

**STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM  
STATEMENT OF NEED FOR FY07  
ENVIRONMENTAL RESTORATION NEW START**

**IMPROVED UNDERSTANDING OF REMEDIATION PERFORMANCE IN  
FRACTURED GEOLOGICAL SETTINGS**

### **1. OBJECTIVES OF THE PROPOSED WORK**

This Statement of Need (SON) seeks to develop an improved understanding of how the complexities associated with fractured geology impact the performance and monitoring of contaminated groundwater remediation technologies. Research should focus on how best to deploy, modify, and/or assess existing remediation, characterization and monitoring technologies to improve success in the removal of groundwater contamination in fractured geological settings. Results from these efforts should lead to: (1) improved understanding of the impact of varying subsurface conditions on overall removal and destruction efficiency during remedial treatment; (2) identification of the limitations associated with remediation in fractured geological settings; and (3) development of improved application and monitoring methodologies.

Contaminants of greatest interest are chlorinated solvents, perchlorate, and munitions constituents (e.g., RDX, TNT). Proposals should focus on developing a better understanding of how the fractured bedrock matrix impacts remediation performance and assessment as opposed to proposing new technologies to remediate contaminants of concern. Research and development activities at the laboratory-, bench-, and field-scale will be considered, but work does not necessarily have to culminate in a field-scale effort.

### **2. EXPECTED PAYOFF OF PROPOSED WORK**

Development of a better understanding of the issues surrounding the remediation of fractured bedrock and development of possible solutions to remediate contaminants in fractured zones on DoD installations will help facilitate the establishment of more cost-effective and efficient remedial action plans that are protective of human health and the environment.

### **3. BACKGROUND**

**Statement of Problem:** Many DoD installations contain bedrock with contaminants in tight geological matrices interspersed with highly permeable zones on a scale which does not allow mapping of the network connectivity. Such fractured geological settings include:

- Limestone or karst geological formations typical in the south-east and south-central United States
- Fractured igneous and metamorphic rock

- Fractured sediments deposited in glacial, fluvial, or lacustrine environments

Due to the typically poor characterization of fractured zones, it is difficult to characterize the distribution of the contaminants in the pathways the fractures provide. Several technologies have been applied to remediate fractured geology sites; however, it has proven extremely difficult to flush contaminants out or to install effective barriers to prevent contaminant migration. Another characteristic of fractured geological settings that can cause difficulties in characterizing and remediating these sites is the large differences in hydraulic conductivities between the fractured zones and the surrounding matrix.

#### **4. COST AND DURATION OF PROPOSED WORK**

The cost and time to meet the requirements of this SON are at the discretion of the proposer. The proposer should incorporate the appropriate time schedule and cost requirements to accomplish the scope of work proposed. SERDP staff will evaluate the cost and duration of the project plan in light of the scope of work proposed. SERDP projects normally run from 2 to 4 years in length and vary considerably in cost consistent with the scope of the effort. Proposers are encouraged to and may submit smaller proposals that offer technical or cost advantages that only address one or more portions of the SON.

Proposers with innovative approaches to the SON, that entail high technical risk and/or have minimal supporting data, may submit a pre-proposal for a limited amount of funding (less than \$100,000 for a single year) to develop the data necessary to provide for risk reduction and/or a proof of concept. Such proposals, if successful, may be eligible for follow-on funding. These pre-proposals are due on January 5, 2006, the same date as pre-proposals (for BAA responders) or on the date requested by the federal member's organization (for federal responders).

The government reserves the right to fund more than one proposal either to meet this requirement fully or to pursue more than one innovative approach.

#### **5. POINT OF CONTACT**

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For proposal submission instructions and additional solicitation information, visit the Funding & Opportunities page on the SERDP web site: [www.serdp.org/funding](http://www.serdp.org/funding)