

SCOPE

Substrates: fine to coarse sediments
Pollution: light to heavy
Pollutant: various
Sea: with (or without) tides



EQUIPMENT NEEDED

Basic equipment:

- Farm machinery (harrow, rotovator, plough)

Extra equipment:

- Effluent recovery system
- Skimming/effluent absorption means
- Storage facilities
- Sand screener

DESCRIPTION/PRINCIPLE

This technique fulfils different objectives depending on whether it is carried out in or out of the water:

- Case 1: frees fluid oil trapped in the sediment by agitation: the sand is scoured in shallow waters as the tide rises and frees the oil, which is then recovered at the water surface (alternative version of underwater agitation carried out with hoses).
- Case 2: promotes natural breakdown of oil in situ by increase aeration and exposure to UV rays: tilling of the upper beach if it is lightly contaminated, or stained, by fluid oil.
- Case 3: to assist sand screening operations, using a plough in order to cause patches of viscous pollution buried under a thick layer of clean sand to resurface.

CONDITIONS OF USE

Pollution: (case 1) light to heavy, in the form of localised pockets of oil.

(case 2) light pollutant which is no longer in the form of mobilisable accumulations but of a homogeneous coloration which may be marked to a varying extent.

(case 3) buried clusters of heavy fuel oil.

Substrate: fine- to coarse-grain sand.

Site: access possible for farm machinery; not too exposed to the sea's energy.

IMPACT ON THE ENVIRONMENT

Physical: loosening of the surface layer of the beach; ground temporarily deconstructed.

Biological: may be significant for macrofauna but recolonisation is rapid.

PERFORMANCE

Yield: variable according to the site; relatively rapid work rate in cases 1 and 2, but slow speed required for case 3 to prevent clusters from being pulverised.

Waste: (case 1): liquid waste and polluted sorbents; (case 2): N/A; (case 3): diverse clusters of heavy fuel oil blended with sand.

OBSERVATIONS

- Cases 1 to 3: operation generally needs to be repeated depending on the degree of contamination of the sediment.
- Case 1: underwater tilling is similar to the principle of underwater agitation; the two can also be combined. Recover the freed floating oil.
- Case 2: this process can be coupled, if deemed necessary, with a bioremediation operation (spreading nutrients).
- Case 2: can be applied in the Mediterranean on polluted beaches in the event of a storm surge.