In-Situ Bioremediation of MTBE Contaminated Ground Water Using Biobarriers

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Executive Summary:
Due to widespread use of MTBE (methyl tert-butyl ether) in the United States as a gasoline additive and its toxicity, public health officials are concerned about the risks posed by potential MTBE contamination of vadose zone soil and ground water. Recently, there have been calls for proposals to study the extent of MTBE contamination nationally AWWARF 1998) and within California (SB591 1997). The rising number cases of MTBE contamination reported from a variety of sources including government reports and published articles indicate that mitigative solutions are needed to remediate MTBE-contaminated sites and prevent the migration of MTBE into the underlying ground water.

Surprisingly, very little is known about MTBE biodegradation and especially how to develop a cost-effective bioremediation method in the field. In order to develop an effective in situ bioremediation method for MTBE mitigation, two essential components are needed: 1) identification and optimization of an MTBE-degrading culture, and 2) development and/or construction of an in situ environment that can support and maintain the identified MTBE degrading culture.

This study will develop an in situ ground water treatment technology, hereafter referred to as a *biobarrier*. Supporting objectives to reach this goal are to gain a comprehensive understanding of the kinetics and microbiology fundamentals for MTBE biodegradation from which laboratory and field-scale biobarrier systems may be designed, and to build and operate laboratory-scale biobarrier systems to test the efficacy of treating MTBE-contaminated ground water.

It is anticipated that subsequent to this study, full-scale demonstration, possibly in Port Hueneme, California, at the DOD National Environmental Technology Test Site (D/NETTS) will be performed. Overall, the results of the proposed study should allow for cost effective treatment of MTBE contaminated ground water.