Oil or Chemical Spill Notification

call the National Response Center at
800-424-8802

Oil Spill Response

in the Region IV Coastal Zone,
contact the U.S. Coast Guard
Marine Safety Office (MSO):

MSO Wilmington, NC
910-792-8408

MSO Charleston, SC
843-724-7616

MSO Savannah, GA
912-652-4353

MSO Jacksonville, FL
904-247-7310

MSO Miami, FL
305-732-0160

MSO Tampa, FL
813-228-2189

MSO Mobile, AL
334-441-5121

In the Region IV Inland Zone,
contact the U.S. Environmental
Protection Agency:
404-562-8700

Inland Zone U.S. Coast Guard Offices are:

MSO Huntington, WV
800-253-7465

MSO Louisville, KY
800-253-7465

MSO Paducah, KY
502-442-1621

MSO Memphis, TN
901-544-3912

State Pollution Response Contacts are:

North Carolina
919-733-3300

South Carolina
Spill: 888-481-0125
Office: 803-896-4000

Georgia
404-656-4300

Florida
850-413-9911

Alabama
334-242-4378

Mississippi
601-352-9100

Tennessee
800-258-3300

Kentucky
800-928-2380

Suggested References:

Using Oil Spill Dispersants
on the Sea
National Research Council 1989

The Use of Chemicals
in Oil Spill Response
American Society of Testing
and Materials 1995

Effects of a Dispersed and Undispersed
Crude Oil on Mangroves, Seagrasses,
and Corals, Ballow et al. 1987
API Publication No 4460

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Regional Response Team

RRT IV Co-chairs:
U.S. Coast Guard 305-536-5651
U.S. EPA 404-562-8721

DISPERSANTS IN OIL SPILL RESPONSE

A Coast Guard C-130 fitted with a Airborne Dispersant Delivery System or ADDS-Pack sprays water during an exercise

General Spill Response Considerations

When prevention efforts fail and an oil spill occurs on the water, spill responders face a difficult battle against a dynamic opponent. They have a number of tools at their disposal, depending on the unique aspects of each situation. Among the options available are mechanical cleanup methods, such as containment booms and skimmers, non-mechanical methods, such as dispersants or *in-situ* burning, natural removal, and shoreline cleanup. The selected mix of countermeasures will depend on potential shoreline and natural resource impacts, the size, location, and type of oil spilled, weather, and other variables.

This pamphlet on dispersant use is one of a series that provides an overview of oil spill prevention, planning, and response topics.

What Are Dispersants?

Dispersants are specially designed oil spill products that are composed of detergent-like surfactants in low toxicity solvents. Dispersants do not actually remove oil from the water. Instead, they break the oil slick into small particles, which then disperse into the water where they are further broken down by natural processes. Dispersion of oil into the water column occurs naturally in untreated spills; dispersants just speed up the process. Dispersants also prevent the oil droplets from coming together again and forming another surface slick. Dispersants also reduce the ability of the oil to attach to birds and other animals, shoreline rocks, and vegetation. Fire and explosion hazards are lessened because dispersants reduce evaporation of volatile oil components. The effects of the rapidly diluted dispersed oil must be weighted against the effects of that oil if it were allowed to impact wildlife populations or the shoreline.

Dispersants may be applied to oil from airplanes, helicopters, or vessels. Dispersant spray systems are designed to provide the correct droplet size and dosage, as both are important factors in effective oil dispersal. The volume of dispersant applied is a fraction of the volume of oil treated, with a typical dispersant to oil ratio of 1:20.

Where the Oil Goes

When the oil is treated with dispersants, it initially disperses within approximately the upper 30 feet of the water column. The dispersed oil will be spread horizontally by tides and currents, rapidly decreasing the concentration of the oil. Many impacted water column populations will rapidly recover from the dispersed oil exposure because of their mobility. If these impacts are expected to be short-term, these organisms are given a lower priority than bird and mammal populations and sensitive shoreline habitats, which when oiled recover quite slowly. Typically, dispersant use is reserved for deeper waters to ensure sufficient dilution of the oil and to prevent impacts on bottom-dwelling organisms. There may be cases where use in shallower environments can be justified to minimize impact to highly sensitive areas that are difficult to otherwise protect.

Dispersant Effectiveness

Like other spill response techniques, dispersants are not likely to be 100% effective in dispersing surface oil, but may be strategically employed to protect certain areas. Dispersant effectiveness is dependent on the type of oil and environmental conditions.

Approval of Dispersant Use

Because of the tradeoffs involved (i.e., relative benefits and potential negative effects), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) sets limitations on dispersant use. Dispersants must be on a national list maintained by the Environmental Protection Agency. Federal and state agency agreements establish areas where rapid decisions on dispersants may be made by the Federal On-Scene Coordinator. Use outside these areas requires the approval of additional agencies identified in the NCP.

Studies of Dispersants

Relevant to some of our sensitive subtropical resources, a 1987 study funded by API (Ballow et al. was conducted to determine the effects of oil and dispersed oil on mangrove, seagrass, and coral communities. This study concluded that dispersants applied to offshore oil in deep water greatly reduced the impacts to mangroves. The impacts to the seagrass and coral communities would be insignificant. The chemically dispersed oil was diluted to non-toxic concentrations in deeper water. It was recommended that dispersants be considered when highly sensitive inter-tidal communities are involved. The dispersant application should take place in the deepest water possible.

What Are the Potential Benefits?

- Reduced impact of surface oil on shorelines, sensitive habitats, birds, mammals, and other wildlife.
- Rapid treatment of large areas.
- Reduced oil storage and disposal problems.
- Accelerated natural degradation processes.
- Use in high seas and currents is feasible.

What Are the Potential Tradeoff Considerations?

- Increased oil exposure to organisms in the upper 30 feet of water column.
- Time frame for effective use may be short.
- Application equipment or dispersants may not be readily available.