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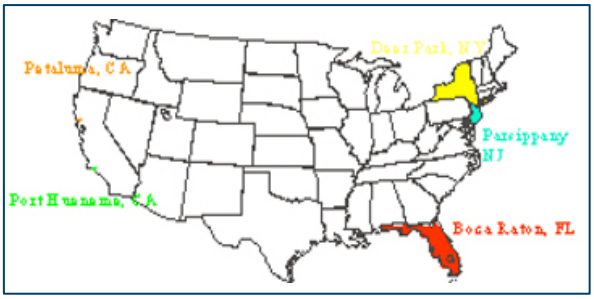
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
GROUND WATER AND ECOSYSTEMS RESTORATION RESEARCH

Laboratory Studies on the Fate of MTBE, TBA, and Ethanol in Aquifer Material

Introduction

The Federal Reformulated Gasoline Program was established in the Clean Air Act Amendments of 1990, which called for the reduction of air pollutant emissions from motor vehicles. Methyl tertiary butyl ether (MTBE) was introduced as a fuel additive for gasoline. MTBE is an oxygenate that allows gasoline to burn cleaner, releasing fewer pollutants into the atmosphere. The addition of MTBE created a risk to drinking water and ground water resources.



Background

EPA commissioned a Blue Ribbon Panel to study MTBE and oxygenates in gasoline. On July 27, 1999, the panel recommended ways to maintain air quality, while protecting water quality from the risks of MTBE. The goal was to phase out the use of MTBE, while avoiding gasoline supply shortages and ensuring price stability. The panel suggested the institution of an alternative fuel oxygenate, such as ethanol.

Objectives

The states use a risk-based approach to select remedies for spills of gasoline at underground storage tank sites. The risk evaluation requires an understanding of the rate and extent of biological degradation of fuel components in ground water.

This project is a survey to gather information on the rates of transformation, the pathways of transformation, and the important transformation products for fuel components that are major contaminants of ground water.

Approach

The project will use soil microcosms to determine the rate and extent of biodegradation and sorption of MTBE, tertiary butyl alcohol (TBA), ethanol, and other oxygenates in sediment samples from six sites where gasoline spills have resulted in methanogenic conditions in ground water.

Investigators

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