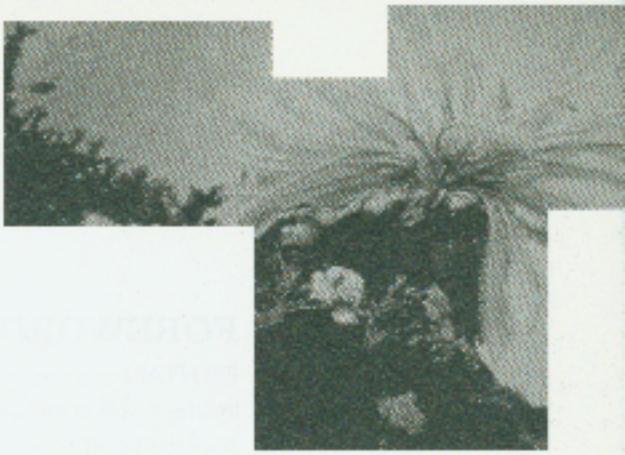
REEFPLAN

OIL SPILL CONTINGENCY PLAN
FOR THE GREAT BARRIER REEF

SUPERSEDED

REEF



AN OIL SPILL CONTINGENCY POLICY DOCUMENT FOR THE GREAT BARRIER REEF WORLD HERITAGE AREA

PLAN

AMSA
Australian Maritime Safety Authority

FOREWORD

REEFPLAN provides the policy and strategic setting for the response arrangements to pollution incidents within the Great Barrier Reef World Heritage Area (GBRWHA). REEFPLAN was first published and promulgated in 1987 as a sub-set of the National Plan.

REEFPLAN has been updated to take into account the oil spill contingency arrangements which followed a review of the National Plan in 1993 and the development of the *Queensland Coastal Contingency Action Plan* (QCCAP) and TORRESPLAN.

REEFPLAN complements the QCCAP, consequent regional plans and the *Guidelines for the Provision of Safe Haven for Damaged or Disabled Vessels* (GPSHDV). The operational response arrangements in QCCAP and consequent regional plans will apply within the geographic area covered by REEFPLAN.

The oil spill contingency arrangements outlined in the QCCAP, GPSHDV and other plans for the region are not duplicated in REEFPLAN.

REEFPLAN is a strategic, not an operational response plan. As such it provides the policy framework and intergovernmental linkages essential to ensure that:

- responses to oil spill incidents are implemented in the most operationally and cost effective way; and
- the World Heritage values of the Great Barrier Reef are protected.

REEFPLAN recognises that the threat of an oil spill is real. Even though prevention is the main focus of the relevant transport authorities and the Great Barrier Reef Marine Park Authority (GBRMPA), there is still a risk to the environmental values of the GBRWHA from accidents which could result in an oil spill incident.

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GLOSSARY

AIP	Australian Institute of Petroleum
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
ASA	Australian Shipowners Association
ASC	Administrative Support Co-ordinator
GBRMPA	Great Barrier Reef Marine Park Authority
GBRWHA	Great Barrier Reef World Heritage Area
GPSHDD	Guidelines for the Provision of Safe Haven for Damaged or Disabled Vessels
IMO	International Maritime Organization
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships
MLO	Media Liaison Officer
MOSAP	Marine Oil Spill Action Plan
OSC	On-Scene Co-ordinator
POLREP	Pollution Report
QCCAP	Queensland Coastal Contingency Action Plan
QDoT	Queensland Department of Transport
QDE	Queensland Department of Environment
QES	Queensland Emergency Services
RHM	Regional Harbour Master
SES	State Emergency Service
SITREP	Situation Report
SOSC	State Oil Spill Commander
SSC	Scientific Support Co-ordinator

PART 1 INTRODUCTION

1.1 SCOPE OF THE PLAN

1.1.1 National Plan

The *National Plan to Combat Pollution of the Sea by Oil* (National Plan) provides a level of preparedness to the threat posed to the marine environment by oil spills. The Plan represents a combined effort by Commonwealth and State/NT governments, the oil, shipping and exploration industries to respond to marine pollution incidents. The Plan has been in operation since 1973 and a major review of National Plan activities was undertaken in 1993. As a result of this review, the capabilities of the National Plan were significantly increased.

The objectives of the National Plan are based on Australia's responsibility to protect natural and other resources from the adverse effects of oil pollution and to minimise these effects where possible.

The Plan provides details for a national response which promptly and effectively deals with marine oil pollution incidents by designating competent national, state and local authorities and maintaining:

- contingency plans for preparedness and response to pollution incidents;
- an adequate level of pre-positioned oil spill combat equipment;
- a comprehensive national training program to familiarise personnel with the requirements of planning for, and responding to, oil spills; and
- detailed state, local and industry contingency plans and communications arrangements for mobilising resources and responding to an oil pollution incident.

Funding of the National Plan is based on the 'polluter pays' principle. To achieve this a small quarterly levy (Protection of the Sea Levy) is imposed on commercial shipping using Australian ports.

1.1.2 Aim of REEFPLAN

REEFPLAN details the policies and strategies which will be employed in the event of an oil spill occurring in waters within the scope of the plan.

1.1.3 Geographical Scope of REEFPLAN

The REEFPLAN area is defined as conforming to the boundaries of the Great Barrier Reef World Heritage Area (GBRWHA). The area covered by the GBRWHA is shown on Map 1. A geographic description of the area is given in Schedule 1 of the nomination of the Great Barrier Reef by the Commonwealth of Australia for inclusion in the World Heritage List and is at Appendix 1 to this plan.

Gazetted port areas within the World Heritage Area are under the control of Queensland port authorities. Map 1 shows the port areas which are covered by specific regional oil spill contingency plans. These regional plans are implemented through the Regional Harbour Masters (RHM).

1.1.4 Objectives of REEFPLAN

Within the framework of the administrative arrangements for the National Plan, the broad objectives of REEFPLAN are:

- to outline policies and strategies which will be implemented for effective and timely response to a marine or land sourced oil spill;
- to complement regional operational plans describing procedures for a coordinated response to evaluate and combat an oil spill as outlined in the Queensland Coastal Contingency Action Plan (QCCAP); and
- to assist in development of teamwork, cooperation and a required level of preparedness between Commonwealth and Queensland Governments, the community and industry in managing the response to an oil spill.

1.1.5 Preparation of REEFPLAN

REEFPLAN has been prepared by the Australian Maritime Safety Authority (AMSA) in cooperation with the Great Barrier Reef Marine Park Authority (GBRMPA), Queensland Department of Transport (QDoT) and the Queensland Department of Environment and Heritage (QDE).

1.1.6 Contacts

For further information on REEFPLAN contact:

FOR FURTHER INFORMATION ON THE QCCAP AND OTHER PLANS WHICH APPLY TO THE REEFPLAN AREA CONTACT:

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1.2 LEGISLATION AND STATUTORY ARRANGEMENTS

1.2.1 Operational Discharges in the Great Barrier Reef

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) contains special requirements for ships navigating in the Great Barrier Reef region.

The Convention generally permits operational discharges from ships providing certain conditions are met, most notably that the ship must be a specified distance from the nearest land. In respect of the Great Barrier Reef, however, the Convention defines a line covering part of Torres Strait and the entire outer edge of the reef from which such distances must be measured, as indicated in Figure 1.

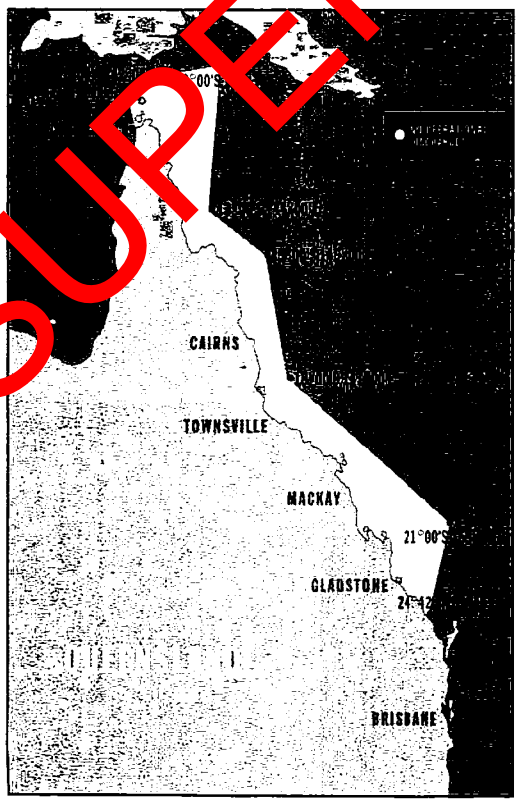
The effect of this is that no operational discharges are permitted in the Great Barrier Reef region.

For example, discharges of cargo tank washings from oil tankers which can normally be made more than 50 nautical miles (nm) from the nearest land must be made more than 50nm outside the line indicated above in Figure 1.

Similarly, unprocessed garbage can only be disposed of more than 12nm outside the line. The only exception to this in terms of garbage disposal, are small quantities of food waste for the specific purpose of fish feeding in connection with fishing or approved tourist operations.

The MARPOL 73/78 Convention is applied in Australia through the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*, the *Great Barrier Reef Marine Park Act 1975* and the *Navigation (Protection of the Sea) Amendment Act 1983* and in Queensland state waters through the *Queensland Transport Operations (Marine Pollution) Act 1995*.

FIGURE 1



1.2.2 Intervention In Pollution Incidents

Within the 3nm state waters limit off the Queensland coast, the Queensland Government has the right to intervene in any actual or threatened pollution incident. Beyond the 3nm limit the Commonwealth Government has powers of intervention in regard to Australian or foreign ships where there is an actual or threatened pollution incident involving oil or certain noxious liquid substances. These powers are based on the 1969 International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, and the 1973 Protocol to that Convention. The relevant Queensland legislation is the *Queensland Transport Operation (Marine Pollution) Act 1995* and the Commonwealth legislation is the *Protection of the Sea (Powers of Intervention) Act 1981*

1.2.3 Compensation for Damage

The *Protection of the Sea (Civil Liability) Act 1981* implements the provisions of the 1969 International Convention on Civil Liability for Oil Pollution Damage. Ships carrying more than 2000 tons of oil in bulk as cargo are required to maintain insurance to cover liability for pollution damage. In the event of a pollution incident, the costs of clean-up and compensation for damage are recoverable from the polluter up to the limits or liability specified in the Act.

The *Protection of the Sea (Oil Pollution Compensation Fund) Act 1993* implements the provision of the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1971. This Convention is funded by contributions from oil companies and provides compensation where costs exceed the amount available under the Civil Liability Convention.

1.2.4 International Maritime Organization 'Areas To Be Avoided'

In May 1983, the International Maritime Organization (IMO) proclaimed that a central portion of the Capricornia/Swain Islands and Reefs of the Great Barrier Reef Marine Park should be an 'Area to be Avoided' by ships over 500 tons gross tonnage. The recommended area is shown at Appendix 2.

1.2.5 International Maritime Organization Recommendation On Pilotage

In November 1991, the IMO Assembly adopted Resolution A 710 (17) This replaced a similar resolution (A.619 (15) of 1987) on pilotage in the Great Barrier Reef region. As a result, Masters of ships of 70 metres in length and over, all loaded tankers, chemical carriers or liquefied gas carriers irrespective of size, must embark a licensed pilot when navigating in the Torres Strait, the inner route of the Great Barrier Reef north of latitude 16°40' South or through the Great North East Channel or Hydrographers Passage. (see 1.2.9)

Prior to this Australia relied on a non-mandatory IMO Resolution (A.619(15)) which, broadly, recommended that all ships over 100 metres in length using the Torres Strait, Great North East Channel, Inner Route of the Great Barrier Reef and Hydrographers Passage should carry a pilot.

1.2.6 Impact of Proposals Legislation

Any proposal which may result in or cause pollution of international waters will trigger the operation of the Commonwealth *Environment Protection (Impact of Proposals) Act 1974*. All Commonwealth proposals and activities are subject to environmental impact assessment under this legislation.

1.2.7 Dumping at Sea

The *Environment Protection (Sea Dumping) Act 1981* provides for the protection of the environment by regulating the dumping of materials into the sea; the incineration at sea of certain waste, other matters and objects of dredge spoil; and the decommissioning of vessels and machinery. Through this Act Australia gives effect to the International Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter.

1.2.8 World Heritage Area

The *World Heritage Properties Conservation Act 1993* implements Australia's obligations with respect to property which is 'cultural heritage' or 'natural heritage' under the Convention for the Protection of World Cultural and Natural Heritage. The environmental values of the Great Barrier Reef are recognised internationally by its nomination on the World Heritage list as the GBRWHA. The GBRWHA area has both cultural and natural heritage values which could be affected by spills of oil or other hazardous substances. Australia is obligated by international law to protect this property.

1.2.9 Great Barrier Reef Marine Park

The establishment, control and development of the Great Barrier Reef Marine Park is through the *Great Barrier Reef Marine Park Act 1975*. The Marine Park includes both the waters and the seabed beneath the sea including corals within the declared areas. Pilotage on certain 'regulated ships' is mandated by the Act and includes:

- vessels 70 metres or longer in overall length; and
- vessels that are towed oil tankers, chemical tankers or liquefied gas carriers.

1.3 THE OIL SPILL THREAT

Ship-sourced oil pollution in the REEFPLAN area may result from either accidental or illegal operational discharges. Accidental discharges may involve escapes of bunker fuel or oil cargo, resulting from a marine incident.

Within the REEFPLAN area the oil spill threat is largely a function of the types of oil cargo and bunkers carried through the area, the degree of navigational hazards, the weather and shipping density.

1.3.1 Principal Shipping Routes in the REEFPLAN Area

The waters of the REEFPLAN area are traversed by various shipping routes and reef passages including the Torres Strait, North East Channel, the Inner Route and the Curtis, Capricorn, Palm, Grafton and Hydrographers Passages. The major shipping routes through the REEFPLAN area are shown in Map 2.

MAP 1

Area covered by the Great Barrier Reef World Heritage area and regional Harbour Master boundaries

1.3.2 Shipping Density

Annually, some 2000 ships are piloted through the Inner Route of the Great Barrier Reef. Of these, 200 are crude oil and product tankers. In excess of 450 vessels are large bulkships trading to Hay Point and Dalrymple Bay (many using the Capricorn Channel), while some 80 vessels visit Abbot Point. These dry cargo bulkships, many carrying bunkers of 5000 tonnes and more, contribute significantly to the shipping density within the region. Less significant numbers of bulkships call at Mourilyan and Townsville. Unpiloted transits of Torres Strait, the North East Channel and the Inner Route are estimated at about 200 per annum.

1.3.3 Risk Assessment

High level risk arises from the overall volume of shipping transiting the inner shipping route through the reef. This includes both crude oil and dry bulk cargo ships. The primary risk is from an accident involving a grounding, a stranding or collision within the Inner Route or reef access passages, particularly in the navigationally difficult area to the north of Cairns. The resultant discharge could realistically be expected to be an upper Tier 2 (a medium spill up to 1000 tonnes) or Tier 3 (a large spill over 1000 tonnes) event.

Low level risk could arise from refined petroleum product carried along the coast to all regional ports and from bunker fuel carried on general cargo vessels. A spill is likely to result from a vessel grounding on a reef, island or a harbour incident.

In recent decades new bulk trades have developed within the REEFPLAN area, the most important of which are bauxite from Weipa to Gladstone and coal exports from the central Queensland ports. Although the carriage of general cargo to Queensland and Papua New Guinea ports has declined, the distribution of petroleum products from Brisbane refineries to other Queensland ports has increased. Refined product carriers transiting the REEFPLAN area and operating from regional ports are typically up to 60 000 deadweight tonnes (dwt).

Shipments of crude oil from Indonesia to Brisbane refineries are significant and expected to increase in coming years as Australia's Bass Strait production declines. Also increasing are shipments from Australia's Timor Sea fields to Brisbane and Sydney. Crude oil shipments through the Inner Route are generally in the 70 000 to 90 000 dwt range, tonnage being limited by draught constraints. Some chemicals are also shipped through the region, mostly in small tankers.

1.3.4 Potential Oil Pollutants

The risk of environmental damage is mainly from so-called persistent oils, that is, the heavier oils such as marine fuel oils and crude oil. Although the toxicity of light fractions is high, oils such as gasoline, kerosene and distillate evaporate rapidly and their toxic release phase is of a much shorter duration.

An understanding of the characteristics of persistent oils carried through the REEFPLAN area is necessary for the implementation of response procedures given in the QCCAP. Table 1 summarises the characteristics of the oils commonly carried through the REEFPLAN area.

TABLE 1

CHARACTERISTICS OF OILS COMMONLY CARRIED THROUGH THE REEFPLAN AREA

PRODUCT	SPECIFIC GRAVITY	KINEMATIC VISCOSITY	POUR POINT
Heavy Fuel Oil	0.95 to 0.99	>12 cSt at 40°C	-4 to 16°C
Fuel Oil	0.91	11 - cSt at 40°C	-29 to 5°c
Gas Oil	0.82 to 0.87	1. - 3.4cSt at 40°C	-34 to -6°C
Ultra-light Sumatran Crude Oil	0.8	16.5cSt at 40°C	32 to 38°C
Timor Sea Crude Oil (Elang/Kakatua)	0.81	2.5cSt at 40°C	18°C

The density of crude oil, generally measured as specific gravity, is important in spill assessment for two reasons. Firstly, the density of an oil determines whether it will sink or float; heavier oils can collect sediment, entrain water, and become heavy enough to sink. Secondly, once it has been determined that an oil will float, the height that the oil floats in water, or its 'freeboard effect', determines the surface 'sail area' and will be more easily moved by the wind.

Specific gravity, otherwise known as relative density, is the density of a substance relative to fresh water. An oil that floats will have a specific gravity less than that of freshwater (1.00). The specific gravity of sea water ranges from about 1.02 to 1.07. Accordingly, oil which floats in fresh water will be slightly more buoyant in sea water. The density of liquid oil is inversely proportional to the temperature.

Kinematic viscosity is the measure of resistance to flow of a fluid under gravity. The viscosity of an oil effects the rate of spreading of the slick, penetration of substrate and persistence. It also effects clean-up operations. Low viscosity oils are those which have a light, more fluid, consistency; high viscosity oils are those which tend to be tarry or thick. Viscosity decreases as oil temperature increases.

The pour point of a material is the temperature at which it begins to flow when heated. Oil may be solid or semi-solid during cool nights and fluid during the day, or solid when immersed in cool water and fluid when warmed past the pour point while stranded on land. These situations require different clean-up methods and if round-the-clock clean-up effects are carried out, daytime strategies and equipment could differ from night-time.

1.3.5 The Effects of an Oil Spill

An oil spill can effect the environment in a number of ways. The extent and type of damage depends on a number of factors, namely, the type of habitat or animal that is effected, the season of the year, and the stage of life that the various marine organisms have reached at the time of the pollution incident.

The lighter fractions of oil are soluble in sea water which may render them toxic to some organisms. While adult fish are sufficiently mobile to swim away and avoid the toxic area, larvae and less mobile creatures have no such escape. They may be killed or experience changes in their feeding or reproductive cycles that may effect the size and species composition of fish stocks. Fish and especially filter feeders, such as oysters and mussels, may become tainted and unmarketable for human consumption.

Sea birds can be severely effected if they become coated with oil. The oil infiltrates their feathers which lose insulating properties. Oil on bird's legs may be transferred to eggs thus preventing the embryo chicks from obtaining oxygen through the shells. Seabirds may ingest oil with toxic effects and may pass on contaminated food to their chicks. Seabirds, and especially diving birds, are more likely to be major casualties of oil spills.

Physical coating of the sea surface is not as much of a problem as the coating of shoreline or reefs. This is why the clean-up effort is directed at preventing oil from reaching the shoreline if at all possible.

Physical coating of the shore is a potential major long-term result of an oil spill. The actual effect of a particular spill depends on the type and quantity of oil spilled, the weather, and the type of coastline. One of the big problems in tackling an oil spill clean-up is to decide if the cleaning procedures will help or whether the combination of oil and cleaning methods will cause more environmental damage, than the oil alone. For example, a sandy shore may look much better after chemical cleaning or mechanical removal of the oily sand, but there will be fewer worms and shellfish remaining than if the oil had been left alone.

Regional oil spill contingency plans covering Regional Harbour Master Boundaries (Map 1) are important because they indicate areas that have high priority for cleaning, as well as showing those areas that are better left alone if polluted.

Once oil is spilt, it will spread. The rate of spread depends on a number of factors including the weather, the temperature and type of oil discharged. Most oils spread laterally under the combined effects of gravity and surface tension. They form continuous or patchy slicks of thick, dark oil, eventually thinning into silvery sheens at the edges.

1.3.5 (continued) As the oil spreads, the more volatile components evaporate. The rate and extent of evaporation depends on the type of oil and its volatility. Light refined oils such as petrol and diesel fuel will evaporate almost completely within a few hours. Some crude oils may lose up to 40 percent of their volume by evaporation during the first day, while heavy oils will lose very little.

Some of the lighter elements of spilled oil will dissolve in water. This may render the water toxic to marine life in the area for some time, depending on the type and quantity of oil discharged. Waves and sea turbulence mix the oil with water to produce oil droplets which then become scattered throughout the upper levels of water column. This is known as an oil-in-water emulsion. These emulsions are very beneficial since the surface area of the oil is increased and bacteria and other micro-organisms can attack and degrade the oil more quickly. These organisms occur naturally in the environment.

When oil has been in contact with water for an extended period another type of emulsion can be formed, which is known as a water-in-oil emulsion. This is not nearly so beneficial as an oil-in-water emulsion. Because a water-in-oil emulsion can become a thick, sticky, dark, mixture it is often called 'mousse'. In a spill area, this mixture can often be several centimetres thick and very little evaporation will occur. In this state it is also very difficult for organisms to attack the oil.

When oil eventually comes ashore, it mixes with sand and other debris on the beach and forms tar balls. In this state it is very stable and may last for years before it is broken down.

PART 2 STRATEGIC PLAN

2.1. ADMINISTRATIVE ARRANGEMENTS

2.1.1 National Plan Arrangements

The National Plan policy, operations and procedures are fully explained in the Australian Maritime Safety Authority (AMSA) publication *National Plan to Combat Pollution of the Sea by Oil - National Contingency Plan.*

All organisations and personnel having a role in oil pollution response should be fully familiar with the contents of this manual. Copies may be obtained by contacting either AMSA or the Marine Incident Section, QDoT, Brisbane.

LEAD AGENCY The lead agency is the agency having responsibility to take action to respond to a marine pollution incident. Lead agencies designated within the geographical scope of the QCCAP are as outlined in 2.1.2 below.

PRIMARY AGENCY The primary agency is the agency having statutory authority for the area in which a pollution incident occurs.

2.1.2 Division of Responsibility

Under National Plan administrative arrangements, lead agency responsibility for dealing with oil spills within the geographical area of REEFPLAN is as follows.

AREA OF RESPONSIBILITY	LEAD AGENCY
In the REEFPLAN area of the Great Barrier Reef as delineated in Map 1	Queensland Department of Transport (via the State Committee, with assistance from AMSA as required)
Within State coastal waters, including all foreshores and islands but excluding ports and national parks	Queensland Department of Transport (with assistance from the State Committee and AMSA as required)
Ports (other than oil terminals)	The administrative authority of that port
Oil terminals, oil exploration rigs, platforms and pipelines	The relevant oil or oil exploration company
Foreshores and islands in declared national parks	Queensland Department of Environment (QDE) (with assistance from Queensland Department of Transport, the State Committee and AMSA as required)

The Marine Incident Section, QDoT, is available to provide advice and support concerning response and investigation to the lead agency.

The State Committee is responsible to provide advice and support in the event of a significant incident, if requested by the lead agency. If the State Committee Chairperson considers that the lead agency cannot provide adequate resources to combat a spill, the State Oil Spill Commander (SOSC) may provide alternative or additional resources, or may assume responsibility for management of a spill response.

2.1.3 Industry Involvement

The National Plan is implemented in conjunction with the petroleum, shipping and exploration industries. Through the Australian Institute of Petroleum (AIP), the petroleum industry is represented on the Queensland National Plan Oil Pollution Committee. Shipping industry participation in the National Plan process is through the Australian Shipowners Association (ASA).

The lead agency in an oil pollution incident may call on the human and equipment resources of the petroleum industry to deal with an oil spill if necessary, through the industry's Marine Oil Spill Action Plan (MOSAP). MOSAP is administered by the Australian Marine Oil Spill Centre (AMOSC), Geelong, a subsidiary of the AIP.

Regional industry resources may be accessed directly via Local Industry Co-ordinators in ports having marine oil terminal facilities. Industry equipment located outside the region, including the resources of the AMOSC, Geelong, are to be requested through the Marine Incident Section, QDoT, Brisbane, or in a major incident through the State Committee.

2.2. RESPONSE ARRANGEMENTS

2.2.1 Overall Protection Priorities Policy

It should be recognised that despite the best preventative measures, oil spill events can occur and damage may result to the sensitive ecosystems of the GBRWHA. Under this Plan the aim of the response is to minimise impacts on the natural environment.

Environmental protection priorities to be exercised within the geographical scope of the plan are, in order of decreasing priority:

- human life;
- habitat;
- rare and/or endangered species;
- commercial resources; and
- amenity, including cultural resources.

2.2.2 Oil Spill Response Strategies

Strategies for implementing response techniques for all incidents should adhere to the following procedures.

- Terminate or reduce the outflow of oil from the source.
- Where marine or coastal resources are not threatened, monitor the oil slick.
- Attempt control and recovery of the oil at sea.
- Apply dispersants at sea in accordance with dispersant policy (see Part 3.3.1 and Appendix 3).
- Protect key resources.
- Shoreline clean-up.
- A combination of the above measures.

These procedures will be applied according to the circumstances of the spill and the prevailing conditions and will be implemented having ensured that safety of life considerations have been met. Implementation of response is as directed in the QCCAP.

Oil spills and the required response are classified according to the size of the spill. There are three tiers of spill recognised in the National Plan, as outlined in the QCCAP and are applicable in the REEFPLAN area.

TIER 1 - UP TO 10 TONNES - SMALL SPILL, LOCAL RESPONSE.

The lead agency will generally be able to respond to and clean-up the pollution utilising local resources. In cases where additional resources are required, the Australian Maritime Safety Authority will provide assistance through the Marine Incident Section, QDoT.

TIER 2 - 10 TO 1000 TONNES - MEDIUM SPILL,

REGIONAL AND INTERSTATE RESPONSE.

The lead agency will require regional assistance from within the state and possibly resources from interstate. The National Plan will facilitate these resources through the Marine Incident Section, QDoT or the State Committee.

TIER 3 - ABOVE 1000 TONNES - LARGE SPILL,

NATIONAL AND POSSIBLY INTERNATIONAL ASSISTANCE.

The lead agency may require all regional and national assistance. For catastrophic spills, resources from overseas may be required. These resources will be arranged by the Australian Maritime Safety Authority through the State Committee.

Response techniques for spills of oil and hazardous materials are outlined briefly at Appendix 3.

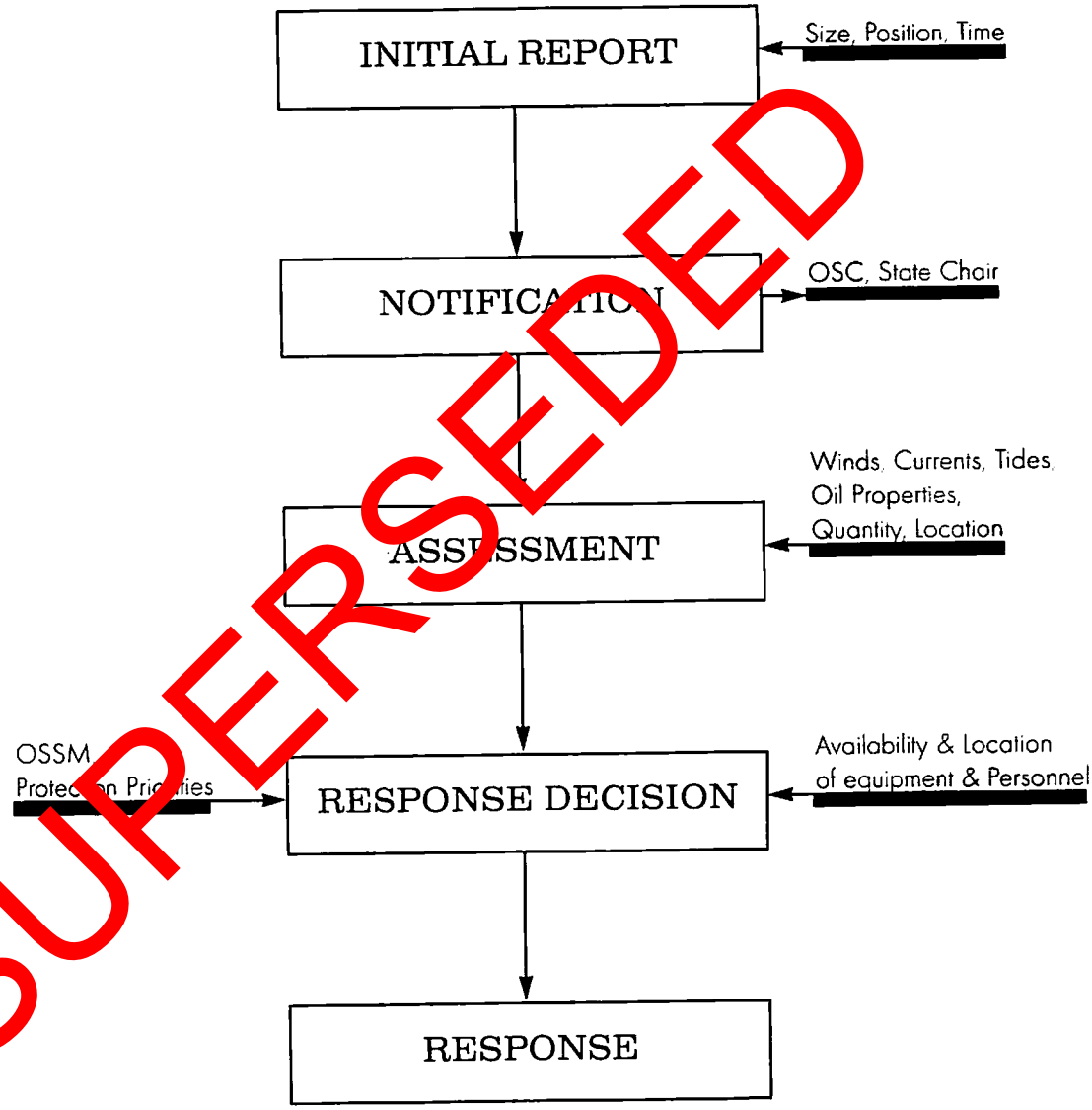
2.2.3 Notification and Reporting Procedures

INITIAL NOTIFICATION

Notification of a pollution incident will normally be made as a result of planned surveillance activities, through the observations of Government agencies, by shipping or aircraft, by those responsible for the incident, or by the public. The action mechanisms which will be followed are summarised on Figure 2.

FIGURE 2 OIL SPILL RESPONSE PROCEDURE

ACTION MECHANISM FOR RESPONDING TO A REPORT OF A SPILL



The first agency, having a responsibility under the Plan, to be notified of a pollution incident will contact the appropriate Regional Harbour Master (On-Scene Co-ordinator, OSC) immediately.

If the Regional Harbour Master cannot be contacted the incident will be reported to the adjacent Regional Harbour Master.

In the event that AMSA's Marine Environment Protection Services is advised of an incident, immediate contact will be made with the Marine Incident Section, QDoT.

Information concerning the spill report will be obtained as outlined in the Guidelines for Receiving Information on Oil Spills, Appendix 6 of the QCCAP.

If the pollution incident threatens to effect an area outside the geographical scope of this Plan, (a gazetted port) or an area where the AMSA is the Primary Agency (the high seas) immediate notification will be made to these authorities as appropriate.

Pollution Report (POLREP).

Following a report of an incident POLREP will be compiled and forwarded as outlined in Appendix 7 of the QCCAP.

Situation Report (SITREP)

The OSC is responsible to ensure SITREPs are made as frequently as necessary so that those who need to know will have a full and timely appreciation of the incident and of actions and progress made during the response. SITREPs will be compiled and forwarded as outlined in Appendix 8 of the QCCAP.

Sampling Procedures

Samples from both the source and from the water or foreshore will be obtained, where possible, with a minimum of delay so that the effects of weathering are minimised. The recommended procedures for collecting and forwarding samples for analysis are contained in Appendix 9 of the QCCAP.

2.2.4 Response Team and Outline of Duties

Key lead agency personnel and support organisations comprising the Response Team, together with their roles and responsibilities are as follows. The staff and field positions used for the QCCAP are shown on Figure 3.

State Oil Spill Commander (SOSC)

The position of State Oil Spill Commander, is held by the Executive Director Maritime Division, QDoT.

The Deputy is the Principal Adviser (Maritime Incidents) Maritime Division, QDoT.

The OSC will have overall responsibility for managing the response. This includes the co-ordination of all available resources and, where necessary, liaison in relation to obtaining additional National Plan resources through AMSA.

The role of the Spill Commander is to direct and control combat and clean up arrangements at a senior management level. This person must be capable of high level liaison with Ministers as well as senior government and industry representative.

On Scene Co-ordinator (OSC)

QDoT Regional Harbour Masters are appointed as On Scene Co-ordinators as outlined in Section 3 of the QCCAP, *Operational Plans*.

The OSC is responsible directly to the Spill Commander and is responsible for the management and co-ordination of response operations at the scene of a pollution incident to achieve the most cost effective and least environmentally damaging resolution to the problem. Depending on the size and circumstances of a spill, is assisted by a team having appropriate technical, operational, scientific, administrative. communications and media liaison skills.

In the event of a spill greater than Tier 1 the OSC will be advised by or supported on site by staff from the Marine Incident Section, QDoT, Brisbane and the Marine Environment Protection Services, AMSA, Canberra.

In all but minor incidents the OSC will appoint deputy OSCs who will be responsible for undertaking specified field operations. The number of deputies appointed will depend on the size, location and circumstances of the spill, but should be adequate to cover the tasks allocated below, and if necessary to establish round the clock operations.

Scientific Support Co-ordinator (SSC)

The role of the SSC is to provide the OSC with an up to date and balanced scientific assessment of the likely environmental effects of an oil spill and advise on environmental priorities and preferred response options taking into account the significance, sensitivity and likely recovery of the resources likely to be affected.

The SSC for REEFPLAN is pre-designated as the Project Officer - Shipping and Ports of the GBRMPA. The SSC is supported in this role by the QDE.

Administrative Support Co-ordinator (ASC)

The OSC will appoint an Administrative Support Co-ordinator (ASC) from within the Region to be responsible for all financial, legal, procurement, clerical, recording and administrative procedures. These responsibilities will embrace all accounting activities and the contracting of personnel, equipment and support resources.

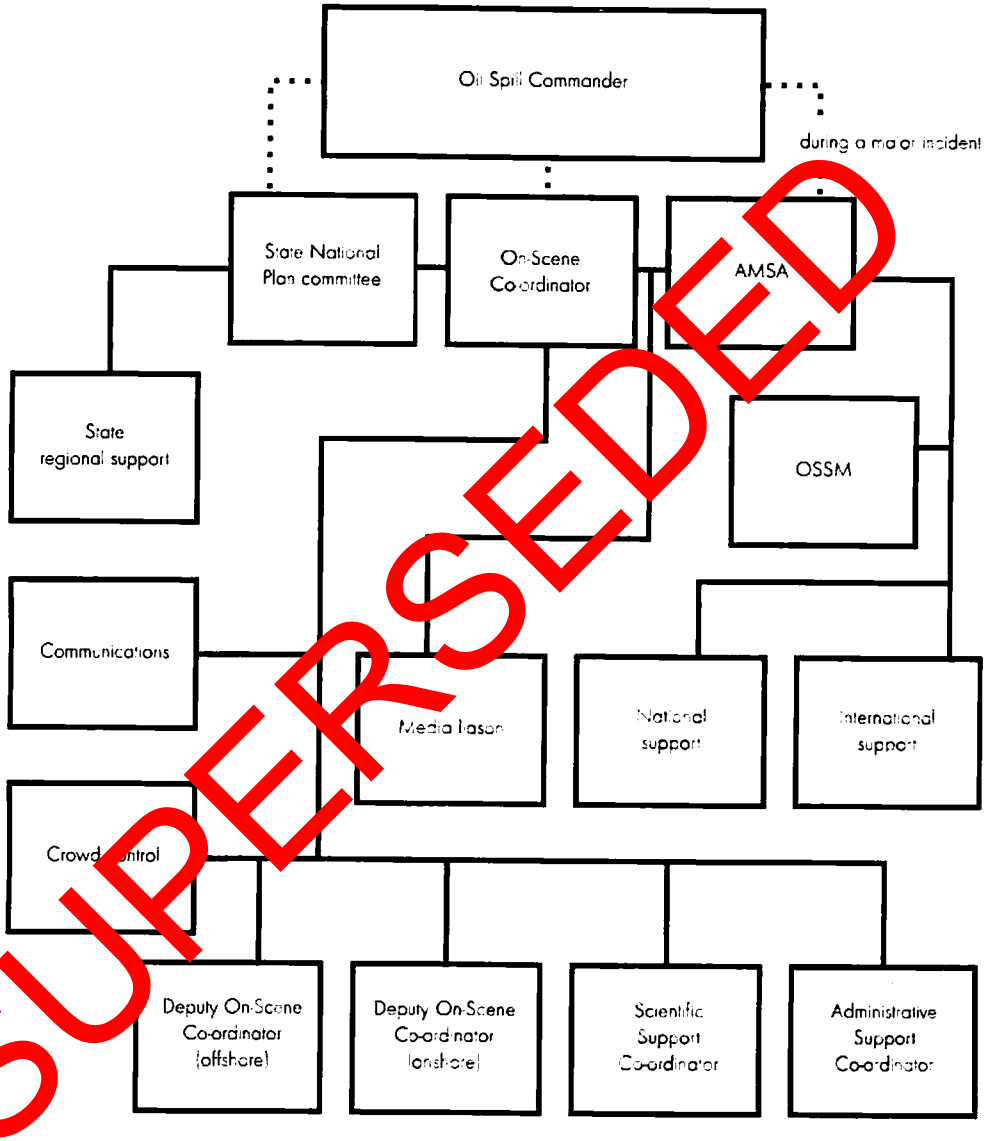
Commensurate with the size of the incident, the ASC will need to ensure sufficient support staff and equipment are made available to cope with all the above activities.

Requirements for back up staff and equipment will be identified during the early stages of an incident and channelled through the Marine Incident Section, QDoT or the State Committee.

ASCs are listed in Section 3 of the QCCAP, *Operational Plans*.

FIGURE 3 RESPONSE ORGANISATION

FLOW CHART OF STAFF AND FIELD POSTIONS



for further details refer to the QCCAP (Queensland Costal Contingency Action Plan).

Media Liaison Officer (MLO)

When a pollution incident occurs, the public must be provided with timely and accurate information on the nature of the incident and the steps being taken to cope with the problem. This policy is followed to obtain understanding from the public, to ensure cooperation from all interested parties and to reduce the possibility of the spread of concern through misinformation.

The MLO and support staff as required will be appointed by the lead agency or if required by the State Committee in conjunction with the Regional OSC.

In the period following an incident until this appointment is made, the Regional OSC will direct the release of information to the media and the public.

The MLO will maintain liaison with the OSC, the State Committee and other interested parties, including the news media, local authorities, community groups and government agency and industry press officers.

State Counter Disaster Organisation

The State Counter Disaster Organisation is represented in National Plan arrangements by the State Counter Disaster Management Division of the Queensland Emergency Services (QES).

Incorporated in the Counter Disaster Management Division is the State Emergency Service (SES), whose functions include providing resource support to the OSC during response and clean-up operations.

The type of support which might be provided could include personnel, equipment, communications and advice on community resource availability.

Regional OSCs may access these support arrangements through the Local Government Counter Disaster Committees.

SES Area Managers (Appendix 3, QCCAP), will provide information on accessing this support.

Representatives from the State Counter Disaster Management Division provide advice on the acquisition of State Disaster and Local Government resources for operational support.

Under Part III, Section 23 of the *State Counter Disaster Organisation Act 1975-1978* an oil spill might give rise to the initiation of a *Declaration of a State of Disaster* by the Disaster District Co-ordinator (DDC) or the Governor in Council.

Such a declaration provides authorised personnel with additional powers and the DDC may use, direct or co-ordinate all available resources within the Disaster District in support of the operation.

Disaster District Co-ordinators contact arrangements and areas of responsibility are listed in Appendix 4, QCCAP.

Industry Advice

Senior industry personnel are available during an incident to provide advice and support to the State Oil Spill Commander by providing high level liaison with the oil and shipping industries with regard to logistic and personnel matters. Additionally these personnel can provide detailed technical advice on oil products and cargo, when required, in addition to keeping the Spill Commander informed of any industry concerns.

Queensland National Plan Oil Pollution Committee (State Committee)

The primary functions of the Queensland National Plan Oil Pollution Committee are:

- to provide management, technical and environmental advice and support to the lead agency as requested;
- to support management of the response to a pollution incident if required; and
- implement and manage oil pollution exercises.

The two groups comprising the National Plan Committee are:

- an Incident Response Management Group (Management Group); and
- an Operational and Technical Advisory Group (Technical Group).

Detailed functions and membership of both groups are listed in Appendix 5, QCCAP.

In the event of a significant pollution incident the lead agency should immediately contact the Committee Chairperson, the Deputy Chairperson or the Marine Incident Section, Queensland Department of Transport, to initiate any advice or support required.

When convened, the State Committee will meet at:

The Operations Room,
State Disaster Co-ordination Centre,
Floor 11 Forbes House,
Brisbane

Telephone: 07 3227 4194
Facsimile: 07 3236 4040

If required to convene in North Queensland, the location is:

The Townsville District State Disaster Co-ordination Centre,
Corner Flinders and Stanley Street,
Townsville

Telephone: 07 7 221 113
Facsimile: 07 [illegible] 14 992

Specialist Assistance

Where State Committee assistance is not required by the lead agency, but additional advice and support is required for the response to the spill, the Marine Incident Section, QDoT, Brisbane will assist and arrange provision of appropriate regional and national personnel and materials.

2.2.5 Resource Availability

Resources available to deal with a response in the REEFPLAN area are detailed in the QCCAP. These include both national and Queensland response personnel and equipment as well as equipment stockpiled by AMOSC in Geelong and held by industry interstate.

Additionally, a National Response Team exists whereby the services of experienced personnel, ranging from operator level through to senior spill response managers, can be obtained from other State/Commonwealth agencies, industry and other organisations. The services of the National Response Team are obtained through AMSA, which has made arrangements with the respective agencies, industry and organisations for the release of designated experienced personnel for oil spill response activities. These services are available when an oil spill incident exceeds the resource availability of the lead agency and State concerned.

2.2.6 Termination of Response

The OSC has the responsibility in conjunction with the SSC to advise the Primary Agency when further clean-up action is unrealistic and will not benefit the environment. This decision will be undertaken following consultation with scientific and local authority advisers.

In the case of a major incident, the OSC, in consultation with the SSC, will recommend termination of response to the State Committee. The matters which will be addressed at the termination of the response are as follows:

- Clean-up, return and audit of equipment.
- Debriefing arrangements.
- Post response restoration, monitoring and remediation.

2.2.7 Incident Investigation Procedures and Follow Up

Investigations into the cause of an incident are the responsibility of the primary agency under the *State Pollution of Waters by Oil Act* or the Commonwealth *Protection of the Sea (Prevention of Pollution by Ships) Act*, depending on the jurisdiction.

The investigation should be carried out as soon as possible following the occurrence of the incident.

Procedures are outlined in the publication *A Guide to Reporting and Investigation for Queensland State Authorities* as issued by the Marine Incident Section, QDoT.

2.2.8 National Plan Financial Procedures

PAYMENT OF COSTS OF A POLLUTION INCIDENT.

Following a pollution incident, National Plan administrative arrangements provide for AMSA to reimburse the lead agency from National Plan funds.

COMBAT INCIDENT REPORT.

Combat reports required to authenticate the source of the oil discharge, will accompany any claim for reimbursement of clean-up costs. The Combat Incident Report will contain details in respect to the incident as shown in Appendix 11 of the QCCAP.

2.2.9 Safe Havens

The *Guidelines for the Provision of Safe Haven for Disabled or Damaged Vessels at Sea* (GPSHDV) have been prepared to assist officers from the QDoT, Queensland port authorities, QPE, GBRMPA and AMSA who have responsibilities relating to the investigation of requests from ships at sea, for the provision of safe haven in Queensland's State coastal waters and waters of the GBRWHA. While there may be a natural reluctance for regional administrators to accept damaged or disabled ships into their area of responsibility, it is rarely possible to deal satisfactorily and effectively with a marine casualty in open sea conditions.

The guidelines recognise the fact that not all casualties may qualify for the granting of safe haven. However, in some circumstances, the longer a damaged ship is forced to remain at the mercy of the elements in the open sea, the greater the risk of the vessel's condition deteriorating or the physical situation changing and thereby becoming a greater hazard to the Queensland inshore zone, reefs and islands.

Bearing in mind the ecological, economic and recreational value of the Queensland coastline, ports and nearshore zone, and the necessity to act objectively, quickly and decisively in the event of a vessel becoming distressed within, or adjacent to Queensland waters, it is essential that all responsible authorities respond in a cohesive and consultative manner.

The policy for granting of safe haven within Queensland waters and the waters of the GBRWHA is to ensure that standard contingency arrangements are put in place to appraise requests received from ships, against an agreed and established set of criteria, to determine whether or not safe haven can be granted within prescribed waters.

Safe haven is provided with the aim of protecting:

- the safety of the vessel's crew;
- the safety of human life and health within the immediate vicinity of the distressed vessel;
- ecological resources and marine and coastal environments;
- economic infrastructure and amenity facilities in ports and within the coastal zone; and
- the safety of the vessel and its cargo.

Damaged or disabled vessels requesting safe haven within prescribed Queensland State and Commonwealth waters will be assessed:

- on a case by case basis against established operational and environmental criteria listed in the guidelines;
- taking into account the type and condition of the ship.

The assessment will be undertaken in accordance with the regional contingency plans agreed to by AMSA, QDoT, QDE and the GBRMPA.

Assessments of requests for safe haven will be carried out by the QDoT Regional Harbour Masters and the AMSA in consultation with port authorities, QDE and the GBRMPA.

2.2.10 Training

Whilst the absolute risk of significant marine oil pollution in Australia is comparatively small, regular exercises are essential to ensure an adequate level of response preparedness. As part of the National Plan, the Marine Environment Protection Services, AMSA, and the Maritime Division, QDoT conducts a series of training activities. These include:

Courses Conducted by AMSA

- Courses for Oil Spill Commanders and Senior Oil Industry Advisers.
  - Provided for senior government and industry executives.
- Workshop for On-Scene Co-ordinators.
  - Designed to provide potential spill managers with an appreciation of the principles of coordination and management of the response to a marine pollution incident.
- Workshop for Contingency Planners.
  - Covering site-specific and organisation planning, this forum addresse all the elements necessary for the production of an effective contingency plan.

- Workshop for Scientific Support Co-ordinators.
  - Has the aim of bringing together Australian and other environmental scientists to exchange response philosophies and to gain an appreciation of the needs of the on-scene coordinator in the management of a spill.

- Workshop for Administrative Support Co-ordinators.
  - Designed to provide potential administrative support personnel with the range of administrative issues and requirements likely to be encountered during an oil spill, with an emphasis on cost tracking for submitting claims to AMSA or the Protection & Indemnity insurers.

Both AMSA and QDoT conduct the following courses, either combined or separately:

- OSC/State Pollution Committee Exercises.
  - Simulation requiring active participation of key players and their response team. These are primarily decision making exercises which explore the roles of players and the effectiveness of their response actions and organisation.

- Operator Courses.
  - Designed for equipment operators and supervisors to demonstrate maintenance and operation of equipment as well as capabilities and techniques used in pollution combat.

Appropriate personnel from all relevant agencies identified in REEFPLAN attend contingency planning and OSC workshops arranged by both AMSA and QDoT. The Maritime Division of QDoT also provides operator courses for personnel from the port authorities and local councils within the Reefplan area.

Regular training activities are conducted within the REEFPLAN area and include use of locally held equipment. These activities are planned in association with the Maritime Division of QDoT.

Substantial benefit is gained from regular table-top exercises designed to stimulate responses to oil spills of differing sizes. Exercises held within the REEFPLAN area will involve Commonwealth, State and industry personnel. Exercises include a debriefing session at which the effectiveness of the combat response is critically examined and measures taken to correct deficiencies. Any apparent weaknesses in REEFPLAN organisational arrangements detected through these exercises are referred to the Manager, Marine Environment Protection Services, AMSA, Canberra (see 1.1.6).

In addition to the training forums outlined above, the oil industry also conducts training for industry personnel at a local level (terminal operations), and for more senior personnel at the Australian Marine Oil Spill Centre (AMOSC) located in Geelong, Victoria.

PART 3 ENVIRONMENTAL PROTECTION

3.1 GREAT BARRIER REEF WORLD HERITAGE AREA

3.1.1 Description

The GBRWHA extends along the eastern coast for a distance of 2500 kilometres southward to Gladstone and offshore to 350 kilometres at the widest point. The region covers approximately 345 000 square kilometres, containing 2900 reefs, about 300 cays and about 600 continental islands.

A World Heritage Area of unique biological significance. The Great Barrier Reef also embraces an offshore and onshore tourism industry as well as fishing activities of primary economic importance.

Collectively, tourism, commercial and recreational fishing and boating are worth approximately one billion dollars annually which is spent and earned in the GBRWHA and adjacent regions.

3.1.2 Environmental Conditions

The environment of the REEFPLAN area is complex and varied, ranging from extensive stands of mangroves, tidal flats to sand beaches, coral reefs and offshore islands. The flora and fauna supported by the wetland, estuarine and marine ecosystems are diverse and highly susceptible to damage from pollution or inappropriate pollution countermeasures.

A detailed knowledge of the local marine environment is a key factor in tackling marine pollution to minimise damage. Because of the susceptibility of fisheries and coral reef communities to the effects of both oil pollution and oil spill dispersants, dispersants should only be used for oil spill responses in accordance with the guidelines outlined at Appendix 3.

3.2. INFORMATION SOURCES

3.2.1 Environmental Information

Insufficient environmental information on the reef region is currently available to provide comprehensive guidelines on vulnerability grading and protection priorities for all areas covered by REEFPLAN. However, computerised coastal resource maps are available for the region. A feature of these is that wind, tide and current effects can be superimposed and oil movements predicted accordingly.

Extensive knowledge of the reef region is accessible through QDE, Queensland Department of Primary Industry (QDPI), GBRMPA, James Cook University and the Australian Institute of Marine Science (AIMS). Other institutions and local reef users provide valuable guidance to the SSC and the combat team deployed under the QCCAP.

3.2.2 Coastal Resource Atlas

A coastal resource atlas has been developed for the whole of the Queensland coast and off-lying islands. The atlas is a Macintosh computer-based program to provide the OSC, through the SSC, with all of the environmental information necessary for the formulation of an appropriate response in a specific area.

A map of the area threatened by the oil spill is called up from the program and with the use of a series of overlays describing the biological communities of the area, tidal streams, tourist resorts, marinas, appropriate strategies, etc. The OSCs's team is given a comprehensive physical and environmental picture of the area under threat and advice of the available response options.

Transmission of this information is made to the Advance Operations Centre by facsimile or computer modem link.

3.3. PROTECTION MEASURES

3.3.1 Dispersant Policy

The policy for using chemical dispersants within the geographical area is that the appointed OSC, after consultation with the appointed SSC, may authorise the use of chemical dispersants in strict accordance with guidelines given in Appendix 4. GBRMPA have pre-designated dispersant use and non-use zones for the REEFPLAN area and these are adhered to as advised by the appointed SSC.

In the event of a risk of fire or explosion, the OSC is empowered to use chemical dispersants irrespective of all other considerations or advice from the SSC.

3.3.2 Application of Oil Spill Dispersants

Where a sensitive environment, island or reef is under threat, the use of oil spill dispersants, preferably applied from aircraft, should be considered as an early response option.

In determining whether or not to use dispersants, the OSC, as well as seeking advice from the SSC should consider criteria such as:

- whether the oil is of a type amenable to dispersion;
- whether the area has active water exchange; and/or
- whether the area has an adequate depth of water.

The OSC will maintain close consultation with the SSC to ensure that all environmental considerations are taken into account including the nature of the resource under threat and the distance between the resource and the spill.

Because of the extensive area covered by REEFPLAN it is impractical to predesignate all those areas where dispersant use may be considered. However, to support the OSC in his operations, the SSC should implement a degree of pre-planning, at least for those areas in close proximity to traffic lanes. This planning should also consider the trade-off in protecting a sensitive environment by dispersing the oil in a less sensitive environment.

A schedule of sensitive areas, which include offshore rookeries of diving birds where use of dispersants may be approved is shown at Appendix 15 of the QCCAP.

In accordance with National Plan guidelines only approved dispersants will be used.

3.3.3 Bioremediation Policy

Bioremediation has potential as an oil spill response option in the REEFPLAN area. However, it is also recognised that there is very little data on bioremediation in tropical marine environments and that considerable research is required before the effectiveness and side effects of bioremediation in the REEFPLAN area can be determined. Until such research has been conducted, bioremediation will only be used on an experimental basis on any oil spills that may occur in the REEFPLAN area and only under direct supervision of GBRMPA and QDE.

3.3.4 Disposal of Oil and Oiled Debris

Early consideration will be given to the task of removal and disposal of recovered material. This requires liaison between the OSC, the SSC and effected local authorities.

Where the method of permanent disposal is unable to be determined in the short term, arrangements for temporary disposal will be made. Temporary disposal options to be considered include:

- portable purpose built tanks available under National arrangements;
- oil terminal tanks, both portable and in situ;
- road tankers or rail tank wagons;
- refuse tips; and
- lined, bunded earth pits.

Potential permanent land fill disposal sites, including municipal tips and disused quarries, have been identified by a number of local authorities and a register of these sites is held by the Marine Incident Section, QDoT, Brisbane. Use of these sites will depend largely on the amount of oil and oiled debris recovered during a spill response.

Assuming that local landfill sites are not available, the following options will be considered early in the response.

- Recycling or blending with fuel oils.
- Incineration, both on site and through transport to dedicated incinerators.
- Spreading on selected vacant land (private or Crown) with little or no soil cover.
- Use in land farming projects.
- Bioremediation.

Composting techniques can be used to treat small amounts of oil and oily debris.

Consideration of any of these options will depend on:

- oil type;
- composition of debris (sand, vegetation, sorbent materials);
- compatibility of debris with on-site and adjacent land use;
- distance from recovery area; and
- freedom from leachate problems leading to contamination of ground water.

Regular liaison with local authorities to identify potential disposal sites, both temporary and permanent, will be undertaken by the OSC/SSC.

Sites should satisfy the following basic criteria.

- Be compatible with on site and adjacent land use.
- Not become a source of water pollution (thus geology, pedology and hydrology are relevant considerations).

- Be within a practical distance of areas where oil spill debris is expected to be collected or stockpiled.
- Access roads into the area should be of all weather standard.

The SSC will maintain a current list of potential disposal sites and will ensure that any changes in governmental policy which might effect this use is reflected in contingency plan arrangements.

Where there is no approved disposal site in the vicinity, sites for the disposal of contaminated debris will need to be identified in consultation with State Government and local authorities. No permanent disposal sites should be located on any of the reef islands and cays.

3.3.5 Oiled Wildlife

The SSC is responsible for the coordination of all oiled wildlife rescue and rehabilitation operations. Actual wildlife operations will be undertaken by the QDE. Should oiled wildlife be found the local QDE office is to be contacted. Contacts are detailed in Section 3 of the QCCAP, *Operational Plans*.

3.3.6 Restoration and Monitoring

On termination of the clean-up operation the QSC, in consultation with the SSC, will ensure that measures are taken, where practical, to restore both the impact site and disposal site to their pre-incident condition.

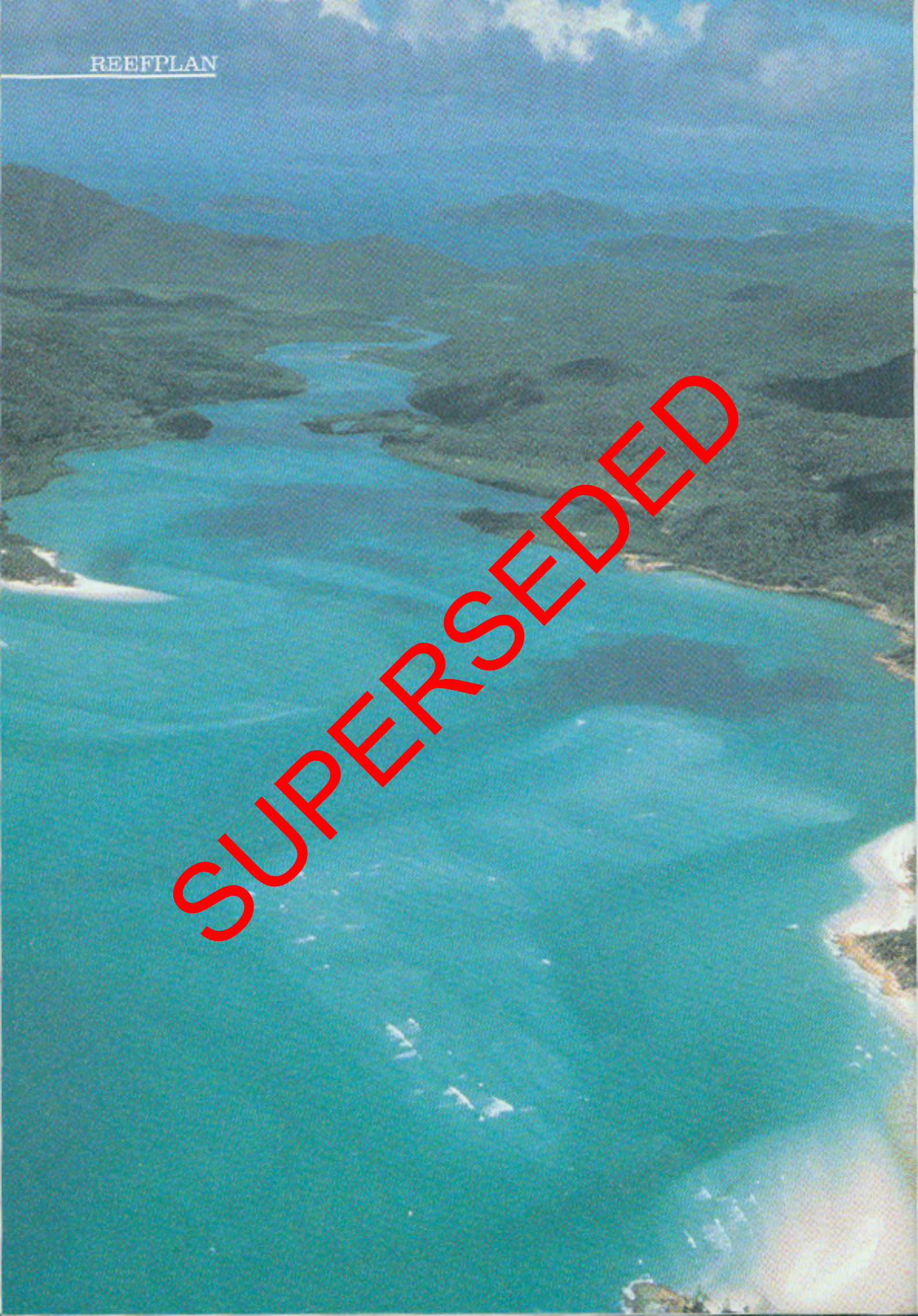
Where significant amounts of contaminated material have been removed from foreshores, an attempt will be made to replace it with similar material. Advice should be sought in the selection of the source area to ensure that environmental disturbance is minimised. Care will also be exercised to minimise the impact on the environment of equipment and personnel used in restoring the site.

Adequate monitoring practices will be implemented both in and around the impact and disposal sites to assess the level of environmental disturbance. If required, monitoring will be undertaken on both a short and long term basis.

The SSC is responsible for coordinating monitoring activities and arranging access and provision of facilities for monitoring teams. Regular appraisals of the short and long term environmental effects of the oil pollution incident and response operations will be made.

MAP 2

Major shipping routes through the Reefplan area



PART 4 APPENDICES

APPENDIX 1 SCHEDULE 1 FROM THE NOMINATION OF THE GREAT BARRIER REEF BY THE COMMONWEALTH OF AUSTRALIA FOR INCLUSION IN THE WORLD HERITAGE LISTING

GEOGRAPHICAL DESCRIPTION OF THE AREA OF THIS NOMINATION

This nomination applies to the area the boundary of which:

a. commences at the point that, at low water, is the northernmost extremity of Cape York Peninsula, Queensland;

b. runs thence easterly along the geodesic to the intersection of parallel of latitude 10°41′ South with meridian of longitude 145°00′ East;

c. runs thence southerly along that meridian to its intersection by the parallel of latitude 13°00′ South;

d. runs thence southeasterly along the geodesic to a point of latitude 15°00′ South longitude 146°00′ East;

e. runs thence southeasterly along the geodesic to a point of latitude 17°30′ South longitude 147°00′ East;

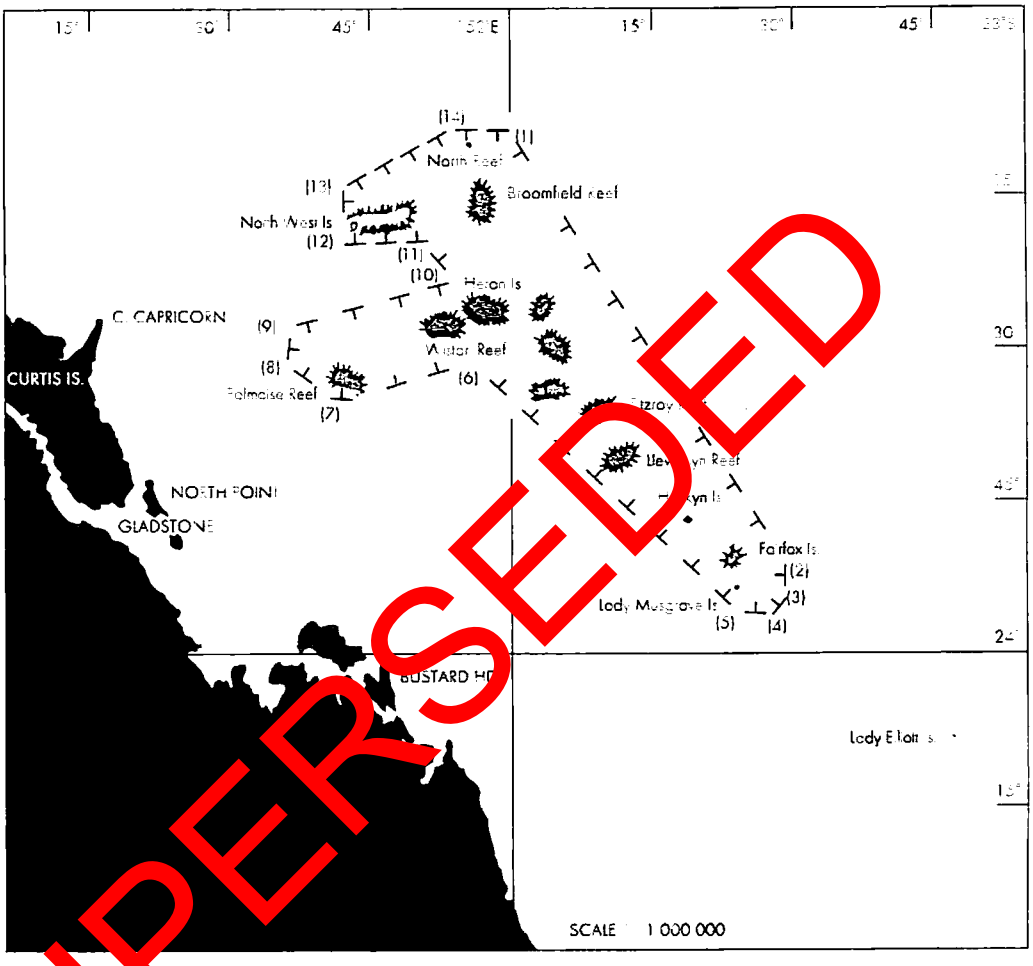
f. runs thence southeasterly along the geodesic to a point of latitude 21°00′ South longitude 152°55′ East;

g. runs thence southeasterly along the geodesic to a point of latitude 24°30′ South longitude 154°00′ East;

h. runs thence westerly along the parallel of latitude 24°30′ to its intersection by the coastline of Queensland at low water;

i. runs thence generally northerly along that coastline at low water to the point of commencement.

APPENDIX 2 IMO AREA TO BE AVOIDED



In order to avoid the risk of pollution and damage to the environment in the region of the Great Barrier Reef Marine Park, all ships in excess of 500 tons gross tonnage should avoid the area which is bounded by a line connecting the following points:

DESCRIPTION OF THE AREA TO BE AVOIDED			
	(1)	23°10'S	151°56'E
	(2)	23°53'S	152°28'E
	(3)	23°55'S	152°28'E
	(4)	23°57'S	152°26'E
	(5)	23°57'S	152°24'E
	(6)	23°32'S	151°55'E
	(7)	23°36'S	151°39'E
	(8)	23°33'S	151°35'E
	(9)	23°30'S	151°35'E
	(10)	23°25'S	151°53'E
	(11)	23°20'S	151°50'E
	(12)	23°20'S	151°40'E
	(13)	23°15'S	151°40'E
	(14)	23°10'S	151°52'E

APPENDIX 3 RESPONSE TECHNIQUES TO COMBAT SPILLS OF OIL AND HAZARDOUS MATERIALS

A number of options exist for the treatment of oil and other hazardous materials which have been released into the marine environment. All may be effective to a degree, according to the conditions prevailing and the sensitivity of the environment under threat.

The following briefly represent the basic response options available. Depending on the situation one or more of these options may be used.

A. OIL SPILLS

SURVEILLANCE

Monitor the movement of the oil and leave it alone.

- In open waters leaving the oil to disperse and degrade naturally creates the least disturbance to the marine environment. It requires the support of sound advice to the media to clearly explain why no other action has been taken.

CONTROL AND RECOVERY

Using oil spill booms and skimmers, oil may be recovered from the surface of the water.

- This method is generally only effective in relatively smooth waters with a minimum influence of wind, tide or currents.
- Essential to this technique is an adequate supply of containers or tanks to take the recovered mixture of oil, water and debris.
- Access to the area without causing further damage to the environment is also essential.

Use of booms alone may protect environmentally sensitive areas, allowing the oil to move to other areas from where it may be recovered or allowed to degrade naturally.

- Pre-planning to identify those areas that lend themselves to this technique under most conditions is advantageous.

APPLICATION OF OIL SPILL DISPERSANTS

Where a sensitive environment, island or reef is under threat, the use of oil spill dispersants, preferably applied from aircraft, will be considered as an early response option.

In determining whether or not to use dispersants, the OSC, as well as seeking advice from the SSC, will consider criteria such as:

- whether the oil is of a type amenable to dispersion;
- whether the area has active water exchange; or
- whether the area has an adequate depth of water;

The OSC will maintain close consultation with the SSC to ensure that all environmental considerations are taken into account including the nature of the resource under threat and the distance between the resource and the spill.

Because of the extensive area covered by REEFPLAN it is impractical to predesignate all those areas where dispersant use may be considered. However, to support the OSC in his operations, the SSC should implement a degree of pre-planning, at least for those areas in proximity to traffic lanes. This planning will also consider the trade-off in protecting a sensitive environment by dispersing the oil in a less sensitive environment.

A schedule of sensitive areas, which include offshore rookeries of diving birds where use of dispersants may be approved is shown at Appendix 15 of the QCCAP.

Dispersant Use Guidelines

The following general guidelines are followed.

- Oil type must be amenable to dispersant use.
- Oil weathered more than two days is generally not amenable to dispersant use.
- The area should be one of high energy input.
- The area must not contain eggs and larvae of ecologically important species (for example corals), commercial fisheries species or aquaculture.
- The decision to use dispersant must be based on an evaluation of the impacts that will occur if dispersant is used compared to the impacts that will occur if dispersant is not used. It may be necessary to accept impacts on one resource in order to minimise impacts on a more valuable resource.
- Ecological considerations should be made in relation to aesthetic/ amenity considerations.
- Only National Plan approved Oil Spill Dispersants will be used.

Habitat Specific Guidelines

The following guidelines are observed for each specific habitat

- Coral Reefs
  - Generally dispersed oil is more damaging to coral reefs than undispersed oil.
  - Use of dispersant to prevent oil reaching a reef is recommended only if the upstream site is less sensitive than the coral reef itself and sufficiently distant to ensure that oil does not reach coral reef once it is dispersed (that is while it is desirable to prevent dispersed oil reaching a reef it is more desirable to prevent dispersed oil reaching a reef).
  - Use of dispersants on oil already over coral reefs is recommended ONLY if the alternative is to allow the oil to impact on mangroves downstream (that is impact of dispersed oil on reef is preferred to impact of undispersed oil on mangroves).
- Seagrasses
  - Generally, dispersed oil is more damaging to seagrasses than undispersed oil.
  - Use of dispersant to prevent oil reaching seagrass beds is recommended only if the upstream site is less sensitive than the seagrass beds themselves.
  - Use of dispersant on oil already over seagrass beds is recommended ONLY if the alternative is to allow the oil to impact on mangroves downstream, and only if the area is well flushed.
- Mangroves
  - Generally dispersed oil is less damaging to mangroves than undispersed oil.
  - Use of dispersant to prevent oil reaching mangroves is recommended.
  - Use of dispersant on oil already in mangroves is recommended only if it can be applied manually in a controlled manner as dispersants on vegetation can cause defoliation and mortality.

- Beaches and Rocky Shores
  - Ecologically, it may be more desirable to allow oil to beach where it can be cleaned up mechanically rather than to disperse at sea where it enters the water column.
  - Where aesthetically/amenity considerations require the use of dispersants to prevent oil beaching, such a decision should take into account ecological considerations.
  - Use of dispersant on oil that is already beached is dependent on the shoreline type and the possibility of causing the oil to sink into the substrate creating the potential or long term impacts should be considered.
- Bird and Turtle Rookeries
  - Undispersed oil can have severe effects on bird life and nesting hatching turtles.
  - Use of dispersants to prevent oil from reaching bird or turtle rookeries is recommended.
- Physical Structures
  - It may be possible to use dispersants to remove oil from physical structures such as rock walls, wharfs, buoys and boat hulls.
  - However, a number of non-toxic, biodegradable de-oilers are now available that are more effective and less harmful than dispersants for this purpose.

In-situ Burning

Burning of the oil at sea has the potential of removing large quantities of spilt oil or fuels but has *not* been used extensively in oil spill response, either in Australia or overseas.

The application of in-situ burning could prevent oil coming ashore into populated areas or preventing oil contamination of environmentally sensitive habitats and wildlife. The technique offers the advantage of a quick removal process minimising shoreline contamination and reducing the quantity of oily waste products requiring treatment or disposal, as well as removing the oil before it spreads or moves to other areas under the action of wind and currents.

The disadvantages of in-situ burning is the inefficient combustion of the oil resulting in a visible black smoke plume. It has been perceived that atmospheric fallout of combustion by-products, soot, combustion gases and volatilised hydrocarbons could pose a health risk down wind. Recent research has shown that these emissions and their toxicity were lower than expected. Residues after in-situ combustion tests varied between 1-10% of the original oil. The combustion behaviour of the oil spilled must be known prior to this option being considered for use. The field monitoring or plume dispersion modelling of the combustion cloud is a high priority in the decision to use this option.

For in-situ combustion to be sustained the heat generated by the burning of the oil must overcome the cooling effect of the sea. Thin slicks do not burn and a minimum thickness of oil is required for combustion. Because oil spreads rapidly, especially low viscosity oils, the use of containment systems such as fire resistant booms, are sometimes required to maintain this minimum thickness. These booms are very expensive and not readily available and often require full replacement after one use.

In-situ burning of oil spills in open waters is receiving greater attention by response agencies world-wide as it offers a very viable and cheap option to stop oil spreading especially in remote areas where the lack of equipment or weather conditions limits conventional open water containment and clean-up.

SHORELINE CLEAN-UP

Weather and other circumstances permitting, every effort will be made to either disperse or control and recover the oil as close as possible to the source of the spill. However, it is inevitable that some oil may come ashore. The location of a spill, weather conditions, rate of oil movement and speed of the response will determine whether the bulk ogf the spilled oil can be recovered before it reaches the shore.

Where oil does come ashore, the extent of clean-up of oiled coastal areas will be carefully planned with the view of minimising further environmental damage which may result from the clean-up operation.

Sometimes, oil on shorelines may best be left to weather and degrade naturally. This is particularly true where oil impacts a sensitive area such as mangroves, salt marshes or mud flats. In these areas the clean-up operations can result in more environmental damage than the oil itself due to physical disturbance and substrate erosion.

The selection of shoreline clean-up techniques depends on many different factors which include:

- Type of substrate;
- Amount of oil on the shoreline;
- Depth of oil in the sediments;
- Type of oil (tar balls, pooled oil, etc);
- presence of wildlife;
- Prevailing oceanographic and meteorological conditions;
- Environmental or cultural significant sites; and
- Access and trafficability for equipment.

Shoreline clean-up methods may consist of one or more of the following methods, depending on the extent of oiling and the shoreline environment:

- Removal of floating or pooled oil;
- Removal of oiled material and vegetation;
- Use of sorbent materials;
- Low pressure flushing;
- Mechanical collection and removal of oiled material;
- Manual collection and removal of oiled material;
- Use of bioremediation agents;
- Dispersant application.

The National Plan Advisory Committee (NPAC) has recognised that *bioremediation* has a unique potential as an oil spill response option, particularly in the clean-up of sensitive oiled foreshore environments.

The limitations of oil spill foreshore clean-up are exacerbated by the vast area of Northern Queensland, the sensitivity of mangrove and salt marsh foreshores and the remoteness of the region. The development of alternative environmentally sensitive and efficient clean-up technologies is required to provide Australia with a more complete response capability within these and other remote areas.

Bioremediation

Bioremediation, the artificial enhancement of hydrocarbon degrading organisms to consume and break down oil, has been widely advocated as an oil spill clean-up option. However, there is a lack of detailed information regarding the effectiveness and side effects of bioremediation in tropical environments. This to date has precluded Australian authorities from incorporating bioremediation as a response option into current contingency planning.

Recognising this gap in our knowledge NPAC has commenced a three year research and development project into the bioremediation of oil spills in tropical Australia. This project is being jointly funded by the Commonwealth Government and the oil industry.

Bioremediation of oil spills can incorporate three general techniques to artificially enhance the biological degradation of oil;

- addition of nutrients to the environment (fertilisation);
- culture and inoculation of in-situ or exotic organisms;
- culture and inoculation of genetically enhanced organisms.

This research project is to concentrate on nutrient fertilisation techniques only. Overseas research in temperate environments, tends to indicate that fertilisation techniques are the most effective and environmentally accepted method of bioremediation.

The project objective is to develop an information base, draft policies and guidelines on the use of bioremediation in tropical Australian offshore environments, so that bioremediation can be incorporated into the overall planning and response process for oil spills.

B. SPILLS OF HAZARDOUS SUBSTANCES OTHER THAN OIL

In considering risk assessment within the REEFPLAN area, incidents involving pollution by other substances could fall into two categories.

1. Chemicals released at sea from a cargo tank as a result of collision, grounding, or fire.
2. Packages lost at sea being washed ashore or sinking to the sea bed.

For the purposes of determining the appropriate response chemicals fall into one or more of four broad classifications these being:

i. substances which form gas and vapour clouds;
ii. substances which float on water;
iii. substances which are soluble and disperse in water; and
iv. substances which sink.

An active response would be considered for incidents involving groups i. and ii. above, where evacuation of personnel, rendering safe the damaged packages or containers and neutralisation of the leaked substances would have first priority. For group iii. and iv. above, a more passive response would generally be the most appropriate course of action, with appropriate measures taken to restrict marine activities, for example fishing, swimming etc in the area until risk of contamination had passed.

Where incidents involving releases of hazardous substances occur within a port area, the port authority, assisted by police, fire brigade and State Emergency Service will have prime responsibility for response action.

In the case of a release of hazardous substances the management of the incident will be in accordance with QCCAP arrangements. The lead agency will be assisted by such advice and resources as are available and appropriate to the incident. Involvement of AMSA is essential to gain access to technical advice from industry and government agencies, and to ensure wide circulation of safety warnings. Liaison with local emergency services is also essential, as those services have access to communications networks and are experienced in dealing with a wide variety of incidents. Personnel safety and health is of prime consideration, followed by decontamination and disposal considerations.

As specified in the QCCAP, any countermeasures phase involving hazardous substances, the SSC will overview the scientific aspects of remedial actions, field monitoring of data and interpretation of results.

REFERENCES

More detailed information on oil spill pollution and responses may be obtained from:

- *Basics of Oil Spill Clean-up* Environment Canada;
- *Manual on Oil Pollution,* Section IV. International Maritime Organization, London;
- *Response to Marine Oil Spills.* International Tanker Owners Pollution Federation, London.
- *Queensland Coastal Contingency Action Plan,* QDoT, 1996.
- *National Contingency Plan,* AMSA, 1996.
- *Provision of Safe Havens for Disabled or Damaged Vessels at Sea, Guidelines for Responsible Authorities,* QDoT, 1994.

A key reference covering chemical spills is *Manual on Chemical Pollution* published by the International Maritime Organization.

REPORT POLLUTION FROM ALL

VESSELS TO YOUR LOCAL REGIONAL

HARBOUR MASTER, PORT AUTHORITY,

QUEENSLAND TRANSPORT OFFICE:

PHONE: 07 3895 1317 (24 HOURS)

OR TO THE MARITIME RESCUE

COORDINATION CENTRE

PHONE: 06 230 6811 (24 HOURS)

FAX: 06 257 2036 (24 HOURS)

OR VIA TELSTRA MARITIME STATIONS

QUEENSLAND TRANSPORT

Great Barrier Reef Marine Park Authority

AMSA
Australian Maritime Safety Authority