Oiled Shoreline Assessment And Cleanup

As it is almost impossible to fully prevent shoreline oiling during a spill, cleanup decisions at the shoreline are as important as containment and protection priorities. Several factors influence the selection of cleanup techniques.

Spill response workers flush an oiled shoreline with water.

Influence oil volume and type

The type and quantity of the oil spilled must be determined. Oil types vary greatly and have a major influence on the degree of shoreline impact, oil persistence, and ease of cleanup. For example, lighter fuels (diesel, home heating fuel and light crude oils) will evaporate quickly, but tend to be more toxic and penetrate the shoreline sediments to a greater degree. Heavy oils (bunker C, #6 fuel and heavy crude oils) are less toxic to shoreline ecosystems and do not penetrate finer sediments, but they are very persistent, difficult to clean and may smother shoreline organisms.

Influence of Shoreline Type

Shorelines types greatly influence the impacts of oil and cleanup methods, and must be considered in each spill. State and federal mapping projects have categorized U.S. coastlines in terms of habitat sensitivity to oil. The NOAA Environmental Sensitivity Index, the most common scheme, ranks shorelines by sensitivity to oil spill impacts, predicted rates of removal of stranded oil by natural processes, and ease of cleanup.

The ESI shoreline ranks, from least to most sensitive:

1. Exposed rocky cliffs & seawalls
2. Wave cut rocky platforms
3. Fine to medium-grained sand beaches
4. Coarse-grained sand beaches
5. Mixed sand and gravel beaches
6. Gravel beaches/Riprap
7. Exposed tidal flats
8. Sheltered rocky shores/man-made structures
9. Sheltered tidal flats
10. Marshes

Defining Cleanup Options

Types of shorelines impacted and degree of impact allow responders to develop a list of preferred response options by shoreline type. Many Area Contingency Plans have pre-defined matrices with appropriate response methods by oil and shoreline type. Major categories of techniques include:

1) Natural Recovery
2) Manual Removal
3) Mechanical Removal
4) Passive Collection with Sorbents
5) Vacuum
6) Debris Removal
7) Sediment Reworking/Tilling
8) Vegetation Cutting/Removal
9) Flooding (deluge)
10) Ambient Water Washing (low to high pressure)
11) Warm Water Washing (< 90 °F)
12) Hot Water Washing (> 90 °F)
13) Slurry Sand Blasting
14) Solidifiers (special approval required)
15) Shoreline Cleaning Agents (special approval required)
16) Nutrient Enrichment (special approval required)
17) Burning (special approval required)

Preferred techniques for the spill are set based on shoreline type. For example, the method for treating exposed seawalls might be high-pressure, ambient-temperature seawater flushing at mid-tide stages. Natural recovery is often misunderstood; in sensitive environments active cleanup activity may cause more harm than allowing the oil to slowly degrade naturally, as disturbance by activity can drive oil below the surface causing significant damage.

Cleanup teams are mobilized based to conduct shoreline surveys and develop recommendations for specific shorelines, based on the general options for each shoreline type. The survey teams include scientific and oil response expertise. Survey results include type, degree of oiling, location of specific sensitive resources to be avoided or protected, other logistical information, and the team's recommended cleanup method, selected from the agreed upon cleanup options for that shoreline type. Areas of specific concern are identified and are planned based on unique factors. Cleanup is monitored to ensure that continued response measures do not cause more harm than remaining oil.

Shoreline cleanup plans try to minimize the harm caused by spilled oil, not to clean up all oil. Responders must weigh the response priorities in determining the end point for shoreline cleanup actions.

Report Oil or Chemical Spills to the National Response Center: 800-424-8802