

Introduction

Oil is a complex and variable natural substance. When released into the sea it can be transported long distances, undergo various physical and chemical changes, and adversely affect marine ecosystems. Oil's fate and effects depend on the type and quantity of oil spilled, properties of the oil as modified over time by physical and chemical processes, the organisms and habitats exposed, and the nature of the exposure. All of these factors should be considered when evaluating response methods. Interactions among these variables result in a large range of spill situations. Accordingly, spill responders must determine the combination of response methods that best suits the spill situation.

Response techniques have “windows of opportunity,” specific timeframes when each response method works the best. These windows are defined by the type of product spilled, the initial spill conditions, product weathering and emulsion rates, and the very different environments and ecosystems that are, or will be, impacted. When the methods are used within these windows, they are more effective and less damaging to populations that survive the oil, reducing the time affected ecosystems need to recover.

In every oil spill, government and industry decision-makers are presented with a unique set of challenges requiring timely application of appropriate response methods.

- How does an on-scene coordinator or a responsible party sort through the myriad of options and select those methods that will effectively mitigate and clean up the oil?
- What is the rationale for selection?

Characteristics of Response Strategies addresses these questions by providing information to decision-makers relating to tradeoff decisions for specific habitats and response options. It focuses on maximizing response effectiveness while minimizing resource impacts.

Remember that the selection of a proper response method is highly dependent on incident-specific conditions, and that the strengths and weaknesses of a given response tool affect the suitability for its employment in a given habitat for a

specific spill. Accordingly, using multiple methods simultaneously throughout an incident can produce a more effective response and minimize environmental impacts.

Selecting response options, including natural recovery, involves considering tradeoffs among their potential environmental impact, appropriateness for habitat, and application timing.

Characteristics of Response Strategies and its companion guide, *Characteristic Coastal Habitats: Choosing Spill Response Alternatives* (NOAA 2000), are based on information contained in *Environmental Considerations for Marine Oil Spill Response*, published by the American Petroleum Institute, National Oceanic and Atmospheric Administration, the U.S. Coast Guard, and the U.S. Environmental Protection Agency. Refer to that publication for complete information on proper use and cautions regarding the information presented in the document.

Characteristics of Response Strategies is a useful aid for informing people who will be participating in cleanup assessments as part of Operations and Planning Units within the Incident Command System.

How to Use this Document

This document summarizes the technical rationale for selecting response methods. A companion guide to *Environmental Considerations for Marine Oil Spill Response*, *Characteristics of Response Strategies* can help you select appropriate response options to minimize adverse environmental impacts of a marine oil spill. The guide discusses developing incident-specific strategies and describes the characteristics of individual response methods. Response methods include natural recovery, mechanical, chemical, and biological treatments; and in-situ burning.

When choosing effective response options including natural recovery, you must consider trade-offs affecting the options' potential environmental impact, their appropriateness for the habitat, and the timing of the application. *Environmental Considerations for Marine Oil Spill Response* discusses these considerations in detail; consult it before using this guideline. Remember, the benefits and impacts of response options depend upon incident-specific conditions and affect the options' suitability for use in a habitat during any spill.

This guide includes information about response methods now used during oil spill responses in marine environment. It provides guidelines for developing response actions, evaluating incident-specific feasibility issues for both on-water and shoreline environments, and developing incident-specific strategies.

The final section of this guide includes detailed descriptions of the response methods now in use during oil spill responses in marine environments. These descriptions begin on page 41 with Natural Recovery.