous proposals and assessments in the same general area, exploration drilling proposals in environmentally sensitive areas have generally been formally assessed at the lower level of CER by the Authority. This recognised that ESL's and SPL's were of broadly the same environmental sensitivity for the purposes of environmental assessment and the setting of environmental conditions. The elevation of the SPL to one where formal assessment was also required for exploration drilling allowed for public input and full consideration of the potential impacts of the proposal upon the environmentally sensitive resources within this zone. Drilling proposals outside ESLs and SPLs have been treated on a case-by-case basis but generally have not been formally assessed.

The current system of referrals and assessment of exploration wells reflects the changes in terminology used in this bulletin, the increased levels of knowledge about the environment and impacts from drilling. These are set out in Section 4.1 of the report. As with Bulletins 104 and 679, proposals for petroleum production continue to be formally assessed.

Appendix B

Points raised in submissions

to

Bulletin 679

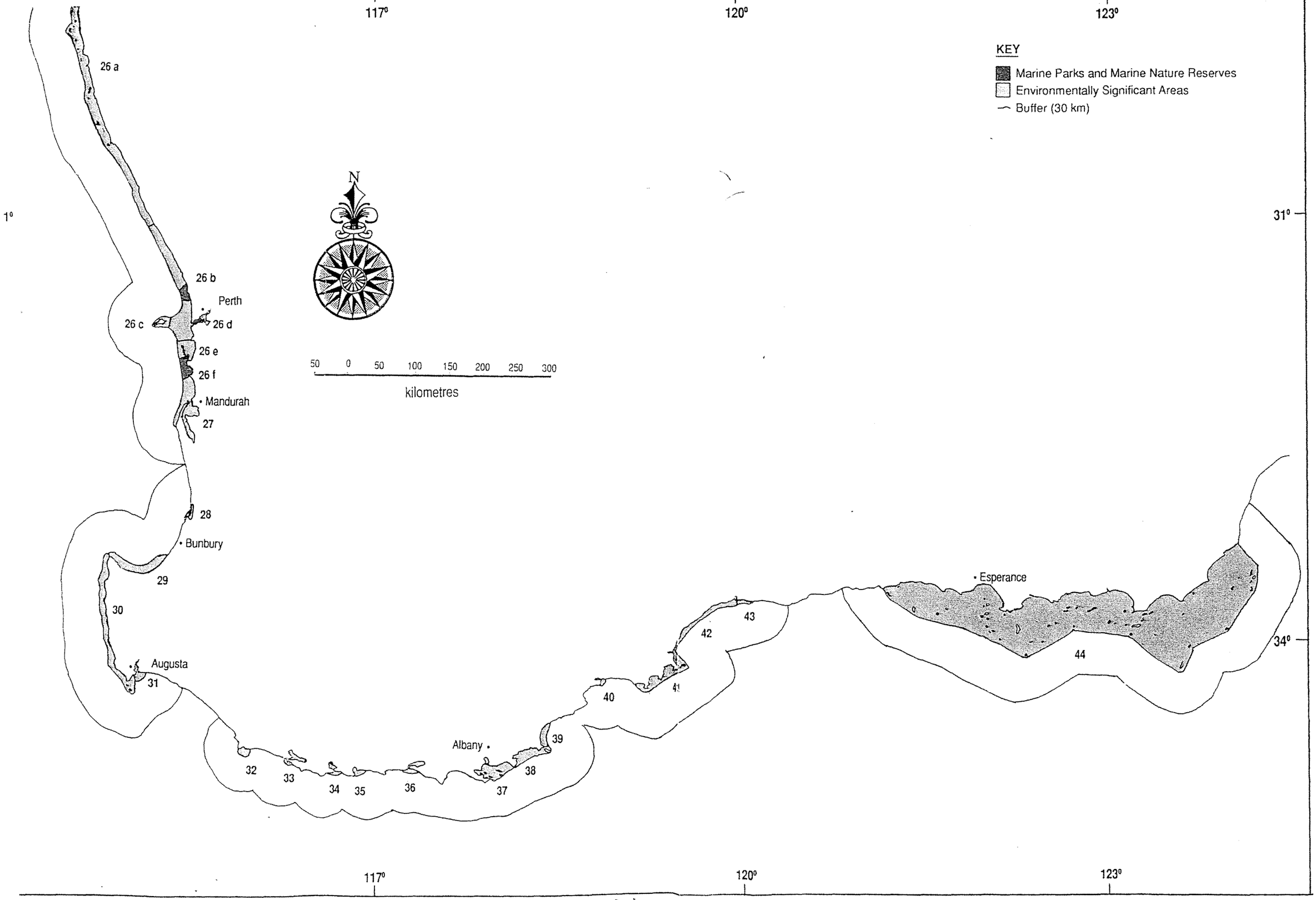

Figure 4: Sensitive marine environments in the south-west region of Western Australia (see Appendix B for locality number guide)

POINTS RAISED in SUBMISSIONS on Bulletin 679
(A) from PETROLEUM INDUSTRY

B679 is disjointed and unbalanced, and in parts too prescriptive. It would benefit from some flow diagrams, figures and tables to make it more user-friendly. Clarify which statements are legal requirements and which are guidelines. These points have been noted and attended to.

1. CONFUSING TERMINOLOGY of sensitive marine environments and notification zones.
• *What are their implications and how are they nominated?* These are detailed in Section 3 and Appendix B of this report.
• *Many believe that the ESA's were defined specifically for the petroleum industry, rather than generically.* While it is certainly true they were first offered to the petroleum industry (in Bulletin 104) they are intended to be independent of all activities. They are truly generic, as defined by the five criteria in Appendix B.
• *Prefer to use less emotive term, such as "area of environmental interest" rather than the word "sensitive".* These areas are sensitive, not just interesting.
• *ESA's cover large amount of WA coastline but criteria for determining sensitivity are open to wide interpretation.* The criteria used are exactly the same as for Bulletin 104 published in 1984. They are also almost exactly the same as those used in other jurisdictions of Australia and by the International Maritime Organisation.
• *Prefer to see more case-by-case scrutiny and review.* Others would prefer a more standardised approach. Where a proposal is sufficiently different from those which preceded it, it will be assessed on its particular characteristics.
• *ESA's appear to have been defined without consideration of susceptibility to damage.* This is the approach also taken by other jurisdictions. The two criteria (ie sensitivity and vulnerability) are different but linked with regard to susceptibility to spills and consideration is given to both in the event of a response to a spill which has the potential to impact a sensitive area.
• *Where are the key source concerns for pollution of WA marine env't, ie where should we be putting our priorities? Management zones should be proposed for these.* This is something to aim for. Meanwhile we rely on proponents to consider these areas and to plan accordingly when drafting oilspill contingency plans.
• *Maps on ESA's are at inappropriate scale to be useful (suggest 1:20000 as a stand-alone wall chart). Also would prefer to see colour used to make more user-friendly, as will be extensively used.* Agreed, this is being attended to by the creation of a larger scale graticular map by DOME.
• *Why has no company data been used to prepare better resource maps? The map should incorporate the data collected by the oil industry and submitted to EPA.* The five criteria used to define ESA's are adequate to identify the coastal areas at the scale used. The industry data referred to is valuable on the more detailed level. It would also take considerable resources to incorporate this data into a State-wide GIS but this is a longer term objective of Government.

2. NOTIFICATION ZONES
• *Why have them if drilling allowed in them anyway? Seems irrelevant to exploration and production but may have a basis for delineation of shipping lanes. Width of the notification zone needs better scientific justification. What are the implications of having the 30km wide notification zone beyond State waters? Formula used is too simple-does not reflect the degree of variability in local conditions.* These are dealt with in Sections 1.3 and 3.3.

3. FUTURE MARINE PARKS
• *Support for larger, multiple-use areas. Management objectives for marine areas should be established; activities should only be excluded if incompatible with them.* These matters will be dealt with when the Government releases its policy on marine parks.
• *Assessment and management of marine env't must recognise ESD principles. Assessments should also take* ***economic*** *values into account.* The EPA's brief is to assess the environmental implications of proposals, free of other considerations, and to report to the Minister for the Environment. **His** brief is to weigh the **environmental** considerations against the advice from other Ministers.

4. "PRESUMPTION AGAINST" activities.

• *Access by existing title holders to Ningaloo Marine Park: EPA outside its charter if it refuses to assess these proposals. EPA's policy regarding drilling in Marine Parks not scientifically justifiable-want scientific assessment to guide EPA decisions, not influenced by "erroneous" community perceptions. Large areas in Ningaloo in the built-in notification zone which are non-sensitive could be safely drilled. Some state that they would not seek to drill on Bundegi Reef or similar areas within the park. Assessment of proposals should be on their individual merits. Suggest flexible approach for deserving operators to drill in particularly sensitive areas if they can demonstrate acceptable levels of safety and have the resources to be able to minimise the risk of damage. Unwise to be too prescriptive regarding acceptability of proposals-would prefer more flexibility e.g allow vertical drilling within park rather than directional from outside; dispersant usage options etc.*

Issues to do with access to marine parks are not discussed in this report as the Government has not yet released its policy on marine parks.

5. DEVIATED DRILLING

• *Not a panacea for protection. Using it just outside Marine Park boundaries is not good prevention policy, technically it is safer and quicker to drill a vertical well from within the park..*

The point is taken.

6. RESPONSIBILITIES AND INTERACTION BETWEEN GOV'T AGENCIES

• *Need to be clarified. An organisational chart would be useful. As the WA State Plan and the NATPLAN were established to cater for spills from ships do they have a role in drilling rig spills? Don't want EPA to be prescriptive re advice on oil spill cleanup procedures.*

These have been addressed in Sections 6 and 7.

7. OIL SPILL CONTINGENCY PLANS

• *needs DOME guidelines for preparation of OSCP's in an Appendix.*

In the interests of relative brevity of the document these have been omitted.

8. DISPERSANTS

• *Seek pre-approval for them in specific circumstances, at time of approval of OSCP. Who is the "responsible authority" to authorise the use of dispersants ie what is the legal position? Clarify the roles of DOME and DEP with regard to approvals. Toxicity and efficiency of dispersants needs to be established for Australian conditions-Department of Transport has approved lists. The 20m depth limit for use of dispersants has little technical basis and should revert to 10m. Many detailed technical suggestions about whitecapping, oil evaporation rates etc.*

Sections 6 and 7 attempt to clarify the issues raised here.

9. OILSPILL RISKS FROM SHIPPING

• *Have been mixed unfavourably with those of exploration and production. Equity issue-this policy discriminates against the local industry and favours imports of oil in ships because there are presently no controls on shipping..*

This report clearly distinguishes between the spills from shipping and those from the exploration and production of petroleum.

10. MISPLACED FOCUS ON OIL EXPLORATION / PRODUCTION

• *With respect to total oil inputs to sea, 70% of it originates from land-based activities unrelated to this part of the industry. What about targetting other users of marine environment which make much more impact? (tourism, trawling, shipping). Paper doesn't reflect the industry's excellent record.*

This report foreshadows future reports targeting other users of the marine environment.

(B) from GOVERNMENT, CONSERVATION, and FISHING GROUPS

1. MARINE PARK PHILOSOPHY

• Support for larger, multiple-use marine park areas. Also, not necessarily "representative reserves". "Whole of region" reserves may be appropriate. Endorsement of multiple use concept provided that the activity proposed is consistent with the stated objectives for that part of the park. ACF wishes to see existing marine reserve system extended and made contiguous with terrestrial reserves. "Presumption against" policy implies no multiple use concept for marine parks and marine nature reserves.

• ACF believes that the Recherche Archipelago should be declared a marine park so as to maintain the ecological integrity of both the Cape Le Grand and the Cape Arid NPks, which extend to low water mark.

• Inconsistent policy on access between Great Barrier Reef Marine Park and Ningaloo with respect to petroleum industry. There should be no seismic or drilling. Pipelines should not be allowed through marine park or marine nature reserve. Mining activities should not be allowed in the existing reserves, or in surrounding ESA or in the Notification zone.

• EPA should soften stance on drilling/production within marine parks, as premature in the absence of Government policy.

• Don't allow exploration in areas where production is going to be forbidden.

• Directional drilling is not usually the answer to accessing marine reserves. It should not be permitted.

• Notification zones need to be bigger for extra safety (CEPA, ACF). Notification zones and ESA's are outmoded as they don't stop oil exploration or production in any case (Cape Cons Cmte)

2. RESOURCE INVENTORY

• How much coastline has been surveyed for sensitivity to oil exploration/production? Need detailed habitat maps to allow oilspill response teams to plan.

3. SHIPPING

• State has little control over shipping. Ballast waters should be sterilised before discharge (ACF).

• Tankers seen as the major threat (loading, breakdowns combined with bad weather, shipping routes), not blowouts. Therefore upgrade ships and their crews (ACF).

• Mitigate with better pilots, more powerful tugs and compulsory pilotage on specific routes in sensitive waters (as with North Queensland passage inside Great. Barrier Reef). Establish safety zones to keep tankers out of specified areas. Upgrade navigational charts, use satellite navigational facilities. Companies could take initiative regarding pilotage of tankers, provision of suitable anchorages and inspection of seaworthiness of tankers. Should have more and better regional oilspill combat facilities around the coastal areas of high traffic and high sensitivity.

• WA Government needs to work cooperatively with other State and Commonwealth agencies. These issues should be addressed in the document.

4. OSCP / DISPERSANT USE:

• OSCP's are merely a public relations exercise as little can be done to protect reefs or mangroves from spills if they occur in the open sea (Cape Cons Cmte).

• Cyclone warning system is unreliable at present and should be upgraded before the oil industry is allowed to expand further in the N-W Shelf.

• Protect marine ecosystems, not charismatic megafauna or public amenities (WAFIC).

• Planned use of dispersants should involve the potentially affected community.

5. FISHING-impacts and alienation of grounds
• What consideration is given to existing fishing rights when assessing expln/prodn proposals?

• Data on impacts of seismic airguns on larva and eggs are inconclusive-what do the APEA studies reveal? Until proven conclusively WAFIC wish to exclude airguns from shallow prawn nurseries and during peak spawning times.

• Alienation of fishing grounds by wells and pipelines. Pipes should be removed from the sea bottom on closedown of the field at the end of production life.

6. RATIONALISE / GROUP
• Prefer fewer, larger pipes using common route to more, smaller ones taking separate routes.

• Don't separate the upstream (exploration and production) sectors from the downstream (transport, product use and waste disposal strategy) sector. The industry should take responsibility for all sectors, not just their own patch.

OPERATIONAL SUGGESTIONS (by industry) FOR DRILLING NEAR REEFS IN PARKS
•float the rig into position rather than dragging it over the reef;
• confine all vessel movements to waters beyond the reef's edge;
• drilling the first section of the well at times when the currents will transport cuttings and fluids away from the reef;
• making every reasonable effort to pump all other drill cuttings and fluids down the hole into the "lost circulation " zone;
• treating cooling water by electrolysis rather than using biocides and corrosion inhibitors;
• controlling discharge of surplus drill fluids at a rate of less than 2 barrels/min and at times when currents will take them away from the reef;
• dedicated crew and vessel on standby at the rig with a boom to enable immediate response in the event of a spill.

Appendix C

Sensitive marine environments of Western Australia

Basis of classification, main resources and associated activities

For the purpose of this report the marine environment of Western Australia includes all coastal waters up to the limit of tidal influence. Sensitive Marine Environments are classified according to the five broad criteria outlined below, any one of which is sufficient for an area to be classified as sensitive.

These are environments of:

(I) International ecological/conservation significance

- internationally recognised protected areas such as World Heritage areas, Biosphere reserves, Ramsar wetlands, and areas of significance for the conservation of internationally protected species;

(N) National or State ecological/conservation significance

- major coral/ limestone reef, seagrass and mangrove ecosystems, as well as marine nature reserves, marine parks, aquatic reserves and may include the marine components of national parks and nature reserves.

(E) Economic significance - based on the values of the biological resources of the environment

- major commercial fisheries, important identified nursery areas for commercial species, mariculture leases.

(C) Cultural significance

- environments of major recreational and/or historical value, scenic attractiveness and areas important as subsistence Aboriginal fisheries; and

(S) Scientific and educational significance

- environments of major scientific significance (eg, Abrolhos Islands) and/or educational value (eg areas close to major population centres).

Localities and boundaries

The Seaward boundary of the Sensitive Marine Environments identified below are generally defined as the 20 metre isobath, unless specified otherwise. Where archipelagos are involved the Sensitive Marine Environment is defined as the waters enveloped by the islands of the archipelago.

Changes to the environmentally sensitive areas listed in Bulletin 104

The following significant changes have been made to the list of Environmentally Sensitive Areas in EPA Bulletin 104 (1984). These areas are now called Sensitive Marine Environments in this Bulletin.

- There is more extensive representation of Kimberley environments, which were under-represented in Bulletin 104. This region includes the most extensive mangrove and intertidal environments in the State in an area featuring a complex, deeply embayed coast, islands, archipelagos and reef systems. Tidal movements are a significant factor in the potential movement of oil spills in this region due to the combination of a macrotidal regime and a deeply embayed environment, which may result in tidal jets with the potential to move oil many kilometres during a single tidal cycle. This is not generally the case in other regions.

- Oceanic island and coral reef systems off the Kimberley coast - Adele Island, Browse Island and Scott Reef have been included as Sensitive Marine Environments.

- The 80 Mile Beach has been included. This area is now recognised as an international significant site for migratory wading birds.
- The Sensitive Marine Environments along the Pilbara coast have been revised with the deletion of the criteria identifying ports and industrial sites as sensitive environments, and through improved representation of the region's major mangrove communities. Recognition of the Rowley Shelf as a sensitive environment has been extended to include similar but more oceanic shallows of the Barrow Island Shelf extending north to the Montebello Islands.
- The continuation of the Ningaloo coral reef formation south from the southern end of the Marine Park to Red Bluff is recognised by the inclusion of this area in an extension of the Sensitive Marine Environment covering the Ningaloo Marine Park.
- The Geraldton Port area has been deleted as a result of the revised criteria mentioned above.
- The coast between Seven Mile Beach north of Dongara and the Peel-Harvey Inlet is represented as a continuous area, amalgamating and extending the several small areas previously represented. The reef and regional environments along this section of coast are biologically diverse and important for the crayfishing industry, as well as recreational and educational purposes near the major populations.
- The several small nodes of recreational importance identified along the Leeuwin-Naturaliste coastline have been amalgamated into a continuous representation in recognition both of the major recreational significance of this coast, and its biological significance as a transition zone between west coast and south coast marine environments.
- The coastal waters adjacent to the Fitzgerald National Park have been included in recognition of this area's international status as a Biosphere Reserve and major calving ground for the Humpback Whale.
- The area identified to protect the Recherche Archipelago has been extended to cover all the islands of the archipelago.
- Twilight Cove has been added in recognition of the significance of this sandy coast, its importance to migratory waders and as a scientific monitoring site. There is a paucity of information on the values of the marine environment in the Nullarbor Region which precludes further consideration of areas in this region.

Links with Marine Park Selection Working Group

During the revision of this document close liaison has been maintained with the Marine Park Selection Working Group, co-ordinated by the Department of Conservation and Land Management.

The task of that group is to provide scientific advice to identify areas with potential for reservation as part of a system of Marine Parks and Marine Nature Reserves representative of the environments in Western Australian State waters. The report of the Marine Parks Selection Working Group was completed in early 1994.

Sensitive marine environments (from north to south)

1. CAMBRIDGE GULF AREA - (I.N.E.C).

   Comprises the waters contained in the West Arm, the Ord River and their main tributaries (Forrest River, Durack River, Pentecost River and King River), from the shoaling banks at the mouth of Cambridge Gulf to 15°45'S, and from 128°00'E to 128°40'E.

   Includes areas designated as a Wetland of International Significance. Mangrove areas of the Ord River are enclosed within the Ord River Nature Reserve, false mouths of the Ord Nature Reserve and a potential marine park. Extensive intertidal flats, salt-water crocodile population, subsistence Aboriginal fishing. Irrawaddy dolphins are likely to occur in this area.

2. NORTH WEST KIMBERLEY COAST AND ISLANDS - CAPE RULHEIRES TO CAPE LEVEQUE

2(a) CAPE LONDONDERRY AREA - (N.E.C).

   Cape Rulhieres to Cape Bougainville via Lesueur, Stewart and Troughton Islands.

   Adjacent to and partly enclosed within boundaries of proposed 'A' Class national park (System 7 Report). Islands and embayments, mangroves, seagrass, salt water crocodiles. Irrawaddy dolphins are likely to occur in this area. Aboriginal subsistence fishing.

2(b) ADMIRALTY GULF AND LONG REEF - (N.C).

   Cape Bouganville to Cape Voltaire

   Adjacent to and partly enclosed within boundaries of proposed national park and island nature reserves (System 7) and potential marine park. Long Reef is a large offshore coral/algal reef platform. Important bird habitat, including mangrove birds, salt water crocodiles. Irrawaddy dolphins are likely to occur in this area. Aboriginal subsistence fishing and increasing tourism use.

2(c) CAPE VOLTAIRE TO KURI BAY/CHAMPAGNE ISLAND - including the Bonaparte Archipelago (I.N.E.C.S).

Adjacent to and includes part of Prince Regent River Biosphere Reserve, potential marine parks and proposed Bonaparte Islands Nature Reserves (System 7). Macrotidal environment supporting extensive mangrove and intertidal communities and fringing coral reefs on islands. Large protected salt-water crocodile populations, deeply enclosed embayments and pristine island/reef environments, increasing tourist use, commercial pearl culture. Irrawaddy dolphins are reported to live in this area.

2(d) KURI BAY TO KOOLAN ISLAND - Champagne Island to Conway Island. (N.E.C.S).

Macrotidal environment supporting extensive mangrove communities, coral and algal reefs (Montgomery Islands), and extensive intertidal mud flat environments. Dugong and salt-water crocodile populations, deeply enclosed embayments and pristine island/reef environments, increasing tourist use, commercial pearl culture. Irrawaddy dolphins are likely to occur in this area. Adjacent to and includes parts of the proposed Walcott Inlet National Park. Proposed aquatic reserve - System 7 (potential marine park).

2(e) BUCCANEER ARCHIPELAGO - Koolan Island to Cape Leveque and King Sound, includes the Fitzroy River downstream from Langey Crossing. (N.E.C).

Macrotidal system supporting extensive island and intertidal reef systems, mangrove and mud flat communities. Irrawaddy dolphins are likely to occur in this area. Commercial pearl culture, Aboriginal commercial trochus and subsistence fishing. Islands of the Buccaneer Archipelago are proposed conservation reserves and potential marine park. Recent research indicates this area is an important mating/calving ground of the humpback whale (C Jenner *pers comm*).

3. BROWSE ISLAND AND SURROUNDING REEFS - approximately 360 km north of Derby. (N).

Nature reserve to Low Water Mark, an important green turtle nesting area.

4. SANDY ISLET-SCOTT REEF - Approximately 400 km north-west of Derby (Sandy Islet in State waters, Scott Reefs, North and South are in Commonwealth Waters). (N).

Coral cay in a pristine environment. Shelf atolls, rich diversity of marine life. Turtle nesting site (Sandy Islet).

5. ADELE ISLAND AND SURROUNDING REEFS - Approximately 200 km north-north-west of Derby. (N).

Proposed nature reserve, important sea-bird nesting colonies, significant coral reef. Recent research indicates the area between Adele island and the mainland coast is an important mating/calving ground of the humpback whale (C Jenner *pers comm*).

6. CAPE LEVEQUE TO LOW SANDY POINT - Thomas Bay, Pender Bay and Beagle Bay. (N.C).

Mangrove communities and extensive tidal flats. Proposed Cape Borda Nature Reserve. Subsistence Aboriginal fishing, commercial pearl culture.

7. LACEPEDE ISLANDS AND IMMEDIATE SURROUNDING REEFS (N).

Nature reserve (System 7). Green turtle nesting area. Giant clams. Rich variety of corals. Important sea bird nesting area. Type locality for some coral species.

8. ROWLEY SHOALS (Mermaid, Clerke, Imperieuse Reefs) - approximately 300 km west of Broome. (I.N.C.S).

Clerke and Imperieuse Reefs are a Marine Park, Mermaid Reef is a National Nature Reserve. Bedwell Island, within Clerke Reef, is a breeding area for the Red-tailed Tropic Bird, an endangered species. Spectacular coral reefs in a pristine environment. Shelf atolls, biologically and geomorphologically unique in WA. Huge diversity of tropical marine fauna including rare species and new genera of corals and fish. WA Museum study area. Increasingly important recreational diving area.

9. BROOME AND ROEBUCK BAY- STATION HILL TO CAPE VILLARET

9(a) BROOME - Station Hill to Entrance Point. (N.C.S).

Tourism. Subsistence Aboriginal fishing. Broome beaches and boating areas. Aquatic reserve to protect rare shells. Intertidal reefs, important palaeontological site for dinosaur footprints.

9(b) ROEBUCK BAY - Via a straight line joining Entrance Point to Cape Villaret (I.N.E.C).

Includes a declared Ramsar wetland of international significance as migrant wading bird habitat. Potential marine park. Commercial pearl culture. Tourism. Subsistence Aboriginal fishing. Boating and yachting. Sport fishing.

10. CAPE VILLARET OFFSHORE AREA - An area opposite Cape Villaret 122°00'37"E to 122°03'53"E by 18°17'08"S to 18°18'52"S. (E).

Commercial pearl culture.

11. LAGRANGE BAY - Cape Latouche Treville to Cape Bossut. (N.C).

Migrant wading bird habitat. Subsistence Aboriginal fishing. Potential marine park.

12. CAPE MISSIESSY AREA - An area opposite Cape Missiessy 121°10'E and 19°00'S, 121°30'E and 19°00'S, 121°00'E and 19°20'S, 121°20'E and 19°20'S. (E).

Major area for collection of pearl oysters for culture and for Mother of Pearl.

13. EIGHTY MILE BEACH AND CAPE KERAUDREN- Cape Missiessy to Point Poolingerina and extending to 5km seaward of Low Water Mark. (I.N.C).

Declared Ramsar wetland of international significance as migratory wading bird habitat. Regional recreation and sport fishing.

14. BEDOUT ISLAND (N).

'A' Class nature reserve. Important seabird nesting area.

15 . BREAKER INLET - Poissonnier Point to Spit Point and down Breaker Inlet to 20°03's, and extending 5km seaward of Low Water Mark. (N.C).

Mangroves, important seabird feeding areas. Subsistence Aboriginal fishing.

16. NORTH TURTLE ISLAND AND SURROUNDING REEFS (N).

'A' Class nature reserve. Important seabird nesting area.

17. LITTLE TURTLE ISLAND AND SURROUNDING REEFS (N).

'A' class nature reserve

18. PORT HEDLAND WEST - Western edge of Finucane Island west to Cape Thouin, extending 5km seaward of Low Water Mark. (N.C)

Mangroves. Boating. Subsistence Aboriginal fishing. Sport fishing.

19. CAPE COSSIGNY TO POINT SAMSON - Coast from Cape Cossigny west to Point Samson, extending 5km seaward of Low Water Mark. (N.E.C).

Significant mangrove communities. Fishing boat harbour (Sam's Creek). Subsistence Aboriginal fishing. Sport fishing. Boating. Recreational beach.

20. NICKOL BAY FORESHORE — extending 5km seaward of Low Water Mark. (N.C).

Mangroves. Sport fishing. Recreation.

21. DAMPIER ARCHIPELAGO TO NORTH-WEST CAPE - COAST AND ISLANDS

21(a) DAMPIER ARCHIPELAGO - Boundary to include West Intercourse Island, Eaglehawk Island, Enderby Island, Kendrew Island, Brigadier Island, Legendre Island Delembre Island , Dolphin Island and the eastern coastline of the Burrup Peninsula. (I.N.E.C.S).

Dugongs. Islands are mostly nature reserves proposed as national park and the waters potentially a marine park/s. Significant environments include sand flats supporting rich

intertidal fauna, turtle and seabird nesting areas, coral reefs, mangroves. Economic significance includes commercial pearl culturing, solar salt intake at Dampier, and industrial cooling water intakes. A number of islands important for recreation; boating and yachting, beaches and sport fishing.

21(b) MONTEBELLO ISLANDS, LOWENDAL ISLANDS AND BARROW ISLAND SHELF - Extending to the 20 metre isobath. (N.E.C)

Montebello Islands are 'A' Class conservation park, Barrow Island and the Lowendal Islands are Class 'A' nature reserves. A marine park is proposed for the Montebello Islands area. Important turtle breeding area. Diverse molluscan fauna. Coral reefs, mangroves, intertidal flats, extensive sheltered lagoonal waters, and shallow algal and seagrass reef platform extending to the south of the Montebello Islands to the Rowley Shelf. Commercial pearl culture, increasing recreational importance.

21(c) ROWLEY SHELF - To encompass an area bounded by Ningaloo Marine Park boundary at 114°16'E, 21°43'S and 114°19'E, 21°47'S, Tubridgi Point, the 20m isobath and the mainland east to the Dampier Archipelago, and all islands within this area. (I.N.E.C).

Dugongs near Port Weld. Little Rocky Island, part of Thevenard Island and Serrurier Island are 'A' class nature reserves. Reservation of the other islands as nature reserves is progressing (System 9). Seabird nesting areas. Coral reefs. Turtle breeding areas. Mangrove and tidal flats. Source of nutrients for surrounding ecosystems. Fish and prawn nursery area. Commercial prawn fishing. Commercial pearl culture off Middle Island. Subsistence Aboriginal fishing in Beadon Bay. Offshore fishing. Recreation.

21(d) EXMOUTH GULF- Waters of the Gulf enclosed by a line from Ningaloo Marine Park boundary at 114°19'E, 21°47'S to Tubridgi Point. (I.N.E.C).

Dugongs. Islands are proposed nature reserves (System 9). Rich echinoderm fauna. Extensive mangrove and tidal flats. Seabird feeding areas. Turtle nesting area. Commercial prawn and fin fishery. Commercial pearl culture in Giralia Bay and Gales Bay. Fish and prawn nursery area. Tourism. Sport fishing. WA Museum research areas.

22. NINGALOO MARINE PARK AND CORAL REEF SYSTEM SOUTH TO RED BLUFF- From Red Bluff at 24°02'S, around North West Cape to enclose Bundegi Reef in Exmouth Gulf at 21°53'S. (I.N.E.C.S).

Marine Park. Important large, rich, accessible barrier coral reefs with associated flora and fauna, clear sheltered lagoonal waters, sandy beaches and rocky headlands. Mangroves. Turtle breeding areas. Tourism. Recreation. Sport fishing. Coral Bay marine reserve. Biological research area.

23. SHARK BAY WORLD HERITAGE AREA AND SHARK BAY MARINE PARK/HAMELIN POOL MARINE NATURE RESERVES - Bounded by a line drawn between Point Quobba and Zuytdorp Point at 26°25'S, via Bernier, Dorre and Dirk Hartog Islands and including the near coastal waters to the west of these islands to the 20 metre isobath. (I.N.E.C.S).

World Heritage Listed Area. Stromatolites. Large dugong population, world's largest seagrass bank. Wooramel Seagrass Bank, Denham Sound, Freycinet Reach and Estuary. Hopeless Reach and Lharidon Bight are included in the Shark Bay Marine Park, Hamelin Pool is a Marine Nature Reserve. Turtle breeding areas. Seabird nesting areas. Seagrass meadows. Mangroves. Tidal flats. Commercial prawn and fin fishery (mainly snapper). Scallops. Fish and prawn nursery area. Intakes for commercial solar salt production at Useless Inlet and Useless Loop. Tourism. Sport fishing. Boating. Shell collecting. Geological/biological research areas.

24. KALBARRI - Murchison River Estuary. (E.C).

Commercial fishing, including rock lobster fishery. Tourism. Major recreational area. Sport fishing.

25. HOUTMAN-ABROLHOS ISLANDS AND ASSOCIATED CORAL REEFS (Wallabi, Easter and Pelsart groups). (I.N.E.C.S).

Breeding islands for Lesser Noddy, an endangered bird species. The islands are an 'A' Class reserve for conservation of flora and fauna, tourism and for purposes associated with the fishing Industry. Marine parks are proposed for some areas. Rich and diverse marine flora and fauna. Important seabird nesting areas. Southernmost coral reef system in the Indian Ocean. Mangroves. Algae. Sea lions. Major rock lobster fishery. Scallop fishery. Recreation. Sport fishing. Biological research area.

26. CENTRAL WEST COAST LIMESTONE REEF AND LAGOON ENVIRONMENTS - SEVEN MILE BEACH TO PORT KENNEDY

26(a) Seven Mile Beach to Two Rocks on the mainland extending to the 20m isobath and including all islands and reefs. (N.E.C.S)

Island nature reserves, biologically rich reef and semi-enclosed lagoonal waters. Seabird nesting areas. Sea lions. Rock lobster fishery. Recreation. Sport fishing. Seven Mile Beach is an important biological research and reference area.

26(b) METROPOLITAN BEACHES AND REEFS- Two Rocks to Woodman Point, extending to the 20 metre isobath. (N.E.C.S).

Marmion Marine Park, offshore reefs and lagoons from Ocean Reef to Trigg (System 6). Rock lobster fishery. Sport fishing. Recreational beaches. Tourism. Boating and yachting.

26(c) ROTTNEST ISLAND AND ASSOCIATED REEFS. (N.E.C.S).

'A' Class reserve. Includes adjacent rocks and islands and adjacent waters to 20 metre isobath. Two proposed aquatic reserves (System 6). Rich and varied marine flora and fauna, including coral species. Seabird nesting areas. Professional fishery, mainly rock lobster. Tourism. Recreational beaches. Boating. Sport fishing. Abalone. Biological research and educational area.

26(d) SWAN AND CANNING RIVER ESTUARIES - River mouth to Guildford and Nicholson Rd Bridge. (N.E.C).

Major west-coast estuary, fish nursery area. Includes several marine parks. Tourism, very high recreational usage. Boating and yachting. Sport fishing.

26(e) COCKBURN SOUND - Waters enclosed by Woodman Point, Carnac Island, Garden Island and Point Peron. (N.E.C.S).

Proposed aquatic reserve surrounding Carnac Is. (System 6). Seagrass, major fish nursery area. Professional fisheries (principally pilchard, scaly mackerel, crabs and abalone) and mariculture. Power station and industrial water intakes. Tourism. Sport fishing. High recreational use. Beaches. Boating and yachting. Biological research area.

26(f) SHOALWATER BAY AND WARNBRO SOUND - Point Peron to Becher Point, including Penguin Island. (N.E.C).

Shoalwater Bay Marine Park. Sea lions. Nesting area for Little Penguin. Seagrass. Nursery area for fish. Professional abalone fishery. Beach recreation. Boating and yachting. Sport fishing.

27. PEEL-HARVEY INLET- Includes entrance to Peel Inlet, Mandurah and the Dawsville Channel (when completed). (I.N.E.C).

Designated Ramsar Wetland of International significance. Includes proposed marine park. Commercial fishery. Fish nursery. Tourism. Recreation. Sport fishing.

28. LESCHENAULT INLET (N.E.C).

Isolated southernmost mangrove populations in WA. Professional fishery. Power station cooling water intake. Tourism. Recreational beaches. Boating and yachting. Sport fishing.

29. GEOGRAPHE BAY - To 20m isobath, from Wonnerup Estuary to Cape Naturaliste. (E.C).

    Professional fishery. Fish nursery area. Seagrass. Tourism. Beaches. Sport fishing. Boating and yachting.

30. LEEUWIN-NATURALISTE COAST - Cape Naturaliste to Cape Leeuwin, extending to the 20 metre isobath. (N.C).

    High energy coastal environment, reefs, scattered corals, important seabird nesting areas, sealions. Biologically significant transitional environments between the relatively warmer waters of the west coast and the cooler waters of the south coast. Major recreational significance for sport fishing, beaches, surfing, diving

31. BLACKWOOD RIVER ESTUARY (E.C).

    Major river estuary. Tourism. Recreation. Beaches. Sport fishing. Fish nursery area .

32. WINDY HARBOUR. (N.C).

    Part of D'Entrecasteaux National Park. Recreational beaches. Sport fishing.

33. BROKE INLET. (N.C).

    Proposed aquatic reserve (System 2), surrounded by D'Entrecasteaux National Park. Only estuary in the South-West essentially unmodified by changes associated with land-clearing and development. Fish nursery area. Broke Inlet is only open to the sea during the winter - spring season.

34. NORNALUP INLET. (N.C).

    Surrounded by the Walpole-Nornalup National Park. Fish nursery and fishing area. Recreational area.

35. IRWIN INLET AND PEACEFUL BAY (Foul Bay). (R).

    Recreational beaches. Sport fishing.

36. WILSON INLET - Includes Ocean Beach. (E.C).

    Fish nursery and fishing area. Tourism. Recreational beach. Sport fishing.

37. KING GEORGE SOUND, ALBANY - Bald Head to Cape Vancouver. Includes Princess Royal Harbour, Oyster Harbour and King George Sound. (N.E.C.S).

    Important seabird nesting areas. Seals. Diverse molluscan fauna. Seagrass meadows. Professional fishery (principally pilchard). Tourism. Recreational beaches. Boating and yachting. Sport fishing. Research areas.

38. TWO PEOPLE BAY - Cape Vancouver to Bald Island, includes islands. (N.R).

    Class A Nature Reserve. Recreational beaches. Sport fishing.

39. HASSELL BEACH (Cheyne Beach) - Lookout Point to coast at 118°30'E. (E.C).

    Salmon fishery. Recreational beach.

40. BEAUFORT INLET. (E.C).

    Fish nursery and fishing area. Recreational beaches.

41. BREMER BAY - Smooth Rocks to Gordon Inlet. (C).

    Recreational beaches. Sport fishing.

42. FITZGERALD RIVER NATIONAL PARK COASTLINE - Gordon inlet to Culham Inlet. (I.N.C).

    Reefs and Seagrass meadows. Significant humpback whale calving grounds. Coast is part of Fitzgerald River Biosphere Reserve. Recreational beaches. Sport Fishing.

43. HOPETOUN.- Culham Inlet to Table Hill (C).

    Recreational beaches. Sport fishing.

44. THE RECHERCHE ARCHIPELAGO AND ESPERANCE - Boundary defined by coastline and islands of the Recherche Archipelago, between Stokes Inlet and Israelite Bay. (N.E.C).

    Islands of Archipelago have 'A' Class nature reserve status. Includes Cape Le Grand National Park and Cape Arid National Park which extend to low water mark. Important seabird nesting areas. Seals (especially New Zealand Fur Seal). Diverse molluscan fauna. Scattered corals. Professional fisheries (mainly tuna, shark and abalone). Tourism. Recreational beaches. Boating and yachting. Sport fishing.

45. TWILIGHT COVE - Coastline from 125° 50'E to 126° 25'E. (N.S).

    Fragile sandy coast, fringing reef and lagoon environment, seagrass meadows significant wader-bird habitat. Scientific research area and monitoring site.*

* Note there is little documented information on the characteristics or significance of the marine environment adjacent to the Baxter Cliffs or the Roe Plains sections of the Nullarbor coast east to the border with South Australia. The characteristics of this coastline need to be further investigated to determine their level of significance.

• Systems 2, 5, 6, 7, 8, 9 - refer to References 10, 11,12 and 13.

Appendix D

Seasonal sensitivities of marine environments of Western Australia

The following table presents information on breeding seasons / areas and migration times for various species of marine life in Western Australia. More detailed information is to be included in the coastal resources atlas being developed by the Department of Transport.

SPECIES	TIME	REASON FOR SENSITIVITY
Rock lobster	15 November to 30 June 15 March to 30 June October to November November to January	Fishing season except Abrolhos Islands Fishing season Abrolhos Islands Settlement of larvae Spawning
Prawns (Western King and Brown Tiger)	Mid March to end October April to mid November August to October November to January	Shark Bay trawling season Exmouth Gulf trawling season Release of larvae Settlement of larvae in shallows, eastern parts of Shark Bay and Exmouth Gulf
Fish	October to April	Peak breeding season, becoming less seasonal in tropical waters
Corals	March/April	Spawning and settlement period
Turtles	October to March	Peak breeding period in northern WA
Dugongs	October to March	Breeding period, inshore waters
Seabird breeding	March to June	Peak breeding period, some species breed in spring
Migratory wading birds	September/October and March/April	Migratory species congregate on coasts, Roebuck Bay to Cape Keraudren
Humpback whales	Early April - end July Mid June - late August End August-early December	Northward migration. Calving and mating (major breeding grounds are north of Cape Leveque). Southward migration.
Southern right whales	Early June - end July August - September Early September - end October	Whales arrive in Australian waters. Calving and mating (major breeding grounds are from Great Australian Bight to Cape Leeuwin). Whales leave Australian waters.
Irrawaddy dolphins	summer months	probable breeding season (further research needed to confirm this). This dolphin occurs in inshore waters and estuaries in the Kimberly

Appendix E

Summary of effects of seismic tests on marine animals

(Based on McCauley, R D. 1994, *Seismic surveys*. In *Environmental implications of offshore oil and gas development in Australia - the findings of an independent scientific review*, Swan, J M, Neff, J M, and Young, P C (Eds), Australian Petroleum Exploration Association, Sydney, pp 19-121.)

Lethal effects

Except for plankton and larvae at close range, few species are likely to be killed outright by air-gun seismic surveys.

Pathological effects

Immediate pathological damage will be restricted to short ranges and high sound intensities. Animals which do not move from the path of a seismic vessel because of behavioural or physical constraints, or which are caught unawares within a few hundred metres of an array when it suddenly starts up, will be most at risk from pathological damage. The sound intensities required to produce pathological effects are poorly known in nearly all marine animals, but probably occur at ranges from an air-gun array of less than 100m for marine mammals and 200m for fish.

Hearing of marine animals

Most invertebrates, fur seals, sea lions, dugong, small toothed whales and little penguins have poor hearing at low frequencies so that adverse behavioural effects should be noted only at close range. The ranges for adverse effects are unknown. In contrast, some fishes, baleen whales, and possibly sea turtles, may hear seismic sounds well and behavioural changes may occur at greater distances.

Displacement

Marine animals such as some species of fish and baleen whales will move away from an operating airgun array. This will occur at ranges out to 1.5 to 7 km for baleen whales and 200 to 1000 m for fish. In certain situations displacement may occur at longer ranges.

Alarm response

The behavioural effects of operating seismic vessels include an alarm response where an animal tenses or changes from normal behaviour in anticipation of fleeing, displacement or dispersion.

Habituation

It is possible that animals will habituate to seismic sounds.

Effects on prey animals

Animals which are little affected by seismic survey vessels may in theory be indirectly affected by changes in prey behaviour or abundance if surveys are run for protracted periods (weeks to months) across set feeding grounds. Such animals include little penguins and seals. The effect is speculative only.

Effects on breeding or spawning

The greatest risk to marine animals from seismic surveys appears to be during breeding or spawning periods. Breeding or spawning is a seasonal activity in almost all populations. In some species breeding events often occur at specific locations and over narrow time windows. The simple expedient of not running surveys at such locations will remove this risk.

Effects on migration

Operating seismic survey vessels for protracted periods across narrow, restricted migratory paths may hinder the passage of migrating animals.

Possible effects on baleen whales

On the basis of the available abundance information, humpbacks would appear top be the most likely baleen whales to be encountered during seismic operations. This would be particularly so for surveys run in coastal areas of north-west Western Australia during the months June to October when the bulk of the western population are using these areas as mating and calving areas. Surveys run in enclosed bays such as Exmouth Gulf or Shark Bay over these months may be extremely disruptive. Although far fewer in number the southern right whale will be particularly susceptible to surveys run close inshore along the southern Australian coast. Considering the comparatively small population of Australian southern right whales, disruption to calving and mating behaviour may have detrimental effects on the long term population status.

Raising of hearing thresholds

The raising of hearing thresholds by continued exposure to intense seismic 'shots' may hinder communication or the perception of acoustic cues by baleen whales and fish. This would have repercussions for aggregations of breeding animals which use sound to mediate reproductive behaviour.

Overall conclusions

There have been virtually no reports to date of seismic surveys grossly influencing Australian marine animals in a negative fashion, although there are few detailed studies. Some populations of whales mooted as being at risk show rates of increase comparable with unexposed populations.

All of the effects of seismic surveys on marine animals need to be considered in the perspective of the geographic spread of an animal population, compared with the zones of influence and the duration of surveys. Localised displacement of pelagic animals will have a minimal effect on their population status. Interruption to breeding events will only be important if the population in question has few, concentrated breeding aggregations which are susceptible to dispersal or masking of acoustic cues by seismic surveys.

Provided that seismic surveys are avoided at locations and times of particular sensitivity, and given the relatively small scale of seismic activity, the often large scales over which biological events occur, the low probability of encounter between seismic surveys and 'at risk' populations at an appropriate time and place, then the wider implications of disruptions by seismic surveys appear to be small for most species.

Appendix F

Generic guidelines for the preparation of a Consultative Environmental Review for a proposed offshore petroleum exploration drilling program

Overview

In Western Australia all environmental reviews are concerned with protecting the environment. The fundamental requirement is for the proponent to describe what will be done, to discuss the potential environmental impacts of the proposal, and then to describe how those environmental impacts are going to be managed so that the environment is protected.

If the proponent can demonstrate that the environment will be protected then the proposal will be found environmentally acceptable; if the proponent cannot show that the environment would be protected then the Environmental Protection Authority (EPA) would recommend against the proposal.

Throughout the process it is the aim of the DEP to advise and assist the proponent to improve or modify the proposal in such a way that the environment is protected. Nonetheless, the environmental review in Western Australia is proponent-driven, and it is up to the proponent to identify the potential environmental impacts, and design and implement proposals which protect the environment.

Protecting the environment means that the natural and appropriate social values associated with the project area are protected. Where they cannot be protected, proposals to mitigate the impacts are required.

These Guidelines identify issues associated with the exploration program that should be addressed within the Consultative Environmental Review (CER). They are not intended to be exhaustive and the proponent may consider that other issues should also be included in the document.

The CER is intended to be a brief document, its purpose should be explained, and the contents should be concise and accurate, as well as being readily understood by interested members of the public. Specialist information and technical description should be included where it assists in the understanding of the proposal. It may be appropriate to include ancillary or lengthy information in technical appendices.

Key issues

The important issues for this proposal are likely to be associated with the location of the drill rig close to environmentally sensitive areas such as (for example) coral reefs, seagrass beds, turtle and bird nesting beaches, mangroves and marine nursery areas. Routine and accidental discharges and their impacts on the environment need to be considered. If the development is near a turtle breeding beach, the possible impact of light ("photo-pollution") from artificial lights and flares needs to be considered. The key issues for the project should be clearly identified and the content of succeeding sections determined by their relevance to these issues. The key issues are expected to include:

- an appraisal of the environment within the area covered by the proposal. This should also cover the social environment if, for example, commercial/recreational industries exist within the area;
- broad timing of the proposal. The specific timing of the wells would not be required at this stage as this information would be expected to comprise part of the site-specific data package provided to Government at the time the well sites become accurately known;
- operational details of the program. These should include rig type, rig refuelling procedures, exclusion zones, drilling muds, routine discharges (domestic and drilling), support personnel, vessels and their bases;
- description of any sensitive environments;
- discussion of the probability and impacts of oilspills (Tiers 1, 2 or 3), their grade, trajectories, the time taken to spread into environmentally sensitive areas if uncontrolled, and proposed management of each category of spill. It will be important to acknowledge the probability of drilling occurring near to sensitive marine environments (even if specific

well sites are not known at this stage), and to prepare an appropriate management plan to minimise the risks of a spill and its impact should it occur;

- the purpose of the plan should be to demonstrate the manner in which potential environmental impacts (via routine or accidental activities) can be ameliorated either by design or specific ongoing management. It should also discuss proposed environmental monitoring of any sensitive locations adjacent to proposed well sites, both before and after drilling;
- an abridged version of an Oilspill Contingency Plan, which should be in the form of a stand-alone Appendix provided with the CER. The key points from this plan should be summarised in the management plan within the body of the CER and should include a discussion of the specifications and location of the proposed containment and recovery equipment (booms, skimmers), dispersant stocks and associated application equipment;
- details of measures to be taken to reduce impact of light on turtle breeding beaches (eg use of low intensity lighting, shielding of lights and flares); and,
- any other key issues raised during the preparation of the report.

Public participation and consultation

A description should be provided of the public participation and consultation activities undertaken by the proponent in preparing the CER (such as discussions with the Shire and local communities). This section should describe the activities undertaken, the dates, the groups and individuals involved and the objectives of the activities. It should be cross referenced to other sections and should clearly indicate how community concerns have been addressed. Where these concerns are dealt with via other departments or procedures outside the Environmental Protection Authority process, these can be noted and referenced here. Provisions for notifying the public when exploration activities will actually occur need also to be considered.

Detailed list of environmental commitments

The commitments being made by the proponent to protect the environment should be clearly defined and separately listed. Where an environmental problem has the potential to occur, there should be a commitment to rectify it. They should be numbered and take the form of:

- **who** will do the work?;
- **what** and **where** is the work?;
- **when** and to **whose satisfaction** will the work be carried out?

All actionable and auditable commitments made in the body of the document should be numbered and summarised in this list.

Appendix G

Typical environmental conditions for offshore petroleum exploration drilling proposals within environmentally significant areas

EXAMPLE ONLY

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED

(PURSUANT TO THE PROVISIONS OF THE

ENVIRONMENTAL PROTECTION ACT 1986)

EXPLORATION DRILLING IN PERMIT EP ....

This proposal may be implemented subject to the following conditions:

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

1-1 In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Consultative Environmental Review and in response to issues raised following public submissions. These commitments are consolidated in Environmental Protection Authority Bulletin - - - as Appendix 1. (A copy of the commitments is attached.)

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3 Site Specific Data

The Environmental Protection Authority requires site-specific environmental data for each proposed well site to enable review of environmental management plans for adequate protection of the area.

3-1 At least three weeks prior to the commencement of drilling of exploration wells proposed as part of the programme described in the Consultative Environmental Review, the proponent shall provide details of the exact locations of the wells and descriptions of the adjacent environment together with any proposed site-specific modifications to environmental management provisions for those locations, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy.

3-2 The proponent shall subsequently implement the proposals referred to in condition 3-1 to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy.

4 Type of Drill Rig

The Environmental Protection Authority's assessment is based on the premise that the proponent will use a jack-up drill rig. The impacts associated with different types of drill equipment may vary and may require separate management procedures to be in place for their use.

4-1 Prior to the use of any drilling rig other than a jack-up type, the proponent shall provide plans for its use and environmental management to the Environmental Protection Authority for evaluation and shall subsequently implement appropriate environmental management plans for that rig, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy.

5 Work Programmes beyond Current Proposal

Proposals for work other than the drilling proposed will require further review because of the potential for environmental impacts which have not been assessed.

5-1 Prior to implementing any drilling beyond that in the programme proposed in the Consultative Environmental Review, or development plans resulting from that programme, the proponent shall refer proposals for such further work to the Environmental Protection Authority and the Department of Minerals and Energy.

6 Responsibility for Adverse Environmental Impacts

Recognition is needed of the environmental sensitivity of the area and a commitment to make good any environmental damage which might be incurred as a result of the proposal going ahead.

6-1 Prior to drilling the first well, the proponent shall implement arrangements to accept responsibility for any adverse environmental impacts which may occur as a consequence of the proposal proceeding, to the requirements of the Minister for the Environment after consultation with the Minister for Fisheries and the Minister for Mines.

7 Oil Spill Response Capability

The proponent needs to be able to manage small oilspills which may occur in the vicinity of the drill rig.

7-1 Prior to drilling each well, the proponent shall provide on or adjacent to the rig the capability for containing small oil spillages, to remain there permanently until demobilisation of the rig, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy.

8 Refuelling of the Rig

To maximise the chances of containment and recovery of spilt oil, the refuelling operation should take place in favourable conditions.

8-1 The proponent shall only refuel the rig when weather and sea conditions are sufficiently calm to permit containment and recovery of any fuel oil which may be spilt, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy.

9 Simulated Oil Spill Exercise

The proponent should ensure oilspill preparedness by testing the Oilspill Contingency Plan on a regular basis.

9-1 Prior to commencement of the first well, the proponent shall successfully trial run an oil spill exercise, up to the point of the deployment of resources, to the requirements of the Environmental Protection Authority on advice of the State Committee for Combating Marine Oil Pollution.

9-2 The proponent shall run further oil spill exercises at least once a year or for each change of rig, whichever is the sooner, for the duration of the programme in the Consultative Environmental Review, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy.

10 Decommissioning

The satisfactory decommissioning of the project, removal of the plant and installations and rehabilitation of the site and its environs is the responsibility of the proponent.

10-1 The proponent shall be responsible for environmental aspects of decommissioning the rig and any wells and rehabilitating the site and its environs, to the requirements of the Environmental Protection Authority on advice of the Director, Petroleum Division, Department of Minerals and Energy.

11 Proponent

These conditions legally apply to the nominated proponent.

11-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

12 Time Limit on Approval

The environmental approval for the proposal is limited.

12-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

13 Compliance Auditing

In order to ensure that environmental conditions and commitments are met, an audit system is required.

13-1 The proponent shall prepare periodic "Progress and Compliance Reports", to help verify the environmental performance of this project, in consultation with the Environmental Protection Authority.

Procedure

The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

EXAMPLE ONLY

Commitments

The Proponent undertakes to abide by all of the commitments made in the Consultative Environmental Review (CER) for the five year exploration drilling programme for permit areas EP and in all cases will fulfil those commitments to the satisfaction of the appropriate statutory authority(s).

The major commitments given within the CER are listed below.

(1) The Proponent will adopt the environmental management strategies outlined in this CER.

(2) Well-specific details including the location, water depths, distance from sensitive resources and drilling programmes will be submitted the Department of Minerals and Energy and the EPA with each drilling application. Each application will be submitted at least three weeks prior to the proposed spud date for each well.

(3) Before commencement of their duties, each worker or contractor (including workboat and supply vessel crews) will be given an induction including advice on the sensitive nature of the environment in which the drilling rig is located.

(4) Regular crew transfers between the drilling rig and Onslow will use crew boats.

(5) Masters of crew and supply vessels will be instructed not to allow crew to disturb islands or wreck sites, nor to anchor close to coral reefs.

(6) Deck drainage and other oily wastes will be collected and transported to the mainland for disposal at a site approved by the Shire of .....

(7) The Proponent will manage all oil spills using the approved Oil Spill Contingency Plan (OSCP) and will abide by all procedures detailed in the OSCP.

(8) An oil spill recovery vessel fitted with oil spill combat equipment will be on dedicated standby at Dampier during drilling. A standby vessel will be in the vicinity of the drilling rig at all times to assist with oil spill combat responses in the event of an oil spill.

(9) An oil spill containment boom and skimmer will be stored on board the drilling rig for the duration of the drilling programme. In the event of an oil spill, this equipment will be loaded onto the support vessel for deployment.

(10) In the event that the EPA grants pre-approval to the Proponent for dispersant use, the company will ensure that adequate stocks of an appropriate approved dispersant are stored on board the drilling rig, ready for immediate use under approved conditions.

Appendix H

Use of dispersants on floating oil in sensitive marine environments

USE OF DISPERSANTS ON FLOATING OIL IN ESA's

So as to reflect current improved levels of understanding this section has been revised and differs in parts from its equivalent in Bulletin 104. In that document the use of dispersant was largely prescribed by the two categories of notification zone. In the 8km wide IPZ the use of dispersants was discouraged (proximity to shorelines and generally shallow waters), whereas their use was encouraged in the SCZ, unless within 8km of a shoreline or in waters less than 10m deep.

The normal cutoff for dispersant use has now been set at 20m to allow a factor of safety.

NOTE: The change from 10m to 20m in this document recognises that waters around 10 metres deep are often close to near-surface coral reefs, and that horizontal wind and tidal movements can bring an oilspill into contact with these in a short time. Figure 5 in the main part of the report clarifies this concept. The DEP's current position follows below.

Note that the following are intended for use as guidelines. Operationally the decisions will be made by the National Plan State Committee using the most current data available.

A. Within Sensitive Marine Environments and their Notification Zones:

dispersants generally should not be applied unless specifically authorised by the State Combat Committee. In certain circumstances however, where drilling is close to a particularly sensitive environment, prior approval to apply dispersant under specific conditions and in accordance with a detailed contingency plan may be given, following environmental impact assessment.

B. In waters less than 20m deep (together with an 8km wide protective zone around such shallow areas) and including any reefs or banks rising to within 20m of the sea surface:

dispersants generally should not be applied unless authorised by the National Plan State Committee, or unless pre-approval for the use of dispersants in those particular circumstances was granted.

C. Within 8-30km from the 20m depth contour:

dispersant may be applied if considered by the National Plan State Committee on advice from the DEP to be necessary for the protection of the resources at risk.

D. Within 30-50km from the 20m depth contour:

dispersants are unlikely to be required. The use of dispersants will only be considered by the National Plan State Committee and the DEP if there are indications that the oil will move into an environmentally sensitive area.

E. For oil floating more than 50km from the 20m depth contour:

dispersants should not be needed unless recommended by the National Plan State Committee after it has taken into account meteorological, hydrological and environmental advice.

Whilst the above general procedures are recommended it should be recognised that specific procedures may be applied on a case by case basis as appropriate.

Approval to use dispersants will be assessed on the basis of the following criteria and therefore applications seeking pre-approval should state the situation and scenarios for which pre-approval is sought:

- nature of the material spilt;
- volume of the spill and whether the source has been isolated;
- type of dispersant that is proposed and method of application;
- prevailing and forecast meteorological and oceanographic conditions at the time of the spill;
- direction and rate of travel of the slick;
- sensitive resources potentially at risk of impact, with due regard to seasonal variations, and predicted time elapsed before impact.