

**Strategic Environmental Research and Development Program
(SERDP)**

FY 2017 STATEMENT OF NEED

Munitions Response (MR) Program Area

**PRELIMINARY DESIGN STUDY FOR MUNITIONS RESPONSE
UNDERWATER TEST SITE**

1. Objective of Proposed Work

The objective of this Statement of Need (SON) is to conduct a preliminary design study for a SERDP-sponsored test site for technologies to detect and classify munitions in the underwater environment. A number of SERDP- and ESTCP-sponsored sensors and sensor systems are approaching the stage of development where in situ data collection is appropriate. A well-designed test site (or sites) with carefully emplaced munitions and clutter should support both data collection over known targets for final development of sensors and algorithms and subsequent blind comparative testing of different sensor modalities and systems. The first step toward this objective is a preliminary design study.

Design Considerations: Munitions of interest range from small projectiles and mortars to large bombs. Water depths up to 35 meters are of interest but there is a specific need for systems that can operate in depths less than 5 meters. Sensors being developed by SERDP operate in a variety of conditions with regard to salinity, water depth, water turbidity, bottom characteristics, depth of burial, and clutter scenarios in a variety of marine, brackish, and fresh water environments.

A test site or test sites must be appropriate for as large a subset of these conditions as possible. A successful design could involve items easily deployable in various conditions or be in fixed locations that cover a variety of conditions. Among the issues to be considered in the preliminary design study are:

- Water depths of interest
- Bottom type or types
- Applicability to a variety of geophysical and acoustic sensors in both detection and classification modes
- Navigation and geolocation
- Selection of a representative set of test items, including munitions, surrogates, and clutter
- Details of the burial and placement of test items including buried vs. proud, range of burial depth, and requirement of geolocation accuracy of ground truth
- The potential for subsequent mobility of emplaced items
- Metrics of success and statistical significance of results

An important component of any preliminary design study will be a quantitative analysis based on prior measurement of responses, modeling, calculations, platform capabilities, and other supporting data of expected sensor and system performance.

Additional Information: SERDP plans to host a kick-off workshop for funded projects under this SON shortly after contract award so that each project starts with as complete as possible understanding of the design requirements and SERDP's goals.

SERDP co-sponsored a Workshop on Acoustic Detection and Classification of Unexploded Ordnance in the Underwater Environment in 2013. The workshop report addressed a number of key issues in underwater munitions response. It can be obtained from the SERDP web site (<http://serdp-estcp.org/content/download/27995/277023/version/2/file/SERDP+Acoustics+Workshop+Report+2013+Final+DistroA.pdf>). We strongly encourage proposers to review the information in this report for additional detail.

2. Expected Benefits of Proposed Work

Results from this work will provide a preliminary design document for one or more underwater test sites for the demonstration and comparative testing of underwater sensors and platforms design for munitions response. Pending the results of the design study, SERDP may issue a follow-on solicitation to support design and construction of the test site(s).

3. Background

As a result of past military training and weapons testing activities, munitions are present at sites designated for base realignment and closure (BRAC) and at Formerly Used Defense Sites (FUDS). Modern geophysical surveying techniques can effectively be used to characterize sites potentially contaminated with munitions on dry land. However, many sites contain munitions underwater, where the environment both restricts access to and may significantly impact the performance of established and emerging characterization technologies.

The U.S. Army Corps of Engineers (USACE) and the U.S. Navy have identified more than 400 underwater sites that are potentially contaminated with munitions. The majority of areas are in shallow water (0-120 feet) where the munitions pose a threat to human health and the environment. Some of these sites date back to the 18th century and others were used as recently as this decade. Property potentially containing munitions in underwater environments exceeds 10 million acres.

Complementary SERDP/ESTCP-Funded Projects: Currently, SERDP and ESTCP are supporting a number of efforts addressing the problem of munitions response underwater. These efforts are primarily focused on developing an understanding of the performance of acoustic and geophysical sensors for this mission. Many of these projects are approaching the stage where comparative testing at an in-situ test site would be appropriate. Other projects are addressing the issue of underwater munitions characteristics and their environment. A brief description of these completed and ongoing projects can be found at the SERDP and ESTCP website (<https://serdp-estcp.org/Program-Areas/Munitions-Response/Underwater-Environments>). In conjunction with

the research and development program supporting munitions response on land, ESTCP established two UXO test sites (<https://serdp-estcp.org/Program-Areas/Munitions-Response/Support-Tools/MR-200103/MR-200103>). An appropriate test site capability is now required for the underwater sensors and systems.

4. Cost and Duration of Proposed Limited Scope Effort

Proposers shall submit Limited Scope Proposals for funding up to \$200,000 and approximately one year in duration. Proposers should include a budget item covering attendance at a kick-off workshop in the Washington, DC area shortly after project initiation. Limited Scope Proposals should be submitted in accordance with the SERDP Core Solicitation instructions and deadlines. Proposals that exceed the cost threshold outlined above will not be accepted.

5. Point of Contact

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For Core proposal submission due dates, instructions, and additional solicitation information, visit the SERDP website at www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations.