Fact Sheet

SITE REMEDIATION VIA DISPERSION BY CHEMICAL REACTION (DCR)

PROBLEM

U.S. military installations contain many sites contaminated by oil, other toxic organics, and heavy metals. Current technologies (incineration, deep burial) are expensive and are not always effective in all environmental conditions, particularly in cold regions.

SOLUTION

This project is evaluating DCR (Dispersion by Chemical Reaction) technologies for encapsulation and immobilization of organics and heavy metals in contaminated soils from cold regions. Generally classified as fixation/stabilization technology, the processes can be used to stabilize organic and inorganic waste contaminants, and have been used successfully to treat waste in Europe.

- The organics stabilization process uses a specially formulated calcium oxide to adsorb, disperse in a fine dry powder, and render nonleachable hydrocarbon and other organic compounds. Treated materials easily pass Toxic Characteristic Leaching Procedure (TCLP) testing. The end product is soil-like and can be compacted to achieve high densities and very low permeabilities, which are ideal for site closure applications. Treated materials also may be suitable for fill, road construction material, or landfill cover.
- The inorganics stabilization uses precipitating reagents together with specially formulated calcium oxide or other finely dispersed carrier substances to accomplish an irreversible chemical fixation of heavy metals.

This is a Corps of Engineers Construction Productivity Advancement Research (CPAR) project, which is a cost-shared, cooperative research program designed to enhance the competitiveness of the United States construction industry. CRREL is evaluating the DCR process in the laboratory with special emphasis on effectiveness under cold temperatures. SOUND Environmental Services (SES) of Anchorage, Alaska, is evaluating the technology in field operations at Anchorage and other cold locations in the United States.

RESULTS

The DCR process was used to remediate contaminated soils at Eareckson Air Force Station in Shemya, Alaska. A video and a report (CRREL Report 95-11) outlining the results of this project are available from CRREL. Two sites for testing the efficacy of the DCR process to remediate heavy metals are being evaluated.

CONTACT

Dr. Giles Marion
603-646-4676
gmarion@crrel.usace.army.mil

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US Army Corps of Engineers
Cold Regions Research & Engineering Laboratory

CRREL, 72 Lyme Road, Hanover, NH 03755-1290