



GHANA

**NATIONAL
OIL SPILL
CONTINGENCY PLAN**

**Ghana's
"National Contingency Plan to Combat Oil Pollution"**

Version 6.0

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AMENDMENTS

Suggested amendments or additions to the contents of this National Oil Spill Contingency Plan are to be forwarded in writing to:

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ABBREVIATIONS AND ACRONYMS

COWG	Chemical Operations Working Group
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Agency
EWG	Environment Working Group
GMA	Ghana Maritime Authority
GPHA	Ghana Ports & Harbours Authority
GNPC	Ghana National Petroleum Corporation
HOSR	Head of Oil Spill Response
IAA	Inter-Agency Agreement
IMO	International Maritime Organisation
IPIECA	International Petroleum Industry Environment Conservation Association
MARPOL	International Convention on Prevention of Pollution from Ships 1973 and its 1978 Protocol thereto
NCP	National Contingency Plan
NOSCPSC	National Oil Spill Contingency Plan Steering Committee
NOSCP	National Oil Spill Contingency Plan
NPMC	National Contingency Plan Management Committee
NPOG	National Contingency Plan Operations Group
OOWG	Oil Operations Working Group
OPRC	Oil Pollution Preparedness Response and Cooperation
OSC	On-Scene Commander
OSRICS	Oil Spill Response Incident Control System
UNEP	United Nations Environment Programme
UNCLOS	United Nations Convention on the Law of the Sea
WACAF	West and Central Africa Co-operation



GLOSSARY OF TERMS

Abidjan Convention: Means the Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central Africa Region (the Abidjan Convention, 1981)

Baseline of the Territorial Sea: is the low water mark along the coast of Ghana.

Bioremediation: the process of using living organisms to break down the molecular structure of oil into less complex substances that is not hazardous or regulated. This is often undertaken using hydrocarbon-eating microbes introduced to a contaminated site in large numbers. Nutrients are often added to speed up the organisms' digestion of the oil, and reproduction.

Cargo Vessel: a vessel carrying non-petroleum products which exceed 100 tonnes gross registered tonnage (GRT).

Catastrophic Spill: large-scale spill owing to unusual conditions, which is likely to have severe environmental consequences, and where the likelihood of occurrence is impossible to predict.

Chemical Dispersant: a chemical formulation containing non-ionic surface active agents that lower the surface tension between oil and water, and enable oil film to break up more easily and disperse within the water with natural or mechanical agitation.

Clean-up: (see also Oil spill response)

Continental Shelf: the sea bed and subsoil of those submarine areas that extend beyond the territorial limits of Ghana, throughout the natural prolongation of the landed territory of Ghana, to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baseline from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend to that distance.

Continental Waters: (refer Ghana continental waters)

Contingency Plan: a plan for action prepared in anticipation of an incident. In this case the contingency is for an oil spill incident. The contingency plan prepared for a site or region usually consists of guidelines and operating instructions intended to increase the efficiency and effectiveness of clean-up operations and to protect areas of biological, social and economic importance.

Exclusive Economic Zone (EEZ): all marine waters seaward to a distance of 200 nautical miles from the baseline

Harbour Waters: within harbour limits.



Harmful Substances: any substance, which if introduced into the sea, and terrestrial ecosystems is liable to create hazards to human health, living resources and marine and freshwater life, to damage amenities or to interfere with other legitimate uses of the sea or inland waterways, and includes any substance subject to control by MARPOL 73/78 Convention.

Internal Waters of Ghana: includes any areas of the sea that are on the landward side of the baseline of the territorial sea of Ghana.

IMO/IPIECA: International Maritime Organization/International Petroleum Industry Environmental Conservation Association

Ghana Continental Waters: includes Ghana marine waters and those waters beyond the outer limit of the exclusive economic zone of Ghana but over the continental shelf of Ghana.

Ghana Marine Waters: includes the territorial sea of Ghana and the waters of the exclusive economic zone of Ghana.

Marine Waters: refer Ghana marine waters.

MARPOL 73/78: the International Convention on Prevention of Pollution from Ships 1973 and its 1978 Protocol thereto.

Maximum Credible Spills: the greatest spill that could be expected from the range of hazards (e.g., shipping movements, bunkering, or bulk transfer) which are present at a specific location.

National Contingency Plan: the response plan for combating pollution by oil and other noxious and hazardous substances and produced by the Environmental Protection Agency in consultation with relevant national stakeholders under the auspices of the Ministry responsible for the Environment.

National Oil Spill Contingency Plan: the oil spill response plan produced by the Environmental Protection Agency in consultation with relevant national stakeholders under the auspices of the Ministry responsible for the Environment.

Net Environmental Benefit: a process of weighing the advantages and disadvantages of taking a particular course of action (such as dispersant spraying), including recognising the likely outcomes if the course of action is not taken (the impact of doing nothing). The result will determine if there will be a net (overall) beneficial or detrimental outcome of taking the action.



Offshore Unit: means any fixed or floating offshore installation or structure engaged in gas or oil exploration, exploitation or production activities, or loading or unloading of oil.

Oil: any petroleum in any form including crude oil, fuel oil, sludge, oil refuse, and refined products (other than petrochemicals).

Oil Industry: producers, refiners and marketers of oil, and associated carriers and service contractors.

Oil Pollution Incident: means an occurrence or series of occurrences having the same origin, which results or may result in a discharge of oil and which poses or may pose a threat to the environment (marine, inland waters and land), or to the coastline, or related interests of one or more States, and which requires emergency action or other immediate response.

Oil Spill: means the actual or probable release, discharge, or escape of oil into the internal waters of Ghana or Ghana marine waters.

Oil Spill Response: actions taken to confirm the presence of an oil spill, stop its flow from the source, contain it, collect it, protect areas from damage by it, mitigate its effects on the environment, and clean up wildlife and areas contaminated by it.

On-Scene Commander (OSC): the person responsible for the control and management of the marine oil spill clean-up.

Oil Transfer Site: includes any land, site, building, structure, or facility (whether on land or above the sea) that is used to transfer oil to, at or from which oil is transferred to or from a ship or offshore installation.

OPRC 90: International Convention on Oil Spill Preparedness, Response and Co-operation 1990.

Persistent Oil: oils and petroleum products such as crude oils, fuel oils and lubrication oils that, when spilled, remain after weathering in a residual form in the environment for an appreciable period.

Pollution: the introduction of contaminants into an environment that causes instability, disorder, harm or discomfort to the ecosystem i.e. physical systems or living organisms

Ports and oil handling facilities: means those facilities which present a risk of oil pollution incident and includes, inter alia, sea ports, inland ports, shore-based site where oil is stored in bulk, oil terminals, pipelines and other oil handling facilities.

Risk: an index of values derived from assessment of possible oil spill scenarios, where the risk equates to the probability of a particular event occurring, multiplied by a value which represents the magnitude of the impact which the event would create.

Risk = probability x consequences

Safe haven: a place where a vessel can safely anchor or berth to enable measures to be taken to forestall or minimise the effects of damage (eg, to minimise the leakage of oil).



Shipboard Oil Pollution Emergency Plan (SOPEP): a plan required by MARPOL 73/78 Regulation 26 of Annex 1

Ship: means a vessel of any type whatsoever operating in the marine environment or on the inland waterways of Ghana and includes hydrofoil boats, air-cushion vehicles, submersibles, and floating craft of any type.

Site oil spill contingency plan: A plan prepared for a land-based site or offshore installation, which specifies the measures to be taken in respect of a marine oil spill.

Site-specific: Pertaining to one onshore site where oil is stored in bulk.

Territorial Sea: Coastal marine waters extending out to the 12 nautical mile limit.

Threat: The possible impact or consequences, which a spill of oil could create if allowed to come in contact with a biological, social or economic resource.

Tier 1: site-specific, and includes most shore-side industry with oil transfer sites, offshore installations and all vessels required to have a shipboard plan. All Tier 1 sites and vessels are expected to plan for and be able to provide a clearly identifiable first response to pollution incidents for which they are responsible.

Tier 2: a medium spill requiring additional resources through regional and/or national assistance

Tier 3: a large spill requiring national assistance. The Environmental Protection Agency, which manages the National Oil Spill Contingency Plan and is expected to plan for and respond to marine oil spills within the Territorial Sea (12 nautical miles), or within the EEZ and inland oil spills, where the spills exceed the clean-up capability of Tier 1 and 2, or for which no responsible party can be identified.

UNEP: means United Nations Environmental Programme



SECTION 1

Introduction





1 INTRODUCTION

Incidents involving tanker accidents on the international scene and national capacity building programmes led to the development of a national capability in 1980s to ensure that Ghana would be prepared to respond to pollution incidents. Ghana would use **the National Oil Spill Contingency Plan to combat oil pollution.**

1.1 Background

The Ghana National Oil Spill Contingency Plan has been in operation since 1986 and brings together the combined resources of the nation, and the oil, shipping and oil exploration and Production companies, to provide a level of preparedness to the threat posed to the environment by oil spills.

The National Oil Spill Contingency Plan sets out a clear definition of the responsibilities of the major participants: the national and the industries. This is provided in a set of national arrangements by way of an Inter-Agency Agreement (IAA) or a Memorandum of Understanding (MOU), which also details such matters as divisions of responsibilities, contingency planning, access to in-country equipment, and the management and control of financial affairs (Appendix 1).

Based on these arrangements the prescribed role of the national, through the Environmental Protection Agency (EPA), is one of coordination and provision of technical advice on logistics, maintenance, materials and equipment, and training. Industry (both shipping and oil), as the main source of risk for oil pollution, is responsible for development of tactical oil spill contingency plans at their facilities. Additionally, EPA and the industries shall enter into an agreement for mutual assistance and access to in-country and international equipment stockpiles.

The National Oil Spill Contingency Plan hierarchy outlined in Figure 1 consists of national, area, port, and facility or industry plans organised in a hierarchical order.

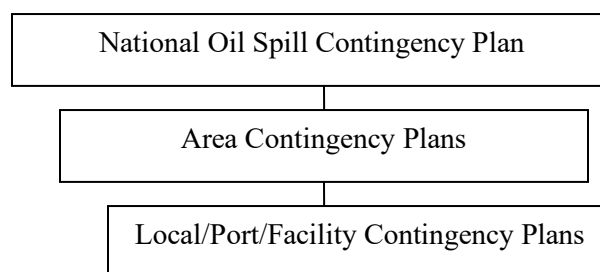


Figure 1: National Contingency Plan Hierarchy



1.2 Threats

The density of marine traffic, especially oil tankers, in close proximity to the coast and offshore petroleum exploration and production activities, present a fairly high risk of marine pollution from collisions, stranding, blowouts and other marine accidents. Such pollution can threaten amenity beaches, the tourist industry, sea birds, marine life in the inter-tidal zones, coastal installations and fisheries with subsequent loss of revenue and protein sources.

There are about two thousand (2,000) ship visits to Ghanaian ports each year. Ship-sourced pollution may result from either accidental or illegal operational discharges. Accidental discharges may involve escape of bunker fuel or oil cargo resulting from a marine incident.

Furthermore, since the discovery of the Jubilee Field offshore Ghana, there has been tremendous increase in E&P activities offshore Ghana. A blowout during drilling or spills due to collision of oil tankers and FPSOs or hose failures during loading could have serious impacts on the ecological and socio-economic resources along the coastline of Ghana.

The threat is largely a function of the types of oil, bunkers, the degree of navigational hazards, the weather, shipping density, etc.

1.3 Aim and objectives of the plan

The aim of this plan is to outline the national arrangements for responding to oil spills into the marine environment, with the aim of protecting it from oil pollution or, where this is not possible, to minimise its effects.

This plan is also intended to delineate responsibilities for the preparation and operational response to incidents, which could or result in spillage of oil into the marine as well as the coastal environment of the Republic of Ghana as defined in the geographical area of coverage section of this document. The Environmental Protection Agency will have the overall responsibility to deal with any incident involving oil installations, oil pipelines or shipping.

This plan also provides the framework for co-ordination of an integrated response by government agencies and relevant stakeholders to protect the environment from the deleterious effects of pollution from spillage of oil substances. It is intended to also promote and ensure the development of local plans for ports, oil installations, oil, pipelines and all other storage and transport facilities for oil to prepare and respond to such incidents in accordance with best practice, such as Net Environmental Benefit Analysis (NEBA).

Thus the objectives of this plan are to:



- a) Identify high-risk areas to oil pollution
- b) Develop appropriate systems for monitoring, rapid detection and reporting of spillage of oil or incidents related to the operation of shipping, oil pipelines, installations, storage and transport facilities for oil, which could result in such a spillage.
- c) Ensure prompt response to prevent pollution and or restrict the spread of the contaminants
- d) Ensure that adequate protection is provided for public health and welfare and the marine and inland environment.
- e) Ensure that the appropriate response techniques are used to clean up the pollutant and that disposal of recovered material is carried out in accordance with the EPA guidelines and regulations on waste disposal.
- f) Ensure that complete and up-to-date records are maintained of all expenditures to facilitate cost recovery.
- g) Ensure that personnel and equipment are in a state of readiness
- h) Ensure there are adequate funds provided to meet the other objectives of the plan.
- i) Ensure that the plan is tested at least every two years.

1.4 Scope of Plan

The National Oil Spill Contingency Plan (NOSCP) outlines combined stakeholder arrangements designed to allow a rapid and cooperative response to oil spills occurring within the area defined by this plan. It is complemented by other government and industry contingency plans prepared at area, port/habour and oil installations/facilities levels. Matters of detail are contained in local, site specific, contingency plans. The NOSCP also serves as the basis for seeking international assistance and support. This plan does not cover Hazardous and Noxious Substances (HNS) or overboard loss of shipping containers, which may be added in later updates of the plan.

1.5 Geographical Area

The geographical area covered by the National Oil Spill Contingency Plan includes;

- a. **Responsibility Area:** The area of responsibility for the National Oil Spill Contingency Plan will include all the areas offshore within the 200 nautical miles Exclusive Economic Zone, the coastal and inland areas of Ghana .
- b. **Interest Area:** The area of interest will apply to all areas outside the area of responsibility, which could affect the country of Ghana. Spills in the area of interest will be monitored in co-operation with neighbouring countries to lessen the impact of the incident in the event that the spill is carried to the area of Ghana's responsibility by the action of wind, ocean currents or natural drainage.



1.6 Legislation

1.6.1 International Conventions

As a Party to the United Nations Convention on the Law of the Sea (UNCLOS), Ghana has an obligation to protect and preserve the marine environment.

Ghana is a member of the International Maritime Organization (IMO) and active in the development and implementation of the IMO Conventions that specifically address pollution from ships.

Ghana also signed the Oil Pollution Preparedness Response and Cooperation (OPRC) Convention to collaborate with the international community to mitigate the consequences of oil pollution accidents involving ships, offshore units, seaports and oil handling facilities. Ghana is under obligation under the convention to undertake a number of activities: These include putting in place an effective oil spill contingency plan, cooperate to provide assistance to other parties to the convention in case of oil spill accidents, to ensure that oil pollution incidents are reported to competent authorities and International Maritime Organisation (IMO) as appropriate, and to develop a national preparedness and response capability to deal with oil spill incidents.

The NOSCP is one of the measures that Ghana has taken to meet these obligations

1.6.2 National Legislations

1.6.2.1 Environmental Protection Agency Act 1994 (Act 490)

By the Environmental Protection Agency (EPA) Act 490 of 1994, the Environmental Protection Agency is responsible for controlling pollution into the environment and enforcement of relevant laws relating to protection of the environment.

1.6.2.2 Maritime Pollution Act 2016 (Act 932)

The Maritime Pollution Act provides for the prevention, regulation and control of pollution within Ghana's territorial waters and incorporates most of the marine pollution conventions ratified by Ghana



1.6.3 Authorization

The National Oil Spill Contingency Plan is the result of a careful and advance planning which has involved all relevant governmental bodies and private organizations or enterprises covered by the plan or which in case of a major oil spill could be involved in the response operation. The plan has been developed with the purpose of covering all oil spill incidents.

Corrections and amendments to the plan would be done under the auspices of the Environmental Protection Agency, which is hereby designated as the custodian of the National Oil Spill Contingency Plan.

The plan is hereby authorized as the National Oil Spill Contingency Plan of the Republic of Ghana and forms the national background for Ghana's participation in the West and Central Africa Co-operation (WACAF) and also Oil Pollution, Preparedness, Response and Co-operation (OPRC) and other relevant international conventions.

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Hon. Dr. Kweku Afriyie (MP)

Minister of Environment, Science, Technology and Innovation





SECTION 2

Preparedness





2.0 PREPAREDNESS

In line with established international best practice, Ghana has adopted a three-tiered approach to all aspects of oil spill preparedness and response. The Shipping/Port/Oil Industry (Tier 1) is responsible for their facilities and the EPA directing both Area (Tier 2), and National (Tier 3) response efforts.

2.1 Plan Support

The Inter-Agency Agreement (IAA) underpins the National Oil Spill Contingency Plan. The IAA aims to:

- provide a basis for continued national, and local government commitment and support for the National Oil Spill Contingency Plan;
- provide a stable reference point whereby those unfamiliar with the National Oil Spill Contingency Plan can readily ascertain the obligations placed on their organisation; and
- be used to set out agreed minimum activities, allowing participants' performance against those minimums to be more readily assessed.

The IAA ensures that the national approach to preparedness and response to oil spills is continued and strengthened. It provides a mechanism to ensure decision-making under the National Oil Spill Contingency Plan is cooperative and that the obligations of all parties are met.

The IAA recognizes Incident Management System as the best system for preparing and managing spills. It therefore outlines a management structure for the National Oil Spill Contingency Plan that covers all elements of this plan. The key management structure of the IAA consists of:

2.1.2 Ministry responsible for Environment

Under the Act 490, 1994 the Minister responsible for Environment is responsible for protection of the environment of the Republic of Ghana. The Ministry responsible for Environment is therefore Ministerial body responsible to Government for matters connected to the NOSCP.

2.1.3 National Oil Spill Contingency Plan Steering Committee (NOSCPSC)

Under the IAA, a National Oil Spill Contingency Plan Steering Committee (NOSCPSC) has been established to provide advice to the EPA on the strategic policymaking and funding direction for the National Oil Spill Contingency Plan.

2.1.4 National Oil Spill Contingency Plan Working Groups (NOSCPWG)

Under the IAA, the Parties have also established a National Oil Spill Contingency Plan Working Groups (NOSCPWG) to support the NOSCPSC by considering the overall operational aspects of the National Oil Spill Contingency Plan.

Five working groups are thus established. These are the:

1. Administration Working Group
2. Operations Working Group
3. Environment Working Group



4. Chemicals working Group
5. Waste Management Group

1. Administration Working Group

This working group handles matters relating to:

- a. Legal
- b. Finance
- c. Documentation
- d. Claims
- e. Press

2. Operations Working Group

This working group handles matters relating to:

- a. Surveillance
- b. Mechanical recovery at Sea
- c. Dispersant Application at Sea
- d. Logistics
- e. Shoreline clean-up

3. Environment Working Group

This working group handles matters relating to oil pollution at:

- a. Sea
- b. Shoreline (fine sand, coarse sand and rocky, mangroves and lagoons and water bodies)

The group is also responsible for issues relating to:

- c. Disposal sites;
- d. Public Health;
- e. Wildlife; and
- f. Sensitivity Mapping.

4. Chemicals Working Group

This working group handles matters relating to:

- a. Dispersants
- b. Other Chemicals



5. Waste Management Working Group

This working group handles matters relating to:

- a. Storage sites
- b. Recovery
- c. Treatment
- d. Final disposal sites

2.1.5 Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) is the designated National Authority for the NOSCP. The EPA is responsible for the update of the National Oil Spill Contingency Plan and is the Agency through which Ghana can ask for international assistance whenever there is any spill in Ghana. EPA's responsibilities also include Tier 3 response. During incidents in tier 1 and tier 2, EPA shall serve as vehicle to provide national support to industry as required.

2.1.6 Area Responsibilities (Tier 2)

Under the IAA, the Western and Tema Regional Offices of the EPA in collaboration with the Western and Eastern Naval Command shall be responsible for preparing and combating oil pollution beyond the capabilities of the spiller (Tier1). The area stretching from Winneba westward to the western border with Ivory Coast shall be under the control of the Western Naval Command whilst Eastern Naval Command shall be responsible for the areas stretching from Winneba eastward to the eastern border with Togo. The Environmental Protection Agency Regional Offices in Sekondi and Tema shall work with the Ghana Navy in the Western Naval Command and the Eastern Naval Command respectively to keep the regional plans in state of readiness. This may be done in consultation with regional emergency committees and with due consideration to the relevant regional emergency management arrangements.

2.1.7 National Contingency Plan Key Contacts

Contact details for key National Oil Spill Contingency Plan personnel are provided in Appendix 2.

2.2 Division of Responsibility

2.2.1 Statutory and Combat Responsibilities

The IAA defines authorities with responsibility for combating oil spills within harbours, onshore, in the territorial seas, EEZ and on the high seas of Ghana. This includes responsibilities of Statutory and Combat Agencies.

Responsibilities for responding to oil spills within harbours, in the territorial seas, and on the high seas of Ghana are shared between EPA, Port Authorities, and the



oil industry. Responsibilities are given in details below and are summarised in Figure 3.

2.2.2 Statutory Agency

In accordance with the IAA responsibility for overseeing response action for oil spills, as follows:

- The EPA shall be responsible for Tier 3 and Tier 2 spills.
- For operational purposes:
 - - The Petroleum Department of the EPA shall be responsible for the National Plan (Tier 3), and collaborate with the- Western Regional Office and the Accra East Regional Office for the coordination of the Western and Eastern Regional Plans for Tier 2 spills respectively.

The EPA is responsible for the institution of prosecutions and the recovery of clean-up costs on behalf of all participating agencies.

2.2.3 Combat Agencies

Combat Agencies have the operational responsibility to prepare tactical plans and take action to respond to an oil spill in the environment in accordance with the relevant contingency plan.

Combat Agencies for responding to oil spills in various locations are as follows:

- **At oil terminals** The relevant oil company or terminal operator using terminal arrangements in their contingency plan shall be responsible for combating Tier 1 spills emanating from the terminal.
- **In ports (other than oil terminal in port)**
The port operator as specified in the relevant contingency plan, using port arrangements in their contingency plan shall be responsible for combating Tier 1 spills emanating from the port.
- **For spills emanating from petroleum operations.**
The relevant company using industry arrangements in their contingency plan shall be responsible for Tier 1 spills emanating from the company's operations.
- **For spills beyond Tier 1 capability.**
Should a situation develop where the necessary response is beyond the resources of the above Tier 1 Combat Agencies, responsibility for control will transfer to the Statutory Agency, with response assistance from other National Oil Spill Contingency Plan stakeholders as required.
- **For spills which cannot be traced to a particular source immediately.**
The Statutory Agency shall also be responsible for combating spills for which the spiller is not readily identifiable with response assistance from other National Oil Spill Contingency Plan stakeholders as required.



The Combat Agency shall, as soon as possible, undertake preventive and cleanup action or may request another institution to act on its behalf.

Regardless of which agency or institution has the lead responsibility, other agencies shall assist as far as is practical, in accordance with requests from the Combat Agency.

In circumstances where the incident has exceeded, or is likely to exceed, the effective response capacity of the Combat Agency, or the response is not being conducted effectively; the Statutory Agency shall assume control of the response.

A response by a Combat Agency and/or Statutory Agency does not in any way indicate an admission of liability for the source of the spill or for acceptance of the costs of a spill. Liability for a spill is to be determined by due legal proceedings.

2.3 Cross Border Incidents and Bilateral Agreements

In those incidents close to Ghanaian borders, it is essential that high-level consultation and cooperation between the two countries occur, with an objective to ensure a clear delineation of responsibility for the response.

It should be noted that a formal arrangements by way of Memorandum of Understandings or Bilateral Agreement and Sub-Regional Agreements that deal with cross border incidents is essential. In this regard Ghana shall work closely with the other parties of the Abidjan Convention to seek and finalize formal arrangements for dealing with cross border incidents. Such agreement may contain such practical arrangements as:

- Notification
- Provision of Visa for International experts
- Custom clearance
- Flight authorisation
- Transport, handling and storing of Equipment.

2.4 Response Policy

All oil spill response efforts at all tier levels shall aim at (in order of priority):

1. Protecting human health and secure their safety;
2. Minimizing environmental impacts;
3. Minimizing the impact on assets; and
4. Restoring the environment, as near as is practicable, to pre-spill conditions.

The environmental impact of an oil spill at all tier levels shall be minimized by good management and planning using Net Environmental Benefit Analysis (NEBA); and by the response actions put into effect by the responsible agency. Such actions should consider the following factors as part of the NEBA process:

- the type of oil(s) involved;
- the size of the spill;
- the location of the spill;
- the prevailing sea and weather conditions at the spill site; and
- the environmental sensitivity of the coastline/site impacted.



2.5 Levels of Response

Under the National Oil Spill Contingency Plan arrangements, oil spills and the response they require are categorised into three ‘Tiers’. The concept of a tiered response links the credible spill scenarios to attainable scales of response and, by linking joint arrangements, enables escalation from one tiered response to another, should the need arise. It is a practical method of planning a spill response in terms of required resources and likely environmental impact.

The National Oil Spill Contingency Plan’s three levels of tiered response are based on the following spill scenarios:

Tier 1 - up to 10 tonnes – a small spill requiring a local response.

The Combat Agency will generally be able to respond to and clean up a spill utilising its own resources. In cases where additional resources are required, EPA shall facilitate the usage of all appropriate in-country resources, or from adjacent industry operators under mutual aid arrangements.

It should also be noted that the above spill size is the minimum desirable response level for all Tier 1 facilities. Each facility would have to conduct risk assessment of their operations and design their response capability accordingly.

Tier 2 - between 10 and 1000 tonnes – a medium spill requiring regional and/or national assistance

The resources of the Combat Agency will need to be supplemented by other resources within the region, or from adjacent industry operators under mutual aid arrangements. In such cases access to those resources would be facilitated by the Environment Protection Agency (EPA).

Tier 3 - above 1000 tonnes – a large spill requiring national assistance.

The Combat Agency will require local, regional, national and possibly international assistance. The EPA will facilitate national and international resources.

2.6 Oil Industry Arrangements

Combat Agency responsibilities of the Ghanaian oil industry are set out in the IAA. Generally the relevant oil company or terminal operator has Combat Agency responsibility at their facilities. Should a situation develop where the necessary response is beyond the Oil Company or terminal resources, the Combat Agency responsibility will transfer to the Statutory Agency. For offshore petroleum operations, the relevant oil company has Combat Agency responsibility, with assistance as required from the Statutory Agency.

Most of the E&P companies in Ghana are members of the Oil Spill Response Limited (a global company set up to respond on behalf of the member companies or governments). Oil Spill Response Limited (OSRL) has leased some of its



equipment stock to these companies. The EPA shall coordinate on behalf of the Government of Ghana in-country resources (equipment), including equipment stockpiles belonging to OSRL in cases where the spiller is not immediately known or does not have the required capability.

2.7 Risk Assessment

Risk assessment underpins all preparation and planning for oil spill response in Ghana. A national risk assessment for Ghana and facility risk assessment shall be carried out periodically to determine:

- The level of risk of oil pollution of the sea, coastline, and ports;
- The proportions of overall risk which specific oils contribute; and
- The consequences of a spill on the environment.

Unless other factors dictate an earlier timetable, a comprehensive national risk assessment will be carried out every ten (10) years. This risk assessment shall focus on existing contributions to risk from the various maritime sectors, as well as those new or potential activities, which are reasonably foreseeable.

The following risk factors are recognised as important in Ghanaian waters:

- risk of collision;
- risk of blowout
- risk of hose or pipeline rupture
- risk of grounding;
- hazards to navigation;
- seaworthiness of vessels;
- negligence and competence of an operator, Master or crew;
- size/type of vessel;
- stowage and control of cargoes;
- type/amount of oil;
- traffic density; and
- environmental factors including tidal flow, weather, coast type, socio-economic, etc.

The risk assessment reports shall be by location on the level of risk of pollution of the sea, coastline and ports of Ghana, taking into account:

- environmental sensitivity;
- industries (e.g. fishing, tourism) which would be most adversely affected ecologically or financially by a spill;
- commercial cargo shipping size, frequency, trading patterns and amounts of oil carried as bunker fuel;
- oil tanker frequency, sizes, shipping patterns and quantities shipped;
- properties of oil to be encountered or produced or shipped as cargo;
- type, density and movement of ships including concentration of fishing vessels and tourist vessels;
- changes in the operation and construction of ships during the 1990's, such as the introduction of double hulls, amendments to the International Convention



for the Prevention of Pollution from Ships (MARPOL 73/78), International Safety Management Code, etc;

- amount and properties of oil produced offshore and transported by pipeline;
- location of offshore production and pipeline facilities;
- extent of offshore exploration drilling; and
- future trends, including proposed new ports and projected changes to trading patterns.

Environmental Sensitivity Atlas

An Environmental Sensitivity Atlas of the coastal areas of Ghana has been prepared (EPA, 2004). In this atlas, amenity areas, ecologically sensitive areas, industrial seawater intakes, fisheries, birds, marine and fresh water mammals, ground water resources and other resources likely to be threatened are identified. Two associated reports (the Coastal Environment and Sensitivity Ranking, EPA, 2004) have also been prepared. These reports describe in detail the features identified in the Atlas. The Risk Index for each area was determined by simple environmental and economic sensitivity factors taking into account the vulnerability and importance of the main environmental and economic resources in each area.

Figure 4 is an illustration of how the ESA can be of help in decision-making during spill situations.

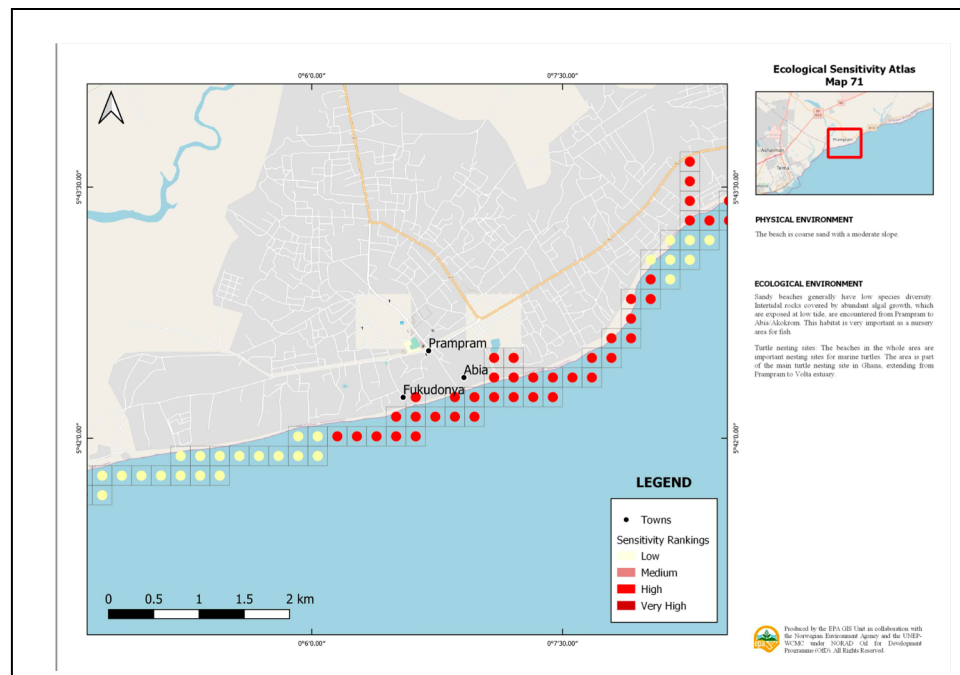


Figure 4: Environmental Sensitivity Map (Physical) of Prampram Area

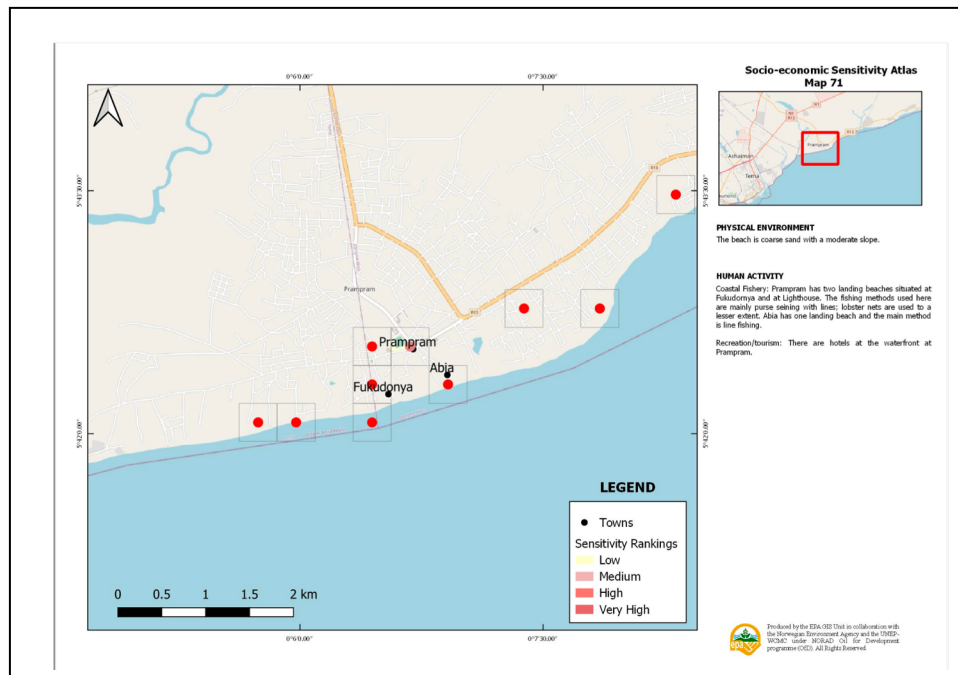


Figure 5: Environmental Sensitivity Map (Socio-economic) of Prampram Area

The Risk Profile for Prampram area of the Ghanaian coastline is shown in Figure 4 and Figure 5 as an example. These maps show how sensitive this part of the coastline is to oil spill in terms of environmental resources and socio-economic in that area. Higher risk areas (where environmental and economic sensitivity are all likely to be higher) are also shown (presented by the deep red points), with progressively lower levels of risk being shown as indicated in the legend, down to the lowest category of risk (presented by the light yellow points). The maps also give a little description of the type of coastline, ecological and economic resources in the area.

The Risk Profile indicates that there are some key areas of relatively higher risk. These are mostly areas of high economic activities and areas of ecological importance.

Copies of the Atlas and its associated reports are available at the EPA and online at maps.ghanaein.net. Changes observed along the Coastal Areas of Ghana over time shall be mapped out and the Atlas updated accordingly.

2.8 Response Planning

Under the IAA, Combat Agencies supported by Statutory Agency, are primarily responsible for ensuring that contingency plans are developed at regional and local levels, and that these plans complement other plans within the region. Statutory Agencies must be supported by National Contingency Plan Committees and provide advice and support to Combat Agencies during pollution incidents.



For every oil spill response, one person, the On-Scene Commander (OSC), will be appointed to have the responsibility and authority to undertake the necessary response. The NOSCP provides the means for the National On-Scene Commander (OSC) to be able to control and manage any spill regardless of size.

The primary oil spill response structure and responsibilities are that:

- The EPA provides management, operational, technical and environmental advice and support to the Combat Agency as required. This may include support for the actual management of a spill.
- During Tier 3 incidents, EPA assisted by the National Oil Spill Contingency Plan Steering Committee shall develop the overall response strategy and implemented by the National On-Scene Commander (NOSC) and section officers, forming the National Incident Management Team (NIMT).
- During Tier 2 incident, the appropriate EPA Regional Office assisted by the Regional Oil Spill Contingency Plan Steering Committee shall develop the appropriate response strategy, which shall be implemented by the appropriate Regional On-Scene Commander (ROSC).
- During Tier 1 incidents, the OSC mentioned in the facility plan shall be responsible for overall response strategy. The facility OSC shall keep the Statutory Agency informed of progress with the response;
- The EPA shall have a national database on trained personnel in order to provide suitably experienced staff to assist the NOSC, ROSC and OSC to initiate and conduct response actions;

2.9 Regional Oil Spill Contingency Plans

EPA shall develop two Regional or Area Oil Spill Contingency Plans to provide Tier 2 responses. The operation boundary of these plans shall be equivalent to the Ghana Naval Command boundaries. The Regional Oil Spill Contingency Plan shall have similar structure as the NOSCP.

2.9.1 Response Organisation Structure

The response to any pollution incident will be managed using the Oil Spill Response Incident Management System (OSRIMS). OSRIMS is based on an incident management system used in a wide range of emergency response activities to provide a standardised organisational structure that is flexible yet provides compatibility between agencies and events while ensuring accountability and standardised records (Figure 5). The system clearly defines roles and responsibilities and provides interoperability between agencies. OSRIMS also allows for the greater ability to escalate or downsize the response as required.

OSRIMS lists four major functions under which it is possible to group the tasks that need to be undertaken during a pollution response - Planning, Operations, Logistics, and Finance and Administration. These form the main elements of the



organisational structure under OSRIMS and are designated as sections in the structure. Responsibility for carrying out the tasks is delegated to a section officer who reports to the OSC thus forming an IMT. Units staffed by people with appropriate skills and experience to deal with particular tasks may be created within the sections.

The number of staff required to fill positions in the OSRIMS structure can be varied according to the size and complexity of the incident and the number of staff available. In a major incident all positions may be filled, but in a lesser incident one person may fill a number of positions. In a very small incident, it may only be necessary to appoint an OSC who will be able to carry out all management functions.

Figure 5 shows the typical structure of an Incident Management System (IMS). A more detailed structure is in Appendix 5.

Combat Agencies shall ensure that persons with appropriate experience and skills are identified so that they can be appointed to the positions if an oil spill incident occurs.

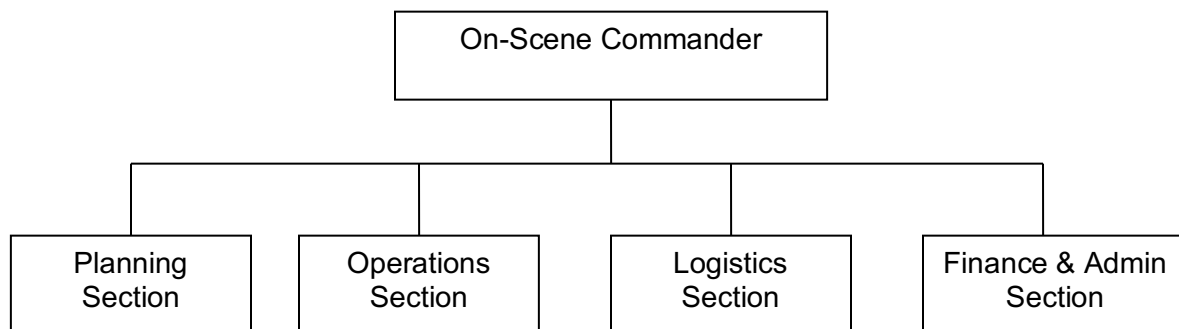


Figure 6: Typical OSRIMS Structure

2.9.1.1 Responsibilities of Key EPA Personnel

1. The Executive Director of the EPA is the overall head of the oil spill response planning (HOSR)
2. The Head of the Petroleum Department of the EPA is responsible for everyday management of the NOSCP.
3. The Head of the Petroleum Department shall collaborate with the Eastern Regional and Western Regional EPA Offices for the day-to-day management of the Western and Eastern Regional Oil Spill Contingency Plans respectively.



2.9.1.2 On-Scene Commander (OSC)

The Director of Operations of the Ghana Navy is designated as the National On-Scene Commander, the Flag Officer Commanding (FOC) the Western Naval Command is designated as the Western Regional On-Scene-Commander and the Flag Officer Commanding (FOC) the Eastern Naval Command is designated as the Eastern Regional On-Scene-Commander

The Statutory Agency should ensure that the OSC is assisted by a response team with appropriate planning, operational, technical, scientific, chemical, environmental, logistical, administrative, financial, and media liaison skills.

2.9.1.3 Planning Officer (PO)

The Statutory Agency shall identify appropriate individuals to act as the Planning Officer (PO) in accordance with relevant contingency plan requirements. The PO is responsible for the provision of scientific and environmental information, maintenance of incident information services, and the development of Strategic and Incident Action Plans.

The PO shall ensure the distribution of all information to the Incident Management Team and to all response personnel generally.

2.9.1.4 Operations Officer (OO)

The Statutory Agency shall identify appropriate individuals to act as the Operations Officer (OO) in accordance with relevant contingency plan requirements. The OO is responsible to the OSC for all response operational activities. This includes ensuring that the requirements of Incident Action Plans (IAP) are passed on to operational personnel in the field, and for ensuring that the plans are implemented effectively.

2.9.1.5 Logistics Officer (LO)

The Statutory Agency shall identify appropriate individuals to act as Logistics Officers (LO) in accordance with relevant contingency plan requirements. The LO shall ensure that all resources are made available as required. This includes the procurement and provision of personnel, equipment and support services for operations in the field and for the management of resource staging areas.

In any response there is a vital need to ensure that response personnel are provided with adequate resources to enable an effective response to be mounted.

2.9.1.6 Finance and Administration Officer (FAO)

The Statutory Agency shall identify appropriate individuals to act as Finance and Administration Officers (FAO) in accordance with relevant contingency plan requirements. The FAO shall be responsible for all financial, legal, procurement, clerical, accounting and recording activities including the contracting of personnel, equipment and support resources. In addition, the FAO is responsible for the management of the Incident Management Centre (ICC).



2.9.1.7 Environmental and Scientific Coordinator (ESC)

The Statutory shall identify appropriate individuals to act as the Environmental and Scientific Coordinator (ESC), at the National and Regional levels. During a spill response the ESC will normally form part of the Planning Section. In this role the ESC is to provide the OSC with an up-to-date and balanced assessment of the likely environmental effects of an oil spill. The ESC will advise on environmental priorities and preferred response options, taking into account the significance, sensitivity and possible recovery of the resources likely to be affected.

2.9.1.8 Media Liaison Officer (MLO)

An experienced and well-informed Media Liaison Officer (MLO) appointed by the Statutory Agency shall be responsible for management of information to the public. The MLO shall ensure adequate liaison between the OCS's team and the media. All queries received from the media should be directed to this person. Before releasing any information, the MLO's action should have the approval of either the HOSR or N(R)OSC, depending on the size of the spill incident.

2.10 Specialist Advice and Assistance

Specialist technical advice is available to response managers from a variety of sources. Advice can vary from the fate of oil, selection and deployment of pollution control equipment, and dispersant use, to the associated environmental effects of an oil spill. Specialist advice can also be provided in relation to the safety and stability of ships. Some of the organisations that can provide a range of specialist environmental and operational technical advice in the event of an oil spill in the environment include:

2.10.1 Environment Protection Agency

Environment Protection Agency (EPA) shall provide:

- advice relating to spill management, operational, logistic and technical issues, dispersant use and environmental effects;
- inputs and advice on decision support tools outlined in Section 4;
- advice relating to intervention powers, legislation and environmental effects.
- advice on habitats in Ghanaian marine protected areas, seabirds, marine mammals, marine invertebrates and macroalgae, along with advice on rates of hydrocarbon biodegradation, dispersal and the use of dispersants.
- advice on potential impacts of oil spills on threatened marine and migratory species, such as seabirds, seals, marine turtles, whales and dolphins.

All EPA assistance will be coordinated through NOSC.

2.10.2 Maritime Operators (MO) (GMA, Ghana Navy, GPHA)

Maritime Operations (MO) shall provide advice relating to intervention powers, ship safety, structural integrity and stability of marine casualties. In addition, MO can advice relating to coordinating rescue and saving of life. The MO can provide



drift calculations and advice on offshore currents. The MO has a range of communication facilities that can be utilised during an incident including International Maritime Satellite (Inmarsat) systems, enabling messages to be communicated directly to vessels.

The Ghana Maritime Authority (GMA) shall advise on matters relating to the sea dumping, including the permitting and reporting of emergency dumping of material at sea. GMA shall also advise on Ghana's obligations under the International Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter (London Dumping Convention) and its 1996 Protocol.

2.10.3 Ghana Armed Forces (GAF)

Ghana Armed Forces (GAF) shall assist in coordinating the movement of National Contingency Plan equipment. Where necessary GAF will facilitate access to Defence Force resources where commercial operators are unable to provide this service. All GAF assistance will be coordinated through the national NOSC.

2.10.4 Wildlife Division (WD) of Forestry Commission

The Wildlife Division (WD) develops and implements national policies, programs and legislation to protect and conserve Ghana's wildlife. The WD shall provide relevant list of threatened, migratory and marine species and also handling of wildlife during spill situations

2.10.5 Industries

As outlined in part 2.6, the industries can provide equipment and personnel resources and advice on a range of issues, including oil characteristics and local industries resource availability.

2.10.6 Regional, Local Authorities and NGOs

Regional, local authorities and NGOs, such as have responsibility for transport, conservation, resource management, environmental protection, emergency services, Port/Harbour Authorities, and local conservation groups shall provide a wide range of site-specific information and resources, either in relation to environmental impacts, or response activities.

2.10.8 International Assistance

In the event of a major oil spill incident, it is likely that assistance may be sought from overseas in accordance with the International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC 1990). Customs, Excise & Preventive Service and Immigration Department will expedite the temporary import of equipment and experienced personnel should the need arise on a request from EPA. If additional overseas resources are required to respond to an incident in Ghana, then EPA in conjunction with Industry will arrange for assistance from



the oil industry's Global Alliance providing services through Oil Spill Response Limited (OSRL) located in Southampton, UK.

EPA, in accordance with relevant Memoranda of Understanding or relevant International Conventions (such as Abidjan Convention) or bi-lateral agreement, may also assist or require assistance from neighbouring countries in relation to oil spill incidents.

2.11 Equipment Availability

Tier 1 pollution response equipment is located in the industry holdings. The location of these equipment are stated in the various Tier 1 plans. In addition to these equipment held by the industries, the EPA shall also arrange Tier 2/3 equipment, which can be utilised for larger incidents or where additional resources are required from OSRL.

2.12 Financial Arrangements

The IAA includes agreed funding arrangements (Paragraphs 21-23), and the administrative arrangements (Schedule 1, Paragraphs 1-10), provide guidance on costs and expenses.

Statutory and Combat Agencies should note that detailed financial records, including all supporting information, are required where a claim is made in accordance with the IAA. This requirement is of particular importance when submitting claims to the Protection and Indemnity (P&I) insurers, as all claims will be assessed to ensure that the costs are reasonable, and that they can be supported by satisfactory documentation. Accordingly, agencies should have in place appropriate systems to ensure that these requirements are met and that these are adequately outlined in contingency plans.

For claims submitted to EPA for reimbursement, the EPA shall address the claims from a standpoint of normal audit requirements and reasonableness, i.e. it should apply the same general criteria used by Protection and Indemnity (P&I) Clubs and their correspondents when assessing the reasonableness of claims for reimbursement of costs incurred in responding to an oil spill, or potential oil spill. In general, costs will be considered "reasonable" if they result from actions that:

- were undertaken on the basis of a technical appraisal of the incident;
- sought to enhance the natural processes of recovery; and
- were not undertaken purely for public relations reasons.

2.13 Communications

In a pollution incident it is important that the OSC has access to adequate communication facilities. In addition to the facilities available through the ports (part 2.10.1.4) it is envisaged that the oil industry communications package, consisting of portable Satcom M, MiniSat, VHF marine band radios and repeater VHF aviation band radios and Ultra High Frequency (UHF) networks would be available to coordinate a response. In a major incident it may be necessary to seek



the assistance of emergency services radio networks and, if necessary, the Armed Forces. To obtain Armed Forces assistance, a request should be made through EPA (part 4.6).

2.14 Wildlife Response

When a marine oil pollution incident occurs it is highly likely that oiling of birds, marine mammals and other wildlife will occur. The impact on wildlife and biodiversity will depend upon the environmental sensitivity, the type and quantity of the pollutant, and the location of the spill. Oiled wildlife attracts both significant community and media attention. The effectiveness of a spill response is sometimes measured on the success of its wildlife rescue and rehabilitation.

EPA in conjunction with WD shall develop National Guidelines for the Development of Oiled Wildlife Response Contingency Plans, with the objective to provide guidance for the immediate and effective protection, rescue, cleaning and rehabilitation of birds, marine mammals, their habitat, and other wildlife resources that are harmed or potentially harmed by a marine oil spill.

2.15 Place of Refuge

It is rarely possible to deal expeditiously and satisfactorily with a casualty in open sea conditions, and the longer a damaged ship is forced to remain at the mercy of the open sea, the higher the risk of its condition deteriorating and thereby becoming a greater pollution hazard.

A place of refuge must provide favourable conditions to enable a ship to stabilise its condition, protect human life, and minimise the risk of environmental degradation.

GMA shall assist in developing specific policies on places of refuge, and these should be followed as appropriate.

2.16 Training and Exercises

The EPA shall develop annual training programs and exercises in order to have sufficient numbers of trained personnel to mount a credible and effective response to an oil spill incident.

Training programs are conducted at three levels, which recognise the overall technical complexity of managing an oil spill response and that the associated knowledge required by personnel varies depending on their level of responsibilities.

The three levels of training are:

Senior Management - Level 3

- the focus is on the requirements of senior government and industry management personnel, including National and Regional appointed committees - responsible for high level decision making;



Middle Management - Level 2

- the focus is on the requirements of middle management personnel, including designated and potential OSCs, their deputies and local committees - responsible for the preparation of contingency and response plans and the management and conduct of effective oil spill response operations and associated logistic, administrative and financial tasks;

Operator - Level 1

- the focus is on the requirements of operational personnel, those undertaking on-site cleanup operations and operating spill response equipment.



SECTION 3

Response





3.0 RESPONSE

All response actions towards any spill shall be done in accordance with Net Environmental Benefit Analysis (NEBA). That is, weighing the advantages and the disadvantages of taking a particular course of action (such as dispersant spraying), including recognising the likely outcomes if the course of action is not taken (the impact of doing nothing). The result will determine if there will be a net (overall) beneficial or detrimental outcome of taking the action.

3.1 Measures to be Employed

In the event of an oil spill the following measures should be employed according to the circumstances of the spill and conditions prevailing:

- if possible prevent, control or stop the outflow of oil from the source;
- if coastal or marine resources are not threatened or likely to be threatened, monitor the movement and behaviour of the oil spill;
- if coastal and marine resources are threatened, activate response operations to protect sensitive resources;
- if possible, contain the spread of oil; and
- if, due to weather and sea conditions, a response at sea is not feasible, or the protection of sensitive areas is not feasible, or these have already been affected, determine appropriate cleanup priorities and other response measures.

3.2 Overall Protection Priorities

Protection priorities to be employed during a response to an oil spill are, in order of descending priority:

- human health and safety;
- habitat and cultural resources;
- rare and/or endangered flora and fauna;
- commercial resources; and
- amenities.

However, in assessing protection priorities, it is necessary to maintain a balanced view of the potential success of particular response strategies.

3.3 Incident Reporting and Response Activation

3.3.1 Initial Reports

Notification of a pollution incident will normally be made from observations by Government agencies, shipping or aircraft, by the public, or by those responsible for the incident. It is important that the information received be reported without delay to enable immediate and appropriate action to be taken. The response procedures that shall be followed are summarized in Figure 6.

The most efficient method of ensuring that reports are dealt with promptly is by reporting through the ports. The ports operate twenty-four (24) hours a day and are equipped with radio facilities, telephone, facsimile and telex lines. The ports will



disseminate this information to EPA.
The ports contact details are outlined in Appendix 2.

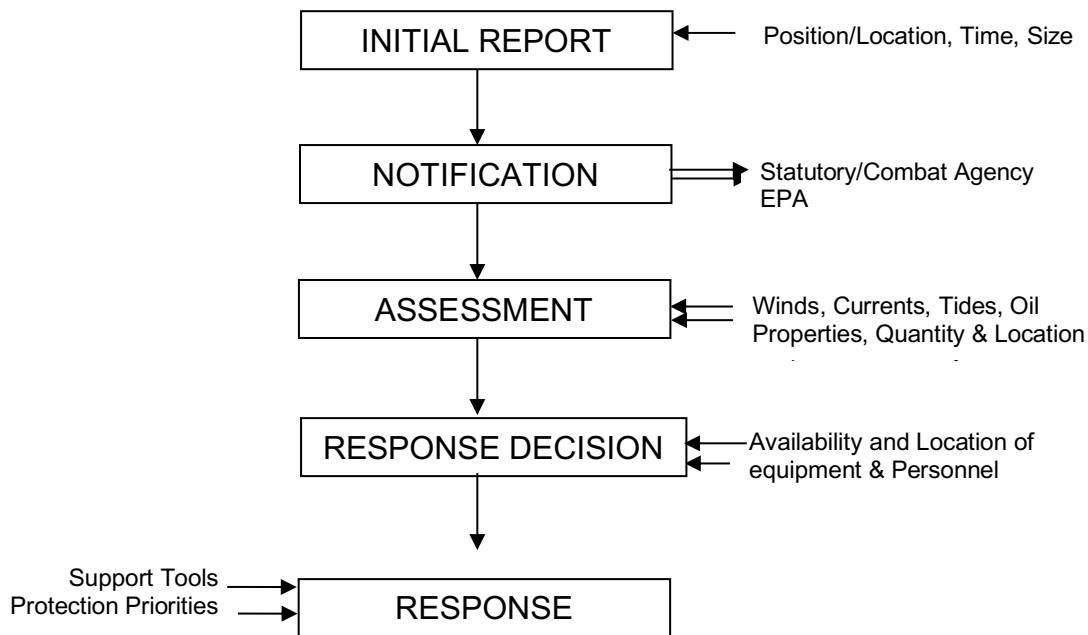


Figure 7: Typical Response Procedure

3.3.2 Initial Action

The agency receiving the report of a pollution incident shall notify the relevant Statutory Agency.

In the event that any of the EPA offices is the first agency to receive a notification of a pollution incident, the office shall notify the relevant Statutory Agency. The Statutory Agency shall promptly assess the information contained in any report and make the necessary decisions in relation to appropriate investigations and response actions. This will include jurisdiction and expected Statutory and Combat Agency responsibilities. The Statutory Agency shall advise the relevant Combat Agency of the need for a response.

Following the report of an incident the Combat Agency shall issue a Pollution Report (POLREP) in accordance with Section 3.3.4.

3.3.3 Activation

When a report has been received by the Combat Agency, that agency should confirm the incident details. The proximity and possible subsequent movement of an oil spill to sensitive areas will dictate the urgency of the method used to confirm the presence of the pollution.

On confirmation of the presence of oil (see Appendix 6 for the appearance of oil on water), or where a decision has been made to implement a response action, the Combat Agency should mount a response operation in accordance with the



appropriate contingency plan arrangements.

This should be done without delay to facilitate any subsequent cost recovery actions.

3.3.4 Pollution Report (POLREP)

After initial verbal notification has been provided to the Statutory Agency, the Combat Agency should issue a POLREP to relevant agencies. This would best be directed to the EPA who would disseminate the information to relevant agencies based on the incident type and location. A generic POLREP form is shown in Appendix 7, which can be used by agencies.

It should also be noted that the MARPOL 73/78 Convention established the requirement for the ship's Masters to report discharges from their vessels. For ease of reference, a copy of the details that the ship's Master should report is in Appendix 8 (Harmful Substances Report).

3.3.5 Situation Report (SITREP)

During a pollution incident (or potential incident), it is essential that all relevant authorities be kept informed of any significant developments.

The OSC will be responsible for ensuring that periodic Situation Reports (SITREPs) are dispatched to those concerned. SITREPs should contain as much information as possible.

During an incident that involves the risk of marine pollution the Combat Agency shall be responsible for communicating SITREPs to relevant agencies. A suggested format, including required content, for reporting this information is outlined in Appendix 9.

3.4 Incident Control

Operational control of a pollution incident is the responsibility of the Combat Agency representative nominated as an OSC, and supported by an IMT that performs the tasks of the Planning, Operations, Logistics, and Finance and Administration sections of OSRICS.

The OSC shall establish an Incident Control Centre (ICC) at a location, in close proximity to the incident, affording resources and facilities for the sustained management of the incident. This shall include access to communication facilities, suitable road access and other resources required for the response.

3.5 Response Plans

3.5.1 Strategic Plans

In a major incident it is important that a strategic plan is drawn up which clearly details the aims and objectives of the overall response. In some cases it may be necessary for strategic plans to be developed to cover a number of aspects of the incident. Strategic plans address the broader issues of the response, not short-term operational activities.



3.5.2 Incident Action Plans (IAP)

Short-term operational objectives and activities are the subject of an Incident Action Plan (IAP). The IAP will provide details of the operational activities and objectives to be achieved over a specified, short-term period. Initially this may be for the subsequent few hours only, but once the operation is underway it is likely to address the activities required over each of the following twenty-four hours or longer.

3.6 Response Options

A number of options exist for the treatment of oil that has been released into the environment. All may be effective to a degree according to the conditions prevailing and the sensitivity of the environment under threat. The response options include:

- surveillance;
- control and recovery;
- application of dispersant;
- in-situ burning;
- shoreline cleanup; and
- bioremediation

3.7 Occupational Health and Safety

Response managers should be aware that at all times human life, health, and safety is paramount. The degree of risk associated with cleanup operations will depend on the:

- type of oil spilled;
- size of the spill;
- location of the spill;
- circumstances of the spill; and
- weather conditions.

At all times response managers should be aware of the limitations and safe operating procedures for all equipment used throughout the phases of the cleanup operation. This should, where necessary, include a risk assessment and development of a formal site-specific management plan, including details for induction and briefing procedures.

Fresh crude oil and refined petroleum products are capable of giving off flammable gases. Therefore, fire and explosion remain a real danger to personnel and equipment, particularly when fresh crude oil and certain refined products are situated in confined locations.

3.8 Cultural and Heritage Issues

Important indigenous and non-indigenous heritage values and places exist in many parts of Ghana's coastal areas, including historic heritage sites and places with physical evidence of indigenous use, places of cultural value to indigenous people (e.g.: sacred grooves) and natural resources. The potential impact of response



operations on the heritage values of the area needs to be addressed in planning the operation.

The potential heritage values of an area need to be identified and the likely impacts that result from the activities should be addressed. Specific consideration should be given to access to, and general use and disturbance of areas. The assessment should consider both direct and indirect impacts, cultural protocols and strategies for minimizing impacts. Consultation with local communities should occur as part of the planning process

Information about the heritage values of an area may be limited, or difficult to access. Some heritage registers held by regional agencies are subject to access restrictions. As such, appropriate National and Local Government agencies should be consulted to facilitate contact with indigenous communities and obtain necessary information required by the IMT and response personnel.

3.10 Obtaining Samples for Evidence and Analysis

In the aftermath of a pollution incident, identification of the source of contamination is a vital component in identifying the polluter not only for possible legal action but also for the subsequent allocation of the recovery of response costs. Even where one ship or oil installation is considered to be clearly the source of the spill it is important to be able to establish that other potential sources have been eliminated. Where a spill has occurred there may be a number of different ships that are potential sources of the spill and they must all be identified and sampled as far as practicable. Samples must be obtained from all possible sources (tanks, bilge, etc.) onboard each ship to compare with a spill sample. The laboratory will use multiple analysis methods to eliminate or identify the source of the spill.

To ensure that a positive analysis result may be achieved, correct sampling, storage, handling, preparation of the samples from all potential sources is essential. Further details concerning sample collection, storage and handling are outlined in Appendix 6.

3.11 Disposal of Oil and Oily Debris

Cleanup operations can generate substantial quantities of oily debris. Temporary storage, transportation and final disposal methods shall be arranged to comply with government disposal approvals. This will usually be facilitated by the responsible regional Environment Protection Agency office.

Regional and local contingency plans should contain information on the disposal of oily waste. This should include any pre-designated arrangements for disposal sites and approved contractors.

Ideally disposal sites should be identified as close as practical to those areas where oil pollution could most likely occur. Additional information is provided in the National Contingency Plan document Management and Disposal of Oil Spill Debris, available at the EPA.

3.12 Equipment

On completion of an oil pollution response operation, the OSC shall arrange



recovery of all equipment and unused materials, and arrange their prompt return to the resource centre from which they came. In the event of a major incident, a NRT member would normally be available to assist in the coordination of equipment transfers, including returning equipment to its point of origin.

The OSC, or delegate, will ensure that all equipment is cleaned after use to the extent available facilities allow, and is returned to the ownership authority by the quickest possible means, having regard to freight costs.

On its return to the resource centre the equipment shall be thoroughly serviced in accordance with equipment maintenance schedules prior to being stored. The Combat Agency shall ensure that all costs incurred in returning equipment to the resource centre, including cleaning and servicing is included in the overall schedule list of costs submitted for reimbursement by the polluter.

3.13 Termination of a Response

Under the terms of the IAA, an incident response will be terminated by the Statutory Agency once the Statutory Agency considers that the effective completion of the response is achieved based on expert Combat Agency advice.

Termination arrangements are outlined in the IAA and should be included in regional and local contingency plans.



SECTION 4

RESPONSE SUPPORT





4.0 RESPONSE SUPPORT

4.1 Environmental Sensitivity Atlas (ESA)

The Environmental Sensitivity Atlas identifies marine and foreshore ecosystems and biological resources for the determination of protection priorities and provides information to authorities on response options, for example boom deployment; chemical dispersant use; foreshore cleanup techniques to be employed, and disposal sites for wastes generated.

4.1.1 About ESA

ESA datasets include but are not restricted to: habitats, both coastal and near-shore marine; high definition coastlines; georeferenced format; scanned topographical charts for coastal area of Ghana (1:20 000); biological resources and conservation status; fisheries; coastal and marine wildlife resources; recreational resources; aerial photography and other infrastructure information.

4.1.2 Access to ESA

Access to ESA and tools is via the EPA. EPA has holdings of the data for emergency purposes

4.2 Oil Spill Trajectory Modelling (OSTM)

4.2.1 Weather and Spill Updates

During the response, periodic updates of the prevailing winds and confirmed observations of the movement of the spill should be reported, preferably by email and facsimile, to EPA for inclusion as necessary in the continuing OSTM predictions. Additionally, EPA shall obtain Meteorology forecasts for comparative purposes.

4.3 Automated Data Inquiry for Oil Spills (ADIOS)

The Automated Data Inquiry for Oil Spills (ADIOS) is a computer-based oil spill response tool that was developed by the US National Oceanic and Atmospheric Administration for emergency spill responders and contingency planners.

ADIOS integrates a library of approximately one thousand oils with a short-term oil fate and cleanup model, which is designed to estimate the time that spilled oil will remain in the marine environment and the amount of oil remaining.

ADIOS calculations combine real-time environmental data based on user inputs, such as wind speed and water temperature, combined with carefully researched information on chemical and physical properties of oils in its oil library. The program provides a prediction of possible ranges in the values of spill properties and oil fate.

ADIOS can be accessed at [http://archive.orr.noaa.gov/topic_subtopic_entry.php?RECORD_KEY%28entry_s%29=entry_id,subtopic_id,topic_id&entry_id\(entry_subtopic_topic\)=182&subtopic_id\(entry_subtopic_topic\)=8&topic_id\(entry_subtopic_topic\)=1](http://archive.orr.noaa.gov/topic_subtopic_entry.php?RECORD_KEY%28entry_s%29=entry_id,subtopic_id,topic_id&entry_id(entry_subtopic_topic)=182&subtopic_id(entry_subtopic_topic)=8&topic_id(entry_subtopic_topic)=1).

4.4 Marine Oil Spill Equipment System (MOSES)

EPA developed MOSES, a computer database that lists the type, quantity, location,



status and availability of pollution control equipment. The database contains listings of in-country and equipment available to the EPA through the OSRL agreement that is available for use in response to a marine oil spill.

4.5 Charter and Hire Arrangements

4.5.1 Charter of Vessels

During an incident there may be the requirement to charter local vessels to assist in response operations. A Vessel Charter Agreement provides an example of an agreement, which may be amended for use by agencies.

It is suggested that a formal agreement be used whenever there is a need for agencies to charter a fishing vessel, or other craft, for use at oil pollution incidents and where the owner agrees to its use for such charter.

Whilst the OSC may need to control the operation of a vessel to suit prevailing conditions and the particular circumstances of the incident, it shall be made clear that THE NAVIGATION AND SAFETY OF THE VESSEL WILL REMAIN THE RESPONSIBILITY OF THE VESSEL'S MASTER AT ALL TIMES.

When an owner is not prepared to accept the suggested agreement, but is prepared to make a vessel available, the charterer should ensure that:

- the vessel complies with all safety and equipment requirements; and
- it is made clear by the charterer to the owner that the controls shall apply at all times. All other aspects of the charter shall be the subject of local negotiation at the time of the incident.

Details of craft availability, including Port craft, should be shown in appropriate regional and local contingency plans.

4.5.2 Hire of Spray Aircraft

EPA has no agreement currently in place with the Oil Spill Response Limited to have in place a Fixed Wing Aerial Dispersant Capability (FWADC) for the application of oil spill dispersants. This is due to the fact that the WACAF is out of service indefinitely.

Notwithstanding the absence of a stand-by arrangement, EPA will advise for planning purposes (not an activation), of significant incidents where dispersant application may be considered as a major response option.

It should be noted that only pre-approved dispersants are to be used in response to any incident involving dispersant use in Ghana. The list of pre-approved dispersant can be found in the Dispersant Policy of Ghana.

4.5.3 Surveillance Aircraft

Where the source of an incident is not identified and thus recovery of costs unlikely, or where it is intended to claim reimbursement of costs from EPA under the IAA arrangements, then the EPA or NOSC, must approve the use of aircraft for surveillance or investigation.



4.5.4 Hire of Other Equipment

In a cleanup operation the hire of other equipment, including earthmoving equipment, storage, and transport will be arranged under the direction of the OSC as required.

4.6 Armed Forces Assistance

Requests for Armed Forces assistance, including the use of military transport are to be directed to EPA or NOSC.

After assessing and approving any requests, the EPA HOSR will seek the assistance of the Armed Forces through NOSC. NOSC will arrange for Armed Forces assistance once all avenues of utilizing commercial resources have been exhausted, or where timeframes are such that it is impractical to use commercial resources.

Costs associated with the engagement of Armed Forces resources, will be charged against the incident and recovered from the polluter. These costs may be determined by the Armed Forces in accordance with Government cost recovery directions.

Following approval of a request by the Armed Force, EPA will continue to liaise with GAF regarding transport details.

4.7 Salvage Arrangements

4.7.1 Salvage Involvement

In the event of an incident involving a damaged or disabled ship, it is paramount that the GMA be involved in the response as soon as possible. Salvage activities may need to be arranged to take the vessel in tow, refloat a grounded vessel, or reduce or stop a discharge of oil to minimize environmental damage resulting from the casualty. It is essential that these operations be undertaken as soon as possible. In accordance with the IAA, GMA has responsibility for safety issues relating to vessels on interstate or foreign voyages and will be responsible for ship operational matters. These functions include alerting and liaising with salvors, taking measures to minimize oil outflow and other salvage activities.

The vessel's Master/Owner will normally appoint a salvor by signing a Lloyds Open Form Agreement. However, in cases where this does not occur, GMA may use its powers under the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties 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.

4.7.2 Salvage Liaison

During an incident requiring the salvage of a vessel, consideration should be given to the appointment of a Casualty Coordinator (CC). The role of the CC is to enable continuing exchange of information regarding the salvage operation between the



OSC, the Salvage Master and Statutory/Combat Agencies. This will enable the Salvage Master to limit briefings to one person, whilst at the same time providing for continuity in information flow. A senior GMA marine surveyor should be available to act as the CC as required.

4.7.3 Independent Salvage Advice

In a major casualty the possibility may arise for the need to have access to independent salvage advice. GMA should identify three suitable companies, which can provide independent advice on the salvage operation, including whether the proposed salvage operations are appropriate. In the event of requiring such advice, GMA will make appropriate arrangements with one of the identified companies.

In incidents involving an intrastate vessel, the Ports may wish to undertake the above salvage arrangements. GMA will provide assistance where required.

4.8 Updating the Plan

Contingency Plans are evolving documents, and as such, require regular updating. All Oil Spill Contingency Plans shall be reviewed annually to take into account policy changes and experience from incidents and exercises. Regular (every three years) amendments shall be made to reflect changes to contacts, equipment and other details.

Minor amendments to this NOSCP will be issued by EPA as they become necessary. EPA will review the National Oil Spill Contingency Plan every two (2) years.

Information for updating the NOSCP should be forwarded on a regular basis to:

**The Executive Director
Environmental Protection Agency
PO Box MB 326
Ministries
Accra
Telephone: (+233) (0)320 664697/8
Email: info@epa.gov.gh**



APPENDICES





APPENDIX 1: Memorandum of Understanding between EPA and Government Agencies (Environmental Stakeholders)





APPENDIX 2: CONTACTS DETAILS

Emergency Contact Details

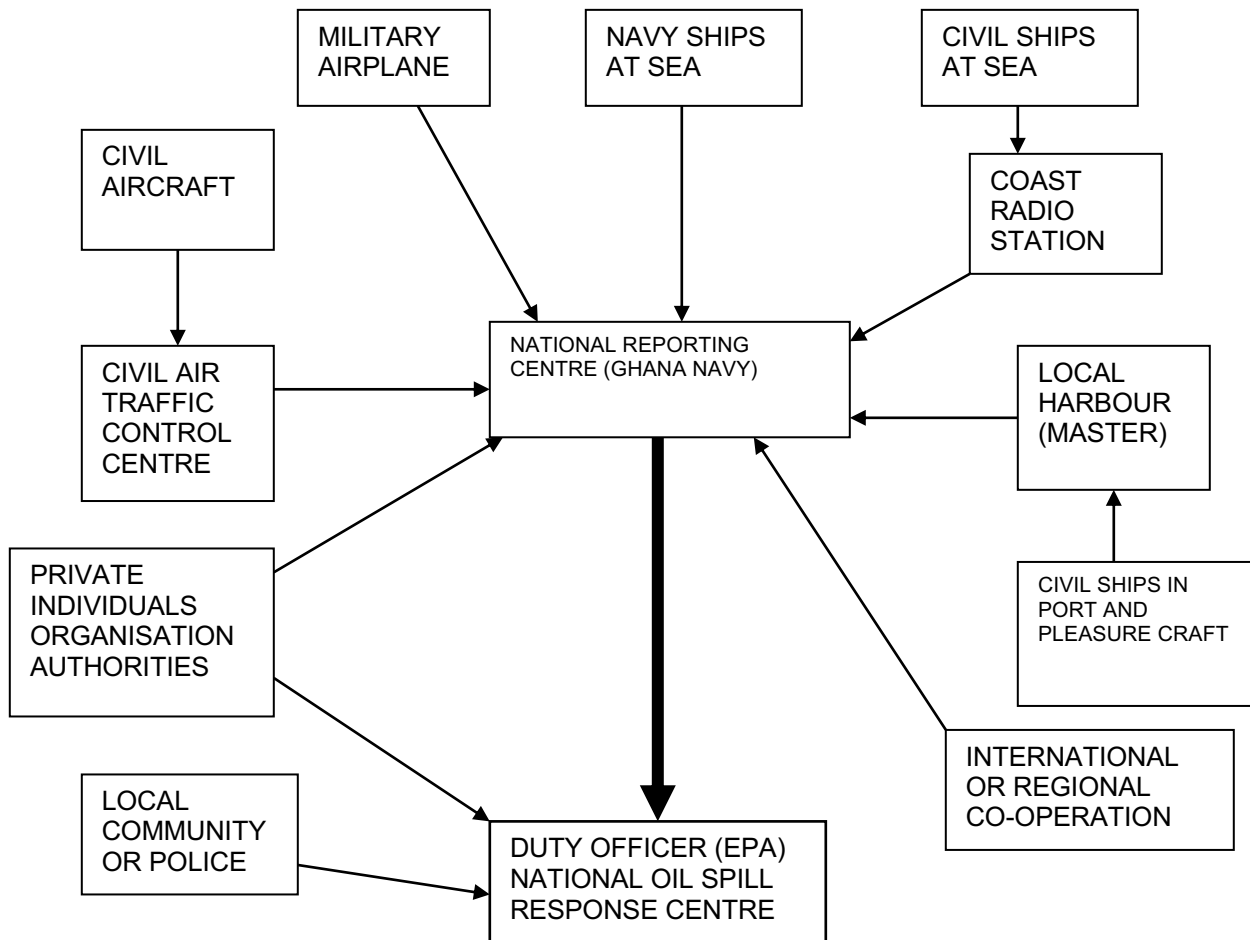
ORGANIZATION	TELEPHONE
Environmental Protection Agency – Accra (National)	+233302664697/8 OR +233 501301381 OR +233 501301567
Environmental Protection Agency – Sekondi (Western)	+233 312046417 OR +233 312046058 OR +233 501301699
Environmental Protection Agency – Tema (Eastern)	+233501301398
Ghana Navy – Accra (National)	+233 302777991 OR +233 30276685 OR +233 302777621
Ghana Navy – Sekondi (Western)	+233 312048621
Ghana Navy – Tema (Eastern)	Get a contact.
Ghana Maritime Authority - Accra	+233 302684392 OR +233 302684393
Ghana Maritime Authority - Takoradi	Get a contact
Ghana Maritime Authority - Tema	Get a contact
Ghana Ports and Harbours Authority - Tema	Get a contact
Ghana Ports and Harbours Authority - Takoradi	+233 312024073 OR +233 244595451 OR +233 208111453



APPENDIX 3: REPORTING OF MARINE POLLUTION IN THE REPUBLIC OF GHANA



REPORTING OF MARINE POLLUTION IN THE REPUBLIC OF GHANA



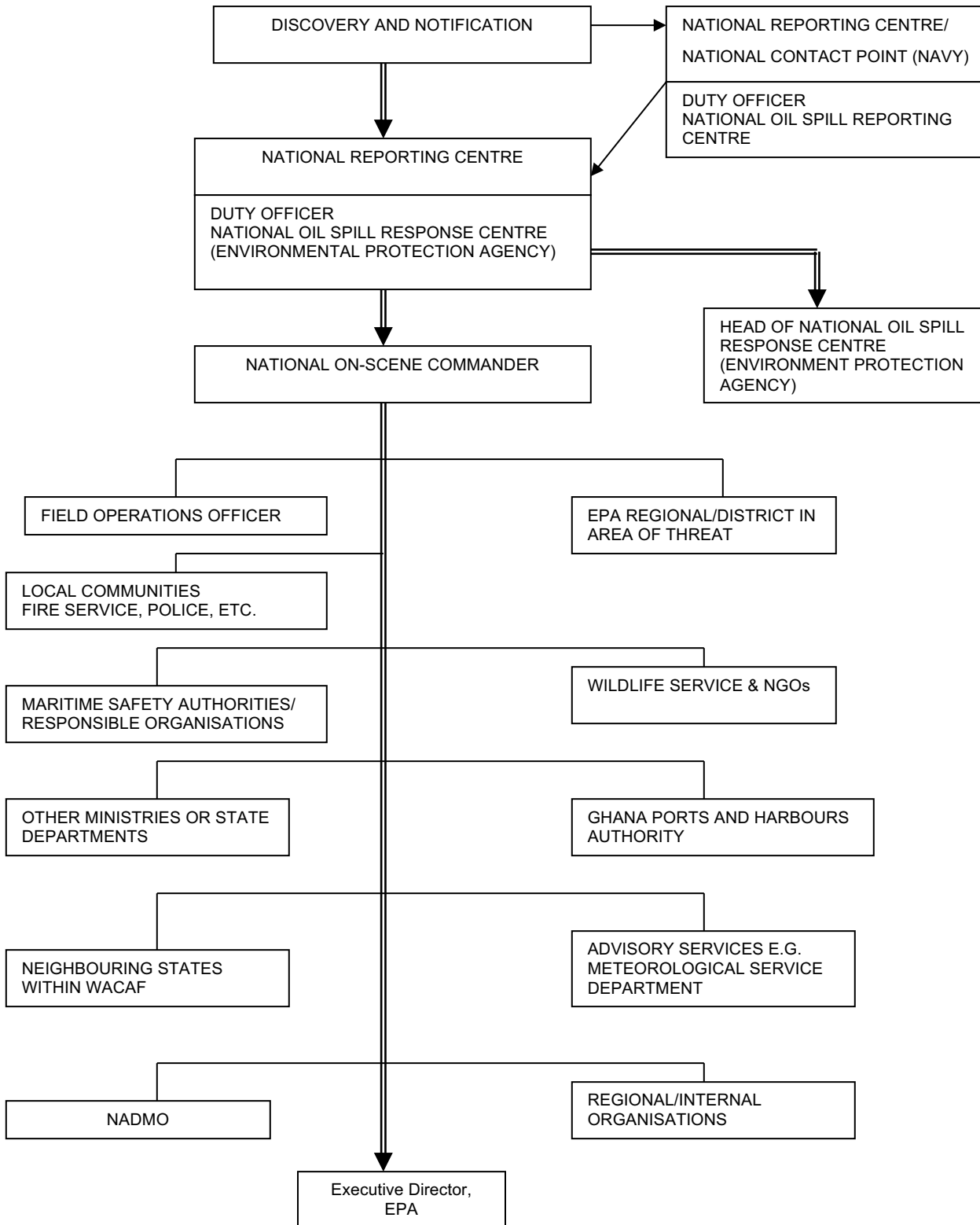


APPENDIX 4: STANDARD OPERATING PROCEDURES (SOP)





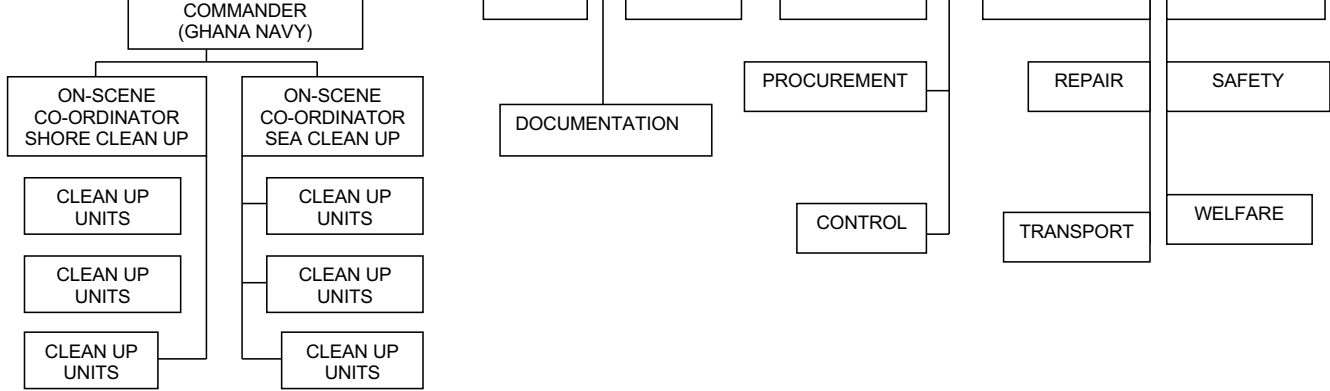
STANDARD OPERATING PROCEDURES (SOP)





APPENDIX 5: INCIDENT MANAGEMENT STRUCTURE DURING SPILLS

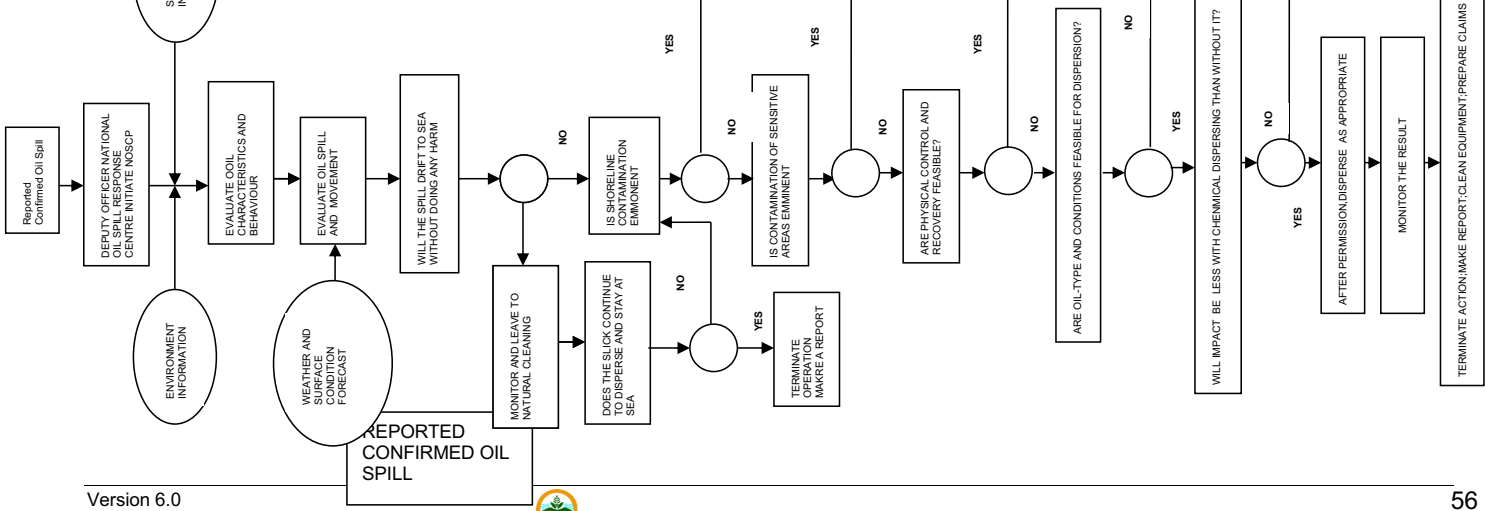






APPENDIX 6: DECISION FLOW CHART FOR OIL SPILL RESPONSE







APPENDIX 7: OIL SPILL NOTIFICATION FORM





OIL SPILL NOTIFICATION FORM

NAME OF PERSON REPORTING INCIDENT:

TITLE:

COMPANY:

TEL/FAX:

SPILL LOCATION:

TYPE AND QUANTITY OF OIL SPILLED:

CAUSE OF SPILL:

RESPONSE TO SPILL (IF ANY):

ANY OTHER INFORMATION:





APPENDIX 8: APPEARANCE OF OIL ON WATER





APPEARANCE OF OIL ON WATER

Relation between appearance, thickness, and volume

	Oil type	Appearance	Approx thickness(mm)	Approx volume(m ³ /km ²)	
1 2 3 4	Oil sheen Crude/fuel oil in-oil emulsions ("mousse")	Oil sheen Water-emulsions ("mousse")	silvery iridescent (colours) black/dark brown Brown/orange	>0.0001 >0.0003 >0.1 >1.0	0.1 0.3 100 1000

Reference: International Tanker Owners Pollution Federation Limited
Technical Information Paper



Figure 1



Figure 2



Figure 3



Figure 4



APPENDIX 9: SAMPLING PROCEDURES





SAMPLING PROCEDURES

Samples of oil/oily mixtures from the marine environment (water and foreshore areas) and all potential sources should be taken with the minimum of delay so that changes in the oil composition due to weathering are kept to a minimum.

All samples should be kept in a cool, dark, secure location (i.e. within an insulated container, an ice chest or a refrigerator if available).

Marine environment - Every effort should be made to obtain representative samples of the pollutant from the water and foreshore areas or other polluted areas (including oiled wildlife). A number of samples should be taken from various locations within the spill. Note that any drains or outfalls in the area should be eliminated as a potential source of the spill. These samples should be contained in clean glass jars (preferably sterilized glass jars if available) and information about where the samples were taken should be recorded. This information should be provided to the laboratory to assist with the analysis of the samples. Blanks or clean water samples should also be taken upstream/outside the spill area and provided to the laboratory.

Ships – Sampling ships should only be undertaken with the assistance of an authorized officer with relevant shipping expertise. Samples from all potential ships that could have been responsible for the spill must be obtained. Samples should be taken from all waste oil tanks, bilge and bilge holding tanks, fuel oil tanks and the discharge from the oily water separator for comparison purposes, particularly if prosecution is envisaged. Information on how the sample was obtained should also be recorded and provided to the laboratory (eg from drain tap, valve, dipping into tank, etc.). Samples should be contained within sterilized or clean glass jars.

Continuity of Samples

To be admissible as evidence, samples taken must be proved conclusively to be in an appropriate person's possession until delivery to the laboratory. This requires that rigid controls be instituted and maintained to establish continuity for the samples from the time of initial sampling.

Delivery of Samples

Where samples are collected for the purpose of prosecution appropriate safeguards need to be ensured during their transport. EPA will identify Failsafe Couriers that can provide transport of samples from the person responsible for its collection and/or custody to the designated analyst, incorporating rigid controls and security.

Analysis of Samples

EPA has arrangements in place whereby analysts will carry out testing of all samples for the purposes of prosecutions.

Further Details

Further details concerning sampling procedures and appointed analysts are available from EPA. The International Maritime Organization publication "IMO Guidelines for Sampling and Identification of Oil Spills" 1998 provides more detailed information on this subject.



APPENDIX 10: POLLUTION SITUATION REPORT (SITREP) FORMAT

This is advice from the Combat Agency of the current status of the incident and the response. This form is transmitted to all relevant agencies including:
 Statutory Agency
 Head of Oil Spill Response, EPA

		Ref. No.	
Priority	Urgent	Immediate	Standard
Final SITREP?	Yes	No	Next SITREP on:
Date/Time			
POLREP Reference			
Incident	Company Name		
Coordinates	Latitude		Longitude
Brief Description of Incident and Impact			
Overall Weather conditions			
Summary of Response Actions to Date			





Summary of Resources Available/Deployed			
Expected Developments			
Other Information			
SITREP Prepared By	Name		
	Agency		
	Role		
	Contact	Telephone	
		Fax	
		Mobile	
Attachments	No. of Pages Attached:		
Current strategies			





APPENDIX 11: POLLUTION REPORT (POLREP) FORMAT

Pollution Report (POLREP)

NOTE: Incidents to be reported are outlined on page 3

Send completed form to: Environmental Protection Agency
 Fax: 0302 664697-8 Email: info@epa.org.gh

cc:

Incident No.

Date of Incident

 / /

Time of Incident

 : AM
 PM

Location name/ description	<input style="width: 100%;" type="text"/>																																
Incident coordinates	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 25%; height: 20px;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td><td style="width: 25%;"></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> <tr><td style="height: 20px;"></td><td></td><td></td><td></td></tr> </table>																																

Description of Incident	<input style="width: 100%;" type="text"/>
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POLLUTION SOURCE	
TYPE OF SPILL:	
NAME OF SPILLED SUBSTANCE:	
ESTIMATED QUANTITY SPILLED:	





ESTIMATED CONCENTRATION:	
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