Anadarko Moçambique Área 1, Lda

Annex H

Emergency Response Plan

Mozambique Emergency Response Core Plan

Document No: [INTN.ERP.00001]

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Attachment Introduction:
The attachments below present location-specific details, local response plans and procedures, local response structure and resources. The attachments are assembled in a single document whose control is done locally. This way, the document and its control is independent of the ERP Core document (controlled by EHS Houston).

Attachment F Scenario Response Procedures

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Appendix VIII Emergency Response Plan & Oil Spill Contingency Plan – Response Procedures

Abbreviations and Acronyms

ABBREVIATION	DESCRIPTION
APC	Anadarko Petroleum Company
BBL	Barrel
CMT	Crisis Management Team
COML	Communications Unit Leader
cSt	CentiStokes
DIVS	Division / Group Supervisor
DOCL	Documentation Unit Leader
ea.	Each
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
ENVL	Environmental Unit Leader
EOC	Emergency Operations Center
ER	Emergency Response
ERP	Emergency Response Plan
ERT	Emergency Response Team
ESD	Emergency Shut Down
FCPA	Federal Corrupt Practices Act
FSC	Finance Section Chief
ft.	Feet
gal.	Gallons
GPD	Gallons Per Day
H2S	Hydrogen Sulfide
HP	Horsepower
HR	Human Resources
IAP	Incident Action Plan
IC	Incident Commander
ICP	Incident Command Post
ICS	Incident Command System
IMS	Incident Management System
IMT	Incident Management Team
ISM	Incident Support Manager
IST	Incident Support Team
ISOS	International SOS
ITOPF	International Tanker Owners Pollution Federation Ltd.
Kts	Knots
Kw	Kilowatts
LSC	Logistics Section Chief
M	Meter
M3	Cubic Meter
Marpol	International Convention for Prevention of Pollution from Ships
MEDEVAC	Medical Evacuation
MERP	Medical Emergency Response Plan
MOC	Management of Change
Mph	Miles per hour
MSDS	Material Safety Data Sheet
nm	Nautical Miles
NOP	Next Operational Period
OIM	Offshore Installation Manager
OPBD	Operations Branch Director
OSC	Operations Section Chief
OSCP	Oil Spill Contingency Plan
OSR	Oil Spill Response
PIC	Person in Charge
PIO	Public Information Officer

ABBREVIATION	DESCRIPTION
Pkg	Package
PPE	Personal Protective Equipment
PSC	Planning Section Chief
Psi	Pounds per Square Inch
PSV	Platform Supply Vessel
QI	Qualified Individual
RESL	Resource Unit Leader
SITL	Situation Unit Leader
SO2	Sulfur Dioxide
SOFR	Safety Officer
STCR/TFLD	Strike Team / Task Force Leader
TRG	The Response Group
THSP	Technical Specialist
UC	Unified Command
V	Volts
VP	Vice President

1 Introduction

1.1 Purpose

This Emergency Response Plan (ERP) defines Anadarko's organizational structure and protocols that will be implemented to respond to any major incident in a safe, rapid, effective, and efficient manner within the International Region.

For purposes of this Plan (Core Plan), incidents are defined as an event or hazardous circumstance that poses a significant impact to people, the environment, or property.

Anadarko's Emergency Response Principles are used as a basis for the assessment of the level of response in the event of an incident. The following principles are described throughout this Plan and should be integrated into all actions taken by the emergency response organization.

The principles below comprise Anadarko priorities and framework in which response actions should be planned and executed.

1) **Establish Priorities**: All response actions should be geared toward the following priorities in the order below
   - Safety of People (always First)
   - Protection of the Environment
   - Protection of Assets
2) **Use Incident Command System (ICS)**: Anadarko has selected the ICS as the management platform in all locations in its response actions.
3) **Establish a Tiered Response Structure**: Anadarko has established a structure that should be in place for all responses. The tiered response structure should be proportionate to the size and magnitude of the incident.
4) **Over-Respond with Resources**: all available resources should be deployed at the time of the response, even if they are later considered unnecessary.
5) **Address the Issues**: Once the immediate response actions have been planned and executed, the Emergency Response Team (ERT), the Incident Management Team (IMT) and the Incident Support Team (IST) should consider the consequences and implications of the incident and the response actions and plans to address them as soon as possible.
6) **Control Information**: At the time of the incident, all information that needs to be provided beyond the ERT, the IMT or IST should be carefully reviewed and delivered.

1.2 Objective

The Objectives of this Plan include:

1) Define the Emergency Response Organizational Structure;
2) Define Emergency Response terminology;
3) Define criteria for establishing Response Objectives;

4) Define Resources (personnel & equipment) that can be accessed and/or released in the event of an incident;
5) Define the roles and responsibilities of Command and Support staff;

1.3 Scope

This plan applies to emergency response activities carried out by the IMTs and ISTs, regardless of incident type and size.

This Plan supports, but DOES NOT REPLACE, Local and/or Corporate-Level Procedures, including Local Procedures and Plans that are maintained and utilized by the ERT and IMT.

1.4 Plan Structure

This Plan is comprised of the following components:

Core Plan:

The Core Plan consists of Sections 1 to 7 of this Plan. It outlines Anadarko's Incident Management Philosophy (People First), Response Actions, and Organizational Structure for all Incidents. The Core Plan is static for all locations within the Region.

Country Specific Attachments

Emergency preparedness actions and procedures for each country/project location within the International Ops / E&P Region are documented as Attachments to the Emergency Response Core Plan (ERP). Attachments to this Plan are described below.

Attachment	Title	Description
A	Record of Revisions of Mozambique Attachments	A table recording all revisions for the each Country specific appendix will be kept updated by the Country EHS Representative
B	Facility Information	A description of the facilities that constitute the project site, including supporting facilities. Each EHS Representative is free to group the facilities in the country per project, block, etc.
C	Incident Management Team (IMT)	Contact information of those individuals in country that will fulfill a role during a response.
D	Incident Support Team (IST)	Contact information of selected individuals trained to support incident in the International Region. The individuals based in APC Headquarters (Houston, TX) who have trained to fulfill a supporting role to the IMT in country.
E	Reporting Procedures and Contact Information	Notification and reporting procedures as well as contact information of those individuals within Anadarko, governmental agencies, partners and other institutions that need to be notified in the event of an incident.

Attachment	Title	Description
F	Response Procedures per Scenario	List of contractor's emergency response procedures as well as those prepared by APC in-country.
G	References and	List of tools and references documents

Emergency Response Tool-Kit

ICS Forms, Incident Management & Incident Support Handbooks and other resources are available, to provide in greater detail of the Reactive, Proactive, and Post-Active Incident Command Systems/Structure.

2 Plan Management

2.1 Plan Review

Anadarko's International Environmental, Health & Safety (EHS) Group is responsible for maintenance of the International Emergency Response Plan. At minimum, this Plan should undergo an annual review, with input as appropriate from each operating area.

In addition, the International EHS Group will:

- Ensure supporting tools and systems are appropriately implemented;
- Ensure continuous improvement opportunities are identified and shared with the organization;
- Ensure training and end-user education/awareness materials are available and appropriate.

2.2 Plan Administration

The International EHS Group will maintain the static component of this Plan, and conduct at minimum an annual review.

The EHS Representative for each location should maintain the dynamic components (Attachments) and ensure overall effectiveness of the requirements of this Plan.

The EHS Representative for each Operating Area shall update this Plan in the event of:

- Significant changes to response capabilities and contractors for the operating area.
- Changes to the IMT
- Changes on the facilities covered by this Plan in each operating area
- Relevant changes to this Plan as required by new regulatory requirements.
- Following significant incidents, drills/exercises, as necessary.

2.3 Plan Copies

To facilitate the use of the ERP, hard and soft copies of the last version of the will be available to the organizations that may be involved in a response.

Hard Copies:

- At a minimum, one (1) hard copy of the entire Plan (Core Plan and relevant attachments) should be kept at each APC International location. The Plan should be printed and kept in a three-ring binder, where pages can be easily added / removed.
- Five (5) hard copies of the Core Plan should be kept at each Incident Command Center – where the IMT most likely meet - one for Incident Commander and each Section Chief.
- At a minimum, one (1) hard copy of all Country's Attachments should be kept at Country's Incident Command Center.
- Five (5) hard copies of the Core Plan should be kept at Houston Incident Command Center (one for Incident Support Manager and each Section Chief).

- One (1) copy of each Country Attachments should be kept at the Houston Incident Command/Support Center. Each Country EHS Representative should ensure that the available copy is up to date.

Soft Copies:

- Intl EHS will update the soft copy of the Core Plan available on the Intl EHS Share Point http://sp/ep/EHSR/Intl/default.aspx). The Intl EHS Share Point will be available personnel in all locations.
- Each Country EHS Representative should update all country-specific attachments in the Country's folder in the Intl EHS Share Point.

2.4 Revision History

The Record of Revisions for the Core Plan are found in the table below. A table with the Record of Revisions for the Attachments to this Plan can be found in Attachment A.

REVISION HISTORY					
Rev. No.	**DATE**	**DESCRIPTION**	**PREPARED BY**	**REVIEWED BY**	**APPROVED BY**
Rev2	09/01/2011	Core Updates based on BMC29	Dunagan		
Rev3	09/12/11	Core Updates based on BMC29	Dunagan		
Rev4	11/02/2011	Core Updates based on Intl EHS Team's comments	Pena		

3 Regional Emergency Response Framework

3.1 Response Levels

The Anadarko International ERP operates within a tiered response framework. The Response Level is determined by the complexity of the incident, the risk to personnel and the public, and the impact on the environment, and is further determined by the need for mobilization of resources.

Anadarko classifies Response into three levels:

Response Level	Level 1	Level 2	Level 3
Definition	Incident that is short-term and can be effectively managed locally utilizing on-site/ facility resources.	Incident that is mid-term and has the potential for off-site impact and requires assistance from regional resources.	Incident that is long-term, may have wide spread impact and requires assistance from global resources.
Organization	ERT / IMT	ERT + IMT / IST	ERT + IMT + IST
Resources Required	Locally Available	Mutual Aid / National / Contract	Global

3.2 Principles of ICS

Anadarko has adopted the ICS as the emergency management system for all incidents in the International Region.

ICS provides a systematic and proactive management approach to guide departments at all levels of the corporation to work seamlessly to prevent, protect against, respond to, recover from and mitigate the effects of incidents, regardless of cost, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment.

This ERP satisfies the following ICS core principles:

1) **Common Terminology**: This ERP establishes common terminology that allows incident management and support organizations to work together across a wide variety of incident management functions and hazard scenarios.
2) **Modular (Flexible) Organization**: This ERP has considerable internal flexibility by being modular, and can readily expand or contract to meet the needs of any incident.
3) **Management by Objective**: The Emergency Response Organization is responsible for establishing tactics that are based on specific, measurable and achievable objectives and responsible for ensuring that Anadarko's Response and ICS principles are implemented.

4) **Incident Action Planning (IAP)**: This Emergency Response Organization will implement a "Process" to Define, Measure, Act, & Assess – to ensure incident priorities, objectives and strategies are centralized and coordinated. Action Plans will be documented, utilizing standardized ICS Forms. Anadarko has adopted IAP software facilitate documentation and communication of Action Plans.

5) **Span of Control**: The organizational structure implemented by this ERP ensures effective and efficient management of response personnel. The recommended supervisor to worker ratio is less than 1:7.

6) **Facilities & Locations**: Incident Command and operational support facilities are established in predetermined locations and equipped with adequate resources to manage response efforts.

7) **Resource Management**: An inventory of emergency response resources including personnel and supplies is maintained for all locations.

8) **Integrated Communications**: All locations are equipped with primary and back-up means of communications and up-to-date contact lists are maintained.

9) **Chain of Command**: This ERP establishes a modular organization with a pre-established hierarchy (see Section 3.3). This hierarchy ensures the orderly line of authority within the greater organization.

10) **Unified Command**: All individuals within the emergency response organization are assigned a specific role with a pre-established reporting hierarchy that supersedes conventional line or organizational management. This ERP will allow for the integration of government agencies in the Command structure, where appropriate.

3.3 Emergency Response Organizational Structure

This ERP defines the organizational structure that will be implemented to respond to any major incident in a safe, rapid, effective, and efficient manner within the International Region. The organizational structure is broken down into the following teams:

Emergency Response Team (ERT): First responders, located at the incident scene that execute tactical responses. Please refer to Section 4 for ERT roles and responsibilities.

Incident Management Team (IMT): A pre-defined team based at or near the incident that directs tactical response operations, facilitates planning and addresses the concerns of public and government agencies. Please refer to Section 5 for IMT roles and responsibilities.

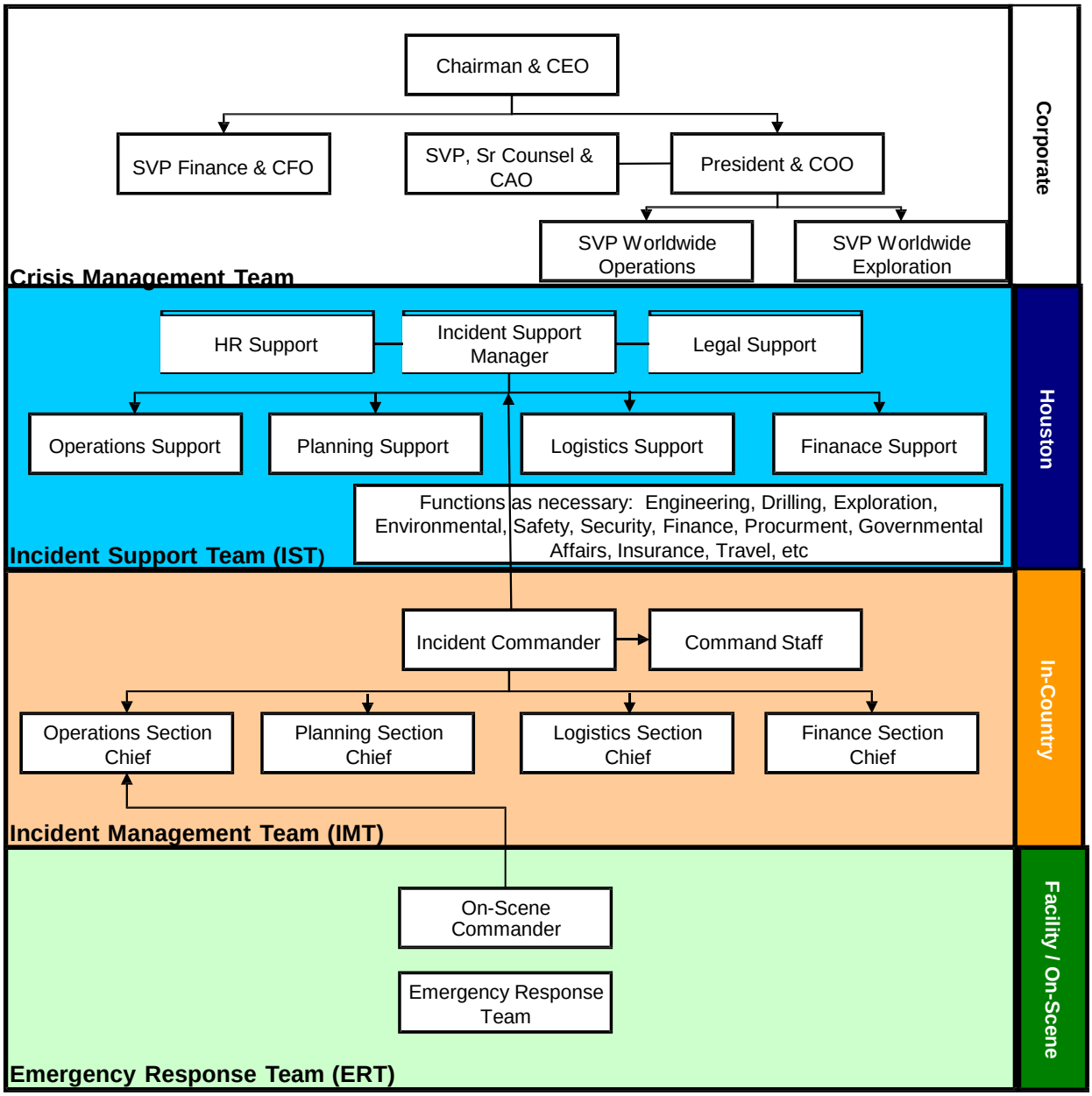
Mobile Incident Management Team (MIMT): A pre-defined team that supplements staffing for the IMT. The MIMT adopts the IMT roles and responsibilities in Section 5.

Incident Support Team (IST): A pre-defined team, based away from the scene that provides support to the Incident Management Team (IMT). Please refer to Section 6 for IST roles and responsibilities.

Crisis Management Team (CMT): Senior management personnel that address the implications of the incident and its potential consequences to the Company's viability, operability and credibility. CMT is outside the scope of this ERP.

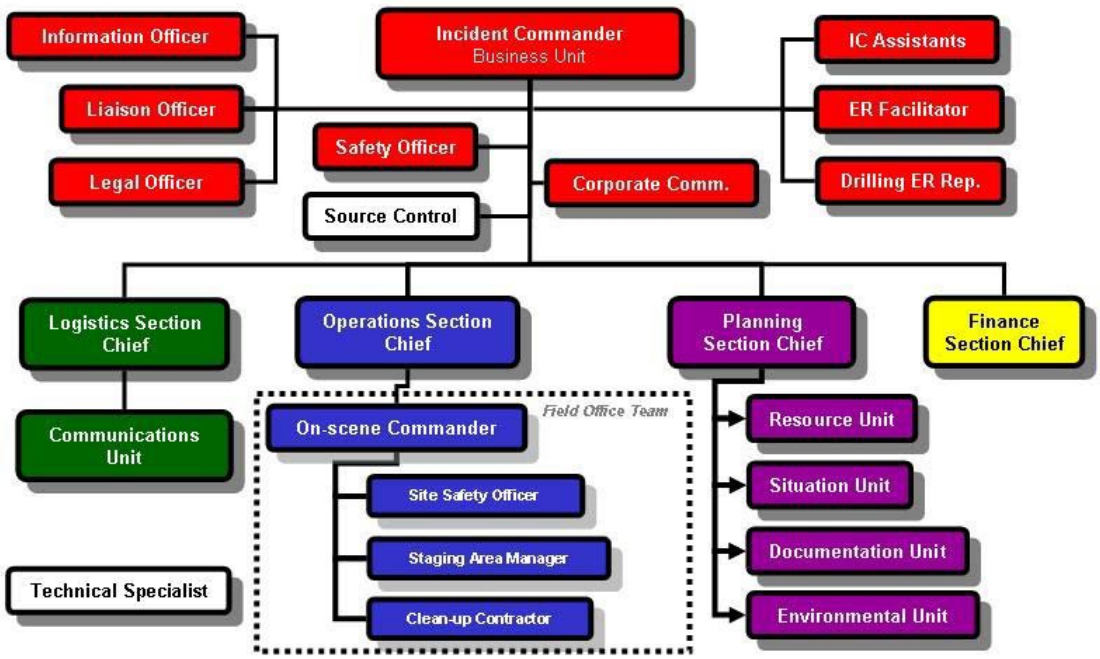
The following figure illustrates the relationship between the in-country and local response teams, the Houston Incident Support Team, and the Anadarko Corporate Crisis Management.

Figure 1. Anadarko's Emergency Response Organization



The figure below is an example of the IMT. This structure will expand, compress and or vary depending on the location and the incident. Refer to Attachment C for country or location specific structure.

Figure 2. Example Structure of the IMT



3.4 Response Implementation

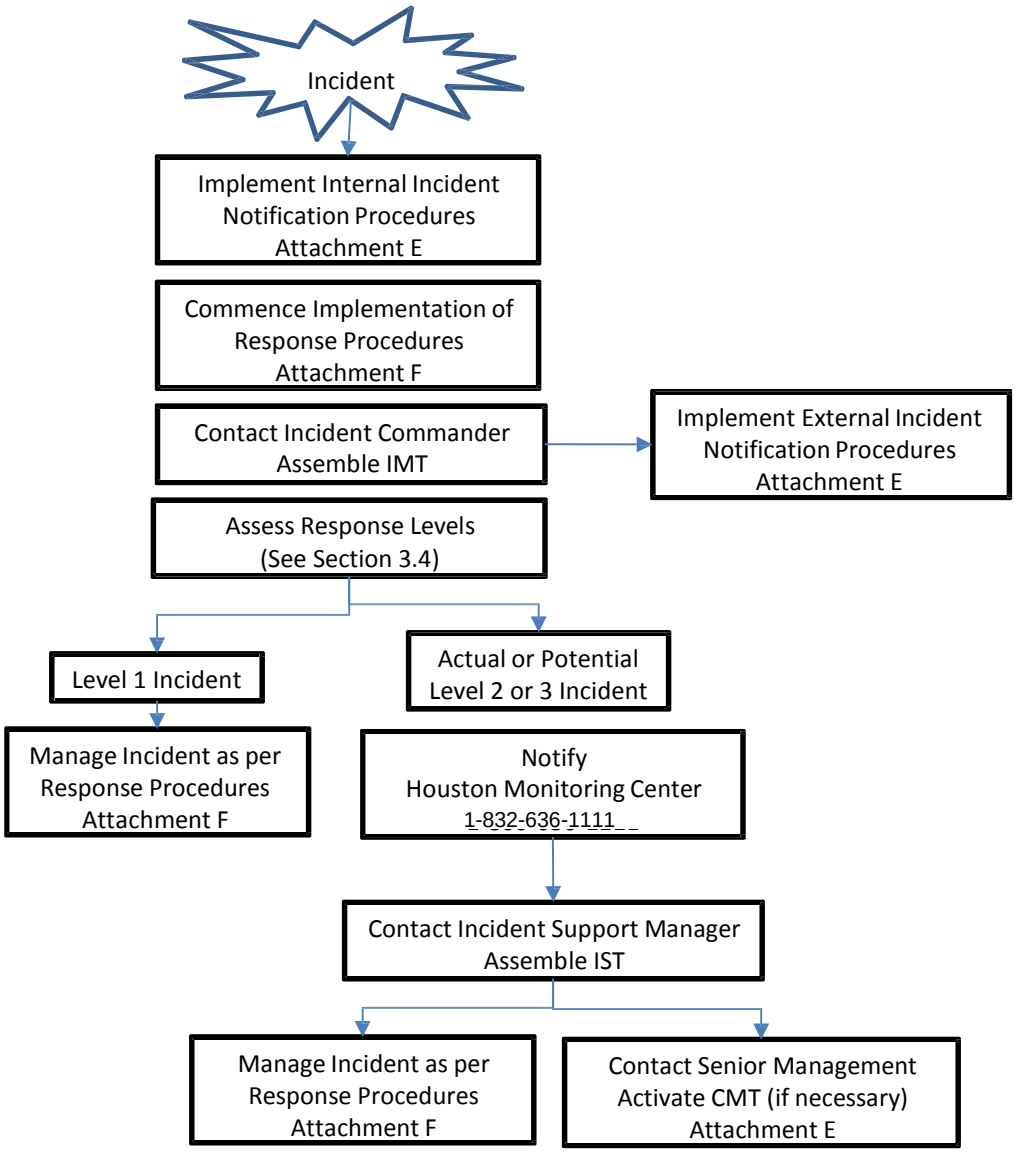
This ERP relies on local, regional, corporate, or contractor plans for the execution of tactical efforts. Depending on the nature of the incident, Anadarko plans may be activated after the initial response has been addressed by the contractor's plans.

The response procedures referenced by this Plan are organized according to incident scenarios. Appropriate procedures (local, regional, corporate or contractor) are provided in Attachment F.

3.5 Activation Procedure

The graphic below describes the general process to activate Anadarko's Emergency Response Organization. Country specific activation procedures for the IMT are provided in Attachment C.

Figure 3. Activation Procedure



Upon Activation, refer to Sections 4 (ERT), 5 (IMT), or 6 (IST) of this Plan for initial actions, roles, and responsibilities.

Immediately upon activation, the filling of the following ICS forms should be considered during the initial (Reactive) phase of the incident (refer to Attachment G for ICS Forms)

- General Incident Report
- Weather Report
- Notification Status Report
- ICS 201-1 (Site Map / Sketch)
- ICS 201-2 (Summary of Current Actions)
- ICS 201-3 (Organization Chart – ERT/IMT/IST)

- ICS 201-4 (Resources Summary)
- ICS 202 (Response Objectives)
- ICS 206 (Medical Plan)
- ICS 208 (Safety Plan)
- ICS 214-A (Individual Log)

3.6 Notification and Reporting Procedures

Country specific notification and reporting procedures (both internal and external) are provided in Attachment E.

4 Response Level - ERT

The Onsite ERT consists of the first responders located at the facility and those emergency contractors (medical, oil spill response, well control, etc.) that arrive very shortly after. This team may be composed of personnel from Anadarko or contractor resources.

A description of the facilities covered by this Plan in each operating area is provided in Attachment B.

The On-site ERT may expand due to the complexity of the incident and/or the arrival of additional resources. When it does, the On-Scene Commander delegates critical functions to subordinate personnel.

For Anadarko operated facilities, the primary responsibilities and tasks of the ERT are as follows (For contracted facilities, refer to facility procedures):

Emergency Response Team Duties and Responsibilities Checklist	
	Response Actions
	Assess the Situation
	Report the Incident
	Secure the Scene
	Account for Personnel
	If safe, shut down the affected operation and isolate the incident/source
	Conduct response per Local Procedure (See Attachment F - Response Procedures & Plans)

Critical responsibilities of the members of the ERT are presented below. A comprehensive list can be found in the Incident Management Handbook.

When applicable, the following positions will also belong to the ERT.

Emergency Response Team Initial Duties and Responsibilities Checklist	
ON-SCENE COMMANDER	
Responsible for executing implementation of the local emergency response procedures.	
	Execute local emergency response procedures. Considering the following priorities: 2) Safety of the people 3) Minimize damage to the environment 4) Protect the integrity of assets (See Attachment F - Response Procedures & Plans)

Emergency Response Team Initial Duties and Responsibilities Checklist	
STAGING AREA MANAGER	
The Staging Area Manager (STAM) is responsible for managing all activities within a Staging Area (the location where incident personnel and equipment are assigned, awaiting tactical assignment) *The Staging Area Manager works closely with the Resource Unit, Operations, and Logistics. Several staging areas may be required depending on the incident.*	
	Proceed to Staging Area
	Establish Staging Area layout
	Determine any support needs for Resources (equipment, feeding, sanitation and security)
	Ensure security of staged resources
	Post areas for identification and traffic control

Emergency Response Team Initial Duties and Responsibilities Checklist	
FIRE SUPPRESSION BRANCH DIRECTOR	
The Fire Suppression Branch Director, when activated, is under the direction of the On-Scene Commander and/or Operations Section Chief (OSC).	
	Direct and coordinate firefighting mission
	Manage dedicated firefighting resources
	Determine resource needs
	Prioritize response action to incident-related fires considering the following priorities: 1) Safety of the people 2) Minimize damage to the environment 3) Protect the integrity of assets

Emergency Response Team Initial Duties and Responsibilities Checklist	
MEDICAL SUPERVISOR	
The Medical Supervisor supervises the Medical Emergencies on-scene. The Medical Supervisor establishes command and controls the activities within a Medical Group/Division, in order to assure the best possible emergency medical care to patients during a multi-casualty incident.	
	Perform Triage on Injured Personnel
	Assess Medical Response
	Direct/Manage medical personnel & supplies
	Activate external (Mutual Aid/ISOS/etc) Resources, if needed

5 Command Level - IMT

A Tier 1 incident beyond the control of the On-site ERT triggers the activation of the in-country IMT who operates from the Command Center. If the incident is expected to reach beyond the in-country capabilities, the IST based in Houston will be called in for support.

If needed, the in-country IMT can be supplemented by personnel available from Anadarko locations (e.g. MIMT) or contractor resources located outside of the affected area.

The primary responsibilities of the in-country IMT include but are not limited to:

Incident Management Team Initial Duties and Responsibilities Checklist	
	Response Actions
	Assess the Incident
	Establish the IMT (Organization Chart)
	Assist in securing and/or mitigating the Incident
	Execute Notification Procedures: Agencies / Community / Houston / Partners
	Activate external resources

Critical responsibilities of the members of the IMT are presented later in this section. A comprehensive list can be found in the Incident Management Handbook.

5.1 IMT Organization

The in-country IMT is organized to carry out the following major functions:

Command: The Command function, headed by the Incident Commander (IC) is strategic in nature. Basically, the command section's function is to:

- Generate strategic objectives,
- Determine response priorities,
- Ensure that emergency response operations are carried out in a safe fashion,
- Interact with government agencies and the public, and handle legal matters

Operations: The Operations function establishes strategic and tactical actions, and provides oversight to the ERT.

Planning: The Planning function takes the lead in the preparing short and long term plans (IAPs and General Plans). In addition, the Planning function manages information associated with the response activities.

Logistics: The Logistics function has two key responsibilities:

- Supports response actions procuring the personnel, equipment, materials, and supplies needed to carry out the operations for up to 7-days.

- Arranges for the services necessary to sustain response operations, including food, water, housing, clothing, transportation, security, fuel, spare parts, and anything else needed to keep people and equipment working in a safe and productive fashion.

Finance: The Finance function manages all financial transactions associated with emergency response operations. This responsibility includes the compilation of documentation needed to support requests for reimbursement from insurance carriers, and the receipt and processing of third party claims. Finance also should track working hours of response personnel.

Technical Specialist: During an incident, Incident Management may require input from technical specialists, responsible for providing technical and/or functional support. Refer to Section 5.3 for additional information.

The contact information for the members of the IMT is provided in Attachment C of this Plan.

5.2 IMT Main Response Actions

Incident Management Team Initial Duties and Responsibilities Checklist	
INCIDENT COMMANDER/DEPUTY IC	
The IC(s) responsibility is the overall management of the incident. On most incidents, the command activity is carried out by a single IC. The IC is selected by qualifications and experience. Deputies may also be used at section and branch levels of the ICS organization. Deputies should have the same qualifications as the person for whom they work, as they should be ready to take over that position at any time.	
	Determine Incident Objectives & general direction for managing the incident.
	Establish the immediate priorities and incident potential.
	If necessary, notify the Monitoring Center for activation of the IST.
	Establish an Incident Command Post.
	Establish the Incident Management Team (Organization Chart)
	Ensure that adequate safety measures are in place.
	Ensure that adequate Security & Intelligence measures are in place.
	In conjunction with the Public Information Officer, authorize release of information to the news media.
	Attend all Command Staff Meetings

Incident Management Team Initial Duties and Responsibilities Checklist	
SAFETY OFFICER	
The Safety Officer (SOFR) function is to develop and recommend measures for assuring personnel safety, and to assess and/or anticipate hazardous and unsafe situations. Only one primary SOFR will be assigned for each incident. The SOFR may have specialists, as necessary, and the assistants may also represent assisting agencies or jurisdictions. Safety assistants may have specific responsibilities, such as air operations, hazardous materials, etc. ***The SOFR has Stop Work Authority for all activities.***	
	The safety of the people is first, including the safety of first responders. First responders should be appropriately trained and not taking unnecessarily risks.
	Ensure initial Site Assessment has been conducted by the ERT and execute a plan for ongoing monitoring
	Identify hazardous situations associated with the incident.
	Ensure compliance with Personal Protective Equipment (PPE) requirements for all response operations.
	Attend all Command Staff Meetings

Incident Management Team
Initial Duties and Responsibilities Checklist

PUBLIC INFORMATION OFFICER

The Public Information Officer (PIO) is responsible for developing and releasing information about the incident to the news media, to incident personnel, and to other appropriate agencies and organizations. Only one primary PIO will be assigned for each incident, including incidents operating under Unified Command and multi-jurisdiction incidents.

The PIO may have assistants as necessary, and the assistants may also represent assisting agencies or jurisdictions. Agencies have different policies and procedures relative to the handling of public information.

The PIO should be trained and authorized by Anadarko Public Relations to release information outside the Company.

	Determine from the IC if there are any limits on information release.
	Develop material for use in media briefings.
	Obtain IC approval of media releases.
	Inform media and conduct media briefings.
	Arrange for tours and other interviews or briefings that may be required.
	In conjunction with the IC, authorize release of information to the news media.
	Attend all Command Staff Meetings

Incident Management Team Initial Duties and Responsibilities Checklist	
LIAISON OFFICER	
The Liaison Officer is assigned to the incident to be the contact for assisting and/or cooperating Agency Representatives. Incidents that are multi-jurisdictional, or have several agencies involved, may require the establishment of the Liaison Officer position on the Command Staff. Only one primary Liaison Officer will be assigned for each incident, including incidents operating under Unified Command and multi-jurisdiction incidents. The Liaison Officer may have assistants as necessary, and the assistants may also represent assisting agencies or jurisdictions.	
	At the direction of the IC, establish contact with Government (Regulatory Agency) Representatives (See Attachment E for Reporting Procedures and Contact Information).
	Maintain a list of assisting and cooperating agencies and Agency Representatives, including name and contact information Monitor check-in sheets daily to ensure that all Agency Representatives are identified.
	Keep agencies supporting the incident aware of incident status.
	Participate in planning meetings, providing current resource status, including limitations and capability of assisting agency resources.
	Attend all Command Staff Meetings

Incident Management Team Initial Duties and Responsibilities Checklist	
LEGAL OFFICER	
The Legal Officer is responsible for providing advice and direction on all matters of a legal nature including claims, legal requirements relating to the emergency response, investigations, major procurement contracts, insurance coverage, and review of information releases to the media, government agencies and the public.	
	Advise the IC on all legal issues associated with response operations.
	Establish documentation guidelines for and provide advice regarding response activity documentation to the response team.
	Review press releases, documentation, contracts and other matters that may have legal implications for the Company.
	Attend all Command Staff Meetings

Incident Management Team
Initial Duties and Responsibilities Checklist

OPERATIONS SECTION CHIEF

The OSC is responsible for the management of all operations related to the emergency response. The Operations Section Chief may be selected from the Department/Functional Group with the most jurisdictional responsibility for the incident and will work in the Incident Command Post (ICP).

The OSC activates and supervises organization elements in accordance with the Incident Action Plan and directs its execution. The OSC also directs the preparation of tactical plans, manages response resources, and maintains the Incident Action Plan.

	Establish immediate response objectives and strategies.
	Coordinate with ERT the implementation of the tactical response actions
	Identify kind and quantity of resources required to support selected strategies.
	Coordinate planned activities with the Safety Officer to ensure compliance with safety practices
	Provide all information to IC as soon as the Command Post has been established.
	Attend all Command Staff Meetings

Incident Management Team Initial Duties and Responsibilities Checklist	
PLANNING SECTION CHIEF - PSC	
The PSC, a member of the General Staff, is responsible for the collection, evaluation, dissemination and use of incident information and maintaining status of assigned resources. Information is needed to: *1) understand the current situation;* *2) predict the probable course of incident events;* *3) prepare alternative strategies for the incident; and* *4) submit required incident status reports.*	
	Collect, process, and display incident information.
	Assist OSC in the development of response strategies.
	Establish special information collection activities as necessary (e.g., weather, environmental, toxics, etc.).
	Determine the need for any specialized resources in support of the incident.
	Attend all Command Staff Meetings

Incident Management Team Initial Duties and Responsibilities Checklist	
LOGISTICS SECTION CHIEF - LSC	
The LSC, a member of the General Staff, is responsible for providing facilities, services, and resources. The LSC participates in the development and implementation of the IAP and activates and supervises the Branches and Units within the Logistics Section.	
	Determine and supply immediate incident resource and facility needs.
	Solicit needs from all Sections of the IMT, and advise regarding resource approval and procurement processes.
	Review proposed tactics for upcoming operational period to determine resources for logistical support.
	Advise Command and other Section Chiefs on resource availability to support incident needs.
	Identify resource needs for incident contingencies.
	Track resource effectiveness and make necessary adjustments.
	Identify long-term service and support requirements for planned and expected operations.
	Attend all Command Staff Meetings

Incident Management Team Initial Duties and Responsibilities Checklist	
FINANCE SECTION CHIEF - FSC	
The FSC, a member of the General Staff, is responsible for all financial, administrative and cost analysis aspects of the incident and for supervising members of the Finance/Admin Section.	
	Manage all financial aspects of an incident.
	Review operational plans and provide alternatives where financially appropriate.
	Manage Procurement, Insurance, Compensation, and Claims issues.
	Provide financial and cost analysis information as requested.
	Track the Working Hours of all Response Personnel
	Participate in incident planning meetings and briefings as required.
	Attend all Command Staff Meetings

5.3 Technical Specialists

During an incident, Incident Management may require input from technical specialists, responsible for providing technical and/or functional support. This function may be filled by company or contract resources depending upon the particular expertise needed. The Technical Specialist will report through the Planning Section Chief or Support Lead unless otherwise directed. Technical Specialist may include (in alphabetical order):

- Aviation Specialist - The Aviation Specialist provides efficient transportation of incident response personnel using owned or chartered aviation resources. They may also be utilized to support and/or ensure the safe operation of contracted aviation resources through safety reviews and the proper selection of equipment and crews.
- Business Continuity Specialist - The Business Continuity Specialist provides assistance with issues relating to business continuity. They will determine nature, severity, and duration of business impacts/interruptions. They will also supervise implementation of applicable business continuity plans and ensure that business continuity efforts are coordinated with emergency response operations
- Compensation and Claims Specialist - The Compensation and Claims Specialist provides assistance with issues related third party damage claims. More specifically, they support the overall management of the claims process by identifying the resources that will provide guidance on the scope of potential claims, and on whether or not a claims center and hotline should be established. Additionally, the Compensation and Claims Specialist is responsible for claims handling activities. If a Claims Center should be established, and claims adjustors engaged, then they shall identify the resources that will support that entire effort. They will also be prepared to assist in ensuring that documentation for claims is adequate to support any insurance or indemnity requirements.

- Drilling/Well Control Specialist - The Drilling Specialist will provide technical expertise, assistance and resources in “well control” incidents.
- Finance Specialist - The Finance Specialist provides for necessary incident financial support including accounting support, cost monitoring, invoice processing and payment, funding for claims processing and payment, emergency bank accounts, and cash transfers.
- Engineering & Operations Specialist - The Engineering & Operations Specialist will provide expertise in construction, salvage, repair and operations issues that arise during the mitigation of an incident.
- Environmental Specialist - The Environmental Specialist provides for assistance in responding to incidents with technical expertise in the areas of air, water, and soil contamination, as well as in the area of waste disposal. They will also be prepared to provide support in the areas of hydrogeology, environmental risk assessment, ecosystems, wildlife rehabilitation, remediation, restoration, and all required environmental permitting.
- Government Affairs Specialist - The Government Affairs Specialist supports response teams by providing resources and expertise to communicate and liaison with governments.
- Geochemistry Specialist – The Geochemistry Specialist provides the resources for sample tracking, sample preparation, analysis, interpretation and reporting. They can also provide sample modeling, specialized analytical service (isotope studies, GC-MS/MS, etc.), oil fingerprinting and baseline studies.
- Incident Management Specialist - The Incident Management Specialist will provide emergency management process and response expertise at the local or geographic emergency management level. This specialist can be called upon to backfill or integrate into the activated Incident Management Team’s ICS structure.
- Insurance Specialist - The Insurance Specialist provides assistance with issues related to insurance and various compensation schemes. More specifically, they support the overall management and processing of insurance claims for bodily injury, property damage, and business interruption as applicable. Additionally, they are responsible for the administration of all issues associated with national and international compensation regimes such as the International Oil Pollution Compensation Fund. The Insurance Specialist will assist the Compensation and Claims Specialist with claims and cost containment activities.
- Medical Specialist - The Medical Specialist provides the resources for developing overall strategic plans which ensure that all necessary guidance and resources are available / applied to provide medical support for an incident.
- Negotiations – Supports the IST by providing advice on existing Production Sharing Agreements/Contracts or Joint Operating Agreements that are in place for the country/activity in question.
- Process Engineering Specialist – Supports response teams by providing expertise and guidance on engineering controls, process and design.

- Procurement Specialist - The Procurement Specialist provides for purchasing, procurement, and contracting support for goods and services in an incident as required or necessary. They will assist in the development of facilities necessary to support or manage the incident and in arranging for the transportation of personnel, equipment, and materials to any required location.
- Safety, Fire, and Health Specialist - The Safety, Fire and Health Specialist provides for assistance in the areas of accident investigation, safety regulations, safety hazards assessment, responder training, firefighting, and decontamination procedure. They will also provide support in the areas of toxicology, industrial hygiene, and health hazard assessment and monitoring.
- Security Specialist - The Security Specialist provides for assistance and support as may be required in the protection of company response personnel, including senior management, and for the security of, and access control at, response facilities, including Command Posts. They will also provide for security support of on-scene operations and response equipment against illegal theft or illegal interference. Security will be prepared to conduct or manage criminal investigations when requested by appropriate management, and will be prepared to establish and maintain liaison as may be appropriate with public safety and/or law enforcement authorities. They will also provide the mechanism to furnish all other advice, as may be requested or necessary on Security matters.
- Supply Chain Specialist - Primarily responsible for receiving, storing and distributing all supplies for the incident; maintaining an inventory of supplies; and storing, disbursing and servicing non-expendable supplies and equipment.
- Translation Specialist – Provides translation services.
- Travel Specialist - The Travel Specialist provides the management of air and ground transportation support for the corporation. It will provide for arrangements to support the transportation or travel of company and external resources to or from affected locations.

6 Support Level - IST

The IST is in charge of all actions that need to take place away from the scene and not available locally, to support the IMT, facilitate planning and provide additional media and HR coordination, and additional support to address the concerns of the public and government agencies.

The IST's role is secondary and supportive. The IST will not duplicate functions that the on-scene emergency response or incident management teams effectively have in place, but will provide first line assistance if the incident location is unable to effectively manage the incident.

Each incident will be unique in terms of the response roles in the IST that are activated to successfully mitigate the event. The specific composition of the team to be activated will depend on the demands of the location and the type of incident. The involvement of the IST may be different for Anadarko-operated, partner-operated or joint-operated projects.

The IST has also identified experts (Support Specialists) in their respective fields, which can be activated by the Incident Support Manager, based on the incident circumstances, to support response activities.

6.1 Procedure for Activation of IST

When an incident occurs, the in-country IMT will determine if the Houston IST needs to be notified. If so, the in-country IMT will call the 24-hour security number at the Houston office (+1-832-636-1111). In turn, the duty officer will notify the Incident Support Manager (ISM).

The following procedure will be followed to engage Houston resources when Anadarko Houston Security Monitoring Center duty officers receive calls to report a remote incident. Incidents may occur in any location, so this procedure describes a general process to follow for any incident calls received. The role of the Tower Security Monitoring Center duty officer is critical to ensure effective, timely response to remote incidents.

At this point, the Incident Support Manager determines which people on the IST organizational chart need to be notified. Afterwards, security will make the notifications that are determined by the Incident Support Manager, and those notified will report to the Houston Incident Response Center. The Incident Support Manager will place a short call to the in-country IMT manager to confirm receipt of notification of incident and report on timing and assembly of the IST.

Based on the geographic location of the incident and the availability of Anadarko Petroleum Corporation (APC) personnel, the ISM may also activate the MIMT.

The contact information of the members of the IST is provided in Attachment D of this Plan.

6.2 IST Main Response Actions

Critical responsibilities of the members of the IST are presented later in this section. A comprehensive list can be found in the Incident Support Team Handbook.

Incident Support Team Initial Roles and Responsibilities Checklist	
Houston Duty Officer	
The following procedure will be followed to engage Houston resources when the Anadarko Houston Monitoring Center duty officers receive calls to report a remote incident. Incidents may occur in any location, so this procedure describes a general process to follow for any incident calls received. ***The role of the Tower Control Center duty officer is critical to ensure effective, timely response to remote incidents.***	
	Upon receiving the call from the field location where the incident has occurred:
	Locate the notification list for the area/country of the incident & begin notifying Key Incident Support Staff
	Call personnel on the list in the order they are given. Call numbers from left to right. If no one answers, leave a message stating the following: a) Duty officer's name and company position b) Telephone number at which to return a call (+1 832-636-1111) c) "I am calling to inform you that an incident has occurred in (*say the location of the incident*). Since I was unable to reach you, I will call (*say the next name and number on the list*)."
	When a contact is reached: a) state who you are and that you are calling because an incident has been reported, b) communicate the information on the Initial Incident Report starting at the top of the form, c) do not speculate, add to, or take away anything from the information previously provided. d) Obtain from the initial contact how many other people need to be notified at this time, and whether or not they need to immediately go to the Houston Incident Response Center on the 16th floor of the Anadarko Tower.
	When the information has been delivered, a) Complete the Initial Incident Report indicating who was contacted at what time, and record any follow-up instructions given. b) Forward the Initial Incident report via email to the initial contact
	Call out all team members included in the organizational chart, as requested by the initial contact person. Leave a message or tell them that an incident has occurred and whether or not the individual needs to go immediately to the Houston Incident Response Center on the 16th floor of the Anadarko Tower.

Incident Support Team Initial Roles and Responsibilities Checklist	
INCIDENT SUPPORT MANAGER - ISM	
The ISM is responsible for providing leadership and direction to the IST, and to ensure that emergency response and crisis management operations are carried out in a manner consistent with Anadarko core values and policies. The ISM also ensures links are maintained with APC senior management in Houston, representatives of the in-country government, joint venture partners and other organizations. The following responsibilities are supportive only. All actual in-country incident management will be handled at the affected asset's IMT level unless otherwise directed by the ISM.	
	Receive the first call from the duty officer and inform the duty officer which members of the IS-team should be mobilized based on incident briefing.
	Mobilize to the Incident Response Center in Houston, if necessary.
	Establish the IST (Organization Chart)
	Call in-country IC to obtain a latest update of the situation and confirm that the Houston IST needs to be, or has been mobilized.
	Serve as a single point of contact for the in-country incident commander.
	Facilitate IST team meetings (in-country Incident Commander will facilitate joint meetings)
	Clarify and agree upon the role of the IST for the particular incident: "What do you need and how can we support you?"
	Ensure the incident has been reported to senior management/Houston Crisis Management Team, and that there is agreement on who will provide any additional updates to the Executive Committee contact
	Request assistance of Planning Support to provide initial and routine communications to senior management, if required.

Incident Support Team
Initial Roles and Responsibilities Checklist

PUBLIC AFFAIRS SUPPORT

Provide advice to the IMT on the media aspects of the incident. The Public Affairs Support Lead will report directly to the ISM.

The Public Affairs Support Lead is the first responder to all external communication. Any and all external communication has to pass through the Public Affairs department for approval prior to release, this includes any external communication from the in-country incident response team.

	Prepare a media statement and make available to IMT, IST and senior management
	Prepare press statements and releases and review those being prepared by IMT
	Ensure that press statements are reviewed by the in-country IMT and the Legal Specialist and approved, as necessary, prior to release to the media.
	Ensure the appropriate “spokesperson” at the right level of management is identified, in the right places and at the right time.
	Provide support to field, regional and/or corporate teams for communications to external organizations - ensure consistency of response communications.

Incident Support Team
Initial Roles and Responsibilities Checklist

HUMAN RESOURCES SUPPORT

Human Resources (HR) provides for advice and assistance on all personnel issues arising from the emergency, including the business interruption aspects of APC personnel dislocation, workman's compensation claims and issues, coordinating the response to concerned relatives and all other personnel problems. HR shall also support all medical and Employee Assistance Program issues that arise, including any Critical Incident Debriefings necessary to restore normalcy in the workplace or in the community. The HR Advisor will report directly to the ISM.

	Prior to an incident maintain a current list of employees with contact numbers and addresses of next kin.
	Prepare list of all expatriate employees currently in-country with contact information on next of kin.
	Identify, and respond to immediate requests for support, information or guidance from the in-country IMT HR function or in-country response team.
	Determine if there are any cultural issues that need to be considered which might affect the type of aid provided as part of Humanitarian Assistance.
	Mobilize Employee Assistance Program as required for the incident.
	Notify and/or mobilize International Humanitarian Response Program as required..

Incident Support Team Initial Roles and Responsibilities Checklist	
LEGAL SUPPORT	
Provide immediate and long term legal implications advice to the IST and in-country IMT as requested. Provide legal advice and assistance including: applicability and interpretation of laws, statutes, regulations, reporting requirements, incident investigation, monitoring, review of media and employee communications, liability evaluation, and litigation.	
	Provide overall legal advice to the IMT
	Compile all existing service and supply contracts that could be impacted by the incident and identify liability and notification language in those contracts..
	Advise on jurisdictional relationships with government.
	Assist the Logistics Support Unit by reviewing contracts for new services.
	Advise on dealing with Federal Corrupt Practices Act (FCPA) issues that may arise from importation of equipment and services.
	Provide legal guidance on the release of all information—including press releases and communications with external stakeholders.
	Establish Attorney-client privilege as required.
	Determine to what extent Anadarko should coordinate response actions, statements, and positions with other responsibilities or partners.

Incident Support Team Initial Roles and Responsibilities Checklist	
OPERATIONS SUPPORT LEAD	
Provide the primary means of contact with the in-country IMT.	
	Provide all operational expertise to the in-country ERT and IMT.
	Work with planning to identify any technical specialists that are or could be needed to support the response.
	Provide assistance in implementing operation specific contingency plans
	Co-ordinate the technical requests from the country.
	Obtain schematics of the affected facility or operation.

Incident Support Team Initial Roles and Responsibilities Checklist	
PLANNING SUPPORT LEAD	
The Planning Support Lead is responsible for the collection, evaluation, dissemination and use of incident information and maintaining status of assigned and future resources. Information is needed to: 1) understand the current situation; 2) predict the probable course of incident events; 3) prepare alternative strategies for the incident; and 4) submit required incident status reports.	
	Compile and display incident status information.
	Keep IST apprised of any significant changes in incident status.
	Ask ISM if they require support in preparing and providing initial and routine communications to senior management, especially during the first hours of any response.
	Work with the in-country Planning Section Chief to establish special information collection activities as necessary (e.g., weather, environmental, toxics, etc.)..
	Work with Legal Specialist and in-country PSC to evaluate potential threat to affected asset's license to operate.
	Assist if requested by the in-country Planning Lead to determine severity and duration of business interruptions; support implementation of applicable Business Continuity Plan(s)
	Work with the in-country PSC to forecast the need for additional in-country resources (both for emergency response as for operational backfill). Provide staffing plan with timing

Incident Support Team Initial Roles and Responsibilities Checklist	
LOGISTICS SUPPORT LEAD	
Provide logistics support to the incident response organization	
	Provide logistics support to the in-country team as requested on: • Procurement of international response products, services and equipment • Shipping and delivery of these services • Assure proper visa are held by service providers. • Preparation of customs documentation. • Aviation support, including use of commercial, company or charter aircraft. • Repatriation of human remains.
	Negotiate service agreements with key international response providers, and have them in place prior to an incident.
	Make necessary arrangements for the transportation (air/ground) of personnel or resources if required

Incident Support Team Initial Roles and Responsibilities Checklist	
FINANCE SUPPORT LEAD	
Provide immediate and long term financial implications advice to the IST and in-country IMT as requested. Provide advice and assistance including: cost reporting requirements, claims handling, contract support, and cost control.	
	Identify and respond to immediate requests for support, as requested activate the Cost Unit, Risk Management, Legal Unit and Negotiations Unit
	Oversee financial control procedures
	Consider the immediate and long-term financial implications of the incident
	Ensure that financial resources are available to meet known or anticipated action, consistent with established financial procedures
	Assess the financial implications of the emergency for Anadarko and prepare action plan to address them.

7 Media

7.1 General

Only Anadarko designated spokespersons may speak with the media on behalf of Anadarko. This

policy is all encompassing and covers both routine press inquiries regarding company operations and activities in addition to negative incidents or issues. Company-approved media training will be provided for selected individuals who may have to act as a spokesperson for a specialized area of the business, or during the early stages of a crisis incident. Only persons who receive this training will be authorized to speak on behalf of the company and provide information to outside representatives, including the media.

Any Anadarko employee who may be contacted by the media should immediately refer the individual to a company-designated spokesperson.

This should be done in a diplomatic and professional manner without offering any information. A listing of authorized spokespersons will be provided to all employees at each operating location as a reference.

No one should release any written information in the form of an official statement or press release, under any circumstances, without prior clearance and approval from (the designated corporate representative) with communications responsibility during an incident.

7.2 Procedure for Release of Information in the event of an incident

Release of information concerning emergency conditions at Company facilities or operations will be provided in accordance with Corporate Procedures.

Employees

	Company employees at the scene of an emergency should:
✓	Contact immediate supervisor or next higher level of management
✓	Maintain site security. Do not allow anyone into ANADARKO facilities except those personnel and equipment required to handle the emergency
✓	Under NO circumstances should the following information be released: • Cause of emergency • Speculation regarding cause • Dollar estimate of physical damage • Names of injured or dead, prior to notification of Next-of-Kin
✓	Refer media inquiries to the Incident Commander until "Designated Spokesperson/PIO" is appointed

Incident Commander

✓	Notifies Line Management
✓	Informs employees not to allow anyone into the facility except those personnel and equipment required to handle the emergency
✓	Directs inquiries from media to Public Information Officer or designated spokesperson
✓	Relays all information gathered at emergency scene to Public Information Officer or designated spokesperson

Designated Spokesperson

✓	Set up room or office outside emergency location for press. If possible, press should have access to telephones for outside calls.
✓	Check credentials of all media before admittance.
✓	Delegate company escorts to accompany media visiting the emergency area.
✓	Issue statements to news media based on suggested outline from Corporate Public Information Officer.

Public Information Officer (PIO)

The PIO will maintain communications with the media in accordance with the requirements of this Section and in close liaison with the Houston Information Officer.

Communication and public affairs are best handled by persons trained in dealing with the media. There will be times when it is not practical to refer all questions from the media and public to our headquarters. Indeed, a factual, short response can help reduce the time and effort ultimately needed to respond to the media and public.

✓	The response should be a short statement of the facts.
✓	Estimates or speculations as to cause or size of the problem should not be made.
✓	If you are going to be questioned in front of a camera, consider your appearance and what will be in the background (behind you) of your interview.
✓	If possible, your interview should be done with a neutral or non-threatening background.

7.3 Example Media Statements

The example statements below have been approved by Corporate Public Information Officer. General statements below may also be given verbally by site manager and communication director in response to media inquiries:

General comments for verbal use only in response to media inquiries to be given by site manager or communications director as appropriate

"An incident occurred at _____ (name of facility) in _____ (location at approximately (time), (date). Anadarko Company has initiated response activities and authorities have been notified. Additional information will be provided as appropriate.

1. "Safety and environmental responsibility are top priorities at Anadarko. While prevention of this type of situation is a core part of our operational strategy, we do prepare for these situations and emphasize internal response training."

2. "(We are responding) or (Necessary teams are responding) and we will share appropriate information with you when it is available."

3. Aswers to general questions about the site/facility.

Attachment E Reporting Procedures and Contact Information

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E.1 Reporting Procedures

Anadarko activities in Mozambique involve operational risks. Certain incidents may require the involvement of additional trained Houston personnel to cover certain responsibilities. It is the responsibility of the Incident Commander and/or the Country Manager to activate the Emergency Response Organization during an incident. Once the Organization is in place, they will make all notifications as assigned to their position and as the need is defined by the incident type.

If needed, the Mozambique Incident Management Team (IMT) can be supplemented by personnel available from the Anadarko Houston office or contractor resources located in or outside of Mozambique. The Houston IST supports all activities undertaken by the Mozambique IMT. It provides a structured framework to provide support to Emergency Response Organizations at remote locations such as Mozambique.

The Mozambique IMT organizational structure represents only a limited number of personnel that are trained and ready to assist in any incident. When an incident occurs, the Operations Coordinator will notify the in-country IMT Incident Commander. The Incident Commander will then determine if the Houston IST needs to be notified/activated. If so, the Incident Commander will call the 24-hour security number at the Houston office (1-832-636-1111). In turn, the security person will notify the Houston IST Incident Support Manager (Exploration Manager) or a member of the International EHS group if the Incident Support Manager is unavailable. At this point, the Incident Support Manager determines which people on the Houston IST organizational chart need to be notified and establishes communication with the in-country Incident Commander.

Afterwards, security will make the notifications that are determined by the Incident Support Manager, and if deemed necessary, everyone will gather in the Houston Incident Command Center. In order to minimize any confusion during the response activities, the Houston IST will not take on any emergency response management responsibilities unless requested to do so by the Mozambique IMT. The Houston IST will provide support in the form of additional personnel, finance, legal, HR, public relations, technical specialists, etc., as well as decisions that need to be made on a corporate level. Direct communication between in-country IMT members and their Houston support team shall be established only upon request from the in-country IMT members and they shall decide the preferred way of communication (phone, email, fax, messenger, IAP, etc).

It will be the job of the security officer on duty to complete the following:	
✓	The Security Officer answering the call will ask very basic questions, such as: • What type of incident occurred • When did it occur? • Is anyone injured?

✓	The Security Officer will take the information provided and start calling the following people in Table 5-3.
✓	Call the numbers in order from left to right. If nobody answers, leave a message stating the following: • Security officer's name and company position • Telephone number at which to return a call • "I am calling to inform you that an incident has occurred in Mozambique. Since I was unable to reach you, I will call (say the next name and number on the list)" Do not speculate, add to, or take away anything from the information previously provided.

It is the responsibility of the Mozambique IMT Liaison Officer to ensure incidents are reported to the appropriate governmental agencies. Report all incidents internally and externally to appropriate agencies using the Reporting Forms found Attachment G. Agency contact/phone numbers are located in Section E.2.

The Houston Public Information Officer or Liaison officer should provide notification to the Woodlands building receptionist in the event of a drill or actual incident. This is very important so they know where or to whom to direct incoming calls relative to the drill or incident. In the future, please email instruction to "zz.Team.Houston Receptionist" giving them the names and numbers where to direct calls. Also, include a brief description of the event such as "THIS IS A DRILL, Mozambique has had an explosion and fire in Pemba and we are (1) having a drill, (2) activating the Incident Command Center and/or (3) we have just been notified of an event". The email should be sent as soon as possible at the start of a drill, if the Incident Command Center is activated or as soon as you learn of an incident that may cause calls to Anadarko.

E.2 Agencies Notifications

All offshore and onshore personnel are responsible for assuring that all required notifications/reports are completed in a timely manner for all incidents. All contacts with regulatory agencies must be properly documented.

Typical information to report would be location of incident, type and size of spill, date & time of the incident, and other relevant information.

#	Agency / Entity	Phone	Alt.	Fax
1	**Instituto Nacional da Marinha (INAMAR)** *~ Responsible for oil pollution at sea within the 12 nm territorial limit*	+258 21 301963 +258 82 3075547	+258 82 3011480	--
2	**Pemba Port Authority**	+258 27 220453	+258 82 6016710	+258 27 220 453
3	**INP (National Petroleum Institute)**	+258 21 320935	+258 82 4906200 +258 82 3081870 +258 82 3081570	--
4	**Mozambique Ports and Railway (CFM)**	+258 27 220710	+258 27 220453	+258 27 220 453
5	**MICOA** (Ministério para a Coordenação da Acção Ambiental)	+258 27 220353	+258 82 3130691	--

5	**National Fisheries Administration** (To be contacted when interruptions to commercial fishing operations are necessary)	+258 21 358000	+258 82 3061996	--

E.3 Other External Local Contact Information

Local Contact Listing		
Contact	**Phone**	**Alt.**
Medical Assistance & Medevac		
SOS Netcare (Maputo)	+258 21 31 31 03	Mike Ferguson: +258 84 39 88 256 +258 84 301 6910
International SOS Assistance, Inc	Johannesburg: Tel: +27 11541-1300 +27 11541-1350 Sat: +881 631419 330	Philadelphia: +1 215 942 8226 Fax: +1 215 354 2338
Hospital Maputo (Servico Medicina Legal)	+258 82 3192640 +258 84 305 3097	+258 21 30 60 74
Pemba Provincial Hospital	Dra Bequezela (Director) +258 84 280 0228	Armando Meque (Director Clinico) +258 84 280 0233 or +258 27 220 796
Cabo Delgado Clinic	+258 82 81 35 450	+258 82 70 39 555
Kenyon Europe, Africa and Middle-East	+44 (0) 134 431 6650	Fax: +44 (0) 134 431 6699
Police / Fire Department		
Police Service	+258 27 22 1006	+258 27 22 0484
Fire Department	+258 27 22 0223	+258 27 220 030
Aviation Support		
CHC Global Operations Canada (Helicopter)	Inside Mozambique: CHC Base Manager Mocimboa de Praia Mozambique Tel: +258 82 918 9628	Corporate contact is: Cees Visser Regional Director CHC Global Operations Africa 9 Parellaan 2132 WS Hoofddorp The Netherlands Mobile: +31 (0)6 22993578 Phone: +31 (0)23 5555527 Conference # +31 (0)23 5555650 Fax: +31 (0)23 5555550 E-mail: cvisser@chc.ca
Solenta Aviation (Charter Flight)	+258 82 813 8257	+258 82 813 8250

Local Contact Listing (Continued)

Contact	Phone	Alt.
Aviation Support (Continued)		
Missionary Aviation Fellowship (MAF) Nampula Contacts	MAF Office at MAF Hangar at Nampula Airport: Telephone: +258 26 215512 maf-mozambique@maf.org David Lepoidevin: Tel: +258 26 217630 Fax: +258 26 218368 Mobile: +258 82 386 4890 Email: dlepoidevin@maf.org	Warren Veal Mobile: +258 82 921 0308 Email: wveal@maf.org Gerd LePoidevin Mobile: +258 82 511 4672 Email: glepoidevin@maf.org
Rani Group	+258 82 575 2925	--
Response Contractors		
The Response Group – IAP Software, Trajectories, & Planning Support	+1 281-880-5000	+1 713-906-9866
Seacor Marine	+1 985-876-5400	Fax: +1 985-876-5444
Oil Spill Response (OSR)	+44 23 8033 1551	
Translator – Language Line Services	+1 832-636-1111	security.monitora@anadarko.com
Fatality Notification		
Kenyon - US Headquarters 24/7	+1 281-872-6074	
Embassies & Consulates		
U.S. Embassy 193 Avenida Kenneth Kaunda Maputo	+258 21 49 2797 Emergency after hours: +258 21 49 0723 or +258 82 310 7190	Fax: (258) 21 49 0448
French Embassy Av. Julius Nyerere, 2361 Maputo, Moçambique CP 4781	(258-1) 491 774, 693, 490 444	Fax: (258-21) 491 727
Bristish High Commission Av Vladimir I Lenine 310 (Box 55) Maputo	+258 21 356000	Fax: +258 21 356060
Australian Consulate Avenida Zedequias Manganhela 95-3rd Floor Maputo	+258 21 322780	Fax: +258 21 307369

Attachment F Scenario Response Procedures

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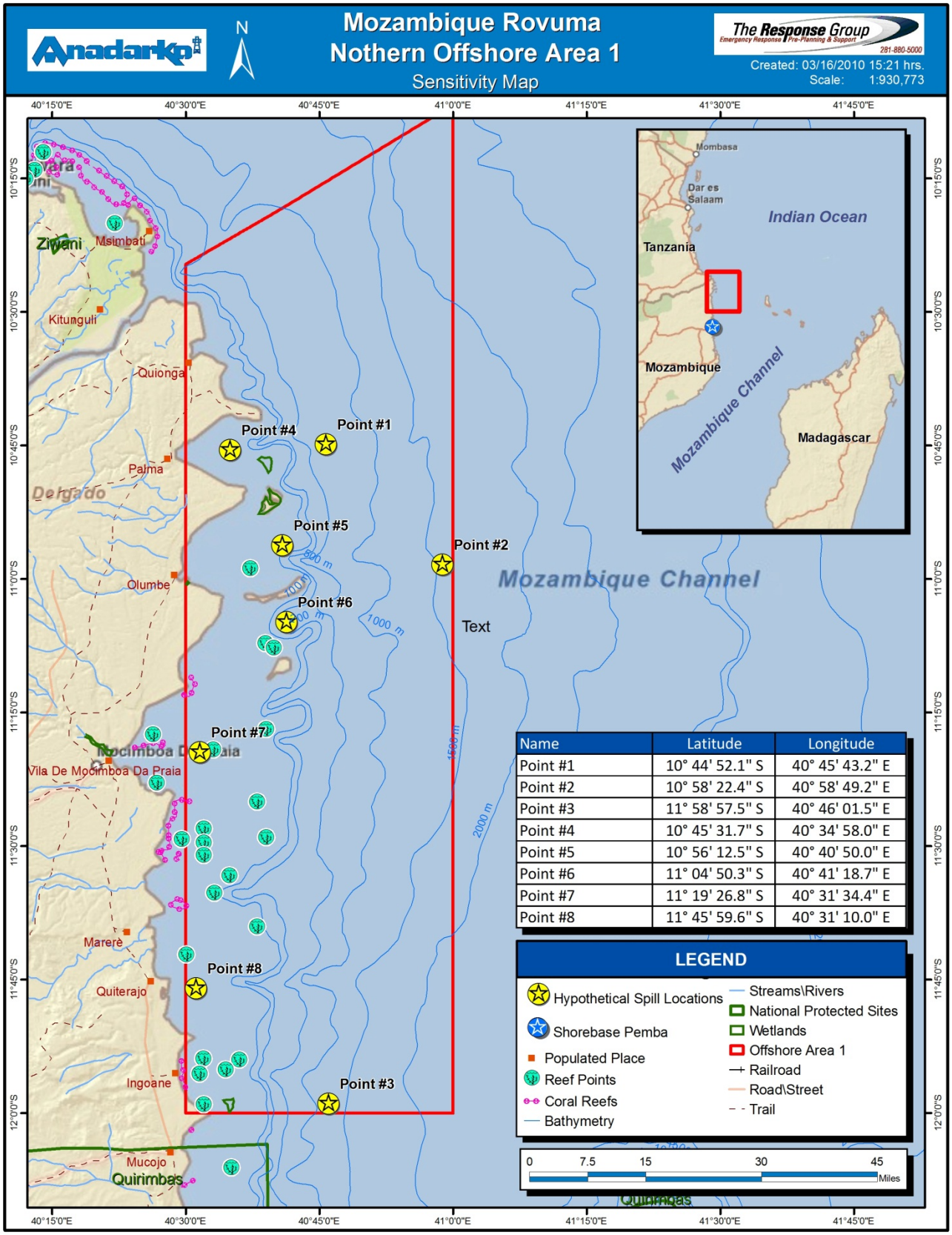
F.1 Resources at Risk

The purpose of this section is to quickly identify the sensitivities that could potentially be affected during an incident.

The resources at risk from are described in detail in The Environmental Impact Assessment (EIA) that has been prepared for seismic & drilling operations. The EIA was used as a planning aid in determining response strategies for spills and is currently located at www.anadarko.com/mozambique.


Mozambique Rovuma
Nothern Offshore Area 1
Sensitivity Map
The Response Group
Emergency Response | Pre-Planning & Support
281-880-5000
Created: 03/16/2010 15:21 hrs.
Scale: 1:930,773
N
Point #1
Point #2
Point #3
Point #4
Point #5
Point #6
Point #7
Point #8
Text
Mozambique Channel
Indian Ocean
Tanzania
Mozambique
Madagascar
Mombasa
Dar es Salaam
Mozambique Channel
Ziwani
Msimbati
Kitumguli
Quionga
Palma
Olumbe
Vila De Mocimboa Da Praia
Marere
Quiterajo
Ingoane
Mucojo
Quirimbas
Delgado
200 m
1000 m
2000 m
1500 m
Name | Latitude | Longitude
Point #1 | 10° 44' 52.1" S | 40° 45' 43.2" E
Point #2 | 10° 58' 22.4" S | 40° 58' 49.2" E
Point #3 | 11° 58' 57.5" S | 40° 46' 01.5" E
Point #4 | 10° 45' 31.7" S | 40° 34' 58.0" E
Point #5 | 10° 56' 12.5" S | 40° 40' 50.0" E
Point #6 | 11° 04' 50.3" S | 40° 41' 18.7" E
Point #7 | 11° 19' 26.8" S | 40° 31' 34.4" E
Point #8 | 11° 45' 59.6" S | 40° 31' 10.0" E
LEGEND
Hypothetical Spill Locations
Shorebase Pemba
Populated Place
Reef Points
Coral Reefs
Bathymetry
Streams\Rivers
National Protected Sites
Wetlands
Offshore Area 1
Railroad
Road\Street
Trail
0 7.5 15 30 45
Miles

F.1.1 Environmental

The risk of accidental hydrocarbon spillage to the marine environment is one of the main environmental concerns associated with oil-industry developments. The impacts upon marine organisms arising from oil spills are well documented, and a summary of these impacts and their effects is given in the following *Table 1: Potential impacts on components of the marine environment from an oil spill.*

Potential Impacts		**Table 1**
Component	Type of effect	Level of impact
Seabirds	Physical fouling of feathers; potential toxicity by ingestion; damage to eyes etc.	Potential fatalities of sensitive offshore species may arise, especially among diving birds and waders, although this will heavily depend on the quantity of oil spilled, and the probability of oil reaching the coast.
Fish	Direct effects are rare offshore.	Fish may leave the immediate area. Tainting of fish flesh is not proven, but public perception can damage commercial fisheries.
Sea turtles	Effects on turtles include increased egg mortality and developmental defects, direct mortality due to oiling in hatchlings, juveniles, and adults; and negative impacts to the skin, blood, digestive and immune systems, and salt glands.	Potential fatalities due to turtles' inability to avoid contaminated areas.
Fisheries	Loss of fishing access, and potential loss of fishing resources.	Potentially severe impacts on subsistence fishing communities.
Dugong	Found in coastal marine and estuarine habitats as well as fresh water along the coast.	Oil could contaminate the food sources or oil could be ingested as well as adhering to the skin as the animal surfaces for breathing.
Aquaculture	Potential toxicity by ingestion/ filter feeding; physical damage to gills etc.; oxygen reduction in pond area.	Potential mass mortality in cases of extreme contamination partly due to high stocking densities and enclosed area. Taint leading to loss of income. Longer term impact on reproduction.

Potential Impacts		Table 1
Component	Type of effect	Level of impact
Algae	Oil may be trapped in the algal mat during low tide causing severe biological impacts	The oil will be removed by wave action and natural degradation, but the biological impacts can be immediate and severe. In exposed rocky flats with tidal pools, oil can be trapped in the pools. This habitat is very important as nursery area for fish. Intertidal rocks covered by abundant algal growth, which is exposed at low tide, are encountered in a wide zone along the coast.
Invertebrates	In exposed rocky flats with tidal pools, oil can be trapped in the pools.	The oil will be removed by wave action and natural degradation, but the biological impacts can be immediate and severe. This habitat is very important as nursery area for fish.
Fish and fish eggs and larvae in confined environments	Oil and the oil components tend to adhere to the tidal flats, preventing removal by tides. Oil may persist for years.	The lagoons are important and vulnerable ecosystems, housing a wide variety of fish, shrimps, crabs and mollusk species. Lagoons are almost impossible to clean up due to the soft substrate and limited access. Usually any cleanup effort will mix oil deeper into the sediment prolonging recovery. Natural removal rates are very slow because there is no wave action to remove the oil and the oil components.
Bird eggs and young birds	Reduction in number of eggs, Fertility of eggs, Reduced thickness of shell. Transfer of oil to young birds can cause death.	Feeding, roosting and nesting sites for thousands of migratory and resident birds. The reproduction of the birds can also be affected when adult birds have been in contact with oil.
Mangroves	Important breeding and nursery areas for fish and crustaceans and essential habitats for numerous birds. Exposed root systems are sensitive.	Oil can enter during high tide and coat the aerial roots and sediment surface as the tide goes out. The oil clogs the pores in the aerial roots and collapses the respiratory system and cause the tree to die. Fresh oil can cause death by toxicity of oil components.

F.1.2 Onshore Response Methods

It is also vital to protect environmentally sensitive areas from the harmful effects of an oil release onshore.

The focus of response efforts will be to protect human life and health, sensitive environmental and ecological areas, and economic entities. Recommended practical steps to take toward achieving these efforts are:

•	Stop further pollution at the source.
•	Consider safety of personnel / call for medical assistance if needed.
•	Shut off ignition sources.
•	Coordinate rescue and medical response actions if necessary.
•	Report all incidents to your immediate supervisor.
•	Contain the pollutant discharge released
•	Remove the product.

Environmentally sensitive areas can consist of waterways, wildlife habitat (as well as the wildlife themselves), water sources used for human consumption, livestock and areas of human habitat. A release may immediately affect these environmentally sensitive areas but in many cases a spill can be contained before it can affect any additional areas. Every effort should be made to safely contain a spill as soon as possible to minimize its effects on these areas. Containment can be accomplished by the use of barriers such as; earth berms, construction of diversion ditches or construction of catchment basins to collect the spilled material.

If any wildlife is affected by an onshore spill, wildlife experts should be notified to assist in capturing and rehabilitating the animals. Initial responders should not attempt to capture affected wildlife as their safety could be jeopardized.

F.1.3 Coastal Response Methods

It is vital to protect environmentally sensitive areas from the harmful effects of an oil release. Many of the organisms living in the area have a limited ability to cope with changes in their environment. Therefore, it is important to keep spills contained in open water and minimize shoreline exposure to the extent possible.

The focus of response efforts will be to protect human life and health, sensitive environmental and ecological areas, and economic entities. Recommended practical steps to take toward achieving these efforts are:

•	Stop further pollution at the source
•	**Contain the pollutant discharge released**
•	**Remove the product**

F.1.3.1 Waterfowl and Wildlife Protection

Anytime oil is spilled on water, methods to protect waterfowl and wildlife will be considered. Although these methods may be used in open waters, a considerable amount of effort will be spent providing waterfowl and wildlife protection in their living habitats along shorelines and natural nesting areas. Some of the methods that will be considered for waterfowl and wildlife protection are detailed in Table 2.

		Table 2
Method	**Applicability**	**Limitations**
Noise Devices (propane cannons, guns, alarms, horns, etc.)	**Devices used to provide noise to keep birds away from impact areas may be used onboard boats or at shorelines**	**Long term use reduces results. Birds/wildlife may become acclimated to sound; not practical in nesting areas.**
Vehicles and Boats	**Noise from motors and horns may keep birds and wildlife away from impact areas.**	**Limited use in shoreline areas; not practical in nesting areas.**
Over flights	**Noise from airplanes and helicopters may keep birds and wildlife away from impact areas.**	**Limited by weather conditions; not practical in nesting areas.**
Fencing and Netting	**Fencing and netting may be placed around impact areas to keep nestlings from entering.**	**Limited to areas accessible for fencing and netting**
Remove Sea Turtle Nests	**Remove nests from impact areas within 2 days**	**Element of time is essential**
Notify spill response personnel in boats to watch for manatees	**Conduct safety meeting to discuss safety issues concerning wildlife including manatees**	**Poor light & inclement weather conditions**
Helium filled balloons stationary figures	**Place balloons & figures in impact areas**	
Play recorded sounds of alarmed birds	**Play recorded sounds of alarmed birds in impact areas**	

F.2 Scenarios

Category	Scenario	Local/Facility/Contractor	Anadarko Regional/Corporate	Appendix
Spills & Releases	Contained Oil Spill	Belford Dolphin OPEP		VII
		Transocean Control and Mitigation Measures		III
		DWM Emergency Response Manual		IV
		Tidewater Marine Emergency Preparedness Manual		VI
	Oil Spill on Water	Belford Dolphin Offshore Emergency Procedures Manual	ERP & OSCP-Response Procedure	I VIII
		Transocean Control and Mitigation Measures		III
		DWM Emergency Response Manual		IV
		Tidewater Marine Emergency Preparedness Manual		VI
	Chemical/Produced/ Water/Vapor/Gas/ Radioactive	Belford Dolphin Offshore Emergency Procedures Manual		I
		Transocean Control and Mitigation Measures		III
		DWM Emergency Response Manual		IV

Wells	Kick Management	DWM Emergency Response Manual		IV
	Blowout	Belford Dolphin Offshore Emergency Procedures Manual Transocean Control and Mitigation Measures DWM Emergency Response Manual	 ERP & OSCP-Response Procedure	I III IV VIII

Fire/ Explosion	Fire or Explosion	Belford Dolphin Offshore Emergency Procedures Manual Transocean Control and Mitigation Measures DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual	--- ERP & OSCP-Response Procedure	I III IV VI VIII

Personnel	Occupational Injury & Illness	Belford Dolphin Offshore Emergency Procedures Manual Tidewater Marine Emergency Preparedness Manual	ERP & OSCP-Response Procedure	I VI VIII
	Medical or Rescue Emergency (Medevac)	Belford Dolphin Offshore Emergency Procedures Manual DWM Medical Emergency Procedure Tidewater Marine Emergency Preparedness Manual	MedEvac Plan	I V II VI
	Deceased Personnel	Belford Dolphin Offshore Emergency Procedures Manual Tidewater Marine Emergency Preparedness Manual		I VI
	Missing Person	Belford Dolphin Offshore Emergency Procedures Manual DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual	---	I IV VI
	Rescue from Height		---	
	Man Overboard	Belford Dolphin Offshore Emergency Procedures Manual	---	I III

		Transocean Control and Mitigation Measures DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual		IV VI
Evacuation	Evacuate/Abandon Vessel/Facility	Belford Dolphin Offshore Emergency Procedures Manual DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual	---	I IV VI
	Regional/Country Evacuation			

Transportation	Collision / Hull Failure	Belford Dolphin Offshore Emergency Procedures Manual Transocean Control and Mitigation Measures DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual	---	I III IV VI
	Aviation	Belford Dolphin Offshore Emergency Procedures Manual Transocean Control and Mitigation Measures DWM Emergency Response Manual		I III IV
	Flooding / Excessive List	Transocean Control and Mitigation Measures Tidewater Marine Emergency Preparedness Manual		III VI
	Grounding	Belford Dolphin Offshore Emergency Procedures Manual Tidewater Marine Emergency Preparedness Manual	---	I VI
	Emergency Towing	Tidewater Marine Emergency Preparedness Manual	---	VI
	Journey Management		---	

Natural Disaster	Severe Weather	Belford Dolphin Offshore Emergency Procedures Manual DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual	ERP & OSCP-Response Procedure	I IV VI VIII

Operations	Facility Shutdown			---
	Loss of Stability	Belford Dolphin Offshore Emergency Procedures Manual Transocean Control and Mitigation Measures DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual		I III IV VI
	Business Continuity			
	DP Failure			

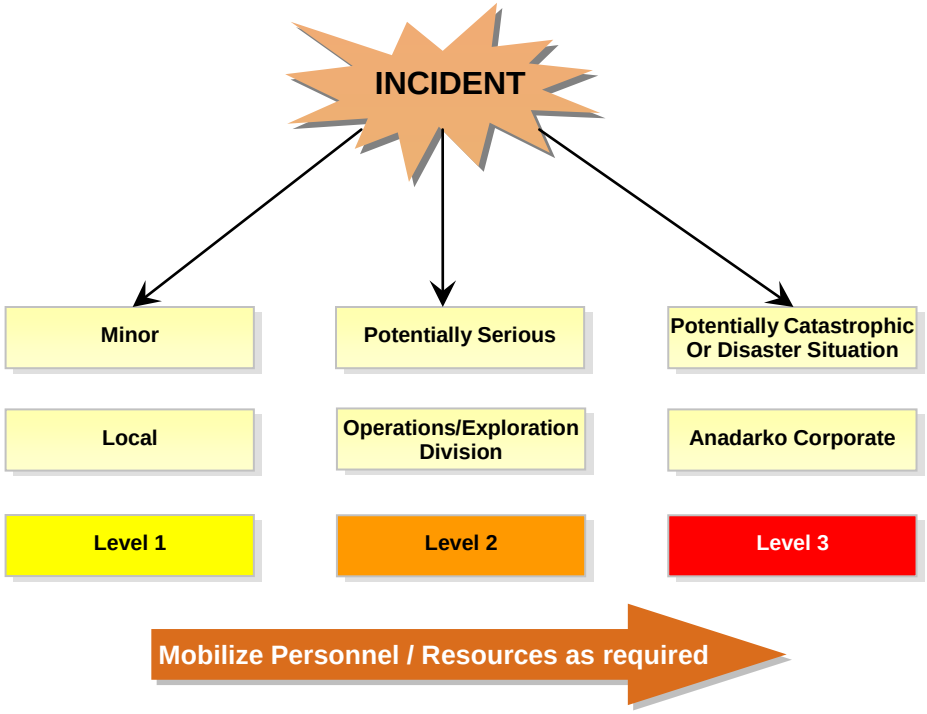
Security	Bomb Threat	Belford Dolphin Offshore Emergency Procedures Manual	ERP & OSCP-Response Procedure	I VIII
	Civil Unrest/Disorder/Acts of Violence	Belford Dolphin Offshore Emergency Procedures Manual DWM Emergency Response Manual Tidewater Marine Emergency Preparedness Manual	ERP & OSCP-Response Procedure	I IV VI VIII
	Kidnap/Missing Persons	Tidewater Marine Emergency Preparedness Manual	---	VI

Appendix VIII
Emergency Response Plan (ERP) &
Oil Spill Contingency Plan (OSCP) - Response Procedures

Section 1 – Response Procedures

1.1 Response Levels & Procedures

In order to properly respond to any emergency, incidents should be classified into one of three levels within Anadarko's Mozambique operating areas. The incident level is determined by the complexity of the incident, the risks to company personnel and the public, and the impact on the environment. These level classifications will be used to communicate to all personnel within the company and do not account for all circumstances.



	Level 1	Level 2	Level 3
Management Level	Superintendent/Foreman	Manager/General Manager/VP	Senior VP
Resources	Local / Facility	External Local/National	External National or International
Government Involvement	Requires Reporting w/ Minimal Follow-up	Immediate Reporting & Likelihood of Involvement	Immediate Reporting & Governmental Involvement
Public Impact	Evacuation in close proximity	Minor Injury/Illnesses Multiple evacuations	Serious Injury, illness or fatality(s), mass evacuations
Area Impact	Limited to Facility	Significant Impact to adjoining facilities	Will Impact External Locations and Pose Additional Risk to Community Locations Beyond Adjoining Locations
Emergency Actions	One Emergency Response Plan (ERP) active	Two ERP's active	Business Continuity Plan or 3 or more ERP's active

1.1 Response Levels & Procedures (Continued)

Below are 12 categories of incidents/risks that have been identified and may occur within Anadarko's operations. Each category has a series of possible incidents listed to better define the categories.

This listing helps in identifying the types of incidents which should be evaluated for each operation, and if likely to occur, to develop an incident-specific plan to properly respond to that incident. The plans should be developed based upon governmental requirements, best industry practices, experience of the ERT/EMT, and Anadarko's internal requirements.

Well Control Problems
- Kick During Drilling
- Blowout of oil
- Blowout of gas
- Radioactive source loss

Evacuations
- From a remote site
- Medical
- Due to civil unrest &/or natural disaster
- Country evacuation

Security
- Civil unrest / revolution
- Strike/ labor unrest
- Kidnap / extortion
- Terrorist threat / attack
- Bomb threat / alert
- Hijacking
- War
- Criminal activity
- Piracy

Spills
- Oil spill
- Other produced product
- Chemical / refined product release
- Produced water release
- Surface or ground water impact

Natural Disasters
- Typhoons / hurricanes / tornadoes
- Floods
- Earthquakes
- Volcanic eruptions
- Forest / grass fires

Anadarko Property Loss
- Could result from any of the listed incidents in many categories

Fire and/or Explosion
- Well
- Pipeline-internal &/or external to facilities
- Facility - equipment process
- Near facility with potential to impact ops

Toxic Releases
- H_2S or SO_2 gas release
- Storage tank - explosive / toxic release
- Gas product release
- Pipeline break / rupture & release off site
- Radioactive incident or source loss

Media / Public Relations
- Could result from any of the listed incidents in many categories

Personnel
- Injury or multiple injuries
- Fatalities
- Missing person(s)
- Medical event
- Evacuation because of injury / illness

Transportation - Personnel & Equipment
- Aircraft - lost or down
- Collisions
- Vessels - work, supply, crew, or standby
- Motor vehicles - buses, autos

Public Impacts
- Public &/or private property
- Community issues
- Environmental impacts
- Injury - Minor or Major
- Fatality
- Third part impacts

Response Procedures/Checklist
Table of Contents

1.2 Oil Spill

Initial Response Checklist	
Upon receiving indication of an oil spill, or other chemical release that may threaten the Waters of Mozambique, the following actions are critical to initiating and sustaining an effective response:	
Detection: Anadarko company employees, contractors, and subcontractors are responsible for maintaining a vigilant watch for oil spill discharges of any magnitude and reporting all discharges to management personnel. In the event the discharge is determined to be from a Anadarko facility or operation, the person in charge (OIM and/or Senior Company Representative) as well as on duty field personnel will take immediate action which may include but is not limited to the following:	
☐	Adopt a "Safety First" attitude throughout the duration of the emergency response, and continually ensure the safety of all personnel.
☐	Person discovering spill will: a) Sound alarm and notify Person in Charge immediately b) Shut off ignition points and restrict access to spill area; c) Isolate discharge source pending approval by Person in Charge.
☐	As quickly as possible, safely shut down the operation responsible for the discharge
☐	Conduct Hazard Assessment to determine the potential for fire, explosion, & hazardous/toxic vapors as well as to define Personal Protection Equipment (PPE) needed by responders.
☐	Identify & evacuate exclusion zone in vicinity of spill site until Hazard Assessment completed.
☐	Initiate notification of management personnel as well as required government agencies as promptly as possible *(Notification contacts located in Section 5).*
☐	The Person in Charge will assume the duties of Incident Commander until the IMT is mobilized and will then resume duties as the On Scene Commander *(Roles & Responsibilities located in Section 6).*
☐	Utilize air monitoring equipment to monitor vapors (I.e. flammable vapors) and required PPE until the response operation is completed.
☐	Notify Anadarko operations personnel (i.e., drilling/platform operators) as well as other company operations that may be impacted by the spill incident *(Notification contacts are located in Section 5).*
☐	The Person in Charge will initiate evacuation procedures in the event unsafe conditions persist to ensure personnel safety.
☐	Sample discharged material as requested by the Incident Commander by using accepted procedures to prevent sample contamination and to protect the legal validity of the sample.
☐	Initiate surveillance over flights of spill area at first light or as soon as possible with fixed wing or rotary wing aircraft (see section 1.2.5 for additional information)
☐	Video and photograph spill area daily during surveillance over flights for documentation and operational purposes, dependent upon weather conditions.
☐	Activate the Anadarko Houston IST dependent upon the severity of the emergency event.
☐	Notify Oil Spill Response Limited (OSR) to respond to the emergency dependent upon spill response requirements (On-Water Recovery & Dispersant Operations). See notification form in Section 10.

1.2 Oil Spill (Continued)

The following oil spill strategies (1.2.1-1.2.13) were developed by Oil Spill Response (OSR):

Oil Spill Response Strategies Contents

1.2.1 Strategy Selection

The following flow chart should be used to select which main oil spill response strategy is applicable depending on the exact situation at the time of the incident.

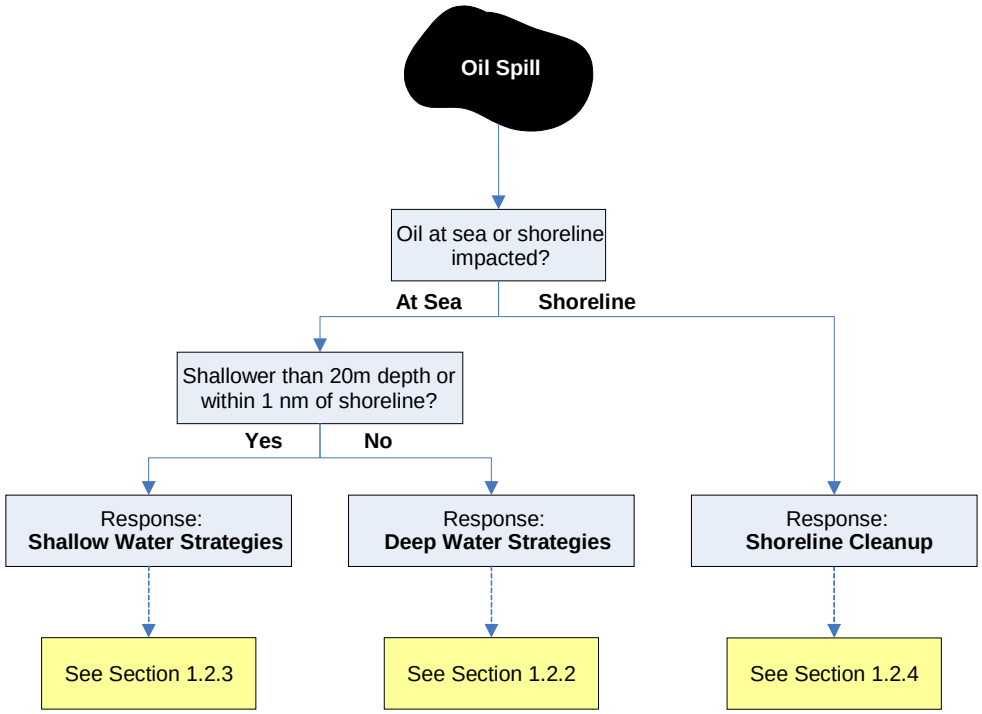


Figure 1-1: Strategy Selection Flow Chart

1.2 Oil Spill (Continued)

1.2.2 Deep Water Strategies Flowchart

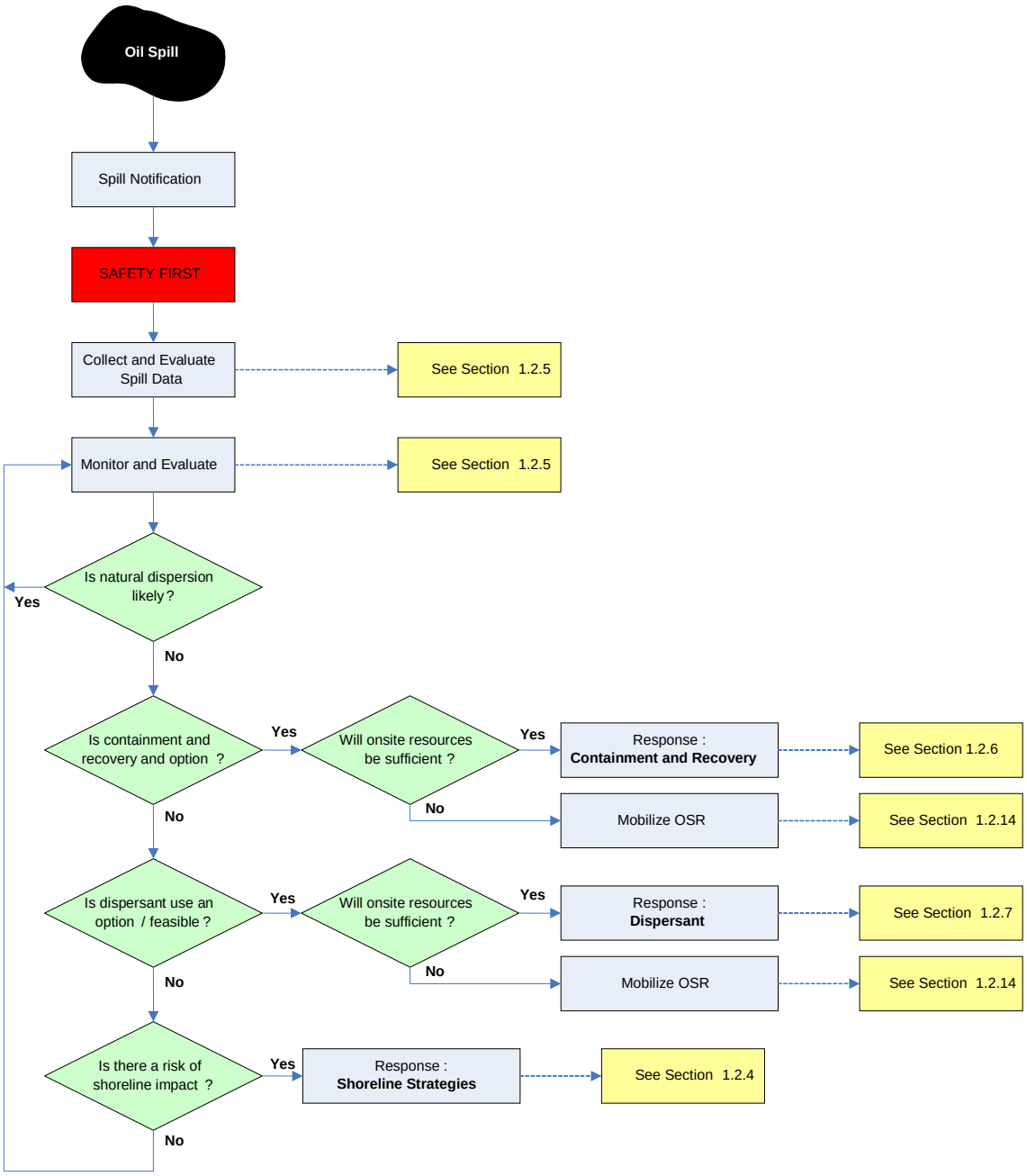


Figure 1-2: Deep Water Strategies Flow Chart

1.2 Oil Spill (Continued)

1.2.3 Shallow Water Strategies Flowchart

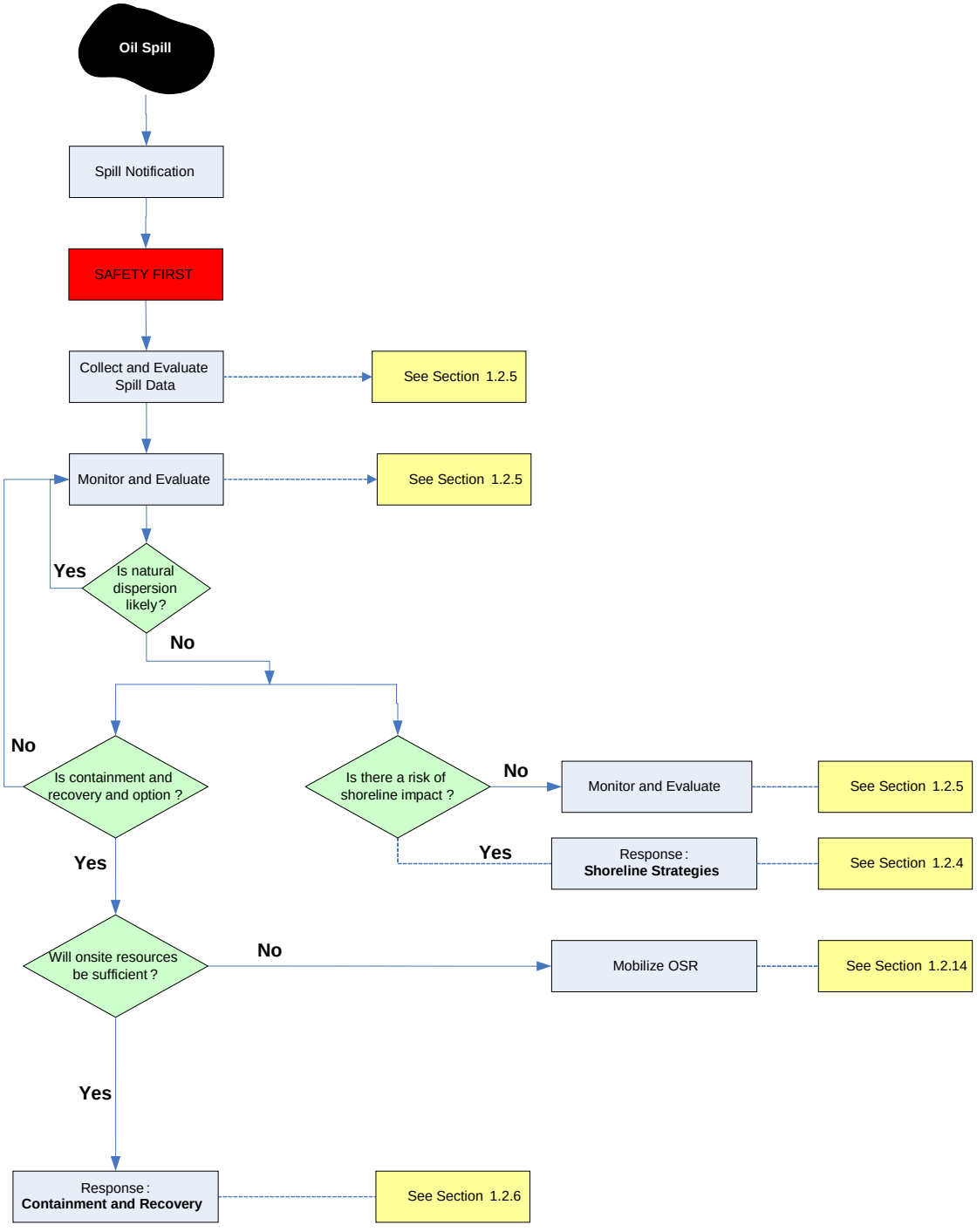


Figure 1-3: Shallow Water Strategies Flow Chart

1.2 Oil Spill (Continued)

1.2.4 Shoreline Cleanup Strategies Flowchart

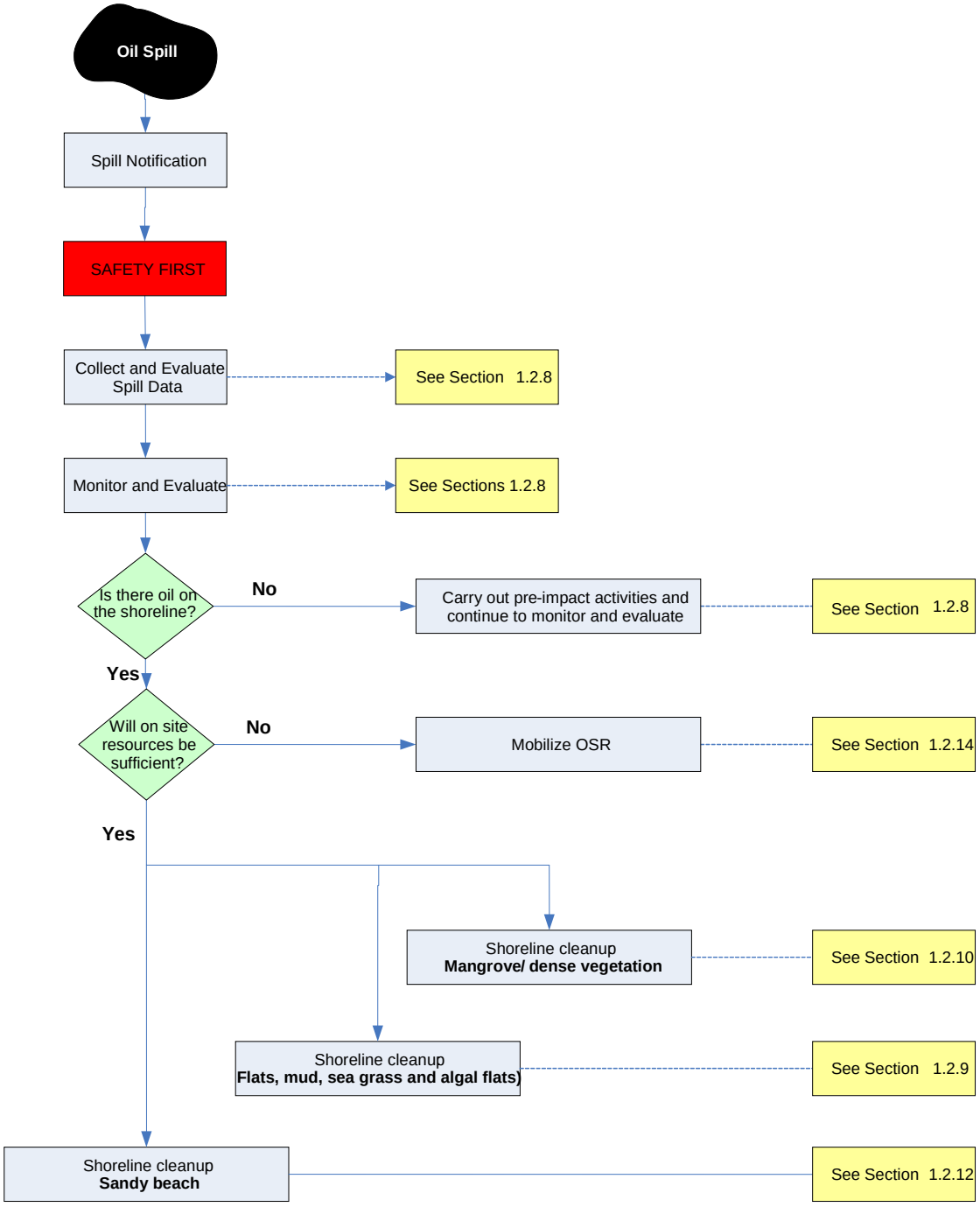


Figure 1-4: Shoreline Cleanup Strategies Flow Chart

1.2 Oil Spill (Continued)

1.2.5 Monitoring and Evaluation (Deep Water / Shallow Water)

1.2.5.1 Safety Considerations

Be aware of the volatile light ends and toxic gases of the oil e.g. gases such as H_2S can be potentially hazardous to life and may even be a danger during aircraft operations. Changes to a flight plan may be required to avoid the remit of the H_2S gas. Gas monitoring near the spill site / operations site will be required to detect the presence of such hazardous gases in accordance with Anadarko procedures and the guidance set out below.

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person. ✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date. ✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels. ✓ Only to be use by personnel trained in the correct operation. ✓ Always use a gas monitor when you are approaching site for the first time. ✓ Approach site from up wind. ✓ Work up wind from any contaminated area and continually gas monitor. ✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

1.2.5.2 Data Collection

After initial notification, data collection should be the first response to any incident following a hydrocarbon release onto water. This will enable the most suitable response strategy to be formulated. The information that needs to be collated should include, but not be limited to the following:

Oil Type and Volume	The assay sheet (contains the properties the oil) and MSDS (Material Safety Data Sheet) will primarily give safety advice and information required for both predicting the oil weathering / behavior and formulating a response plan.
Weather Conditions	These will affect the response options, safety considerations, the weathering of the oil and its trajectory.
Spill Trajectory	✓ Request a spill trajectory model from The Response Group (trajectory form found in Section 10.8) and/or OSR/EARL. This can be done at any time, day or night. ✓ A model will give an indication of where the oil is migrating and what resources may be impacted, e.g. another rig or the shoreline. ✓ A basic trajectory can be plotted manually; on a chart, plot one point per hour using 100% of the current and 3% of the predicted wind for that time. The resultant vector represents the predicted oil trajectory:

1.2 Oil Spill (Continued)

1.2.5 Monitoring and Evaluation (Deep Water / Shallow Water) (Continued)

1.2.5.2 Data Collection (Continued)

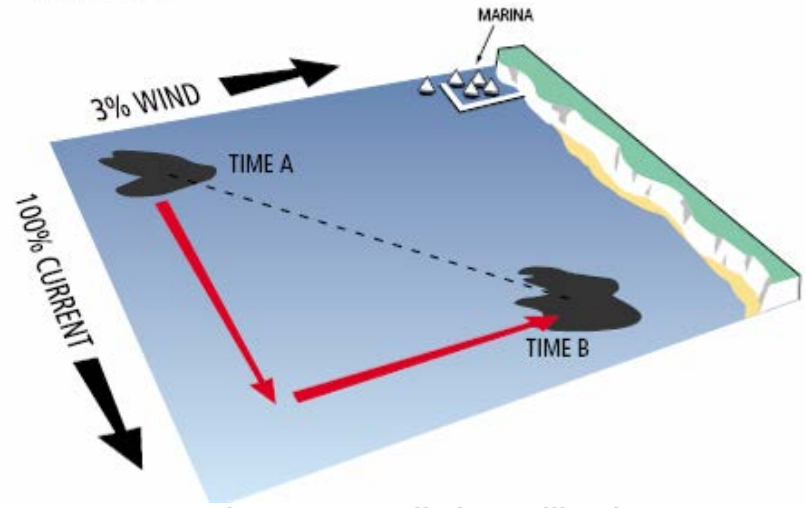


Figure 1-5 Predicting spill trajectory

1.2.5.3 Monitor and Evaluate

Oil is a naturally occurring product and, over time, will dissipate or evaporate. Especially with lighter oils that have a greater risk of explosion or release of toxic gases, if the oil is not going to impact any sensitive resources, it must be recognized that sometimes, the safest and most efficient response will be to let the product naturally dissipate. This will require regular monitoring to track the spill and ensure that other actions are taken in a timely manner if it looks likely to impact other resources, such as the coast line. Monitoring of oil spills is best carried out from a helicopter or small plane with a trained observer.

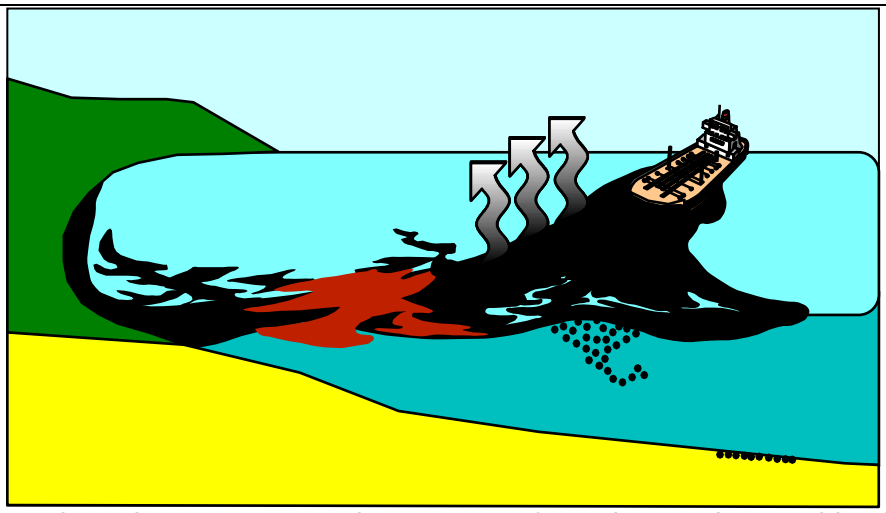
Technique	▪ Factors that should be considered when assessing oil spill movement and weathering include: ✓ Currents and tide ✓ Weather (including wind direction and speed), water temperature ✓ Spill size / volume. This can be estimated either from oil lost or from an aerial surveillance flight (see below) ✓ Type of oil spilled and its properties (viscosity, pour point, specific gravity, dispersion and evaporation. These can be found on the oil's assay sheet).

1.2 Oil Spill (Continued)

1.2.5 Monitoring and Evaluation (Deep Water / Shallow Water) (Continued)

1.2.5.3 Monitor and Evaluate (Continued)

Technique (Continued)



- ✓ Hydrocarbons move on the water surface due to the combined influence of 100% current and 3% wind. See Figure 1-5.
- ✓ The primary aim of a surveillance flight is to estimate the location of the spill. The secondary aim is to quantify the spill. This information will help to predict where impact may occur and formulate an appropriate response strategy.
- ✓ Over flights should carried out at dawn and dusk of each day after an incident until there is not more oil at sea to be seen.
- ✓ Flight paths should be conducted in a 'ladder search pattern'.

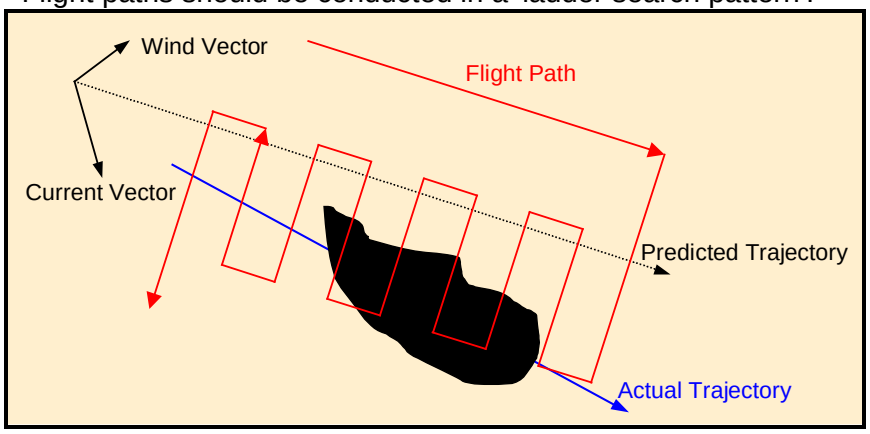


Figure 1-6 Over flight path

- ✓ All observations should be recorded, e.g. photographs, logs, GPS coordinates, etc.

1.2 Oil Spill (Continued)

1.2.5 Monitoring and Evaluation (Deep Water / Shallow Water) (Continued)

1.2.5.3 Monitor and Evaluate (Continued)

Technique cont.

Depending on the exact incident, the spill volume may be obtainable from the source, for example by knowing the volume of the lost / damaged inventory, flow rate, etc. If the volume cannot be determined this way, it can be calculated by observing the total area covered by the spill and estimating the different thicknesses of oil from its color combined with its proportion of the overall spill area. The relationship between slick color and thickness is provided in Table 1-1.

Code	Description - Appearance	Layer Thickness Interval (µm)	Litres per km^2
1	Sheen (silvery/grey)	0.04 to 0.30	40 – 300
2	Rainbow	0.30 to 5.0	300 – 5000
3	Metallic	5.0 to 50	5000 – 50,000
4	Discontinuous True Oil Color	50 to 200	50,000 – 200,000
5	Continuous True Oil Color	> 200	> 200,000

Table 1-1 The Bonn Agreement Oil Appearance Color Code – The relationship between slick color and thickness

- ✓ Surveillance can also be undertaken from a vessel / rig, however this is not as compressive as aerial options.

Avoid

- × Avoid confusing oil with other false image observations, e.g. algal blooms, seaweed / sea grass, cloud shadow, etc.

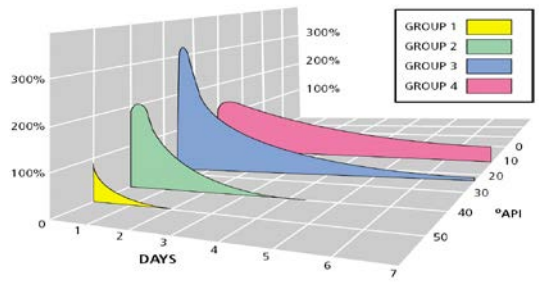
Equipment

Helicopter / fixed wing airplane, binoculars, chart / map, digital camera, GPS, sketchpad and pen.

Additional Guidance

The table below gives a useful guide to the behavior of different oil types. It is emphasized however, that this is only a guide and further oil spill computer modeling for individual product types should be carried out in the event of an incident.

Table 1-2 - Persistence guide for example products

Product	Persistence Guide
Kerosene / Jet A-1	
Gas Oil / Light Crude Oils	
Crude Oils	
Heavy Crudes / HFO	

(Source: ITOPF)

ITOPF: International Tanker Owners Pollution Federation Ltd

1.2.5.4 Waste Disposal

No waste will be generated from these activities.

1.2 Oil Spill (Continued)

1.2.6 Containment and Recovery Response (Deep Water / Shallow Water)

1.2.6.1 Safety Considerations

Safety considerations in this type of response include those posed by the oil e.g. toxic gas emission, risk of explosion (see product MSDS sheet), and those associated with operating at sea, using machinery and by natural hazards e.g. weather, sea, etc. If there is a risk of toxic gases or explosive gasses being present then gas monitoring should be conducted in accordance with Anadarko procedures and guidance set out below.

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person. ✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date. ✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels. ✓ Only to be use by personnel trained in the correct operation. ✓ Always use a gas monitor when you are approaching site for the first time. ✓ Approach site from up wind. ✓ Work up wind from any contaminated area and continually gas monitor. ✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

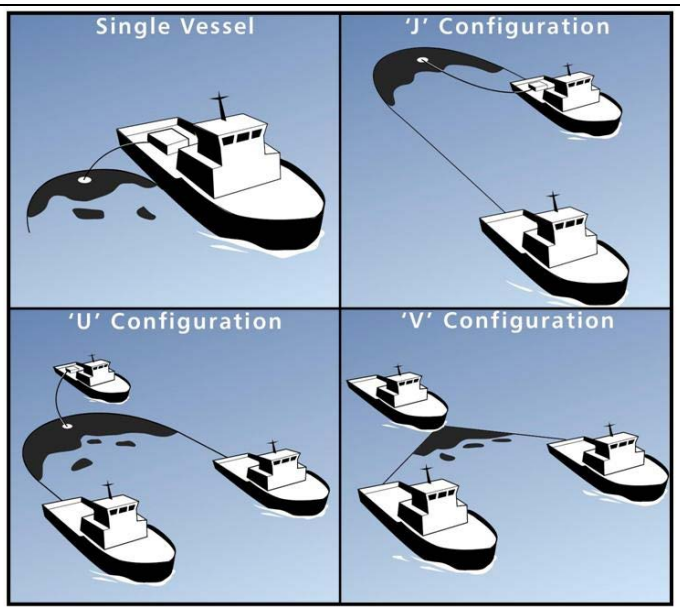
1.2.6.2 Containment and Recovery Options

Technique	
	✓ Boom (a floating barrier) should only be deployed by personnel who have been trained in the safe operation and deployment of containment and recovery strategies. ✓ Booms should be ideally towed with the current to limit failure. ✓ Skimmer (a mechanical oil recovery device) choice will be based on the viscosity of the oil. A weir skimmer is best suited to low viscosity oils, whereas a mechanical skimmer would be better suited to high viscosity oil. Oleophilic skimmers work best with light to medium viscosity oils and have a high oil to water recovery ratio. ✓ A variety of configurations can be used for containment and recovery. The choice will depend on how many vessels and what systems are available.

1.2 Oil Spill (Continued)

1.2.6 Containment and Recovery Response (Deep Water/Shallow Water) (Continued)

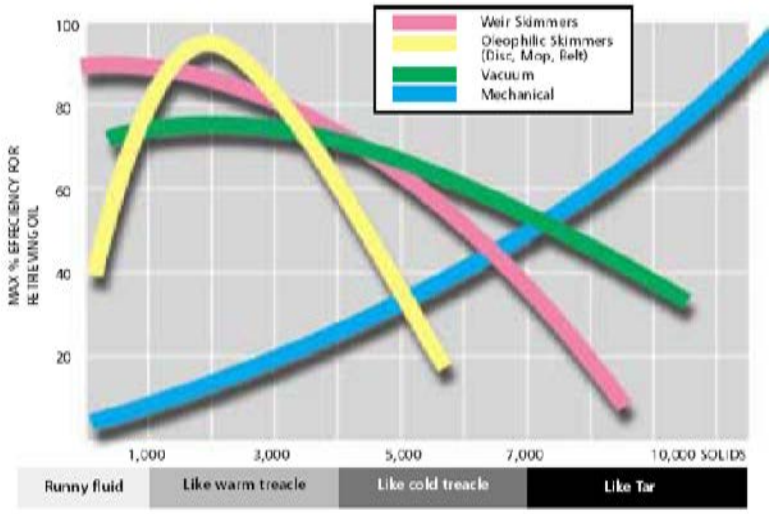
1.2.6.2 Containment and Recovery Options (Continued)

Technique (Continued)	 ***Figure 1-7 Possible containment and recovery options*** ✓ For offshore containment and recovery, there must be storage options available, e.g. slop tanks on the supply vessels, barges, inflatable storage barges, etc. ✓ Sorbents (material that can be used to absorb oil) could be use for absorption of very minor spills in calm conditions.
Avoid	× A boom may fail (loose oil at the apex) due to a number of possible reasons: • If the current speed is at right angles to the face of the boom and it exceeds 0.75 knots (0.36m/s). • If the boom is not flexible enough and can not flex with the swell. • If too much oil is collected in the apex of the boom it will seep underneath the boom. × Oleophilic skimmers should not be used after dispersant has been applied to the oil.
Additional Guidance	✓ Ensure there is a method for removing the oil from the boom. ✓ Ensure there is sufficient temporary storage for the oil and oily water once it has been removed from the boom by the skimmer. The figure below provides guidance on the suitability of different skimmers for different oil types

1.2 Oil Spill (Continued)

1.2.6 Containment and Recovery Response (Deep Water/Shallow Water) (Continued)

1.2.6.2 Containment and Recovery Options (Continued)

Additional Guidance (Continued)	 ***Figure 1-8 Performance of different skimmer types*** ✓ Following a spill incident, ensure all equipment is cleaned, serviced and consumables replaced.

1.2.6.3 Waste Disposal

Waste generated from this type of response will generate the following types of waste:

- Oil / water mix
- Oiled PPE
- Oiled debris
- Oiled sorbents

See Waste Management, Section 1.2.13, for further details.

1.2 Oil Spill (Continued)

1.2.7 Dispersant Response (Deep Water)

1.2.7.1 Safety Considerations

Safety considerations in this type of response include those posed by the oil e.g. toxic gas emission, risk of explosion (see product MSDS sheet), and those associated with operating at sea, using machinery and by natural hazards e.g. weather, sea, etc. There will also be hazards posed by the dispersants themselves e.g. exposure of skin to the dispersants and inhalation of dispersant droplets. The dispersant MSDS sheet should be read before handling to help determine the minimum level of PPE. If there is a risk of toxic gases or explosive gasses being present then gas monitoring should be conducted in accordance with Anadarko procedures and guidance set out below.

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person. ✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date. ✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels. ✓ Only to be use by personnel trained in the correct operation. ✓ Always use a gas monitor when you are approaching site for the first time. ✓ Approach site from up wind. ✓ Work up wind from any contaminated area and continually gas monitor. ✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

1.2.7.2 Dispersant Application Techniques

Dispersion of oil into the water column will occur naturally under the right conditions. Dispersant is a surfactant-based chemical than can be applied onto the oil slick to enhance natural dispersion of the oil into the water column. The subsequent formation of tiny oil droplets improves the opportunity for biodegradation. Dispersant spraying requires trained and experienced personnel to assist in calculating dosages and application rates, advice on safety, and to analyze the effectiveness of the spray operation.

Technique	✓ Dispersant can be sprayed from: • A vessel with hose adaptors. Do not spray directly from fire monitors as the droplet size will be too large and penetrate through the oil, rather than settle onto the surface. • A vessel with spray arms. Ensure that the spray arms are mounted towards the bow to ensure maximum efficiency. • A helicopter carrying a dispersant spray bucket. • An aircraft (large or small) with bespoke spray arms. Accurate targeting of aerial dispersant application should be monitored by another aerial asset.

1.2 Oil Spill (Continued)

1.2.7 Dispersant Response (Deep Water) (Continued)

1.2.7.2 Dispersant Application Techniques (Continued)

Technique (Continued)	✓ For modern concentrate dispersants, use an application rate of about 1: 20 – 1:50. Read manufacturers data for guidance on the correct rate. ✓ The effectiveness of the dispersant on the oil slick must be monitored, and this is best done by observing the sprayed area from the air or a vessel. The observations should be made about 30 minutes after spraying. Where there is a coffee-coloured plume in the water, this generally indicates effective dispersion of the oil. Where the oil has resurfaced there will be black patches. White clouds of dispersant in the water indicate the dispersant is not acting effectively on the oil.
Avoid	× Do not use in water depths less than 20m or within 1 nautical mile of the shoreline. × Do not use on light oils such as diesel, light products such as condensates or on sheen. Dispersants may become less efficient with oils of a higher viscosity (above 3000 – 5000 cSt) or that are emulsified. Field-testing prior to application is required on these oils, and increased and more vigilant monitoring. × Dispersant is unlikely to be effective on very heavy oils or heavily emulsified oils. × Do not spray in high winds (~35mph) or in conditions which is dangerous to do so.
Additional Guidance	✓ Ensure dispersant is approved for use by relevant authority. Appropriate authorisation must be obtained before applying any dispersant. ✓ Dispersants must be labelled, with correct health and safety supporting documentation. ✓ Ensure correct PPE is available for use by response teams. ✓ Field test effectiveness of the dispersant on the oil if there is doubt of the efficiency prior to application. ✓ Adjust the speed of vessel / aircraft and pump rate to change the dosage rate. ✓ Dispersants to be applied by spray only. Spray sets to be purpose designed to ensure correct droplet size. ✓ Following a spill incident, ensure dispersant stocks are replenished.

Figure 1-9 Vessel delivery system

Figure 1-10 Airborne delivery system

1.2 Oil Spill (Continued)

1.2.7 Dispersant Response (Deep Water) (Continued)

1.2.7.3 Waste Disposal

A small amount of waste may be generated from this response option:

- Soiled PPE
- Empty dispersant containers

See Waste Management, Section 1.2.13, for further details.

1.2.8 Data Collection, Monitoring and Evaluation (Shoreline)

1.2.8.1 Data Collection

After initial notification, data collection should be the first response to any incident following a hydrocarbon release on to water. This will enable the most suitable response strategy to be formulated. The information that needs to be collated should include, but not be limited to the following:

Oil type and volume	The assay sheet and MSDS will primarily give safety advice and formulating a response plan.
Weather conditions	These will affect the response options, safety considerations, the weathering of the oil
Spill trajectory (if oil still at sea)	Request a spill trajectory model from The Response Group (trajectory form found in Section 10.8). OSR can also provide this service. This can be done at any time of the day or night. This will give an indication of where the oil is going and what areas, e.g. another platform or the shoreline, could become oiled / impacted. A trajectory can be plotted manually; on a chart, plot one point per hour using a vector of 100% of the current and 3% of the predicted wind for that time, or oils spill computer modeling can be requested.

1.2.8.2 Shoreline surveying

Pre-cleaning and shoreline surveying should take place, if possible, before the oil comes ashore. Basic pre-cleaning involves moving beach debris to above the high water mark and should only be done on firm substrates i.e. sandy beaches, not mud flats or mangroves. This will reduce the amount of oiled waste that needs to be disposed of. Shoreline surveying before the oil comes ashore will help the clean up return it to its original state.

1.2 Oil Spill (Continued)

1.2.8 Data Collection, Monitoring and Evaluation (Shoreline) (Continued)

1.2.8.3 Monitor and Evaluate

Oil is a naturally occurring product and, over time, will dissipate or evaporate. Especially with lighter oils that have a greater risk of explosion or release of toxic gases, it must be recognized that sometimes, the safest and most efficient response will be to let the product naturally dissipate. For low energy habitats, such as mangroves, mud flats and algal flats, more harm than good can come from invasive cleaning techniques as entry to the areas will cause the oil to become entrained into the substrate. This will require regular monitoring and liaison with the local communities to help understand the response methods.

This obviously depends on the type of product, which has spilled and what resources it has impacted. Monitoring of oil spills on shorelines can be carried out by foot, boat or aircraft. Surveying by foot should only carried out over firm or solid substrates e.g. sandy or rocky beaches. Mud flats and mangroves should avoid being walked through as this will mix in the oil and damage the substrate. Be aware of the volatile light ends and toxic gases e.g. H_2S. An aircraft is a quick and efficient way to view a large amount of shoreline in a short space of time but may miss light oiling that can be seen on foot. Strategy discussions should include the advice of local stakeholders and relevant government officials.

1.2.8.4 Waste Disposal

Oiled waste is generally not generated from these activities. If there is any oiled PPE that requires disposing of from beach surveying, see Waste Management, Section 1.2.13, for further details.

1.2.9 Mudflats / Algal Flats Response Strategies (Shoreline)

1.2.9.1 Safety

Safety considerations in this type of response include those posed by the oil e.g. toxic gas emission, risk of explosion (see product MSDS sheet), by natural hazards e.g. weather, tides and machinery operation. Also be aware of personnel and equipment of becoming stuck in the mud. If there is a risk of toxic gases or explosive gasses being present then gas monitoring should be conducted in accordance with Anadarko procedures and guidance set out below.

1.2 Oil Spill (Continued)

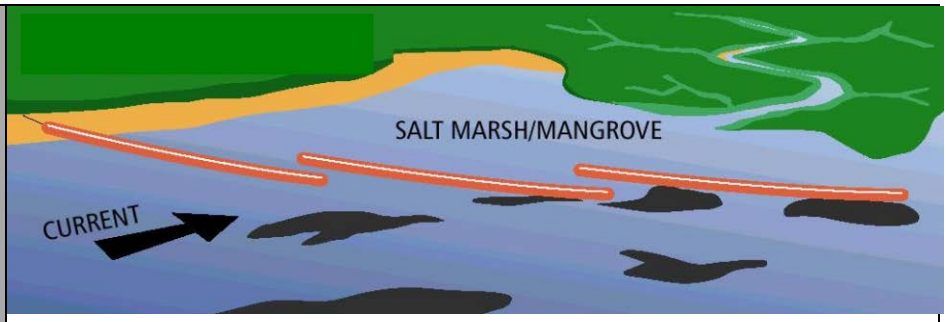
1.2.9 Mudflats / Algal Flats Response Strategies (Shoreline) (Continued)

1.2.9.1 Safety (Continued)

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person. ✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date. ✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels. ✓ Only to be use by personnel trained in the correct operation. ✓ Always use a gas monitor when you are approaching site for the first time. ✓ Approach site from up wind. ✓ Work up wind from any contaminated area and continually gas monitor. ✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

1.2.9.2 Shoreline Protection

Booms can be used to protect installations or sensitive areas from oiling and a cascade system can be used where near shore sensitive areas are at risk. Long boom lengths are required for this strategy.

Diagram	
Technique	✓ Booms can be used to redirect oil away from a sensitive site or area towards a selected location where shoreline cleanup may be easier and more effective. ✓ This may be achieved by using the cascade booming method, as in inland waterway containment. ✓ Booms can also exclude oil by providing a barrier around a resource or embayment (e.g. river mouth, lagoon entrance etc.).
Avoid	× Do not use heavy machinery to get to the shoreline, as this will cause long-term damage the structure of the flats.

1.2 Oil Spill (Continued)

1.2.9 Mudflats / Algal Flats Response Strategies (Shoreline) (Continued)

1.2.9.2 Shoreline Protection (Continued)

Equipment	***Sorbent boom*** A sorbent boom may be deployed in areas where the current speed flows at <0.7 knots. Consider, where possible, storing sorbent booms close to areas at risk from oil spills, such as pipeline crossings. This would allow more rapid deployment in the event of a spill. Sorbent recovery is more labor intensive than other skimming methods. ***Skor Boom*** Skor Boom combines the characteristics of sorbent boom and the conventional containment boom. It is highly absorbent and can be deployed 3 times longer than conventional sorbent boom. It has a high absorbency for a wide range of crude and refined oils. ***Shore Sealing Boom*** Special booms have been designed for use in intertidal areas, which are able to move up and down with the tide and maintain a good seal between the boom and the shoreline to stop oil escaping underneath. They have an air chamber for buoyancy on top of two water ballast chambers at the base, which follow the contour of the shore / the tidal patterns when aground and form a sub-surface barrier to oil when afloat. ***Nearshore Boom*** These booms are best used in areas which are reasonably sheltered such as estuaries, rivers, shoreline, and harbors. Inflatable versions can be stored in a relatively small volume but they are prone to damage from abrasion.

1.2.9.3 Clean-up

Shoreline clean-up is usually labor intensive. Once oil is stranded onshore, a response to an oil spill normally changes from an emergency to a project and will need to be managed as such.

It is important to note that the use of inappropriate techniques and inadequate organization can aggravate rather than mitigate the extent of the damage caused by the pollution. There are three stages in the cleanup of shoreline contamination:

Stage 1 Removal of floating oil at the water's edge and thick concentrations on the shore.

Stage 2 Clean-up of moderate contamination, stranded oil and oiled beach materials.

Stage 3 Clean-up of lightly contaminated shorelines and final polishing (i.e. removal of oil stains).

1.2 Oil Spill (Continued)

1.2.9 Mudflats / Algal Flats Response Strategies (Shoreline) (Continued)

1.2.9.3 Clean-up (Continued)

Oil is a naturally occurring product and, over time, will dissipate or evaporate. Especially with lighter oils that have a greater risk of explosion or release of toxic gases, it must be recognized that sometimes, the safest and most efficient response will be to let the product naturally dissipate. Mudflats are a low energy environment and more harm than good can come from invasive cleaning techniques as entry to the areas will cause the oil to become entrained into the substrate. This will require regular monitoring and liaison with the local communities to help understand the response methods. Before attempting any shoreline clean-up operation it is most important to take guidance from recognized environmental organizations as to the most sensitive approach to adopt.

Technique	✓ Consult with experts familiar with the areas ecology. ✓ Use booms to protect areas not impacted. ✓ A combination of safety considerations and the possible entrainment of oil into the substrate by cleanup crews may conclude that the most effective strategy would be to allow the oil to naturally dissipate. Continue to monitor the area. ✓ Oil can be sometimes be remobilized from the shoreline by using low-pressure flushing with sea water. This is when sea water is pumped to the top of the shore and allowed to flow down to the waterline and where it can then be collected with a skimmer. ✓ Recovery operations can be carried out from a flat bottom boat. ✓ Sorbents can be used on small patches of accessible oil. Consider the use of natural sorbents to reduce the necessity of recovery and disposal the artificial sorbent materials. ✓ If approved use light equipment for manual cleanup.
Avoid	× Do not use heavy machinery or vehicles on these areas. × Do not force oil into the substrate. × Be aware of tidal ranges and ensure personnel are not caught out by the tide. × People walking in these areas unless the substrate will support them and the damage is limited.
Additional Guidance	

Method	Light 	Medium 	Heavy 
Natural	✓	✓	✓
Low Pressure Flush	✓	✓	✓
Manual			✓
Sorbents	✓	✓	✓

✓ Preferred Method ✓ Suitable for relatively small amounts of oil

1.2 Oil Spill (Continued)

1.2.9 Mudflats / Algal Flats Response Strategies (Shoreline) (Continued)

1.2.9.4 Waste Disposal

Waste generated from this type of response will generate the following types of waste:

- Oil / Water mix
- Oiled PPE
- Oiled debris
- Oiled sorbents
- Oiled dead wildlife

See Waste Management, Section 1.2.13 for further details

1.2.10 Mangroves Response Strategies (Shoreline)

1.2.10.1 Safety

Safety considerations in this type of response include those posed by the oil e.g. toxic gas emission, risk of explosion (see product MSDS sheet), by natural hazards e.g. weather, tides and machinery operation. If there is a risk of toxic gases or explosive gasses being present then gas monitoring should be conducted in accordance with Anadarko procedures and guidance set out below.

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person.
✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date.
✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels.
✓ Only to be use by personnel trained in the correct operation.
✓ Always use a gas monitor when you are approaching site for the first time.
✓ Approach site from up wind.
✓ Work up wind from any contaminated area and continually gas monitor.
✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

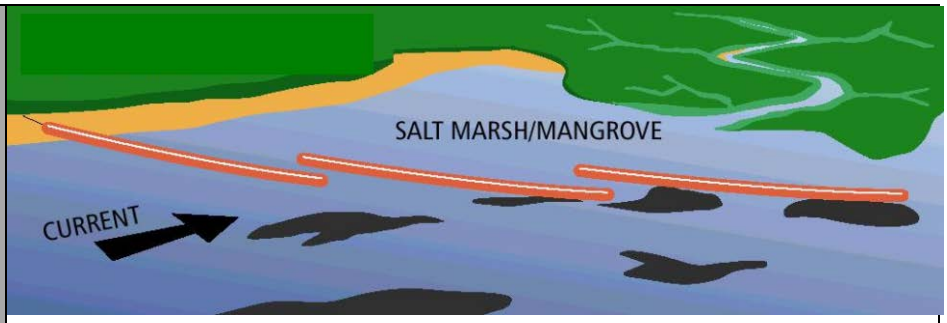
1.2.10.2 Shoreline Protection

Booms can be used to protect installations or sensitive areas from oiling and a cascade system can be used where near shore sensitive areas are at risk. Long boom lengths are required for this strategy.

1.2 Oil Spill (Continued)

1.2.10 Mangroves Response Strategies (Shoreline) (Continued)

1.2.10.2 Shoreline Protection (Continued)

Diagram	
Technique	✓ Booms can be used to redirect oil away from a sensitive site or area towards a selected location where shoreline cleanup may be easier and more effective. ✓ For example, oil could be directed away from a sensitive mangrove area towards a beach, which is easier to clean. ✓ This may be achieved by using the cascade booming method, as in inland waterway containment. ✓ Booms can also exclude oil by providing a barrier around a resource or embayment (e.g. river mouth, lagoon entrance etc.).
Avoid	× Do not use heavy machinery to get to the shoreline, as this will cause long-term damage the structure of the flats.
Equipment	***Sorbent boom*** A sorbent boom may be deployed in areas where the current speed flows at <0.7 knots. Consider, where possible, storing sorbent booms close to areas at risk from oil spills, such as pipeline crossings. This would allow more rapid deployment in the event of a spill. Sorbent recovery is more labor intensive than other skimming methods. ***Skor Boom*** Skor Boom combines the characteristics of sorbent boom and the conventional containment boom. It is highly absorbent and can be deployed 3 times longer than conventional sorbent boom. It has a high absorbency for a wide range of crude and refined oils. ***Shore Sealing Boom*** Special booms have been designed for use in intertidal areas, which are able to move up and down with the tide and maintain a good seal between the boom and the shoreline to stop oil escaping underneath. They have an air chamber for buoyancy on top of two water ballast chambers at the base, which follow the contour of the shore / tidal range when aground and form a sub-surface barrier to oil when afloat. ***Nearshore Boom*** These booms are best used in areas which are reasonably sheltered such as estuaries, rivers, shoreline, and harbors. Inflatable versions can be stored in a relatively small volume but they are prone to damage from abrasion.

1.2 Oil Spill (Continued)

1.2.10 Mangroves Response Strategies (Shoreline) (Continued)

1.2.10.3 Clean up

Shoreline clean-up is usually labor intensive. Once oil is stranded onshore, a response to an oil spill normally changes from an emergency to a project and will need to be managed as such.

It is important to note that the use of inappropriate techniques and inadequate organization can aggravate rather than mitigate the extent of the damage caused by the pollution. There are three stages in the cleanup of shoreline contamination:

Stage 1 Removal of floating oil at the water's edge and thick concentrations on the shore.

Stage 2 Clean-up of moderate contamination, stranded oil and oiled beach materials.

Stage 3 Clean-up of lightly contaminated shorelines and final polishing (i.e. removal of oil stains).

Oil is a naturally occurring product and, over time, will dissipate or evaporate. Especially with lighter oils that have a greater risk of explosion or release of toxic gases, it must be recognized that sometimes, the safest and most efficient response will be to let the product naturally dissipate. Mangroves are a low energy environment and more harm than good can come from invasive cleaning techniques as entry to the areas will cause the oil to become entrained into the substrate. This will require regular monitoring and liaison with the local communities to help understand the response methods. Before attempting any shoreline clean-up operation it is most important to take guidance from recognized environmental organizations as to the most sensitive approach to adopt.

Technique	✓ Give priority to protection of mangroves. ✓ Consult with the experts to what (or if) a cleanup should be carried out. ✓ A combination of safety considerations and the possible entrainment of oil into the substrate by cleanup crews may conclude that the most effective strategy would be to allow the oil to naturally dissipate. Continue to monitor the area. ✓ Low pressure, salt water flushing maybe used remobilize the oil and to herd it into collection points where it can then be collected with a skimmer. ✓ If using sorbents, use natural materials, as it may be impractical to recover them. ✓ Set up devices to scare birds from the area.
Avoid	× Avoid any cosmetic cleanup. × Do not enter the area with heavy equipment. × Avoid walking/driving in the mangroves to carry out flushing. × Avoid removing any substrate, except in extreme circumstances.

1.2 Oil Spill (Continued)

1.2.10 Mangroves Response Strategies (Shoreline) (Continued)

1.2.10.3 Clean up (Continued)

Additional Guidance	Method	Light 	Medium 	Heavy 
	Natural	✓	✓	✓
	Low Pressure Flush	✓	✓	✓
	Manual			✓
	Sorbents	✓	✓	✓
	✓ Preferred Method ✓ Suitable for relatively small amounts of oil			

1.2.10.4 Waste Disposal

Waste generated from this type of response will generate the following types of waste:

- Oil / Water mix
- Oiled PPE
- Oiled debris
- Oiled sorbents

See Waste Management, Section1.2.13 for further details

1.2.11 Sandy Beach Response Strategies (Shoreline)

1.2.11.1 Safety

Safety considerations in this type of response include those posed by the oil e.g. toxic gas emission, risk of explosion (see product MSDS sheet), by natural hazards e.g. weather, tides and machinery operation. If there is a risk of toxic gases or explosive gasses being present then gas monitoring should be conducted in accordance with Anadarko procedures and guidance set out below.

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person.
✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date.
✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels.
✓ Only to be use by personnel trained in the correct operation.
✓ Always use a gas monitor when you are approaching site for the first time.
✓ Approach site from up wind.
✓ Work up wind from any contaminated area and continually gas monitor.
✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

1.2 Oil Spill (Continued)

1.2.11 Sandy Beach Response Strategies (Shoreline)

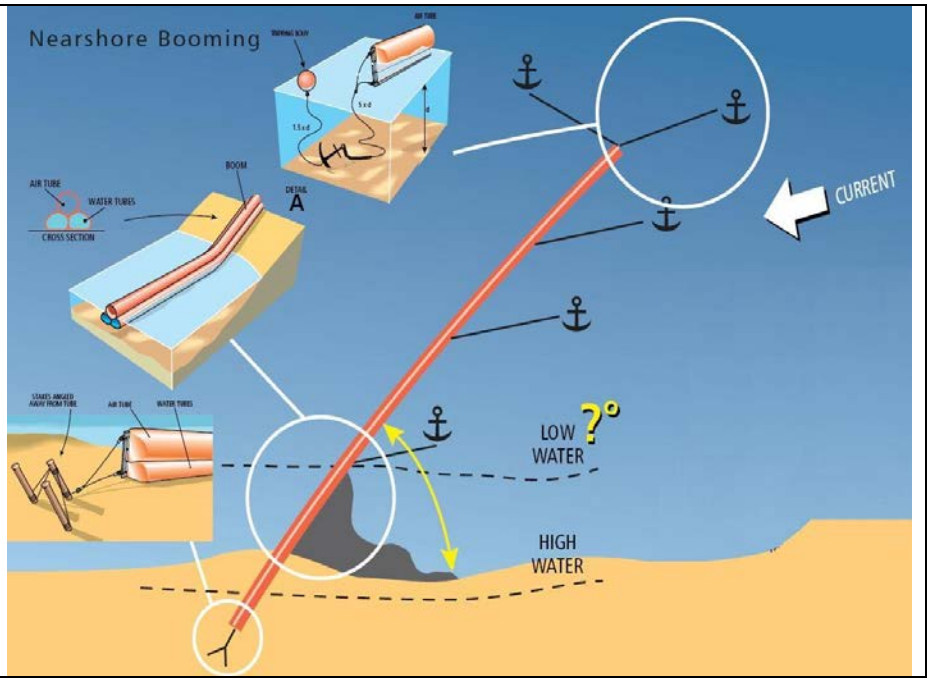
1.2.11.1 Safety

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person.
✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date.
✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels.
✓ Only to be use by personnel trained in the correct operation.
✓ Always use a gas monitor when you are approaching site for the first time.
✓ Approach site from up wind.
✓ Work up wind from any contaminated area and continually gas monitor.
✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

1.2.11.2 Shoreline Protection

Booms can be used to protect installations or sensitive areas from oiling and a cascade system can be used where nearshore sensitive areas are at risk. Long boom lengths are required for this strategy.

Diagram	



1.2 Oil Spill (Continued)

1.2.11 Sandy Beach Response Strategies (Shoreline) (Continued)

1.2.11.2 Shoreline Protection (Continued)

Technique	✓ Booms can be used to redirect oil away from a sensitive site or area towards a selected location where shoreline cleanup may be easier and more effective. ✓ For example, oil could be directed away from a sensitive mangrove area towards a firm, sandy beach, which is easier to clean. ✓ This may be achieved by using the cascade booming method, as in inland waterway containment. ✓ Booms can also exclude oil by providing a barrier around a resource or embayment (e.g. river mouth, lagoon entrance etc.).
Avoid	× Do not use heavy machinery to get to the shoreline, as this will cause long-term damage the structure of the flats.
Equipment	***Sorbent boom*** A sorbent boom may be deployed in areas where the current speed flows at <0.7 knots. Consider, where possible, storing sorbent booms close to areas at risk from oil spills, such as pipeline crossings. This would allow more rapid deployment in the event of a spill. Sorbent recovery is more labor intensive than other skimming methods. ***Skor Boom*** Skor Boom combines the characteristics of sorbent boom and the conventional containment boom. It is highly absorbent and can be deployed 3 times longer than conventional sorbent boom. It has a high absorbency for a wide range of crude and refined oils. ***Shore Sealing Boom*** Special booms have been designed for use in intertidal areas, which are able to move up and down with the tide and maintain a good seal between the boom and the shoreline to stop oil escaping underneath. They have an air chamber for buoyancy on top of two water ballast chambers at the base, which follow the contour of the shore when aground and form a sub-surface barrier to oil when afloat. ***Nearshore Boom*** These booms are best used in areas which are reasonably sheltered such as estuaries, rivers, shoreline, and harbors. Inflatable versions can be stored in a relatively small volume but they are prone to damage from abrasion.

1.2.11.3 Clean up

Shoreline clean-up is usually labor intensive. Once oil is stranded onshore, a response to an oil spill normally changes from an emergency to a project and will need to be managed as such.

1.2 Oil Spill (Continued)

1.2.11 Sandy Beach Response Strategies (Shoreline) (Continued)

1.2.11.3 Clean up (Continued)

It is important to note that the use of inappropriate techniques and inadequate organization can aggravate rather than mitigate the extent of the damage caused by the pollution. There are three stages in the cleanup of shoreline contamination:

Stage 1 Removal of floating oil at the water's edge and thick concentrations on the shore.

Stage 2 Clean up of moderate contamination, stranded oil and oiled beach materials.

Stage 3 Clean up of lightly contaminated shorelines and final polishing (i.e. removal of oil stains).

Oil is a naturally occurring product and, over time, will dissipate or evaporate. Especially with lighter oils that have a greater risk of explosion or release of toxic gases, it must be recognized that sometimes, the safest and most efficient response will be to let the product naturally dissipate. In a low energy environment and more harm than good can come from invasive cleaning techniques as entry to the areas will cause the oil to become entrained into the substrate. This will require regular monitoring and liaison with the local communities to help understand the response methods. Before attempting any shoreline clean-up operation it is most important to take guidance from recognized environmental organizations as to the most sensitive approach to adopt.

Technique	✓ Consider seasonal effect on amenity/ecological impact to determine level of cleanup required. ✓ For severe oiling, boards maybe fitted to mechanical equipment to herd the oil into storage areas. Ensure temporary storage pits are lined. ✓ With heavy oils, it is often the preferred option to manually remove the oil and oily sand. Earthmoving equipment may be used if the beach will support it. With lighter oils, such as light crudes, the surface oil can be mobilized by flushing the beach with high volumes of salt water. Lightly contaminated sand can also be moved into surf, if available. This will use natural energy within the surf to remove the oil from the sand.
Avoid	× Over cleaning or removing any more sand that is necessary. Removal may increase beach erosion and will increase disposal issues. × Machinery or personnel running over contaminated beach and pushing oil into the substrate. × Digging storage pit below the high waterline. × Avoid burying the oil in the sand. × High-pressure washing. × Re-oiling of adjacent beaches. Use booms to keep oil on site. × Avoid cross contamination of oil into clean areas. Set up clean down areas. × Disturbing wildlife especially in breeding seasons

1.2 Oil Spill (Continued)

1.2.11 Sandy Beach Response Strategies (Shoreline) (Continued)

1.2.11.3 Clean up (Continued)

Additional Guidance	Method	Light 	Medium 	Heavy 
	Natural	✓	✓	✓
	Low Pressure Flush	✓	✓	
	Manual	✓	✓	✓
	Mechanical		✓	✓
	Surf wash	✓	✓	✓
	Sorbents		✓	✓
	✓ Preferred Method ✓ Suitable for relatively small amounts of oil			

1.2.11.4 Waste Disposal

Waste generated from this type of response will generate the following types of waste:

- Oil / Water mix
- Oil / sand mix
- Oiled PPE
- Oiled debris
- Oiled sorbents

See Waste Management, Section 1.2.13, for further details.

1.2.12 Wildlife Protection Strategies (Shoreline)

1.2.12.1 Safety

Safety considerations in this type of response include those posed by the oil e.g. toxic gas emission, risk of explosion (see product MSDS sheet), by natural hazards e.g. weather, tides and machinery operation and by the handling of wildlife. The handling of wildlife is best left to experienced personnel as this will also reduce the stress that the animals can be put under whilst being handled. If there is a risk of toxic gases or explosive gasses being present then gas monitoring should be conducted in accordance with Anadarko procedures and guidance set out below.

1.2 Oil Spill (Continued)

1.2.12 Wildlife Protection Strategies (Shoreline) (Continued)

1.2.12.1 Safety (Continued)

Gas monitoring guidance
✓ Set up of monitors should be undertaken in accordance to manufacturer's specifications by a competent person. ✓ Ensure gas monitors are maintained by a competent person. Do not use if the monitor is not within its calibration date. ✓ Turn on gas monitors in 'clean air' before reaching site to ensure that they are reading correct background levels. ✓ Only to be use by personnel trained in the correct operation. ✓ Always use a gas monitor when you are approaching site for the first time. ✓ Approach site from up wind. ✓ Work up wind from any contaminated area and continually gas monitor. ✓ If any gas monitor alarms start ringing, remove all personnel from site until further monitoring confirms that it is safe to resume work.

1.2.12.2 Wildlife at Risk

See Section 8.2 for details on environmental and wildlife at risk.

Technique	✓ Hazing – by scaring birds away it prevents them from becoming oiled. These can be done with noise devices (e.g. propane cannons, guns, horns) or with visual devices (e.g. helium balloons, strings of bunting, stationary figures). Hazing should be performed pre-impact as well as after impacted. ✓ Fencing and netting can be placed around small areas of contamination to prevent wildlife from wandering in and becoming oiled.
Avoid	× Avoid handling wildlife as this can cause extreme stress to the animals. × Do not use hazing around nesting areas as this will only serve to keep the adults away from feeding their young. × Vary the methods of hazing to avoid the birds getting too acclimatized to one type. × Spill response boat handlers should take care to avoid manatees when they are operating in manatee habitats.
Additional Guidance	Experienced oiled wildlife responders should be used to handle all wildlife related issues, including capture, cleaning and rehabilitation.

1.2 Oil Spill (Continued)

1.2.12 Wildlife Protection Strategies (Shoreline) (Continued)

1.2.12.3 Waste Disposal

Hazing should not generate any waste but a full wildlife response will generate the following types of waste:

- Oil / water / detergent mix
- Oiled PPE
- Oiled / dead wildlife
- Oiled debris
- Other biological wastes such as food scraps.

See Waste Management, Section 1.2.13, for further details

1.2.13 Waste Management (Deep Water / Shallow Water / Shoreline)

Most oil spill operations, particularly those onshore, result in the collection of oil and oily debris, which must eventually be dealt with and disposed of in such a way to cause as minimal impact as possible for the future.

Waste management is a major logistics issue during a large oil spill and can impact the entire response operation by causing delays and increasing costs unless suitable arrangements can be made. If there is no temporary storage to deposit recovered oil, the recovery process will have to come to a halt. Similarly, if there is no transport to take oily waste away, the temporary storage facilities will become full and the response operations will have to come to an end. Oily waste is classified as a hazardous substance under Marpol 73/78 and also by Anadarko

1.2.13.1 Waste Streams

Waste collected as part of an oil spill response usually falls into one of the following five waste streams and stored accordingly:

- Oily Liquids
  - Emulsified
  - Non Emulsified
- Oil Solids
  - Biodegradable
  - Non-biodegradable
  - Sand/Pebbles

All oily waste needs to be kept in rain proof and leak proof containers for no more than 180 days. Each container must be labeled in accordance to Anadarko's procedures with contents, hazardous waste warnings, generator information and storage start date. All documents generated regarding the waste, including logs, manifest and movement forms must be kept at the facility of nearest office for no less than three years.

1.2 Oil Spill (Continued)

1.2.13 Waste Management (Deep Water / Shallow Water / Shoreline) (Continued)

1.2.13.2 The Waste Hierarchy Model

A useful model for dealing with a waste stream originating from any source is the 'waste hierarchy' concept (See Figure 1.11 below). It provides a tool for structuring a waste management strategy and can be used as a model for all operations.

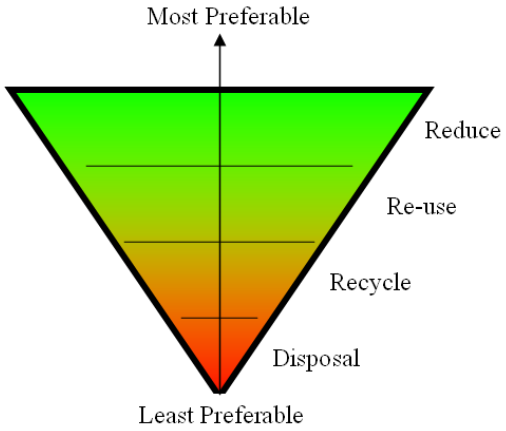


Figure 1.11 - The Waste Management Hierarchy Model

1.2.13.3 Reduce

The volume of oil spill waste can be reduced by following some basic principles:

- If oil is likely to impact an area, move all items that could become oily waste to an area that will not become impacted e.g. above the high water mark. This reduces the amount of oily waste, which requires recovery.
- Recognize the types of waste streams and plan your waste response to cope with these streams. Have a separate waste container for each type of waste stream.
- Set up temporary storage areas in anticipation of a final waste strategy. Guidance on temporary storage solutions is shown below.
- Plan the transport strategy.

1.2.13.4 Re-use

There are current no facilities in Mozambique with the ability to reuse recovered oils.

1.2.13.5 Recycle

No facilities are known to exist within Mozambique for the recycling for oil and oily wastes.

1.2 Oil Spill (Continued)

1.2.13 Waste Management (Deep Water / Shallow Water / Shoreline) (Continued)

1.2.13.6 Direct Disposal

At the time of writing, the sole method for disposal of oily waste from operations in Mozambique is via direct disposal in landfill. This will be done through a contractor. As soon as it is suspected that significant quantities of oily waste are to be generated, it will be necessary to liaise with the waste contractor to ensure that this does not hold up the response chain. Waste generated at sea will be transferred to the waste contractor at Pemba Port. Transportation for waste generated on the shoreline from an oil spill should be discussed with the waste contractor on a case by case basis.

1.2.13.7 Transport and Temporary Storage

Transport of material to a disposal site can become a major cost item. It is therefore beneficial to reduce the amount of material to be transported by separating oil from water and sand during temporary storage. Water-in-oil emulsions can be broken up to liberate water, oil seeping from heaped beach material and debris can be collected in a ditch surrounding the storage area and sieving techniques can be used to separate clean sand.

Methods of transport to final disposal site include vacuum tankers, polythene-lined skips, refuse trucks, open topped tipper trucks etc. Methods of transport along a shoreline include dumpster trucks, front-end loaders, rough terrain vehicles etc. (N.B. Beware of risk of secondary contamination of roads by restricting these vehicles to the beach until they have been cleaned.). Oily waste must only be transported by an authorized and certified carrier in accordance with Anadarko's procedures.

Item	Guidance
Flexible open topped tank	Suitable for initial storage to allow operation to start. Not movable when full. Therefore, an additional transfer required. Primary use with low capacity skimmers up to 10 t/hr.
Flexible pillow tanks	With pallet support - Suitable for initial storage to start operation. Can be moved provided suitable lifting equipment available. May be difficult to remove heavy mousse from tank. Suitable for low capacity skimmers up to 10 t/hr. No pallet support - Suitable for initial storage to allow start of operation. Not movable when full. Therefore, additional transfer required - danger of being unable to remove heavy mousse once inside tank.
Polythene sheets	Continuous polythene tubing cut into lengths and sealed at end. Suitable for initial or emergency storage. Unsuitable for transportation unless very well supported - intended for single use and then disposal. Used for lining containers, skips and pits to prevent escape of oil and gross secondary contamination.

1.2 Oil Spill (Continued)

1.2.13 Waste Management (Deep Water / Shallow Water / Shoreline) (Continued)

1.2.13.7 Transport and Temporary Storage (Continued)

Item	Guidance
Buoyant rubber storage tanks	Suitable for initial storage for operations at sea. May be problems in removing mousse from them. Suitable for low to medium capacity skimming operations up to 50 t/hr, depending on size of tank.
Mobile road tanks	Well suited for operations close to the shore, especially when quays are available. They allow efficient transportation of recovered oil to disposal points. They are also used to recover oil from primary storage vessels, rubber tanks, barges, pillow tanks, etc.
Barges	Normally suitable for both small and large capacity skimmers not only because of their capacity, but also because they can provide a stable working platform from which skimmers can be operated safely.
Oil tankers	Suitable for very large spills - normally best used to collect oil already recovered in barges etc. If recovery systems with very large capacity (500 t/hr) are used, small coastal tankers will need to be used as primary storage.
Ships tanks	It is rare that masters will permit the use of their spare tankage for the reception of recovered oil. However, in a number of areas where boats have been previously identified as oil recovery vessels, some tankage is set aside for handling recovered oil.
Movable open top tanks	Suitable as first storage in separating heavily oiled solids from the bulk of the waste oil by use of coarse sieves of wire mesh. These should be covered if expecting rain as an influx of rainwater will increase amount of waste.
Plastic bags (heavy duty)	Ideally suited when clearing beaches etc. by hand. They can be manhandled when full and moved well away from the high water line for collection.
Open topped barrels	Providing some lifting facilities are available, they can be suitable for collecting debris from beaches and transporting full plastic bags to central storage/disposal areas.
Skips	Very robust containers ideally suited for the transportation of oil contaminated solid debris to disposal sites. Can be transported on boats/landing craft to get to isolated sites. If possible, line with plastic sheet. Cover if expecting rain.
Temporary storage pits	Need to be lined with plastic sheets to prevent contamination of the substrate and seepage into ground waters. Where sharp rocks/protrusions may cause damage to sheet, pre-line with sand to provide a smooth surface. Should be close to major clean-up sites to act as temporary reception for contaminated solid debris. It is recommended that pits are constructed in areas with impermeable substrate or subsoil. The excavated pit should have a flat bottom and a layer of water forming the base.

1.2 Oil Spill (Continued)

1.2.14 Dispersant Use Plan

A. Overview

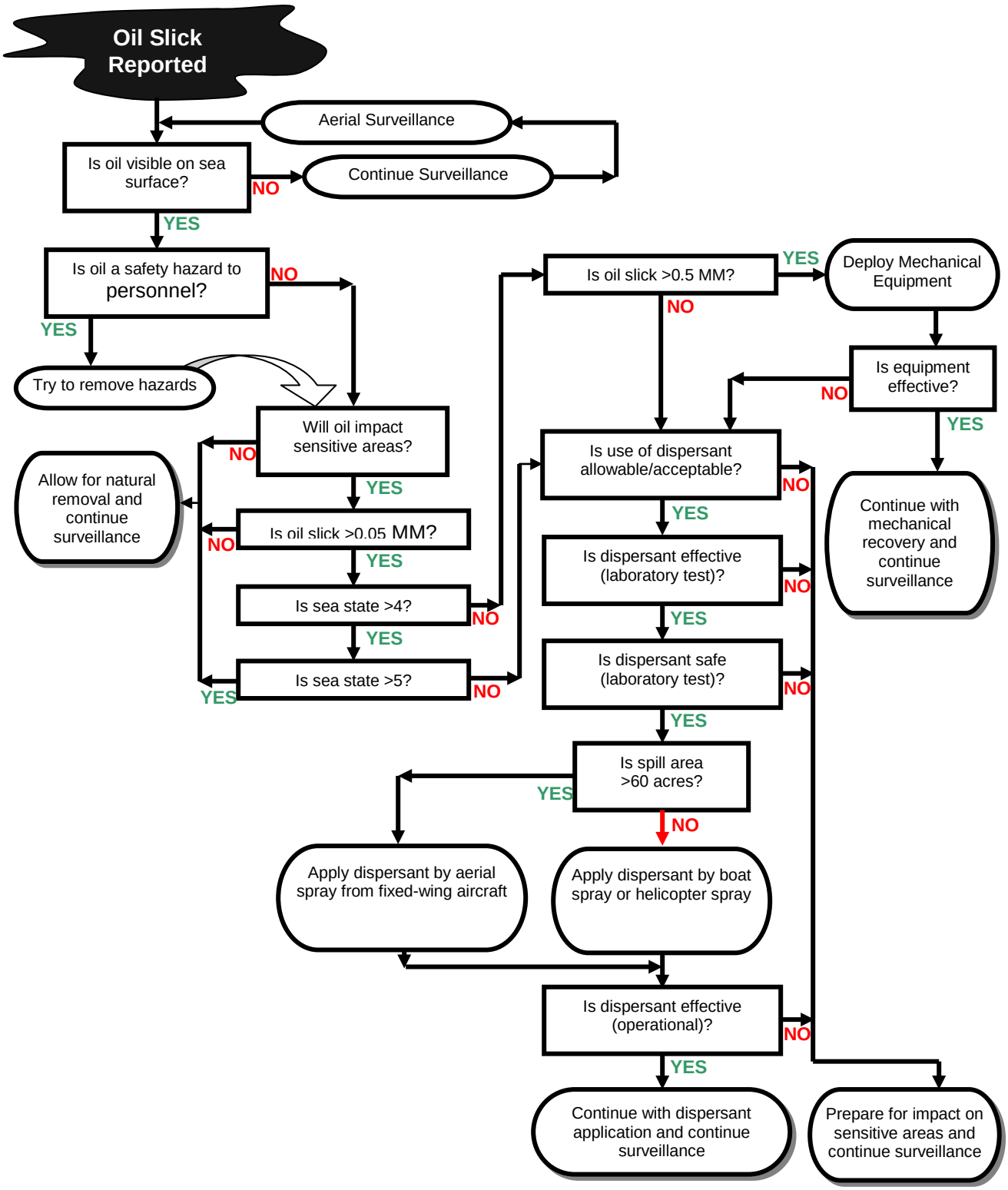
Dispersants are chemicals used to remove floating oil from the water surface and disperse it into the water column in order to reduce impact to sensitive shoreline habitats and animals that are present on the water surface. Specially formulated products containing surface-active agents are sprayed onto the slicks by aircraft or boat and are applied undiluted or mixed with water. The dispersants reduce the oil/water surface tension and decrease the energy needed for the slick to break into small particles and mix into the water column. Some turbulence is needed to mix the dispersant into the oil and the treated oil into the water. The Dispersant Use Decision Tree (**Figure 1-2-8**) may be used to determine if dispersant operations are the optimum countermeasure during cleanup operations.

B. Dispersants Inventory & Application Equipment

Sufficient inventories of dispersants available to Anadarko thru Oil Spill Response (OSR) are detailed in **Appendix B.** Acquisition of dispersant and application vehicles is guaranteed through contracts/agreements with OSR and other supply companies.

Dispersant Use Decision Tree

Figure 1-2-14



Dispersant Use Activity System — **Figure 1-2-15**

DISPERSANT USE ACTIVATION SYSTEM

OPERATIONS SECTION

1. ADVISE PLANNING TO PROCEED WITH DISPERSANT CHECKLIST
   - STATUS 1 "ALERT"
2. ISSUE A DISPERSANT USE "ALERT" THROUGH APPROPREATE OSRO
3. PUT LOGISTICS ON "ALERT" TO ARRANGE TRANSPORTATION, LABOR TO LOAD, AND CONTROL AIRCRAFT
   - STATUS 2 "SPRAY"
4. ESTABLISH A DISPERSANT TEAM
5. WORK WITH THE DISPERSANT TEAM TO IMPLEMENT THE DISPERSANT PLAN WITHIN 6 HOURS OF THE SPILL
6. NOTIFY LOGISTICS TO FINALIZE THE LOADING AND ARRANGEMENTS FOR CONTROL AIRCRAFT
7. ADVISE TO LOAD
8. COORDINATE
9. SPRAY

PLANNING SECTION

1. COMPLETE DISPERSANT PREAPPROVED CHECKLIST (LAT./LONG., TIME, VOLUME, WEATHER)
2. TRANSMIT TO REGULATORY AGENCY FOR DECISION

DECISION

- ***NO*** → ***STOP***
- ***YES*** → NOTIFY OPERATION

3. CONTACT ***THE RESPONSE GROUP*** TO DEVELOP THE SPILL TRAJECTORY SHOWING THE PROJECTED SPILL LOCATION IN 6 HOURS

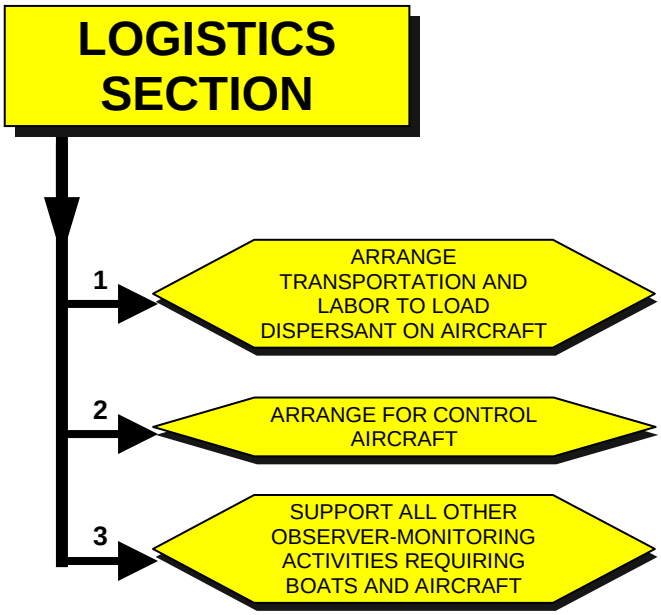
THE RESPONSE GROUP
(281) 880-5000 OFFICE
(281) 880-5005 FAX ***OR***
TRAJECTORY@RESPONSEGROUPINC.COM

4. OBTAIN THE 6-HOUR TRAJECTORY INFORMATION FROM ***THE RESPONSE GROUP***

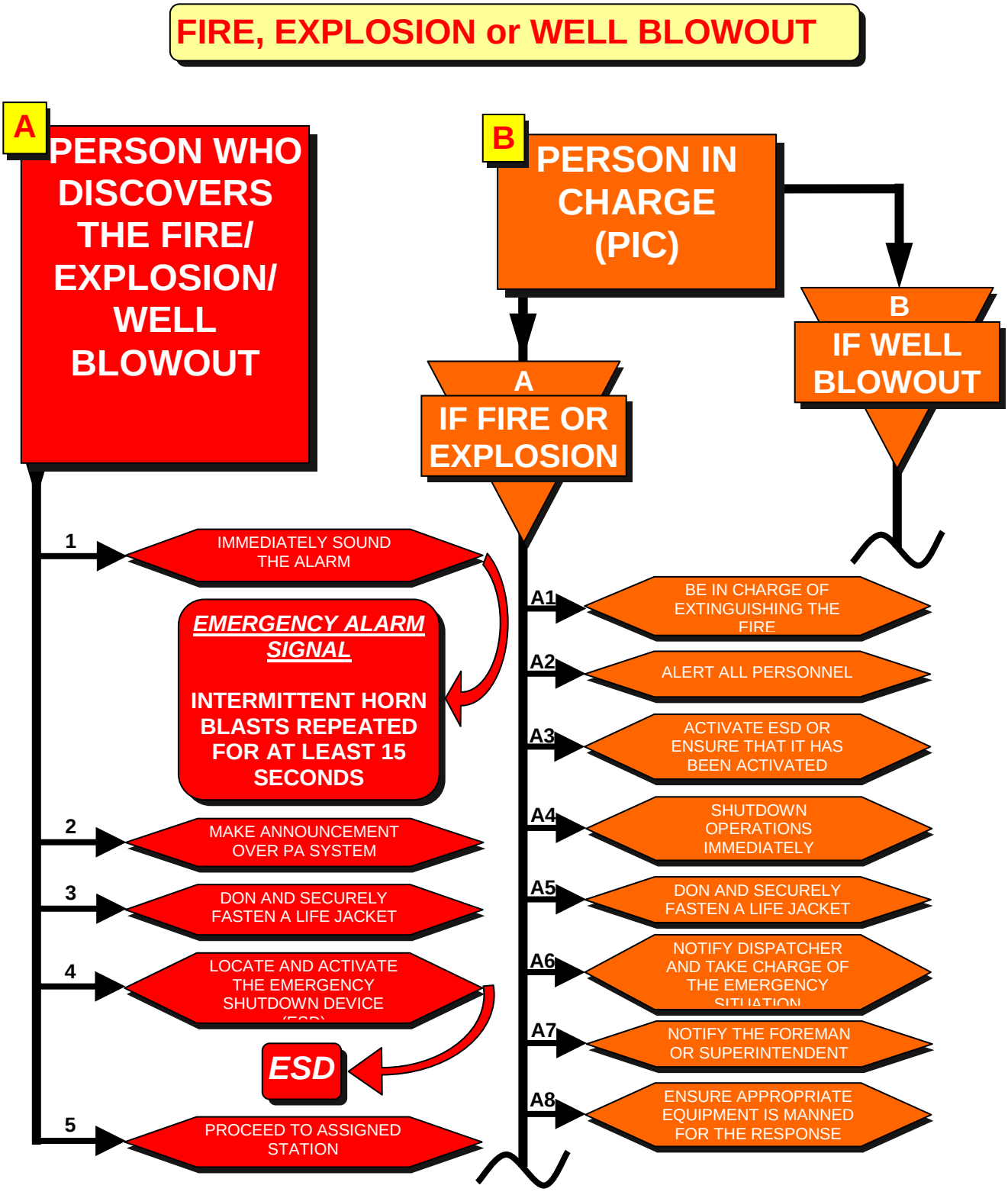
RESTRICTIONS

1. THE PRE-APPROVED AREA FOR DISPERSANT USE IS DETERMINED BY THE APPROPRIATE REGLATORY AGENCY.
2. ACTUAL APPLICATION MAY OCCUR ONLY DURING DAYLIGHT.

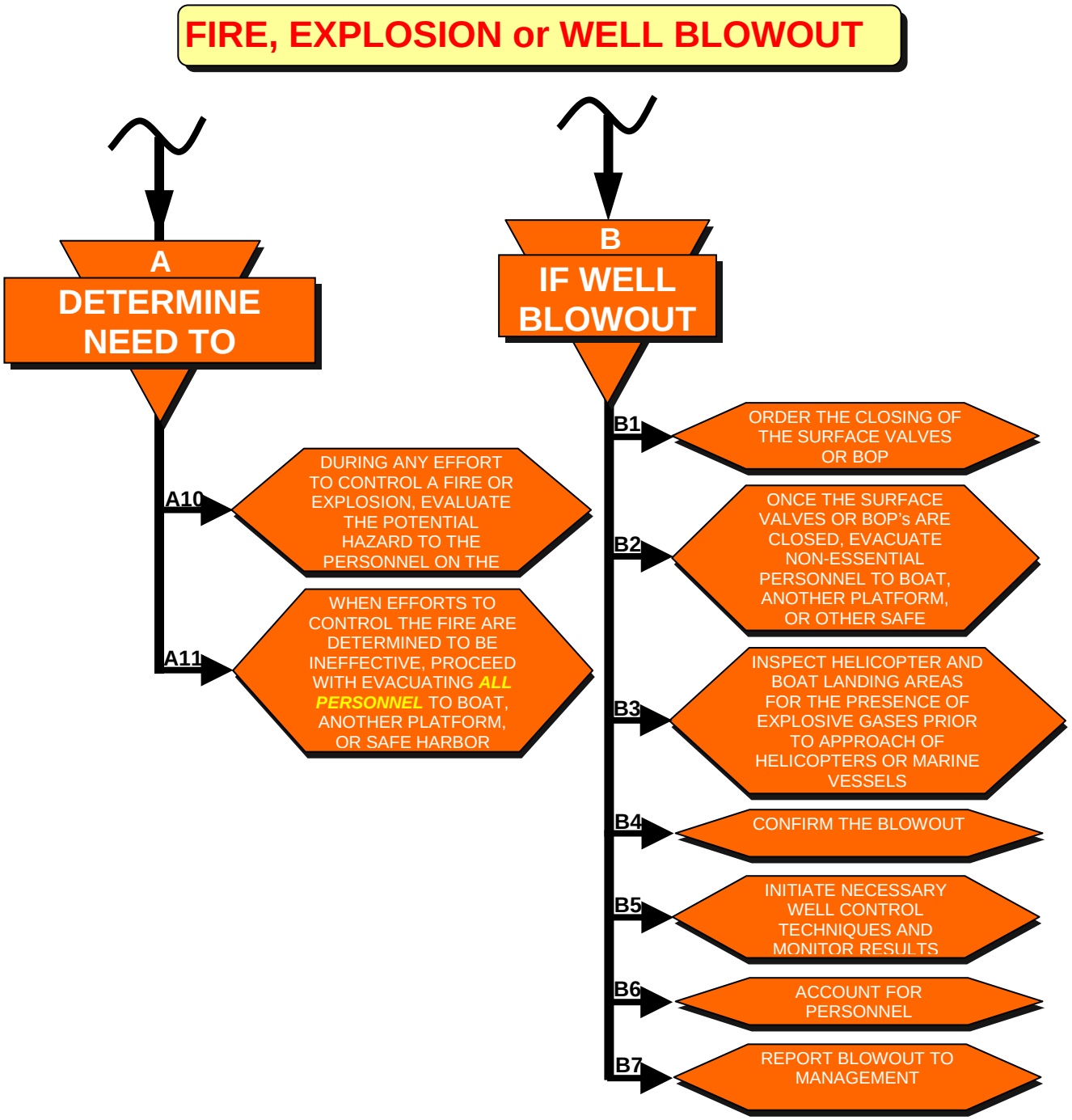
DISPERSANT USE ACTIVATION SYSTEM (CONTINUED)



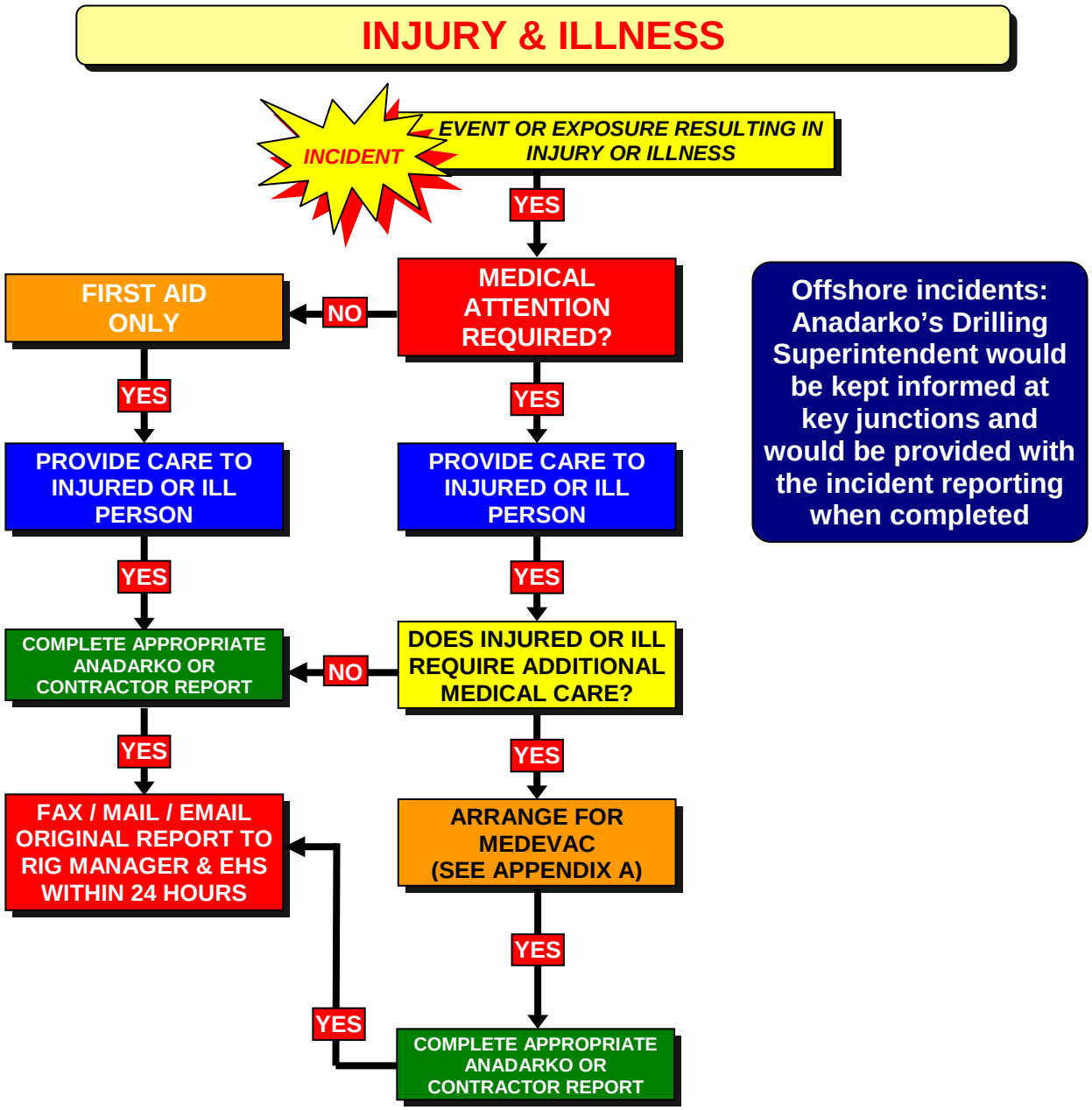
1.3 Fire, Explosion, or Well Blowout



1.3 Fire, Explosion, or Well Blowout (Continued)



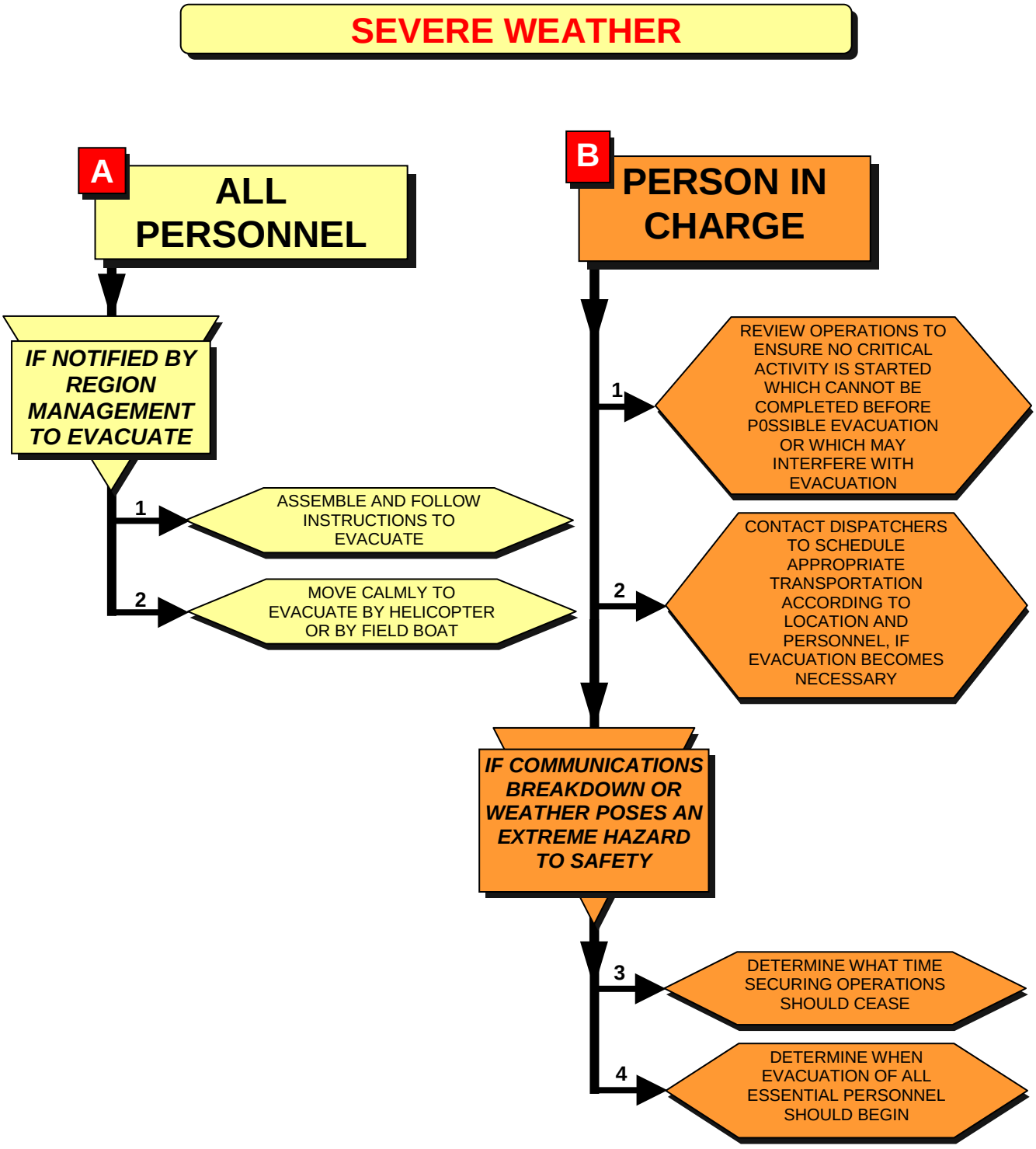
1.4 Injury and Illness



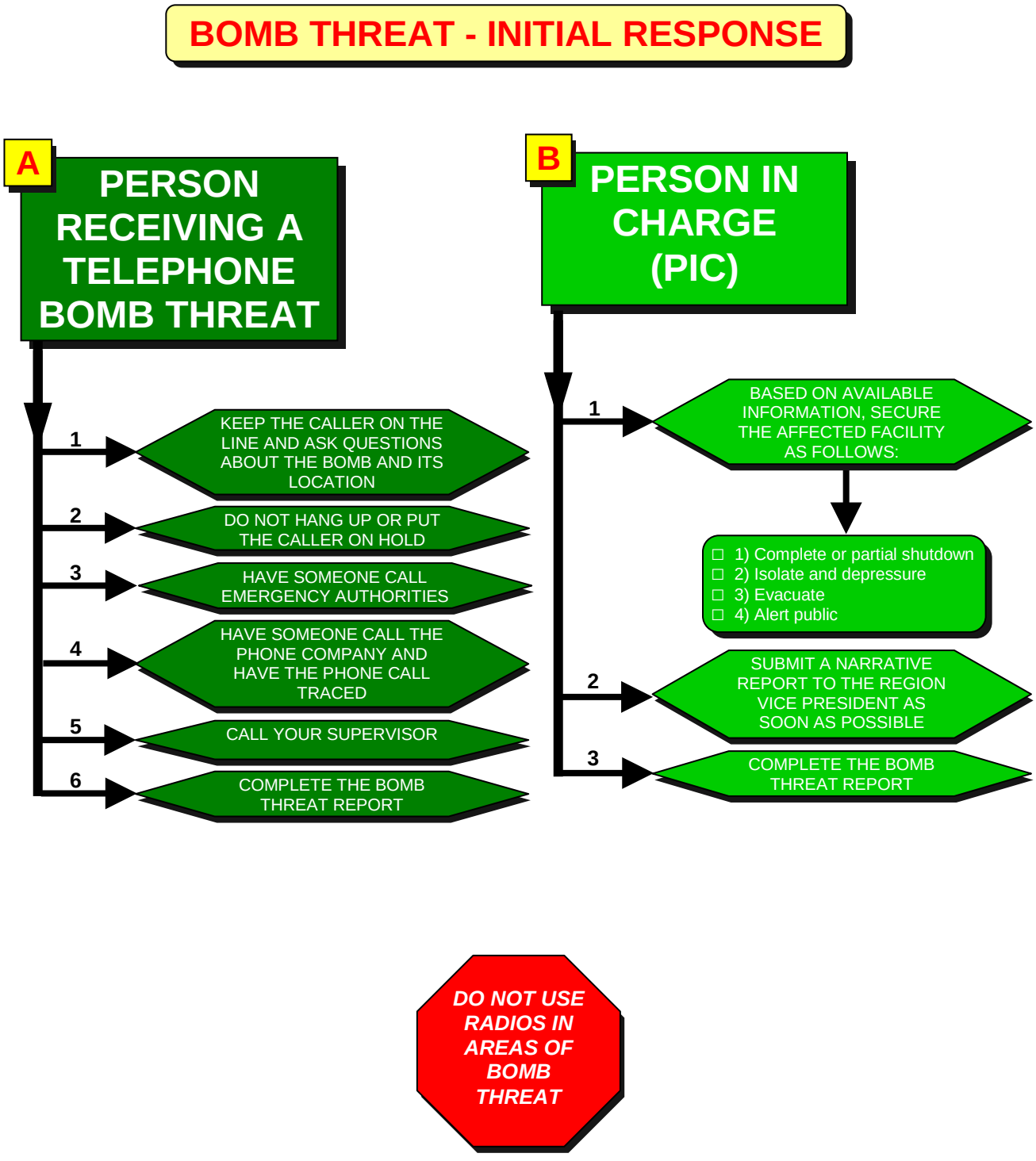
***For additional information, reference the following:**

- **Medical Emergency Response Plan (MERP) – Appendix A**
- **Office Emergency Procedures – in office**

1.5 Severe Weather



1.6 Bomb Threat



1.7 Civil Unrest/Disorder

Unlike with operational incidents and accidents there will be no formal notification of the civil situation going astray, whether it is political or environmental. It is however unlikely for any civil situation to change overnight. Generally there will be build up before the situation either returns to normal or gets out of control. Regardless of the situation, it will have media attention.

It is advised and also everyone's responsibility to stay informed about the status of these types on incidents. Any reports (even rumors) of changes in the situation that might affect the wellbeing of the company's employees should be reported.

IN COUNTRY MANAGER CHECKLIST	
✓	Ensure all in-country personnel are registered with their appropriate embassy and are in the embassy warden program.
✓	Provides an in-country security briefing to all employees.
✓	Develop in-country sources of information and assistance.
✓	Monitors political stability through contacts with embassy officials, host government employees, business contacts and local staff
✓	Has the authority to determine what stage of evacuation is required in a particular situation
✓	Maintains liaison with Corporate Security Department, re: security needs and concerns
✓	Monitor local media to gather as much information as possible.
✓	Ensure the appropriate communications are in place.
✓	Evaluate overall country situation.
✓	Make sure Evacuation Plan is in place.
✓	Establish safe mustering places.
✓	Provide Public Information Officer with updated information.