# Fact Sheet

## REMEDIATION METHODS AT FAA SITES IN ALASKA

### PROBLEM

Diesel-range petroleum hydrocarbons must be removed from soils and groundwater at many Federal Aviation Administration (FAA) sites. These hydrocarbons have come from spills or leaks in fuel storage facilities. Although new storage facilities have eliminated the hydrocarbon source, the contaminated soils and groundwater must be remediated.

### SOLUTION

CRREL is working with Geosphere, Inc., Anchorage, Alaska, to test and implement two bioremediation technologies at four sites:

(1 and 2) Unlined landfarming at Bettles and Huslia;
(3 and 4) In-situ bioremediation (bioventing and air-sparging) at Strawberry Point and Northway.

In landfarming, contaminated soil is spread on the ground surface and remediated by volatilization and biodegradation. Typically, nutrients and moisture are added as required and the soil is tilled for aeration. Landfarming without liners provides a low-cost alternative to thermal desorption and bioremediation in prepared cells, but the system must be sufficiently understood to prevent contaminant leaching.

In-situ bioremediation provides soil microbes an environment conducive to growth, usually by adding air to supply oxygen. The remedial system tested at Strawberry Point and Northway supplies oxygen via an air sparging system and via bioventing. The air-sparging system has the potential to enhance bioremediation below the water table, in the saturated capillary fringe, and in the unsaturated zone. The bioventing system will enhance bioremediation in the unsaturated portion of the vadose zone. Only indigenous microbes are being used.

### RESULTS

Bench-scale land-treatment studies on soils from Bettles have shown that the soils there are suitable for landfarming without liners. Landfarming plots were constructed at Huslia and Bettles in August 1994. Construction of Strawberry Point was completed in July 1994. Neutron moisture–density measurements were used to determine that a pulse mode of operation was required to maintain adequate distribution of sparged air. Other measurements evaluated the air-phase permeability tensor of the soils, the groundwater and vadose zone pressure distribution during air sparging, and the vadose zone pressure distribution during bioventing. Continuous operation of the system begins in May 1995. Results of short-term experiments and long-term monitoring will be documented in annual reports.

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