NATIONAL MARINE SPILL CONTINGENCY PLAN

" NATPLAN "

For

THE GOVERNMENT OF SAMOA

This plan has been developed to reflect the essential steps to initiate, conduct and terminate an emergency marine spill response in Samoa

NATPLAN provides a concise and easy to follow guide to the management of spill response and associated linkages to supporting documentation.

This plan consists of two main parts,
Part A: The core plan text designed to provide key supporting information to assist with spill response operations and planning.

Part B: Appendixes which contain Operational information for Oil Spill Planning, Preparedness & Response.

PLAN AMENDMENT CERTIFICATION

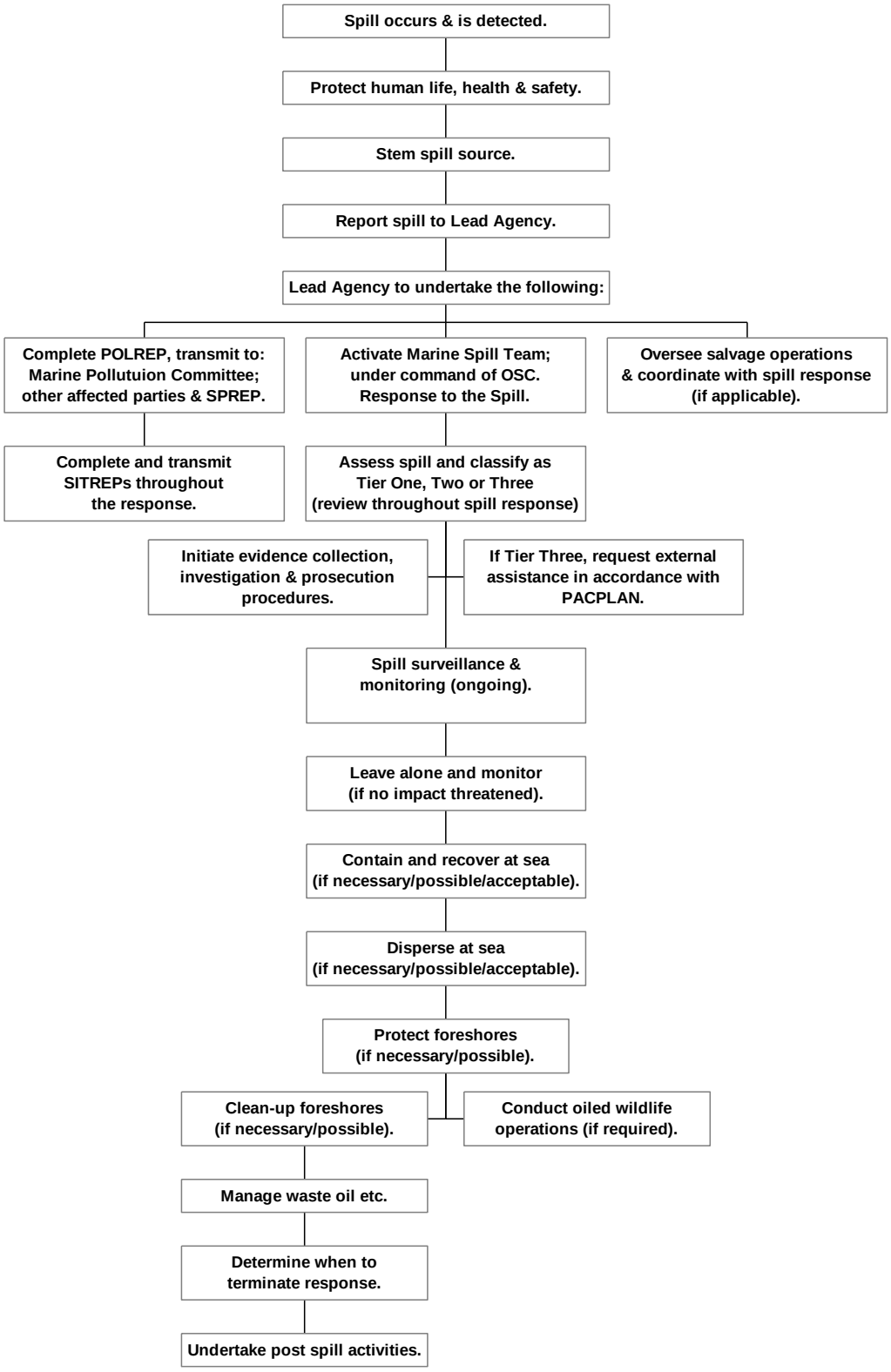
Proposals for amendment or additions to the text of this plan should be forward to:

Chief Executive Officer
Ministry of Works, Transport & Infrastructure
Private Mail Bag, MWTI
Tel (685) 21611
E-mail: enquiries@mwti.gov.ws

Amendment		Section	Page	Entered	Date	Signature
No	Date					

Marine Spill Response – Action Checklist

24 – Hour Contact for Marine Pollution Reports 64 440 (SPA)



CONTENTS

LIST OF FIGURES

Part B: ATTACHMENTS APPENDIXES

1. INTRODUCTION

1.1 Background

The Government of Samoa has developed this National Marine Spill Contingency Plan (NATPLAN) as part of its commitment to protecting our valuable coastal and marine resources from the threat of marine pollution incidents.

NATPLAN has been developed to reflect the essential steps necessary to initiate, conduct and terminate an emergency spill response on, or into the navigable waters of Samoa, on the adjoining shorelines, the waters of the contiguous zone or into waters of the exclusive economic zone.

This plan meets the obligations of Samoa under the *Protocol Concerning Cooperation in Combating Pollution Emergencies in the South Pacific Region (Noumea Pollution Protocol)* of the *Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (Noumea Convention)*. The Noumea Convention Protocols have now been revised to produce the Oil and HNS Protocols. This also meets obligations under the *International Convention on Oil Pollution Response, Preparedness and Cooperation 1990 (OPRC 90)*.

It also meets Samoa's obligations in its *Marine Pollution Prevention Act 2008 Part III: Marine Pollution Response Section 21* where it states *"The CEO with advice from the committee shall ensure that a National Marine Spill Contingency Plan (NATPLAN) is developed, maintained and implemented."*

In the event of a marine pollution incident in Samoa all government departments and agencies and all oil companies, shipping companies and other relevant parties, which operate within Samoa, are required to follow the procedures laid down in this plan.

1.2 Aim & Objectives

The Aim of the NATPLAN for Samoa is:

- To plan and provide for an appropriate response capability to prevent/minimise damage to marine and coastal environments and resources from marine pollution events.

The Objectives of NATPLAN are:

- Provide the basis of planning for marine pollution and other maritime emergencies at a National level.
- To provide the organisational structure and procedures for the coordinated, timely and effective response to maritime spills of oil and other noxious and hazardous substances.
- To provide systems for the detection and reporting of marine spills within the area covered by the plan, including communications networks.
- To outline the counter-measures available to restrict the spread of a spill and minimise the environmental, economic and social impacts of a spill.

- To facilitate the implementation of the Noumea Oil & HNS Protocols and OPRC 90 in Samoa.

1.3 Technical Scope & Tier One, Two and Three Spills

This NATPLAN covers the response to spills into the marine environment of all forms of pollutants, including oil, chemicals and other hazardous materials. However, it retains a primary focus on oil spills, as oil is the main pollutant likely to be spilled Samoa waters.

NATPLAN covers spills into the marine environment from all sources, including both shipping and shore-based facilities.

For the purposes of NATPLAN, spills are classified as Tier One, Two and Three spills. Classification is dependent upon the amount of pollutant spilt, or likely to be spilt, the resources required and level of support both Nationally and Internationally.

Tier One

- Small spills that are within the response capability and resources of an individual port or oil terminal within Samoa. These spills would normally have low potential for environmental or economic harm and are usually covered by oil terminal or port specific response arrangements.
- *As a guide spills of this nature are in the range of less than 1,000Litres*

Tier Two

- Medium spills that are within the national capability and resources of Samoa. These spills would have a moderate potential for environmental and/or economic harm and are **c**overed by this NATPLAN.

As a guide spills of this nature are in the range of 1,000-10,000Litres

Tier Three

- Major spills that are of a magnitude and/or severity that is beyond the response capability and resources of Samoa, and/or
- That impacts or threatens to impact within the jurisdiction of both Samoa and neighbouring country(ies) and,
- The spill has the potential to cause extensive local or regional environmental damage and loss of resources.
- *As a guide spills of this nature are greater than 10,000Litres*

Tier Three spills are covered by this NATPLAN and also require activation of PACPLAN - the Pacific Islands Regional Marine Spill Contingency Plan or other international mutual assistance agreements.

Set quantities and sizes of spills have intentionally not been used in the definition of Tiers. This is because in some instances a relatively small spill of oils and hazardous chemicals may fit the Tier Two or even Tier Three category, depending on the response capabilities and resources available, the prevailing conditions at the time of the spill and the types of environments impacted or threatened.

Allocation of any one spill to a particular Tier can only been done at the time of the spill, according to an assessment by the Lead Agency.

Because in reality spills do not fall into convenient categories, the boundaries between Tiers will inevitably be blurred. The Lead Agency must therefore be prepared to involve the next highest Tier from the earliest moments, as it is easier to stand down an alerted system than to escalate a response by calling up unprepared reserves.

1.4 Integration with Other Contingency Plans

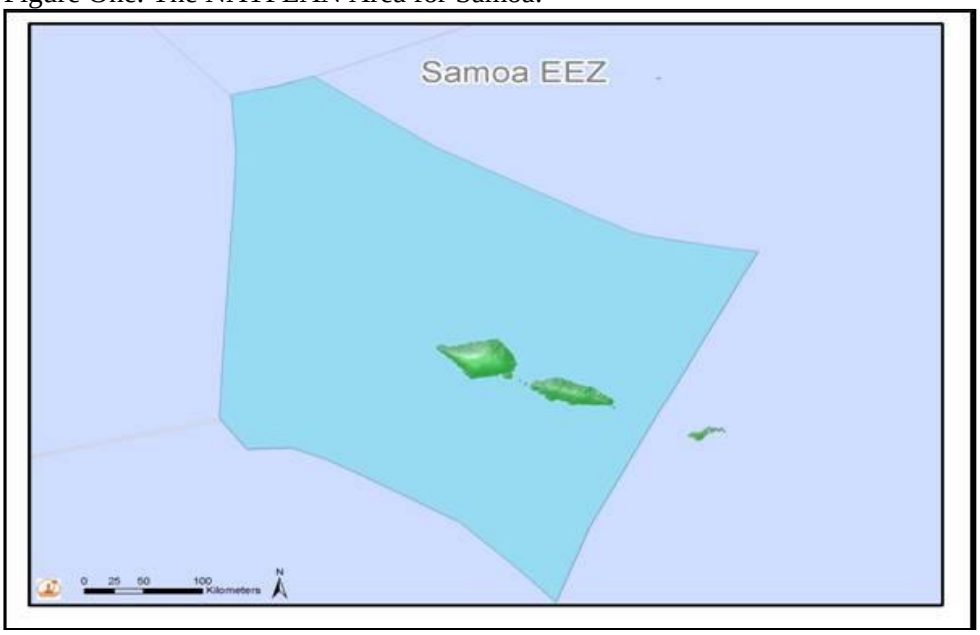
This plan is complimented with National Disaster plans, local, oil industry, site and port emergency plans as well as international support plans like PACPLAN.

- National Disaster Plan
- PPS Oil Spill Contingency Plans
- SPA Spill Contingency Plan

1.5 Geographical Scope

The geographical scope of NATPLAN, referred to hereafter as the NATPLAN Area, is all of the coastlines and all marine waters below highest astronomical tide within the EEZ of Samoa.

Figure One: The NATPLAN Area for Samoa.



1.6 Underlying Principles, Protection Priorities & Environmental Sensitivities

The main four underlying principles of an environmental pollution emergency plan are:

Prevention:	regulatory and physical measures to prevent incidents or mitigate the effects of the pollutant.
Preparedness:	arrangements to mobilise and deploy all necessary resources and services.
Response:	actions taken during and immediately after a pollution emergency to minimise effects.
Recovery:	arrangements to restore the affected environment to normal.

NATPLAN is founded on the following general principles:

- Every effort must be made by industry and government to **prevent** spills of oil and other hazardous materials from occurring, as the highest priority.

- Despite such efforts, for various reasons, spills will continue to occur from time to time, and it is necessary to have competent **contingency plans** in place to deal effectively with such spills, at the local and national level. NATPLAN constitutes the national contingency plan for Samoa.

- The primary purpose of NATPLAN is to provide a national mechanism for the **prevention/minimisation of damage** to marine and coastal **environments and resources** from marine spills, and to hasten the **recovery** of any environments and resources damaged by marine spills.

- The response to marine spills under NATPLAN will always seek to maximise co-operation, co-ordination and integration **between government and industry**, and to adopt the most **cost-effective, efficient** and **practicable** response options available.

In the event of a marine spill requiring a response to be mounted under NATPLAN, the following protection priorities should be adhered to (in order of priority accepted internationally):

- Human life, health and safety.
- Biological habitat.
- Rare and endangered species.
- Cultural resources.
- Commercial resources.
- Non-commercial property and amenity.

Within these protection priorities, various marine and coastal environments and resources have different environmental sensitivities, requiring further prioritisation of spill response efforts.

Tropical coastal foreshores can be classified into a number of broad scaling of sensitivity to oil pollution as follows.

1	Exposed rocky headlands and platforms with high wave energy	Wave swept, most oil removed by natural processes within days according to wave energy.
2	Exposed sand beaches	Oil may sink and/or buried according to sand sub Strata. Generally oil will be removed naturally within weeks. Can be removed by mechanical means.
3	Exposed tidal flats and gravel beaches	Oil may penetrate and be buried. Depending on energy conditions. Oil may persist for sometime.
4	Sheltered rock coasts and high amenity Areas	If not protected oil may persist for sometime. Amenity areas most likely to cause public and tourist operator concern.
5	Sheltered tidal flats, mangroves and Biologically sensitive areas	Most productive of coastal environments. Oil may persist for many years. Difficult to clean, protection of these environments should receive first priority.

The clean up options used must be tailored to suit the needs and sensitivities of the foreshore contaminated. Response authorities must ensure that expert environmental opinion is sought on the correct methods to use in the different coastal environments to ensure further damage is not done to sensitive ecosystems.

Further information on the advantages and disadvantages of various cleanup and response options is contained in section 5. Response Actions and Operations.

These cleanup options can be summarised as follows.

Clean up Response (To be covered further in detail in Appendixes)

Rocky Foreshore:
If clean up action is required, the use of low pressure sea water to disperse the oil back into the water should be considered where booms deployed in the near shore can concentrate the oil for recovery. Dispersant may be used by should only be used in the absence of significant biological activity. Physical cleaning techniques are also widely used.

Sandy Beaches:
Preferred method is physical removal and disposal of oiled material.

Marshlands and Mud Flats.
Expert opinion should be sought in these situations. Water flushing techniques can be used but sometimes no clean up action may be preferable. These environments are very sensitive to physical damage from the impacts of responders disturbing the roots systems of marsh plants and mangroves and trampling oil into the soft sediments.

The distribution of coastal resources is shown in Figure Two and the designation of environmental sensitivity ratings and protection priorities is shown in Figure Three

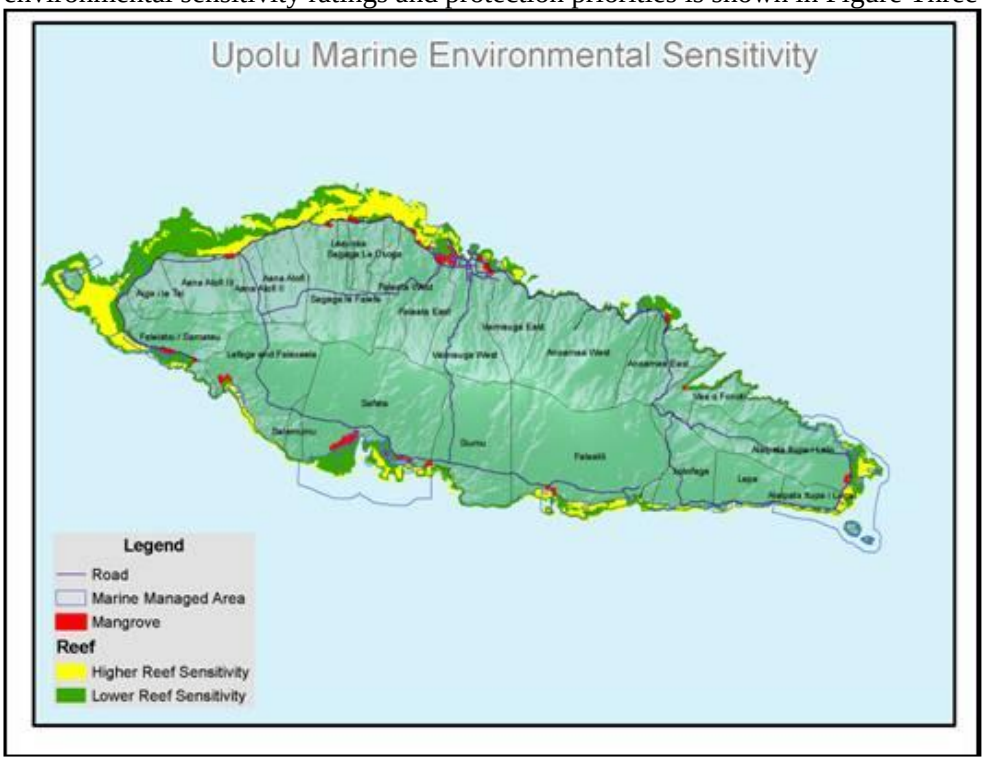


Figure Two-A: Coastal Resource Map of Upolu

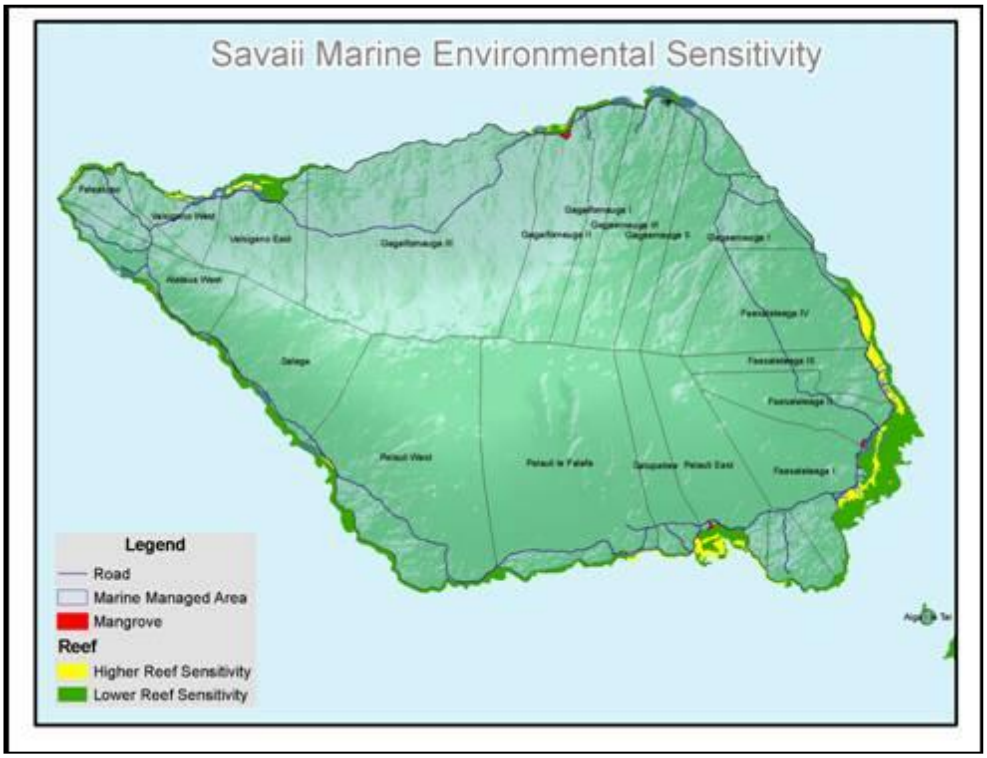


Figure Two-B: Coastal Resource Map of Savaii

Figure Two-C: Coastal Resource Map of Manono

Environmental Sensitivity Ratings & Protection Priorities are included above in Figures 2.A – 2.C.

1.6.1: Apia Harbor – Palolo Deep (Map provided by MNRE)

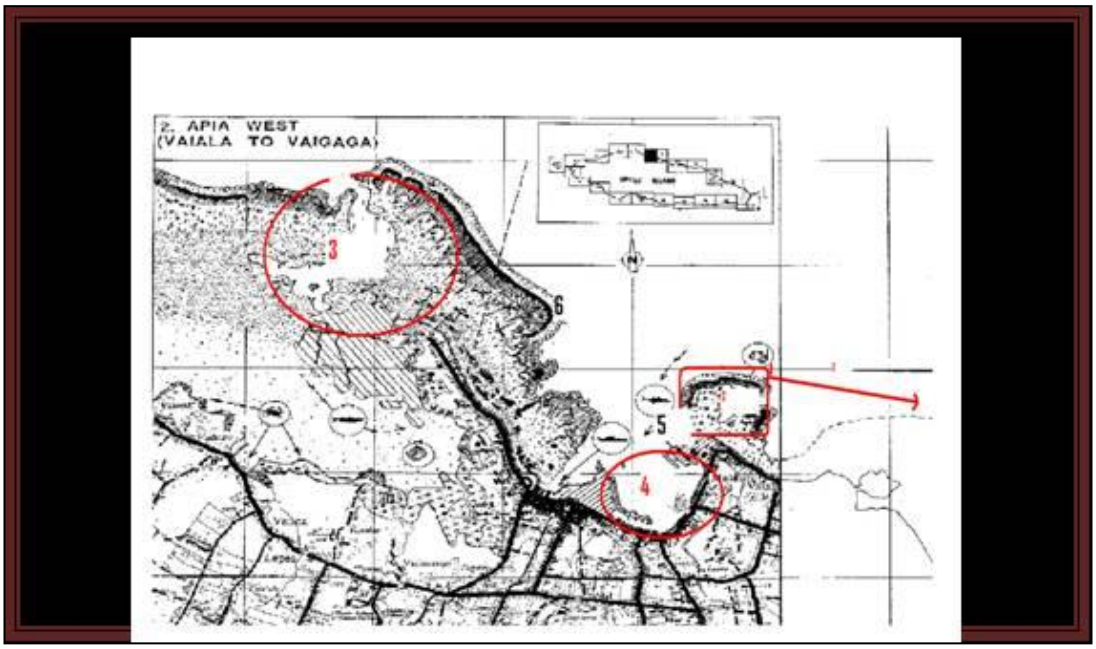


Figure Three-A: –Apia Harbor – Palolo Deep

1. Towards the east to Vaiala and Taumeasina are fishing grounds for both Vaiala and Moataa villages. The Palolo Deep which is both a Marine Park and a permanent monitoring site for Samoa under the Global Coral Reef Monitoring Network (GCRMN) and the most assessed site in Samoa in terms of marine fauna and flora.
2. Westward is the Vaiusu Bay in which the Division of Environment is implementing a rehabilitating project through replanting of mangroves and mudcrab farming/recruitment for recovery of some of the marine resources there. While to the immediate west towards number 5 are fishing grounds for both Sogi and Mulinuu villagers.

Figure Three-B: Apia Harbor – Palolo Deep

3. Also to note that the Apia Bay where the wharf is also the spawning grounds for the big eye scad (atule) that is seen in these areas twice a year I think from Jan – Mar and

July - September or earlier. So round about this time of the year for the second spawning or near spawning.

4. Is the main wharf

1.7 Risk Assessment

In assessing the risk factors in Samoa, we look at several different criteria. In common with many other risk assessment plans we must define a level of risk from the various factors that might lead to a polluting spill.
As this document deals primarily with Marine Spills which could have a polluting effect on the environment in Samoa, the primary criteria that is likely to affect Samoa is shipping and vessel activities, such as unloading and transferring oil products. International data suggests that 80% of marine oil spills occur within port or harbour areas. These spills are usually small in nature resulting from normal operations such as loading/unloading and bunkering of fuels. There is also a high risk of spillage due to grounding of vessels especially cargo vessels and loss of bunker heavy fuel oil which ships could carry in the hundreds of tonnes.

In analysing the risk from such activities we have to take into account risks from ships, petroleum operations, land spills, environmental factors that are unique to Samoa's circumstances:

a. Risk of Collision –

This is not a high risk factor in Samoa due to a combination of a lack of heavy ship traffic lanes and the fact that lanes that are more heavily trafficked are not congested or constrained by land or off lying hazards. The SPREP Risk Assessment Study shows that there are concentrations of collision potential in the Apia channel approach.

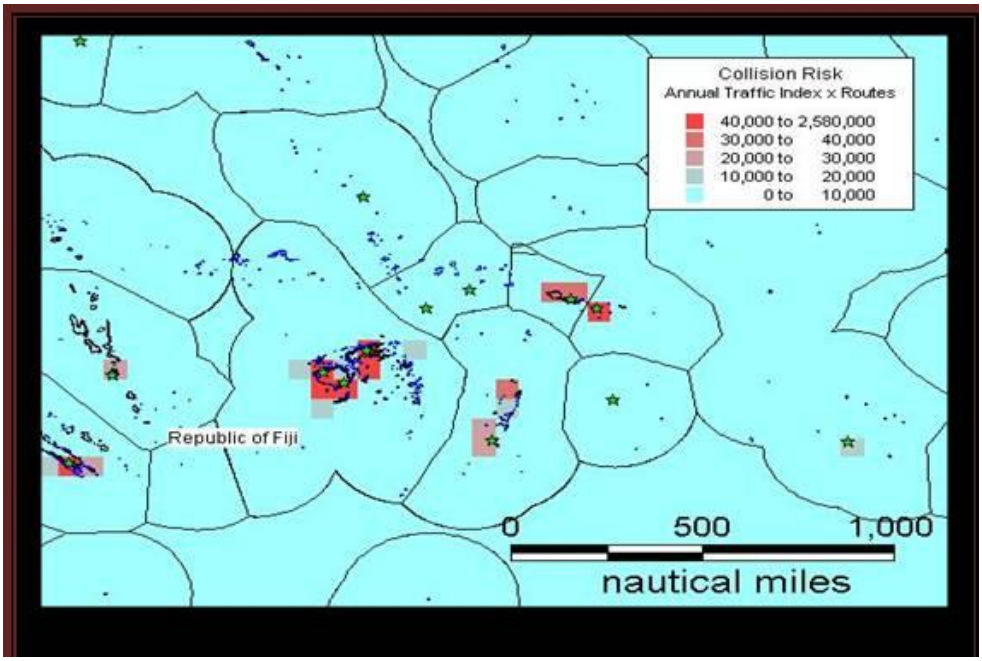


Figure Four-A: Collision potential, south central subregion. - SPREP - Risk Assessment Study

b. **Risk from the Size/Type of Vessel and Traffic Density -**

This risk is relatively low as the traffic density Samoa is relatively low. The oil tanker that services Samoa, is a medium range tanker about 45,000GRT with other smaller container vessels of about 8-10K GRT. There are also cruise vessels that visit Apia regularly with about 50-60(? SPA to confirm) visits a year.

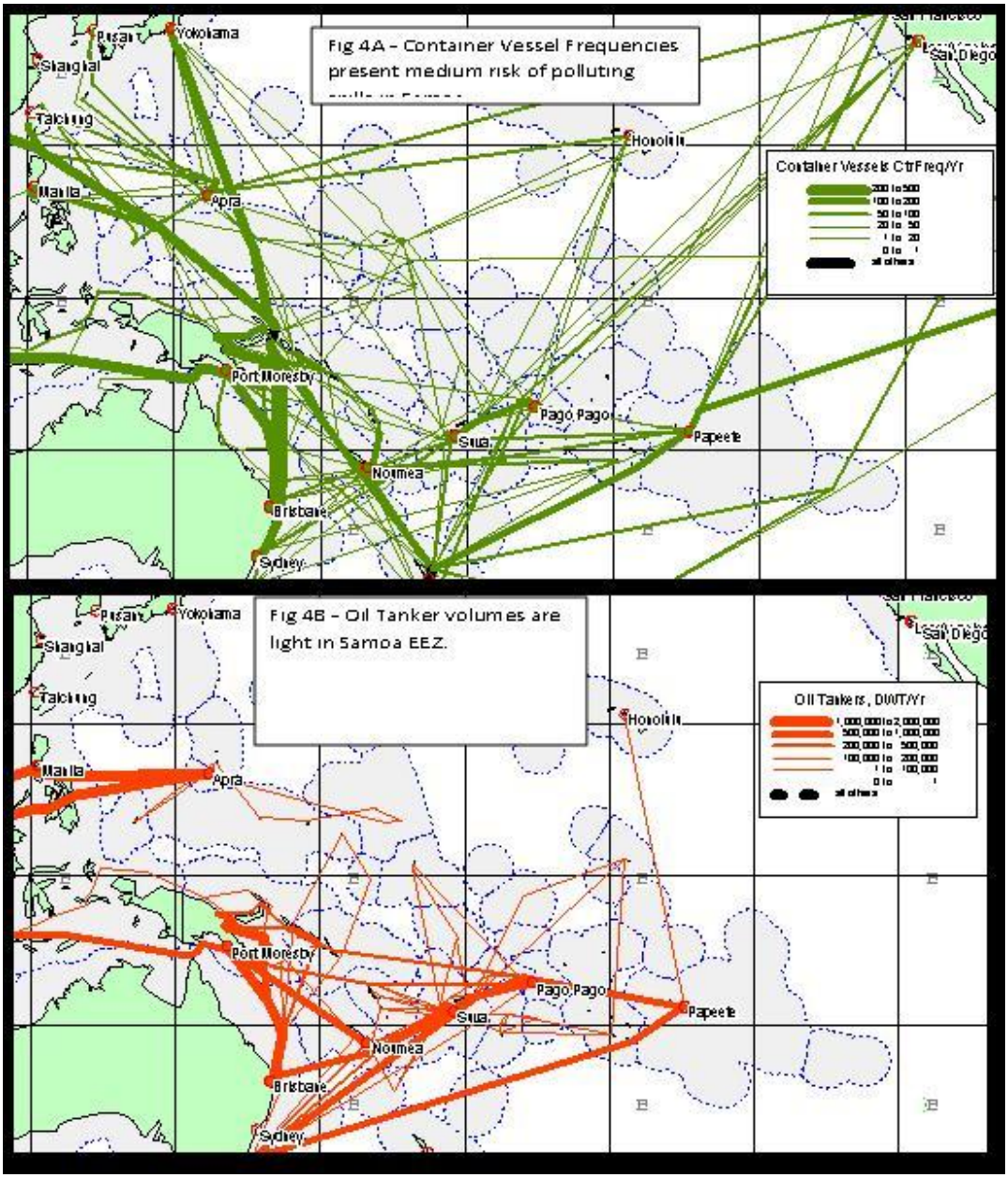


Figure Four-B: Traffic Routes and density

c. **Risks from Hazards to Navigation and Ports Risk** –
The Samoa Apia port has a range of fixed aids and buoys supports positioning in the approach to the tanker mooring buoys. With good visibility, the approach provides a security measure of 1.7. (extracted from SPREP Risk Assessment Study)

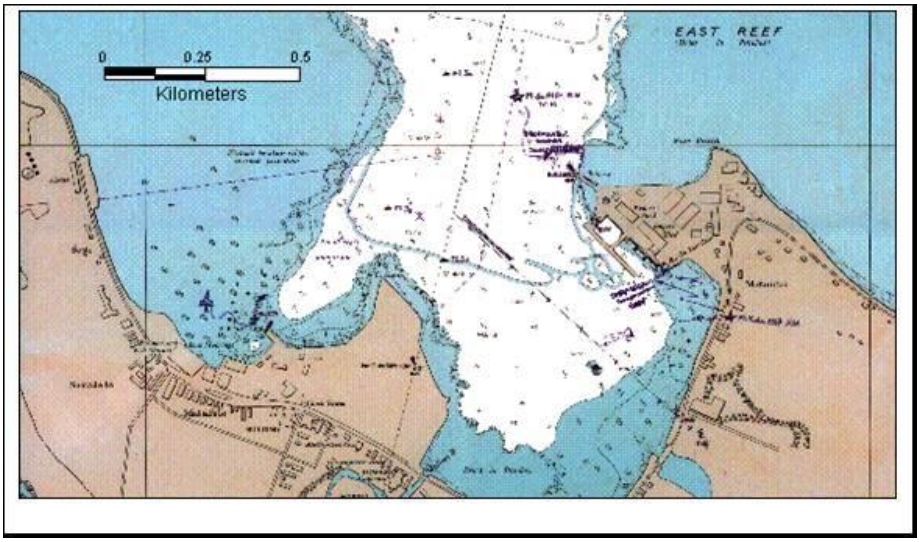


Figure Four-C: Apia Harbour entrance.

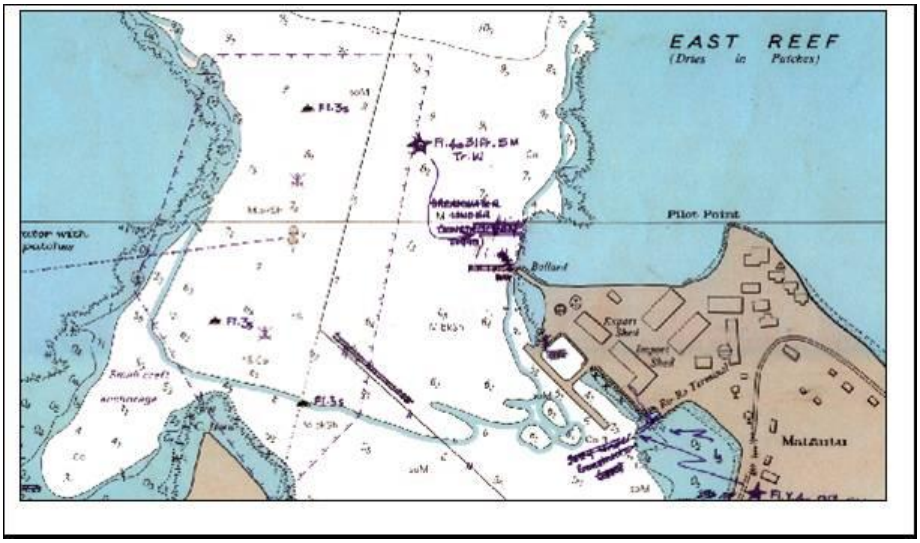


Figure Four-D: High risk waterway: Reef Passage.

Navigation Security Measure

Physical	Ship handling	Positioning	Minimum Safe Design (MSD)	Channel Width (CW)	Security Measure (CW/MSD)
200ft	145ft	75ft	420ft	700ft	1.7

Table 1.1: Apia Harbor Navigational Security Measure

d. **Risks From Seaworthiness of Vessels and Crew Competence**

For the most likely spill candidates, the oil tankers arriving at Samoa from Singapore etc. there is no problem with seaworthiness or crew competence and they are all covered by P&I Club insurance. Some of these vessels may use heavy fuel oil, which could marginally increase spill risk.

Local Cargo vessels and Longline fishing boats are generally seaworthy and crew competence is variable but generally acceptable. The fishing vessels tend to act quickly to help each other out in the event of a problem and carry relatively low levels of potentially polluting spill materials.

e. **Risk From Environmental Factors** (weather, tides, severe weather events)

Tides are less than 1 metre so presents little or no hazard. Cyclones average one per year but good warnings are usually available, therefore spill risk is minimal as long as vessels follow prudent and accepted practices (i.e. leaving harbour and lying in the lee of islands). Outside of cyclone season the weather is reasonably benign. There is a new risk area of Tsunami that posses a great threat to the coastal environment with devastating effects as can be seen by the September 29th 2009 Tsunami that struck the Eastern side of Upolu and Manono. The preventative messages and prudent practises would be to shut operations, close off valves, fuel hatches, tank valve outlets and move road tankers to higher ground as quickly as possible to minimise potential loss of product. Because of the unpredictability and very limited warning time, priority for human life is paramount in this case and every effort should be taken to move to higher ground.

Figure Four-E: Aleipata Slipway and Wharf effect of Tsunami.

f. Risk from Groundings –

This is the most likely area of risk in Samoa. There have been several incidents with both large and small vessels over the years, which testify to the reality of this risk. The mitigating factors mentioned above such as better navigation, communications, and trained personnel, mean that this risk is somewhat reduced in the present day.

The area most likely to suffer a grounding incident would be near the entrance to Apia harbour and the fact that the prevailing wind and currents often blow across the harbour mouth, which means that a vessel attempting to enter or leave the harbour that loses power or manoeuvrability will find itself blown onto the reef, with possibly severe consequences. The methods of dealing with spills from grounding in the Apia harbour area are discussed under Section 5.

If we have a marine spill due to grounding on a distant part of the reef in Samoa there would be limited options to respond in a timely manner. This is due to limited equipment that could be effectively deployed to protect the potentially impacted reef or area. It would be necessary to rely on natural dispersant such as wave action, tidal movements, currents, winds and evaporation to lessen the effects of the spill.

Figure Four-F: Forum Samoa II aground on reef - Apia

g. Risk from Petroleum Facilities and Tank Farms

This risk is reasonably well contained by the oil facilities themselves, although evidence suggests that both PPS installations in Apia and Faleolo Airport tank farms are at considerable risk in the event of a cyclone and Tsunami impacting from the north.

Under normal conditions, PPS, have an effective interceptor sump/filter facility for their waste or spilled oil

h. Risk From Wharf Pipelines

There are no floating pipelines for offloading fuel. PPS have recently commissioned a fixed wharf pipeline about 2km from the Sogi terminal to the main wharf. Since the pipeline is new, there is little risk of spillage. Maintenance records should be checked regularly by the authorities.

In **s**ummary the overall risk factor for a seriously polluting spill in Samoa as a whole is medium to high risk for a major spill. The area most at risk, Apia Harbor, is examined in more detail under Section 1.9. Cyclones obviously increase spill risks. Notwithstanding the low overall risk factor, response options in many cases are severely limited by distance, topography, and available resources.

1.8 Types of Oils and Chemicals Transported in Region

The following products are landed and used in Samoa - Unleaded, Diesel, Kerosene, Lubricating oils, Aviation gasoline. Some ships that call at Apia or pass through Samoa waters carry fuel oil as cargo or fuel bunkers.

1.9 APIA HARBOUR: HIGHEST RISK AREA

- Harbour Channel Risks

Apia harbour thus presents itself as the highest risk area in Samoa.

The PACPOL harbour risk assessment of 2003 (See table- Sec 1.7.3) ranks the harbour in the top 10 most at risk in the Pacific area but with an acceptable safe entrance of 1.7. This means that the habour is relatively safe for the size of vessels that do call into the port. The channel has a width of 700ft with a minimum safe design width recommended of 420ft. This

gives the harbour a ratio of Channel width safety of **1.7** (channel width divided by Minimum safe design width) where a ratio of **1.0 is safe**.
The narrow channel width risk is heightened by the fact that the prevailing winds and currents flow across the harbour mouth thus making it likely that any vessel having power or steering problems entering or leaving the harbour is likely to be forced onto the reef in the vicinity of the channel.

- Vessel Risks

The vessels most at risk are of causing a serious spill are the various tankers and international cargo vessels as they enter/leave or discharge their cargos.
The Apia habour is a mandatory pilotage which provides an added risk reduction.
Historically, the greatest risk of an incident is caused by a vessel entering the harbour and not being able to stop or anchor in time to avoid impact with other vessels or the harbour walls due to mechanical failure or human error. There have been several such incidents in the past in which other vessels and/or harbour facilities have been damaged and others which have resulted in "close calls" and an actual incident in the FSII as noted above in section 1.7 (f).

- Transfer Risks

The highest risk of a Spill in the harbour is in the transfer of product from ship to shore or in bunkering operations for smaller vessels. The oil companies engaging in these operations have contingency plans in place for minor spills and maintain some stocks of sorbent materials and dispersants sufficient to deal with very minor spills.
There are also booms available to contain a spill within a given area such as around a tanker or against a wharf.
The equipment available is minimal for the purposes intended. SPREP purchased 50% of the required port equipment in 2005 however most of the equipment is non-operational damaged by the FSII operations and poor maintenance.
The tankers have to meet MARPOL regulations for inspection of their hoses and transfer equipment and thus far these seem quite efficient in preventing transfer spills but a broke hose or fitting is always a possibility and the risk factor is thus high.

- Discharge Risks

Samoa MPPA doesn't allow for any discharge into Samoa waters of bildge or oily waters. Although this may be the case, there are still those infrequent sources of spills in the harbour from possible vessels pumping their bilges and / or oily water overboard.
Many of these spills occur at night and some are no doubt intentional. Finding the guilty party can be problematic but an investigation can be conducted in accordance with the Marine Spills Investigation and Sampling Guidelines issued by SPREP See Annex 5). Some of these spills are accidental in nature and are usually very minor and would rarely demand even an absorbent response. Some others, especially if heavier lube oils were the pollutant, could be efficiently absorbed. All bilges, oily water and sewage are collected off vessel and disposed on shore.

- Environmental Risks

In terms of harbour spills impact on the environment and wildlife the risk is medium to high as the harbour is just next to Palolo Deep – a marine protected area (refer to 1.6.1).

- Cyclone Risk

The Cyclone risk factor for the harbour is high in some ways but as most vessels are lifted or removed before cyclone arrival and others depart to seek shelter in the lee of the island the risk from vessels is negligible.

- Earthquake & Tsunami Risk

The Tsunami risk factor for the harbour is high however even though the area does not lie directly in the path of a Tsunami wave from the Tongan trench.
Because of the unpredictability and the short warning time, human life should be given the utmost priority. Procedures and SOP need to be implemented for Vessels/port operations to cease immediately and evacuate to higher ground in the event of a major earthquake and Tsunami warning.

The risk of a spill in the harbour or its near environs is thus very real with a response for Tier 1 & 2 and 3 very possible.

COUNTRY	PORT	RISK AREA	Min Safe Design	Chan Width	Ratio Ch W/ MSD	Cont Freq.	Cont Ton nage	Petrol Freq.	Petrol Ton nage	Total Freq.	Total GRT
Vanuatu	Port Vila, Mele Bay	Entrance to Paray Bay to fuel jetty	194ft	110ft	0.6	56	613384	54	47675	133	1523450
Cook Islands	Rarotonga (Avatiu)	Entrance to Avatiu	165ft	110ft	0.7	20	29280	19	50380	78	83736
Republic of Palau	Malakal Harbour, Koror	Malakal Pass	266ft	280ft	1	70	1010464	9	63792	79	1050145
French Polynesia	Papeete	Passe de Papeete	334ft	340ft	1	429	6961403	21	876000	6284	14490620
Northern Marianas	Saipan	Reef transit, entrance to Saipan	356ft	400ft	1.1	241	2453388	-	-	435	5150383
Kiribati	Betio Island, Tarawa Atoll	Betio Entrance	458ft	600ft	1.3	54	622944	14	39730	161	697943
Federated States of Micronesia	Pohnpei	Jokaj Passage	223ft	300ft	1.3	36	325728	18	127584	54	405090
Papua New Guinea	Madang Harbour	Dallman Passage-Turn to jetty approach	579ft	800ft	1.3	263	2096648	39	569715	690	2670479
Solomon Islands	Honiara	Approach to tanker moorings	313ft	450ft	1.4	191	2161561	19	698000	425	3455250
Samoa	**Apia Harbour**	**Reef passage to mooring buoys**	**420ft**	**700ft**	**1.7**	**275**	**2822025**	**33**	**1293600**	**482**	**4262194**
Papua New Guinea	Port Moresby	Basilisk Passage-Lark Patch Turn	709ft	1300ft	1.8	342	2703740	39	248475	762	3236947

Table 1.2 Harbour risk assessment from Pacpol Report

2. ROLES & RESPONSIBILITIES

2.1 National Marine Pollution Advisory Committee

The National Marine Pollution Advisory Committee consists of high-level representatives from the following government agencies:

- Ministry of Works, Transport & Infrastructure (Chair of the committee).
- Samoa Port Authority
- Ministry of Natural Resources and Environment
- Ministry of Agriculture and Fisheries
- Ministry of Police & Prisons
- Fire and Emergency Services Authority
- Attorney General's Office

And from industry representatives

- Samoa Shipping Corporation Limited
- Petroleum Product Supplies
- Betham Brothers Enterprises Ltd
- Transam Samoa Ltd
- Pacific Forum Line
- Apia Export Fish Packers Ltd

And any other members required from time to time.
The committee members are appointed by the Minister.

The role of the committee and its members are to:

- Develop, implement and maintain the NATPLAN.
- Oversee the response to marine spills and monitor performance and effectiveness.
- Review local/facility contingency plans for consistency with National arrangements
- Oversee national marine spill response training and exercises.
- Make available those facilities or resources, that may be useful in a response situation, consistent with the agencies authority and capability.
- Provide advice to government on general marine pollution issues and contribute to development of policy, legislation and other initiatives relating to the prevention and response to marine pollution
- Promote public awareness of, and appropriate community participation in marine pollution prevention, preparedness and response.

2.2 Responsible Authority

The Ministry of Works, Transport and Infrastructure is the Responsible Authority for all marine spills within Samoa waters.

The Responsible Authority has legal or statutory responsibility for administering and enforcing the national marine pollution legislation and for the overall management of the NATPLAN.

2.3 Lead Agency.

The Ministry of Works, Transport and Infrastructure maritime division is the lead agency for all vessel spills in Samoan Waters.

For all non vessel spills that affect the marine environment the MNRE will be the lead agency and will work closely with the MWTI.

The Lead Agency has operational responsibility the response to marine spills, through the designated Incident Controller (IC). The Incident Controller shall be the CEO of MWTI for any vessel spill in Samoa waters. The lead Agency has the responsibility for taking physical action to mitigate the impacts of the spill on the environment. Refer section 4 below for further details.

2.4 Other Government Departments

Regardless of which agency bears lead responsibility all other government departments shall support the Responsible Authority and Lead Agency in accordance with the organisational structure outlined in section 4 below.

2.5 Responsible Party (Polluter)

The party responsible for causing the spill has the following responsibilities:

- Reporting the spill immediately to the Responsible Authority/Lead Agency.
- Taking immediate action to control or stem the source of the spill.
- Taking immediate action to contain the spill and prevent it from spreading.
- Co-operating fully with the Lead Agency in the response to the spill under the direction of the Incident Controller (IC).
- Any legal obligations and responsibilities not covered above as required by relevant legislation, including those relating to meeting the costs of the spill response and clean up and mitigation of any environmental and economic damage.

2.6 Oil Industry

All oil companies operating in Samoa have the following roles and responsibilities under NATPLAN:

- Giving highest priority to preventing spills from tankers, pipelines, terminals, depots and other facilities owned and/or operated by them.
- Immediately reporting all marine spills from their facilities to the Responsible Authority or Lead Agency.
- Developing and maintaining local marine spill contingency plans for all facilities that they own, manage and/or operate as well as ensuring that these plans are compatible and integrated with NATPLAN.
- Establishing and maintaining stockpiles of marine spill response equipment for all facilities that own, manage and/or operate, with the types and amounts of equipment being appropriate to the level of risk at each facility.
- Ensuring that personnel are appropriately trained in marine spill prevention and response.
- In the event of a spill from its facilities, the roles and responsibilities outlined in section 2.5 above.

- Actively participating in the National Marine Pollution Advisory Committee and in planning, exercises and training activities.

2.7 Role of P&I Clubs

Approximately 90% of the world's shipping fleet is entered with a Protection and Indemnity insurer, called a P&I Club. The risks covered by the P&I Clubs include;

- ♦ Liability arising from the carriage of cargo
- ♦ Pollution liability
- ♦ Liability for loss of life and injury to crew members, passengers and others such stevedores on a ship
- ♦ Damage to fixed and floating objects and to other property
- ♦ Wreck removal
- ♦ And other such parts of the liability for collision damage as is not covered under a vessel's hull policy.

When an incident occurs a P&I Club usually appoints a correspondent to assist the P&I Club in relation to claims that arise where the correspondent operates.

The role of the correspondent in marine pollution incidents involving vessels includes but not limited to;

- ♦ Notifying the P&I Club of incidents that occur in his area of responsibility
- ♦ To attend an incident scene if appropriate
- ♦ To appoint surveyors/experts to attend at the scene of a maritime casualty
- ♦ To liase with governments, maritime authorities at the scene of a maritime casualty
- ♦ To monitor salvage operations, pollution containment/removal at the scene of the casualty
- ♦ To assist in posting security for claims and,
- ♦ To assist in carrying out investigations on cause of loss of vessel/cargo

The IC shall ensure that the P&I Club and/or P&I Correspondent are fully informed of the activities being undertaken during the incident response and that they have access to running records of costs of the incident. The correspondent would also be working closely with the Salvors and ships master and will be a valuable conduit for information flow.

3. POLLUTION REPORTS & COMMUNICATIONS

3.1 Surveillance & Spill Detection

All maritime oil and chemical spills should be reported to the Responsible Authority and recorded systematically. Vessel incidents such as groundings, collisions, fires, explosions or other accidents or incidents should also be reported as these can often lead to the release of cargoes or vessel fuels and oils.

Under the *International Convention for the Prevention of Pollution from Ships (MARPOL* 73/78) there is an obligation on the master of a vessel to report any marine pollution incidents

without delay, and to the fullest extent possible, to the coastal State in order to facilitate necessary counter-pollution actions. Mandatory reporting requirements for incidents involving harmful substances are contained in article 8 and Protocol 1 to MARPOL 73/78.

The Samoa *Marine Pollution Prevention Act 2008 Part II Section 16* requires all vessels to report any accidental or intentional discharge of oil into the Samoa waters.

All personnel in industry, government agencies, members of the general public, as well as crews of civil and military aircraft, should be required to, and be able to, report a spill to the Responsible Authority or Lead Agency 24 hours a day.

3.2 Initial Pollution Reports (POLREPS)

Recognising the importance of rapid dissemination of information in the event of a marine spill, any ship's master or crew, aircraft crew, oil company employee, port personnel or any other person observing a marine spill should immediately report the spill to the Responsible Authority or Lead Agency.

24-Hour Emergency Hotline for Samoa
SPA - 64440

The Lead Agency in consultation with the Responsible Authority and other committee members should assess the implications of the situation and make a decision on whether any response is likely to be required. The Lead Agency should also consider whether other parties need to be made aware of a potential pollution situation if operational personnel need to be placed on standby.

The Lead Agency should immediately complete a POLREP, using the standard format contained in Appendix Two, and urgently transmit this to all members of the National Marine Pollution Committee, any other affected/interested parties and to SPREP via facsimile (see 3.6 below).

3.3 Situation Reports (SITREPS)

In order to provide periodic updates on pollution incidents, the Lead Agency should complete SITREPs, using the standard format contained in Appendix Three. These SITREPs should be frequently complied from field information and transmitted to all members of the National Marine Pollution Committee, any other affected/interested parties and to SPREP via facsimile, at regular intervals throughout the spill.

3.4 Post-Incident Reports (POSTREPS)

After a pollution incident, the Lead Agency should prepare a brief report including:

- Assessment of the response operation, including reference to equipment used its effectiveness, additional equipment, and training needs.
- Documentation of clean-up costs.
- Assessment of environmental and economic damage.
- Details of problems encountered.
- Recommendations regarding amendment or revision of NATPLAN.

When the Lead Agency has compiled this report, the Incident Controller and other personnel should meet with the National Marine Pollution Committee to review their collective experiences and compile an overall Post-incident Report (POSTREP), including if necessary, any recommendations for amending or revising NATPLAN.

3.5 Media and Public Reporting

When an incident occurs it is imperative to give the public prompt, accurate information on the nature of the incident and actions underway to mitigate the damage. The CEO of MWTI shall be the Media and community relations personnel ensuring that all appropriate public and private interests be kept informed and their concerns are considered throughout a response. (See Appendix 9 - Media Plan)

3.6 Pacific Islands Regional Marine Spill Reporting Centre (PACREP)

SPREP has established and maintains the Pacific Islands Regional Marine Spill Reporting Centre (PACREP), at its office in Apia, Samoa.

PACREP is simply the SPREP fax number (685) 20231, which provides the focal point for receiving and relaying information concerning any marine pollution incident in the region. PACREP is a facility where:

- POLREPS of all marine spills in the region should be sent to by the Lead Agency where the spill occurs.
- The progress of a spill can be monitored, through the receipt of SITREPs from the Lead Agency where the spill occurs.

POLREPS received by SPREP through PACREP are entered into a database and Geographic Information System, to provide a long-term picture of trends in marine spills throughout the region. This will assist updating of risk assessments and targeting of prevention, education, surveillance and enforcement efforts, and provides a performance indicator for spill prevention efforts and state of the environment reporting. SPREP is responsible for reporting annual spill statistics from PACREP to interested parties.

The contact details for SPREP are contained in Appendix 10 and are provided on the standard POLREP and SITREP transmission forms (Appendices Three).

It should be noted that PACREP is NOT an emergency response facility, and is only functional during normal business hours. Its main purpose is for the collection, analysis and dissemination of spill data. All spills within Samoa must be reported to the Responsible Authority or Lead Agency.

4. Incident Command & Control

4.1 Elements of Effective Control of Spill Response

Establishing effective control and initiating a spill response requires a number of actions, these include:

- Appointment of an Incident Controller – CEO MWTI,
- Mobilising the Marine Spill Response Team,
- Establishing a suitable incident control centre e.g. SPA or MWTI office,
- Establishment of effective communications,

- Effective collation, transfer, display and storage of information,
- Effective management of public and community relations (media and consultative processes).

4.2 Incident Control System and Marine Spill Response Team

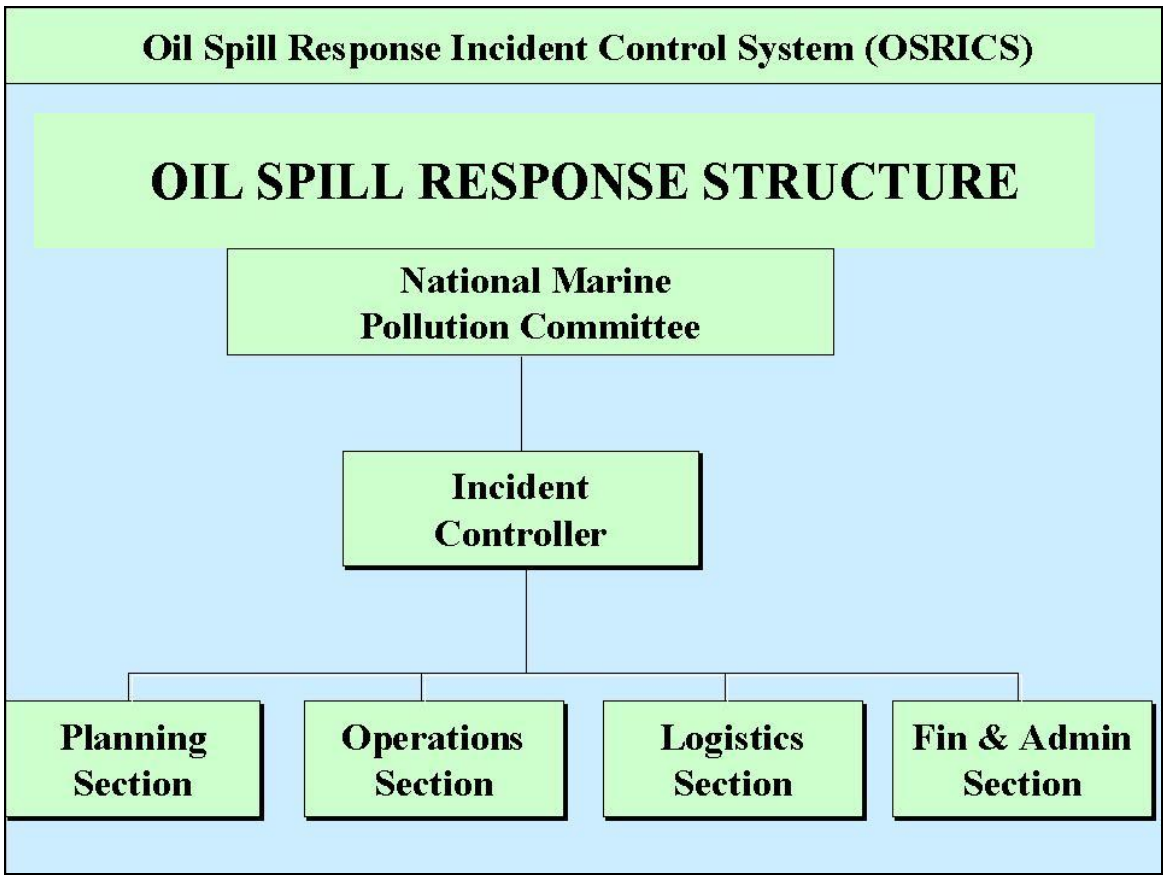
Response operations cannot be effectively carried out unless there is a clear organisational structure to command and control the response and trained individuals to carry out the response plans.

The overall structure of incident command and control system is depicted in Figure Five. In the event of a marine spill within Samoa waters, a Marine Spill Response Team based on this structure should be immediately established by the designated Lead Agency.

The number and nature of the individual sections and units should be flexible and tailored to suit the size and nature of the spill. Several functions may be combined under a single coordinator for small spills.

The IC directs response efforts and co-ordinates all efforts at the scene and is the primary decision-making authority in relation to spill response activities. This is achieved through the Incident Control System especially modified to support oil spill response called the Oil Spill Response Incident Control System or OSRICS.

Figure Five: Marine Spill Response Team (Oil Spill Response Incident Control System)



The responsibilities of the various roles within the Marine Spill Response Team can be summarised as follows:

- **Planning Section** - responsible for the provision of scientific and environmental information, the maintenance of incident information services, and the development of the Incident Action Plan.
- **Operations Section** - responsible for undertaking all response operations in the field.
- **Logistics Section** - responsible for the provision of resources to sustain the response.
- **Finance & Administration Section** - responsible for maintaining financial and administrative records of the response activities.

4.3 Roles and Responsibilities of Marine Spill Response Team

The OSRICS system allows flexibility for the escalation or reduction in the organisational /management structure as the scale of the response increases or diminishes. The number of personnel comprising each of the sections, and its sub units, will be determined by both the size of the incident and the needs of the Incident Controller.

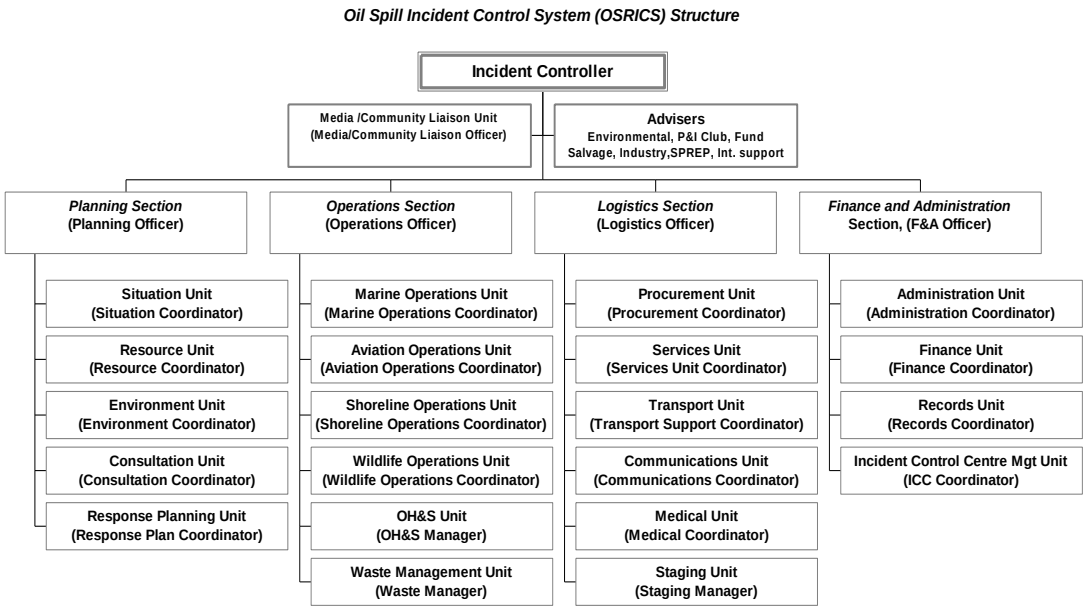
The roles and responsibilities the various members of the Marine Spill Response Team are as follows:

4.3.1 Incident Controller

Incident Controller (IC): The Chief Executive Officer of the Ministry of Works, Transport and Infrastructure is designated as the IC for all marine spills within Samoa waters.

In the event of a marine spill, the IC will assume operational responsibility for commanding the response to the spill and will control and direct the use of all resources. The national government invests the IC with the authority necessary to command all national assets and resources as deemed necessary to deal with the incident.

In carrying out his/her role, the IC shall be supported by an incident response team comprising the personnel and organisational structure outlined in Figure Six.
Figure Six: Organisational Structure – Response to Marine Pollution



4.3.2 Planning Section

The Planning Section has clearly defined specific responsibilities that provide the basis for all operational activities. The Planning Section may be split into a number of sub units in a major incident to enable it to more effectively meet its responsibilities. The sub units identified in OSRICS and their roles are as follows: -

Situation Unit -	responsible for the collection, processing and organization of information
Resource Unit -	responsible for information on the deployment of resources
Environment Unit –	responsible for the collection and collation of environment data and advice
Consultation Unit –	responsible for the coordination and development of community and commercial consultation
Response Planning Unit –	responsible for the coordination, development and review of incident action planning

4.3.3 Operations Section

The operational aspects of the response will take place in the field, remote from the Incident Control Centre where the planning process has taken place.

It is, therefore, essential that significant links are developed and maintained between the response personnel in the field, the Operations and Planning Section staff in the Incident Control Centre.

OSRICS provides for these links to be established by the development of reporting lines on a similar basis to those implemented within the other functional sections. Operations in the field have been subdivided into units with responsibility for specific aspects of the response activities.

These units have been developed with quite clear operational parameters. The six units, each under the direction and control of a Coordinator who is responsible to the Operations Officer, cover the following operations: -

Marine Unit -	all activities undertaken by waterborne craft and equipment
Aviation Unit -	all activities undertaken utilising fixed wing aircraft or helicopters
Shoreline Unit -	all clean up activities undertaken on the shoreline
Wildlife Unit -	all activities involved in the collection and treatment of oiled wildlife
OH&S Unit -	all activities related to the implementation of the Occupational Health & Safety Plan provisions
Waste Management Unit -	all activities related to the containment and disposal of recovered oil and oil debris

4.3.4 Logistics Section

In any emergency situation there is a vital need to ensure that response personnel are provided with adequate resources to enable an effective response to be mounted and that these personnel are provided with the essential amenities. To carry out these functions, OSRICS identifies a Logistics Section that is given responsibilities for ensuring that these resources are made available as required.

The Section is under the direction of a Section Officer and, in cases where the subunits are formed, each sub unit is under the direction of a Coordinator who reports to the Section Officer.

Procurement Unit – responsible for acquisition of personnel and equipment
Services Unit – responsible for the acquisition of services and facilities
Transport Unit – responsible for the provision of aviation, land and sea transport services
Communications Unit – responsible for the provision of communications services and support
Medical Unit – responsible for the provision of medical services
Staging Area Unit – responsible for the activation and management of assembly and staging areas

4.3.5 Administration and Finance

A vital component of any incident response is the need to ensure that fully detailed records are maintained to enable full cost recovery to be achieved from the polluter. OSRICS provides for these records to be kept through a Finance & Administration section. In addition, the Finance & Administration section is responsible for the management of the Incident Control Centre.

Administration Unit – responsible for administrative services
Finance Unit – responsible for the provision of financial services
Records Unit – responsible for the collation of incident records
ICC Management Unit – responsible for the management of the Incident Control Centre

The Section is under the direction of a Section Officer and, in cases where the subunits are formed, each sub unit is under the direction of a Coordinator who reports to the Section Officer.

5. RESPONSE ACTIONS & OPERATIONS

The ecological impact of oil, fuel, and chemical or hazardous substance spill can be minimised by good management and planning as well as the response actions put into effect by the Responsible Authority and Lead Agency. Such actions will largely depend on several factors;

- The type of oil, fuel or chemical(s) involved;
- The size of the spill;
- The location of the spill;
- Prevailing sea and weather conditions at the spill site;
- The environmental sensitivity of the coastline/site impacted.

In commanding the response to the spill, the IC should ensure that defensive actions should begin as soon as possible to prevent, minimise or mitigate the threat to the environment or public health from the pollution.

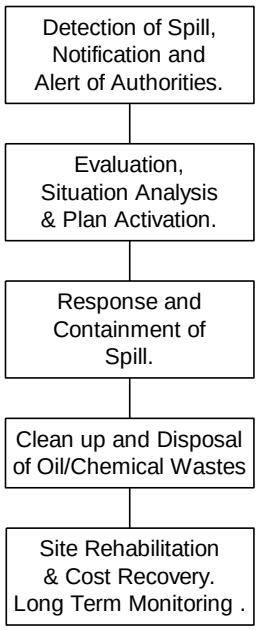
To ensure that these actions are taken, the IC should delegate relevant tasks to the Marine Spill Response Team. To assist in this process a Spill Response Action Checklist at the front of the NATPLAN summarises this sequence.

Depending on the nature of the spill, some of the actions listed below may not be applicable or may be carried out in parallel rather than in sequence, as determined by the IC.

5.1 Phases of a Response

There are five main phases to the overall process of responding to oil or hazardous chemical spills which can be summarised as follows in figure 7;

Figure 7. Five Phases - Response to Marine Spills.



5.2 Secure Human Life, Health and Safety

The highest priority when a spill has occurred is to take action to ensure that there is no threat to human life, health and safety. This protection of public health and safety as well response personnel should take precedence over all other actions to minimise environmental damage.

Each oil, fuel or chemical spill incident has its own unique dangers to which response personnel may be exposed. The protection of the public and response personnel should always be of prime importance in the decision-making. In marine spill response situations, equipment or personnel should not be deployed:

- If the identity of the fuel oil or chemical(s) spilled and hazards are unknown;
- If weather or sea conditions pose an undue risk to personnel safety;
- If there is a threat of fire or explosion;
- If required personnel protective equipment is not available.

Operations should be suspended or terminated if an unsafe condition arises during a response operation.

Major vessel incidents such as fires, explosions, groundings etc can result in the need for the search and rescue of mariners. First priority should always be to the health and safety of personnel.

5.3 Stabilising Spill Source & Intervention at Sea

The second priority action is to attempt to stop the flow of oil (or other pollutant in the case of spills other than oil), in order to minimise the potential size, extent and severity of the spill.

All efforts must be focused on saving a vessel so that the problem is not compounded. Stabilising the situation includes securing the source of the spill and/or removing the remaining oil from the vessel, tank or pipeline to prevent additional pollutant entering the sea.

With accession to the *United Nations Convention on the Law of the Sea (UNCLOS)*, Samoa's jurisdiction extends to the Exclusive Economic Zone and the Territorial Sea extends to 12 miles from the coastline. This permits Samoa to intervene on the high seas against the wishes of the ship and cargo interests. This is only to the extent necessary to prevent, mitigate or eliminate grave and imminent danger to the coastline or related interests from pollution or threat of pollution of the sea, following a maritime casualty, which may be reasonably expected to result in major harmful consequences.

The measures taken must be proportionate to the damage, whether actual or threatened, and must not go beyond what is reasonably necessary to achieve the ends of protection and must cease when those ends have been achieved.

Such measures may include:

- Move the ship or part of the ship to another place;
- Remove cargo from the ship;
- Salvage the ship, part of the ship or any of the ships cargo;
- Sink or destroy the ship or any part of the ship;
- Sink, destroy or discharge into the sea any of the ship's cargo, or
- Take over control of the ship or any part of the ship.

5.4 Salvage of Casualty

In the event of an incident involving a damaged or disabled ship, it is paramount that the salvage industry be involved in the response as soon as possible. Salvage activities may need to be arranged for taking the vessel in tow, refloating a grounded vessel, or reducing or stopping a discharge of pollutant to minimise environmental damage resulting from the casualty. It is essential that these operations be undertaken as soon as possible

In accordance with Samoa's legislation MWTI has responsibility for safety issues relating to vessels on coastal or foreign voyages and will be responsible for ship operational matters. These functions include alerting and liasing with salvors, taking measures to minimise pollution release or outflow and other salvage activity.

The vessel's owner or master will normally appoint a salvor by signing a Lloyds Open Form Agreement. However, in cases where this does not occur, MWTI may use its powers under the *International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Damage 1969*, to either direct the Master/Owner to engage a Salvor or alternatively contract a salvor to undertake necessary work, with costs recoverable from the owner.

5.5 Spill Assessment & Reporting

Once attempts have been made to stem the flow of oil (or other pollutant), the nature, size, extent, severity and likely movement of the spill should be assessed, and a POLREP

completed and transmitted urgently to all members of the National Marine Pollution Advisory Committee, other affected/interested parties and SPREP.

The IC is responsible for the assessment of the spill to attempt to classify it as Tier One, Two or Three (refer section 1.3), and determine whether or not external assistance is required though activating PACPLAN (refer section 6 below). The assessment of Tier levels may change over time and should be periodically reviewed during the spill.

5.6 Spill Surveillance and Forecasting

It is vital that the likely movement of the spill is assessed, in order to identify possible impact areas and determine the most operate response options. There are three main ways a spill trajectory can be determined;

⇒ Direct observation (surveillance),
⇒ Manual calculation using currents & winds,
⇒ Computer modelling.

Visual observation of any spill is essential and the IC, through his support personnel, should arrange for charter, military or commercial aircraft to assess and monitor the movement of the spill.

Meteorological and hydrographic data should be obtained by the IC, through his support personnel, and analysed to obtain predictions of expected spill movement. Local knowledge from people such as fishermen and mariners should be used as a valuable source of expertise on likely spill movement.

It is essential that the results of such observations and predictions be transmitted to other parties likely to be affected by the spill (e.g. neighbouring islands).

In some areas, sophisticated spill trajectory prediction systems may be available, such as computer models. Information on the availability of such systems for various areas can be requested through SPREP.

5.7 Response Option Assessment Criteria

Alternative control and protection options shall be assessed to determine whether they can adequately protect human health and the environment in both the short term and long term from the unacceptable risks posed by the oil or hazardous substance spill.

When assessing the appropriate response options the criteria the Planning Unit and IC should use are;

- Overall protection of human health and the environment,
- Short and long term effectiveness on reducing flow, mobility or toxicity of pollutant,
- Implementability of option and availability of equipment and materials,
- Government/community acceptance of option,
- Relative cost compared to other options.

It is the responsibility of the Planning Section to develop a Response Action Plan (RAP) that must include;

➢ Clear environmental objectives for the plan (e.g. protection / clean-up)

- A strategy for the response and necessary action to be undertaken by the Operations Section
- Clear time-lines for actions to phases of the plan and,
- Concise statements of responsibilities for the set actions/tasks.

5.8 Leave Alone and Monitor

Should surveillance and forecasting indicate that the spill is unlikely to impact on coastlines and is likely to remain in open water, then the best option maybe to leave the spill alone, allowing natural physical and biological degradation to occur at sea.

The response to marine spills under NATPLAN should always seek to complement and make use of **natural forces** to the fullest extent possible.

However, it is vital that the movement of the spill is closely monitored, through continuing surveillance and forecasting. The next stage of response operations should be activated if even the slightest possibility of coastal impact arises.

5.9 Containment & Recovery at Sea

Should surveillance and forecasting indicate that the spill might impact on coastlines, the possibility of containing and recovering the oil at sea to prevent such impact should be pursued.

The equipment available for containment and recovery are outlined in Appendix 4: Inventory.

The ability to conduct effective containment and recovery operations at sea will be limited by the nature of the spill, available equipment, physical conditions and logistical considerations. In many instances, especially in open water, containment and recovery at sea may not be possible.

5.10 Use of Oil Spill Dispersants

In the event that containment and recovery is not possible, or is only partially effective, another possible option to prevent or minimise the spill from impacting on the coast is to disperse it at sea, using chemical dispersants. Dispersants can be applied to the spill from vessels or aircraft.

As with containment and recovery at sea, the effective use of dispersants will be limited by the nature of the spill (including the type of oil and its dispersability), the availability of dispersant stocks and application equipment, physical conditions and logistical considerations. In many instances, effective dispersal of oil at sea may not be possible.

In addition, the inappropriate use of dispersants can cause worse environmental impacts than undispersed oil. Dispersants are pollutants themselves, and their use can temporarily increase the toxicity of the oil, by increasing its surface area to volume ratio and thereby increasing the release of the toxic components of the oil into the marine environment. If used in very shallow water and on shorelines, they can cause the oil to penetrate into sediments, creating potential long-term pollution problems.

The use of dispersants should therefore only occur under strict supervision by competent environmental and scientific authorities and in accordance the SPREP Environmental Guidelines On the Use of Oil Spill Dispersants (Refer to the Guidelines or contact SPREP).

If dispersants are used in accordance with the SPREP Guidelines, they represent a very useful oil spill response tool and it is advised that the nominated environmental unit of the response team be involved in the planning and use of dispersants.

To ensure only approved dispersants are used in Samoa waters the National Marine Pollution Advisory Committee shall maintain a schedule of dispersants and other response chemicals that may be authorised for use on oil spills at sea or on shorelines.

5.11 Foreshore Protection

In most circumstances, despite best efforts to contain and recover and/or disperse a spill at sea, a weather-driven spill is highly likely to impact on coastal environments and resources.

Efforts will therefore have to be made to protect foreshores. Options include the use of oil spill booms to physically prevent oil from impacting on the foreshore, or to direct it to preferred collection points (such as a sandy beach), where it can be recovered.

The ability to conduct effective foreshore protection operations will be limited by the nature of the spill, available equipment and personnel, physical conditions and logistical considerations. In virtually every situation, it will only be possible to protect a relatively small area of foreshore. It is therefore absolutely necessary to clearly establish protection priorities, in accordance with the relative environmental sensitivities and resource values of the threatened coastal environments and resources.

Refer to the designation of environmental sensitivity ratings as shown in Figure Two.

5.12 Foreshore Clean-up

In the likely event that a spill does impact on coastal resources and environments, it may be necessary to conduct foreshore clean-up operations. However, before proceeding with clean-up, the option of leaving the oil (or other pollutant) alone and allowing natural physical and biological degradation to occur, should be considered However, this option is only likely to be acceptable in very remote, unpopulated areas or with high-energy wave environments.

Where oil does come ashore, the extent of clean up of oiled coastal areas is to be carefully planned with the view of minimising further environmental damage that 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 culturally significant sites; and

- Access and mobilisation of 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; and
- Dispersant application.

Refer to Section 1 for cleanup techniques for different environments.

An important consideration during foreshore clean up is to ensure that clean-up operations do not cause greater environmental damage than the spill itself (for example heavy machinery damaging sand-dunes, etc). Also that wastes collected are kept to a minimum to avoid costly waste disposal and loss of foreshore materials and biota.

Equipment such as the following can be used on foreshore cleanup operations if available.

- Rope mops
- Sorbents materials and booms
- Skimmers
- Direct suction equipment (vacuum trucks)
- Water flushing equipment
- Other mechanical equipment etc.

5.12.1. River Mouths

In tidal areas should where possible be boomed to prevent oil entering the river system provided that:

- River flow rates are less than 1.2 m/sec;
- Accessible sites are available;
- Oil storage facilities exist or can be constructed;
- Collection can be achieved using diversion booms and retrieval systems (skimmer, suction devices or sorbent) or using sorbent booms
- It can be done safely.

DO NOT

- Apply dispersant without seeking expert environmental advice;
- Attempt to collect or control in fast flowing streams where booms maybe destroyed or personnel put at risk.

5.12.2 Coastal Swamps and Mangroves

Coastal swamps and mangroves are very fragile and important ecosystems and a high level of protection should be placed on these coastal environments.

- Oil should be prevented from entering coastal swamps by using dispersant on marine spills well off-shore;
- Booms should be deployed so as to restrict flow of oil into the mangrove area;
- Oiled swamps should not be cleaned unless:
  - Access is readily available and sediment is firm;
  - The mangroves do not have aerial roots (pneumatmophores)
- Seek expert environmental advice before using dispersant on or near mangroves;
- Manually clean up mangrove areas must be strictly supervised.

5.12.3 Coral Rubble

Issue will be penetration, remobilisation risk and difficulty of removing oil from porous material.
Options –

- Low pressure flushing
- Chemical shoreline cleaners – non dispersing type – along with flushing or tidal wash (NZ does not stockpile shoreline cleaners but they have shown some success cleaning coral rubble in prior studies. They are commercially available from the US.)
- Removal of rubble and disposal to landfill or other uses depending on level of contamination
- Containment and skimming in collection areas for any oil washed from rubble.
- In surf zone, eg outlying barrier reef, warm water combined with high wave energy would likely result in quite rapid natural recovery, although sheens would be released from the rubble until the oil had been washed out or broken down.

5.12.4 Fine sand

Oil penetration will be less than for coarse sediments and focus should be on minimising waste produced by picking up excessive amounts of clean sand. Especially hard packed sand such as observed on beaches to the west of the harbour would allow little oil penetration except where there are extensive crab burrows. Use of heavy machinery will push oil deeper into sand profile and should be avoided.
Options -

- Manual removal of oil from sand with spades, minimise clean sand taken

5.12.5 Coarse sand
Penetration can be considerable, leading to remobilisation and very difficult to remove oil. Cleaning methods must avoid pushing oil further into the sand.
Options -

- Manual removal of oil from sand with spades, minimise clean sand taken – feasibility will depend on penetration
- Low pressure flushing with containment and collection of oil as it runs off if possible.
- Bulk removal of heavily contaminated sand

5.12.6 Rocks
Remobilisation a risk where oil has penetrated between rocks. Slip hazard in areas where people access water. In rocky walls there is extensive debris, which would also get oiled and have to be managed as contaminated waste.
Options –

- Sorbent pads
- Low pressure flushing with containment and collection of oil as it runs off
- Again, non-dispersing shoreline cleaners may be of value to maximise flushing effectiveness.

5.12.7 Mangroves

- One of the greatest risk for oil persistence and remobilisation. Sediments are often soft and response activities can easily worsen the problem by causing oil burial.

Options –

- Where access without causing oil penetration possible use high volume, low pressure flushing with containment and collection of oil.
- Tidal movement will continually release oil, and collection may be times to contain oil as it moves out on the falling tide.
- Non-dispersant type shoreline cleaners may be an option.

5.12.7 Corals

Oil in contact with corals will cause substantial mortality. Water accommodated fractions of oil are also highly toxic to corals. Subtidal corals where surface is covered with oil for a prolonged period are also vulnerable to reduced dissolved oxygen impacts. Oil contamination may trigger algal blooms. Due to mucus release oil should mostly lift off corals during high tides, however branching corals are prone to oil sticking to skeleton so this will not always occur. Response activities must avoid physical damage to corals where possible.

Options –

- Skimming and sorbents where oil pooled
- High volume, low pressure flushing to clean oil from coral surface, with collection where oil pools.

5.13 Bioremediation

Bioremediation is the artificial enhancement of hydrocarbon degrading organisms designed to consume and break down oil. By accelerating the natural biological processes of biodegradation, bioremediation aims to increase the rate of degradation, by either stimulating microorganisms existing naturally in the area, or by seeding more microorganisms. However, the immediate environment is quickly depleted of available nutrients, especially nitrogen, which is necessary to support this increased population. Thus, most uses of bioremediation will require the application of fertiliser to the affected area. In some cases it may be beneficial to start fertiliser application before an area is affected.

Whilst bioremediation has not been a primary response strategy to an oil spill historically, it is now receiving renewed attention and can be used successfully to assist an area to recover oil foreshores from the effects of an oil spill.

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.

The most effective bioremediation strategies for oiled foreshores have utilised the fertilisation technique.

5.14 In-situ Burning

Burning of the spilt oil or fuels at sea has the potential of removing large quantities of spilt oil or fuels but has not been used extensively in oil spill response in the region.

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 disadvantage 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 and fumes is a high priority in the decision to use this option. Great caution must be exercised with the in-situ burning of petrol spills as this must be carried out well away from population centres and can emit large quantities of radiant heat and fumes in the vicinity of the burn.

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. To enable in-situ combustion to work the oil must have sufficient volatility and light oils must have 2-3 mm thickness and for heavy oils 8-10 mm thickness. 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 within Pacific region or even Australia 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.

5.15 Oiled Wildlife Operations

It is highly likely that wildlife will become contaminated in the event of a spill, including sea birds and shorebirds, marine reptiles (e.g. nesting turtles) and marine mammals.

Because of the complexity of such operations, it may be necessary to have a separate oiled wildlife plan as a sub-set of NATPLAN or detailed annex.

5.16 Oily Waste Management

An often-difficult problem created by oiled foreshore clean up is the generation of quantities of recovered oil and oily waste, which needs to be treated, recycled and/or disposed. The problems of oily waste management are exasperated on small islands such as those of the region, due to severe limits on management options.

Oil and oily wastes recovered in cleanup operations shall be disposed of in accordance with local legislation and by-laws.

Temporary oily waste storage sites must be selected taking into account;

- Accessibility of the storage site
- Distance from where oily wastes is collected
- Oil type
- Composition of contamination e.g. vegetation, sand, sorbents
- Volume of oil/contaminants
- Potential for groundwater pollution
- Potential for flooding from tidal movement
- Compatibility with on-site and adjacent land use
- Proximity to environmentally sensitive areas
- Wildlife access to site e.g. birds.

Oily waste management arrangements are outlined in Appendix 13

5.17 Chemical Spills/HAZMAT Response

As outlined under section 1.3, NATPLAN is designed to cover the response to spills into the marine environment of all types of pollutants, including oil, chemicals and hazardous materials (HAZMAT).

However, technical details within NATPLAN relate primarily to marine **oil** spills. This reflects the fact that oil is the main pollutant likely to be spilled in the region, and the fact that the discipline of oil spill response is far more developed and advanced than that of chemical spill/HAZMAT response.

In the event of a chemical/HAZMAT spill within the NATPLAN Area, the general procedures and arrangements of NATPLAN should be followed.

External assistance may be requested via SPREP under PACPLAN and MOUs.

6. EXTERNAL ASSISTANCE

Should the Lead Agency assess a spill to be a Tier Three spill (refer sections 1.3 and 5.3), it should activate a Request for Assistance through SPREP, in accordance with the procedures laid down in PACPLAN - the Pacific Islands Regional Marine Spill Contingency Plan.

According to PACPLAN Samoa's primary source of assistance is to be sort from the USA and the secondary source of assistance from New Zealand. For the case of the FSII September 2009, the government of Samoa sort assistance from the New Zealand Government which is an indication of possible future assistance. The assistance from the USA could be sourced from American Samoa where there is an adequate equipment stockpile.

Copies of PACPLAN are held by the Lead Agency.

When requesting assistance, as much information as possible about the nature of the spill should be provided and the request should be as specific as possible about the type of assistance required. Appendix 12 has a template - Request for External Assistance

6.1 Pacific Islands Regional Marine Spill Contingency Plan (PACPLAN)

The Pacific Islands Regional Marine Spill Contingency Plan (PACPLAN) now endorsed by countries sets up a framework for the activation of a regional response to large marine spills

that are beyond the response capability of one country or that have the potential to impact on more than one country. It allocates responsibilities in the event of marine spill incidents for the Secretariat, Pacific island members, non-island members and industry. It also provides a mechanism to address the responsibilities of countries to the SPREP Convention of 1986.

At Noumea, New Caledonia on 25 November 1986, the members of SPREP adopted the *Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (the Noumea Convention)*, with associated Protocols. The Convention includes a *Protocol Concerning Co-operation in Combating Pollution Emergencies in the South Pacific Region (Noumea Pollution Protocol)*. The Noumea Convention Protocols have now been revised to produce the Oil and HNS Protocols. The Protocol provides a formal framework for co-operation between Pacific Island Countries and Territories when responding to marine spills.

The Noumea Oil & HNS Protocols requires Parties to:

- Take initial action at the national level to respond to pollution incidents (marine spills).
- Co-operate with other Parties in the response to pollution incidents.
- Establish and maintain, within their respective capabilities, the means of preventing and responding to pollution incidents, including;
    - Enacting relevant legislation.
    - Developing and maintaining contingency plans.
    - Designating a Responsible Authority.
- Exchange information with each other and report all pollution incidents to relevant authorities and other parties likely to be affected.
- Provide assistance, within their capabilities, to other Parties who request such assistance.
- Facilitate the movement of personnel and materials needed for the response to a pollution incident into, out-of and through its territory.
- Develop and maintain, where appropriate sub-regional and bilateral arrangements for preventing and responding to pollution incidents.

PACPLAN now provides the framework for co-operative regional responses to major marine spills in the Pacific Islands region, including broad aims and objectives, underlying spill response philosophies and priorities, roles and responsibilities of relevant organisations, regional and international linkages and mechanisms for accessing regional and international assistance.

6.2 Disaster Management Plan

This plan is a sub-plan of the Disaster Management Plan and the National Marine Pollution Advisory Committee forms a sub-set of the Disaster Advisory Committee and will act as an advisory body in the event of a marine pollution emergency declared under the Disaster & Emergency Management Act 2007.

6.2 Other Mutual Aid Arrangements

PPS have mutual arrangements with their contract supplier who can provide assistance upon request. Currently PPS has a supply agreement with Mobil Oil.

7. RESPONSE TERMINATION & POST-SPILL ACTIVITIES

7.1 Response Termination

In any marine spill response operation, a point is reached where the cost and effort involved in continuing clean-up operations outweigh the benefits to be gained. The IC, in consultation with his/her support personnel under the Marine Spill Response Team and the members of the National Marine Pollution Advisory Committee, should determine the point when further effort and expenditure become unreasonable and can no longer be supported on grounds of environmental effectiveness and cost.

The advice of the nominated scientific/environmental expertise, including any provided through external assistance, will be of paramount importance in determining when the environmental effectiveness of continued spill clean-up efforts do not justify continued expenditure.

7.2 Equipment Cleaning/Restoration and Return

Oiled equipment should be cleaned as soon as possible after use. Cleaning should be carried out in a controlled situation where run-off can be contained without causing further pollution of the environment.

Equipment cleaning methods include:

- High pressure hosing.
- Steam cleaning (do not use on booms made of PVC, or plasticity of the boom will be lost).
- Apply dispersants and brush (especially heavily oiled booms).
- Flushing pumps that have been used to apply dispersants with fresh-water, immediately after use.

All oil collected from cleaning operations must be disposed of in accordance with the oily waste management procedures outlined in NATPLAN.

Once cleaning is completed, all equipment that has been provided through external assistance should be inspected and checked-off, and arrangements made in consultation with the assistance provider for returning/replacing the equipment.

7.3 Response Evaluation & Debriefing

As soon as possible after termination of clean up, a full de-brief session should be held. The aim of the debrief session is not to assess the performance of individuals, but to evaluate the response and to translate any lessons learned into improvements to the NATPLAN, so as to improve the effectiveness of any future spill responses.

It is preferred a concise report of lessons learnt and any operational deficiencies be compiled for submission to the National Marine Pollution Advisory Committee for action.

7.4 Damage Assessment & Monitoring

Following a marine spill it is necessary to conduct post-spill damage assessment and monitoring activities, in order to scientifically and quantitatively assess:

- Ecological damage.
- Impacts on commercial resources and activities such as fisheries, aquaculture and tourism.

It will also provide a baseline against which to measure recovery from the spill.

The information gathered will assist with:

- Determination of compensation claims.
- Better understanding of the effects of spills and the ability of the environment to recover from such effects.
- Better understanding of the effects and effectiveness of the various clean-up techniques used.
- Identification of any necessary ongoing restoration and rehabilitation requirements for damaged environments and resources.

Responsibility for initiating and coordinating post-spill damage assessment and monitoring should generally rest with MNRE, which provides the Environmental Scientific Coordinator (ESC) on the spill response team. The following general principles should apply to post-spill damage assessment and monitoring.

- The MNRE, should organise joint government/industry monitoring teams, to undertake coordinated, integrated studies. This will avoid duplication of effort and the possibility of conflicting results that may be used for compensation claims.
- Assessment and monitoring should aim to be as quantitative as possible, and the basis of any qualitative assessments stated.
- Monitoring must be designed so as to be statistically valid and rigorous, with the levels of confidence clearly stated.
- Data collection should commence as soon as possible after the spill.
- The use of sound pre-spill baseline data is essential to the success of post-spill damage assessment and monitoring. MNRE should rapidly identify all such data, including that held by government environment and fisheries agencies, universities and research institutions.
- The monitoring design should include the identification and monitoring of control sites.
- The monitoring design should include areas impacted by the spill, areas disturbed by clean-up activities and areas used for the storage of oily waste.
- All organisations involved in post-spill damage assessment and monitoring should keep detailed records of all costs and expenses associated with these activities.
- The results obtained should be published in the scientific literature, to assist the development of the spill response discipline in general.

7.5 Environmental Restoration & Rehabilitation

Following a spill, it may be necessary to undertake activities to restore and rehabilitate damaged ecosystems and resources, for example replanting mangroves killed by a spill, rehabilitating beaches damaged by clean-up activities or transplanting coral to a high-use tourist area impacted by a spill.

Responsibility for Post-spill restoration & rehabilitation should generally rest with the MNRE, which provides the ESC on the spill response team. The following general principles should apply to post-spill restoration & rehabilitation.

- Areas requiring restoration and rehabilitation should be identified during post spill damage assessment (refer section 7.4).
- In determining the best options for the restoration and rehabilitation, techniques that seek to complement and make use of **natural forces** to the fullest extent possible should be selected, including the option of allowing natural recovery without active intervention.
- The effects and effectiveness of restoration and rehabilitation efforts should be assessed through rigorous monitoring, as part of post-spill damage assessment and monitoring activities (refer section 7.4).
- All organisations involved in restoration and rehabilitation should keep detailed records of all costs and expenses associated with these activities.
- The results obtained should be published in the scientific literature, to assist the development of the spill response discipline in general.

8. Cost Recovery & Reimbursement

It is the responsibility of the Responsible Authority to initiate cost recovery actions direct with the polluter's representative, e.g. P&I Club correspondent. If required to negotiate or to take legal action to achieve full settlement of amounts incurred in the response. In most cases the identity of the spiller is known and a representative of the P&I Club or Fund will be aware of the Authorities intervention.

The reimbursement of the costs of a marine spill response should be attempted from the polluter, under existing legal regimes (such as relevant national legislation, the Civil *Liability Convention1992 and the Fund Convention 1992*, if applicable).

To assist in the recovery of costs, detailed records of action taken and equipment and other resources used to respond to the incident, including detailed and complete records of all costs incurred must be kept by all parties. These records can be utilised both to support cost recovery, claims for compensation and for subsequent analysis of actions taken during the pollution incident, in order to upgrade NATPLAN.

The IC through the Marine Spill Response team shall ensure the necessary collection and safeguarding of oil and environmental samples, information, accounts, receipts and reports for the recovery of costs through the spillers' insurer.

9. EQUIPMENT

The national equipment inventory is a joint government/industry arrangement, with both parties contributing and having access to the equipment. In general, the oil industry provides the equipment necessary to respond to Tier One spills from its facilities, and government provides the balance of the stockpile necessary to bring the capability up to Tier Two level.

A list of equipment available in Samoa, storage locations and contact details is contained in Appendix Four.

Additional equipment may be available through external assistance (refer section 6).

10. TRAINING & EXERCISES

10.1 Training of spill responders

Training of key personnel is an essential component of contingency planning and preparedness. All personnel involved in spill response should have as a minimum health and safety training. Ideally they should have sufficient training to fully understand their responsibilities during a spill response, be capable of operating all equipment and performing all duties allocated to them in a safe, timely, efficient and environmentally safe manner.

Individual members of the team will be given training tailored to their specific responsibilities in the team, from management level to equipment operator level. The following topics are a guide to the types of training that are available to spill responders.

- Basic safety, fire and health precautions to be taken in the vicinity of a spill;
- Overview of incident Command System (ICS) organization structure and position responsibilities
- Incident Action Plans and the planning process cycle;
- Tactical operations planning
- Actions to be taken to minimise the effects of a spill;
- Basic fate and effects of spilled oil in the environment;
- Introduction to the National Oil Marine Spill Contingency Plan;
- General oil spill response strategy;
- Emergency response organization structure and duties;
- Reporting procedures, requirements and responsibilities;
- Communications procedures during spill response;
- Safe, proper and efficient use of spill response equipment;
- Equipment, materials, supplies, contractors, services etc available from outside sources
- Safe & effective use of oil spill dispersants;
- Transfer, storage and recovery/disposal of oily wastes;
- Safe helicopter operation including personnel safety, internal loading and slinging operations, hand signals and radio communication;
- Safe working practices on small boats;
- First aid;
- General spill response techniques and skills; and
- Confidentially of information and discussion with media.

10.2 Exercises and Response Drills

Exercises and response drills serve to evaluate the thoroughness and effectiveness of the response component of the Contingency plan under simulated conditions. Important elements of response capability to be tested are;

- Practicality (structure and organization);
- Communications;
- Equipment capability and response times;
- Adequacy of action plan; and
- Public, industry and media relations.

Drills will be conducted at sea or on-site using the resources that would be used in an actual spill. Hands-on experience with clean up equipment and techniques will be used where practical.

Types of exercises to be considered include:

- Deployment of selected equipment (as in a training exercises);
- Call-out of personnel who would be involved or contacted during a spill event (including other government department officers, port and harbour personnel, oil industry company personnel, etc.); and
- Full scale exercises.

A national spill response exercise/drill should be held in on an annual basis. Such exercises should be joint government/oil industry activities and seek to further develop government/industry integration. Responsibility for organising these in-country exercises rests with the National Marine Pollution Advisory Committee. SPREP can provide technical advice and assistance in the development, conduct and monitoring of these exercises.

11. APPLICABLE LEGISLATION, ENFORCEMENT & PROSECUTION

In Samoa, marine pollution is regulated under the Marine Pollution Prevention Act 2008 (MPPA 2008).

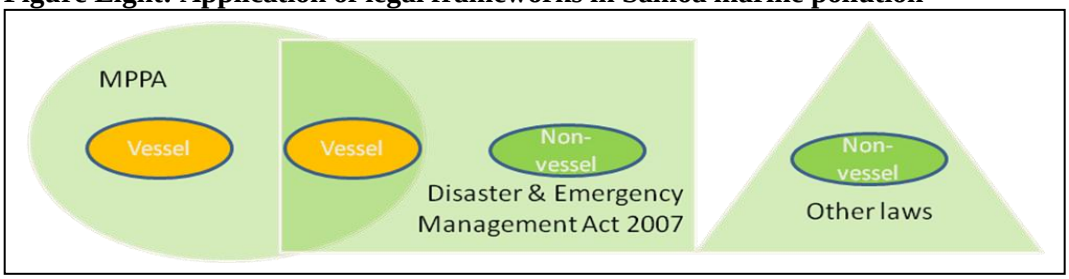
This Act is administered by the Ministry of Works, Transport and Infrastructure.

Under this Act, Part II Section 9, it is an offence to discharge pollutants and harmful substances *"no pollutant or harmful substance, (including but not limited to, any oil, plastics, synthetic ropes and synthetic fishing nets) may be discharged from a vessel, platform or place on land into Samoa waters or from a Samoa vessel into any waters*" and any person who does commits an offence and is liable upon conviction to a fine not exceeding 10,000 penalty units or to imprisonment for a term not exceeding 10years, or both and shall be liable to pay for the total cost of any clean up operations to restore the environment to its original condition.

There is also other legislation that applies to marine pollution - the Disaster & Emergency Management Act 2007 for national emergencies and other relevant laws such the Environment Act 2007 and Shipping Act 1998. There are four scenarios for marine pollution incidents where jurisdiction rests with one or more acts.
(a) in the event of a marine pollution incident that emanates from a vessel and is determined to be a disaster or emergency under the Disaster & Emergency Management Act 2007 – the Disaster & Emergency Management Act 2007 applies subject to provisions under the MPPA 2008.
(b) Where an incident emanates from a source other than a vessel, the Disaster & Emergency Management Act 2007 has effect with any provisions from the MPPA 2008.
(c) Where an incident emanates from a vessel but not determined a disaster or emergency under the Disaster & Emergency Management Act 2007 then the MPPA only applies.
(d) Incident from source other than a vessel and not determined a disaster or emergency under the Disaster & Emergency Management Act 2007 then any relevant law dealing with pollution, wastes, environment protection, ports and administration or land management applies.
However in any case, in the event of a marine spill, the Responsible Authority, assisted by the Lead Agency and other government departments, will arrange for the collection of all necessary evidence, including sampling and analysis of the pollutant and its suspected source, photographs, records of interview and inspection of records, vessels, equipment and other facilities; to assist the effective prosecution of any offence that may have been committed.

[Appendix 5 - contains Investigation and Sampling Guidelines.]

Figure Eight: Application of legal frameworks in Samoa marine pollution



12. APPROVAL, CONTROL & REVISION OF THE PLAN

12.1 Approval of the Plan

The Minister will approve the NATPLAN, with such approval requiring written endorsement of the plan by all members of the National Marine Pollution Advisory Committee as stipulated in the MPPA 2008 Part II Section 21(2).

12.2 Control of the Plan

NATPLAN will be a controlled document under the direction of the Lead Agency. Full contact details for all holders of controlled copies of NATPLAN are maintained on a register at the office of the Lead Agency, in order to facilitate revisions and updating.

12.3 Revision of the Plan

The main body of NATPLAN may only be revised by agreement of all members of the National Marine Pollution Advisory Committee followed by approval by the Minister.

Any member of the Committee may submit proposed revisions to the main body of NATPLAN. The Committee will consider these proposals.

Technical information contained in informational appendixes, such as contact details and equipment inventory, will be revised and updated regularly, and new informational appendices added as required, by the Lead Agency, without the need for agreement by the Committee. Such revisions and updates will be circulated by the Lead Agency to all registered holders of controlled copies of the plan.

The accuracy of technical information contained in informational appendixes, which relates to individual Committee members, is the responsibility of each Committee member. Committee members and other parties to the plan should report to the Lead Agency, any changes in circumstances, including levels of risk of marine spills, capability to manage marine spills, internal administrative arrangements and contact details, that may require revision and updating of the plan. The Lead Agency will then be responsible for circulating such updates to all registered holders of controlled copies of the plan.