



REPLY TO  
ATTENTION OF:

**DEPARTMENT OF THE ARMY**  
ENGINEER RESEARCH AND DEVELOPMENT CENTER, CORPS OF ENGINEERS  
CONSTRUCTION ENGINEERING RESEARCH LABORATORY  
P.O. BOX 9005  
CHAMPAIGN, ILLINOIS 61826-9005

April 5, 2006

**REQUEST FOR STATEMENTS OF INTEREST  
NUMBER W9132T-06-SOI-0007  
PROJECT TO BE INITIATED IN 2006**

**Project Title: EFFECTS OF MILLIMETER WAVE CARBON FIBERS ON  
AQUATIC ORGANISMS**

Responses to this Request for Statements of Interest will be used to identify potential investigators for a project to be funded by the Engineering Research Development Center (ERDC) which investigates acute and sublethal toxic effects of millimeter wave carbon fibers (MMCF) on aquatic organisms. Approximately \$30,000 is expected to be available to support this project. Additional funding may be available for follow on work in subsequent fiscal years to the successful Recipient/Awardee.

**Background:**

The Department of Defense which is a participant of the CESU Network manages nearly 25 million acres of land, and the natural and cultural resources found there. DoD's primary mission is national defense. DoD's conservation program supports this mission by ensuring realistic training areas, and managing its resources in ways that maximize available land, air, and water training opportunities. DoD land management issues and objectives have many similarities to other federal, state, and private land management programs.

The work proposed here ties into current CERL research to study the acute and sublethal effects of military smokes and obscurants on aquatic threatened and endangered species. While other projects are investigating fog oils, colored smokes, and graphite flakes, this project expands the set to include millimeter wave carbon fibers, the newest member of the obscurant family. Our exposure chamber allows for release and dispersion of the smoke, or a combination of smokes, into a controlled, contained space. Open jars within the chamber contain numbers of aquatic organisms. Over time, the smoke components in the air begin to deposit on the water surfaces. Depending on the release times and deposition times, we can tightly control the amount of smoke chemicals that deposit on the water surface. The chamber is cleared of smoke and the jars are observed for acute toxic effects or the organisms are removed for measurement of sublethal effects. In this way, the potential environmental effects of smokes release and subsequent deposition in the aquatic ecosystem may be measured. In addition, this knowledge can be used to mitigate or eliminate deleterious effects by altering training protocol.

### **Brief Description of Anticipated Work:**

The goal is to quantify and describe the acute toxicity of MMCF and the sublethal effects that can disrupt aquatic life. Ingestion is the primary route examined in this work. MMCF will be disseminated or sprinkled onto aquatic systems, either alone or in combination with fog oil and graphite flakes. Several different aquatic organisms will be employed to observe effects on prey species, bottom feeders and filter feeders. This work will involve:

- 1) Measure acute toxicity of various types of carbon fibers (e.g., metal coated, uncoated, etc.) to the water fleas, *Ceriodaphnia dubia* and *Daphnia magna*.
- 2) Determine if *Daphnia magna* ingests carbon fibers, and if so, whether or not ingestion of carbon fibers impacts fecundity.
- 3) Determine if the Asian clam, *Corbicula fluminea*, and the amphipod, *Hyalella azteca*, ingest carbon fibers and if ingestion impacts growth of these organisms.
- 4) Write one journal article describing the toxicity effects from the above objectives.

### **Materials Requested for Statement of Interest/Qualifications:**

Please provide the following via e-mail attachment to:  
joyce.i.roberts@erdc.usace.army.mil (Maximum length: 2 pages, single-spaced 12 pt. font).

1. Name, Organization and Contact Information
2. Brief Statement of Qualifications (including):
  - a. Biographical Sketch,
  - b. Relevant past projects and clients with brief descriptions of these projects,
  - c. Staff, faculty or students available to work on this project and their areas of expertise,
  - d. Any brief description of capabilities to successfully complete the project you may wish to add (e.g. equipment, laboratory facilities, greenhouse facilities, field facilities, etc.).

**Note:** A proposed budget is NOT requested at this time.

**Review of Statements Received:** Based on a review of the Statements of Interest received, an investigator or investigators will be invited to prepare a full study proposal. Statements will be evaluated based on the investigator's specific experience and capabilities in areas related to the study requirements.

**Please send responses or direct questions to:**

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**Timeline for Review of Statements of Interest:** Review of Statements of Interest will begin April 11, 2006. This Request for Statements of Interest will remain open until an investigator team is selected.