In-Situ Bioremediation of Fuel and Efficacy Monitoring

Cleanup
CU-30

RESEARCH CATEGORY: 6.2 Applied Research

LEAD AGENCY: U.S. Navy

LAB: Naval Research Laboratory - Washington, D.C.

PRINCIPAL INVESTIGATOR: Dr. Barry Spargo, (202) 404-6392

FY 1997 COMPLETED PROJECT

OBJECTIVE: The objective of this project was to develop and transition cost-efficient technologies for in-situ bioremediation and on-line performance monitoring to the end user, through a series of field demonstration programs. The use of conventional chemical and biological assays in combination with the proposed on-line stable isotope analyses developed here, will provide the capability to follow assimilation, respiration, immobilization, transport and biotransformation of pollutants in-situ.

BENEFIT: Stable isotope analysis allows differentiation between degradation products of natural origin and those resulting from degradation of target contaminants. Process performance could be monitored on-line.

ACCOMPLISHMENTS: By monitoring the stable carbon isotope ratio analysis of liberated CO2, the fate of individual contaminants in a Polycyclic Aromatic Hydrocarbon (PAH)-contaminated site and a Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) spill site were successfully tracked to allow modeling, mass balance determinations, and optimization of Groundwater Circulation Well bioreactors through enhancement with nutrients and electron acceptors.

TRANSITION: The technology will be transitioned to the industrial contractor, SBP Technologies, Inc., who collaborated with the Naval Research Laboratory (NRL) on this project.