Standardized UXO Demonstration Sites

Geophysical Prove-Outs for Munitions Response Projects

The EM61 in the pushcart platform is shown being demonstrated by Shaw Environmental, Inc. at Yuma Proving Ground, Arizona.

This is a reference photo only and does not serve as an endorsement of the demonstrator's product by the U.S. Army or the Standardized UXO Technology Sites Program.

For more information

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For decades, soldiers and weapons developers have gone to ranges and training areas to train with and test bombs, projectiles, grenades, and other munitions. A portion of these munitions did not function as designed, becoming what is known as unexploded ordnance (UXO). UXO has accumulated from these activities over the years at approximately 1,700 Formerly Used Defense Sites (FUDS), 25 Base Realignment and Closure (BRAC) sites, and a number of active installations covering millions of acres. The U.S. Army is committed to characterizing and remediating these sites to a condition consistent with their intended use.

To that end, surveys utilizing geophysical detection and discrimination systems are an invaluable tool used to locate and identify munitions and explosives of concern (MEC) (i.e., UXO and discarded military munitions) on munitions response sites. If subsurface UXO at a munitions response site (MRS) can be confidently and efficiently located, the risk that ordnance items may be overlooked and left in place on site is greatly reduced. Additionally, using accurate equipment during site surveys also reduces the occurrence of false alarms that are a result of a failure to correctly distinguish between UXO and non-hazardous materials, such as shrapnel, targets, or munitions fragments. Inadequate surveys and high percentages of false alarms result in considerable costs in terms of both time and money.

The accuracy of geophysical systems may vary from site to site as a result of differences in topography, geology, soil type, and density of vegetative cover. Therefore, it is necessary to test the technology selected for a geophysical survey prior to its use at a MRS in order to establish its site-specific adequacy. Demonstrations of a systems' ability to accurately detect UXO take place on both standardized test sites and on the actual MRS during geophysical prove-outs (GPOs).

GPOs on Standardized Test Sites

Standardized test sites are used to evaluate the capability of geophysical systems under controlled conditions. To meet these testing needs, the Standardized UXO Technology Demonstration Site Program was established. The program is a multi-agency program spearheaded by the U.S. Army Environmental Command (USAEC). The U.S. Army Aberdeen Test Center (ATC) and the U.S. Army Corps of Engineers Engineering Research and Development Center (ERDC) provide programmatic support. The program is funded and supported by the Environmental

Security Technology Certification Program (ESTCP), the Strategic Environmental Research and Development Program (SERDP) and the Army Environmental Quality Technology Program (EQT).

While the data collected during demonstrations on a standardized site provides valuable information on a technology's detection capabilities, that data alone is not sufficient for making a site-specific determination. In addition to standardized site demonstrations, the capabilities of the system under consideration must be documented under the actual field conditions to be encountered at the MRS during a GPO.

GPOs on Munitions Response Sites

On munitions response sites, GPOs are used to test, evaluate and demonstrate geophysical systems that have been chosen for UXO response activities under site-specific conditions. Information is used to determine the system's ability to detect and discriminate actual and suspected UXOs onsite. Often site-specific conditions have the ability to influence a system's capabilities in unpredictable ways (e.g., magnetic properties of some rock types such as magnetite), and because no geophysical system or approach can guarantee a 100 percent detection rate, multiple systems could potentially be deployed on a single site. The use of GPOs provides for an additional layer of data analysis, which ensures that the systems chosen for use on a MRS are capable of meeting performance requirements for each specific site.

It is also possible for a single MRS to have multiple GPOs conducted prior to commencing response activities. Larger sites where terrain, geology, and vegetative cover vary widely may require multiple systems to ensure the best possible response. Sites where multiple weapons systems were used may also require more than one GPO to gather enough data to represent all suspected ordnance types. Additionally, if a site manager believes that the response time will cover more than one season where field conditions may vary dramatically (i.e., fall to winter, winter to spring, etc.) then multiple GPOs may be necessary to establish which system(s) may perform better under the varying field conditions.

In November 2004, Interstate Technology and Regulatory Council (ITRC) published Geophysical Prove-Outs for Munitions Response Projects, a technical and regulatory guidance document describing the use of GPOs on MRSs. This publication provides detailed information regarding the necessity of geophysical systems to munitions response efforts in order to detect UXO and discarded military munitions. It also describes how critical the detection of MEC is to the success of the overall munitions response efforts. Information detailing the use of GPOs to achieve more effective and efficient results in completing geophysical surveys is also included in this report.

According to the ITRC report, the GPO process can be broken out into four phases: design, construction, implementation, and reporting. GPO design is a planning phase referring to the progress from initial scoping to completion of the work plan. The GPO construction phase consists mainly of site preparation, target emplacement, and site construction documentation. The implementation phase is the actual testing of the geophysical system(s) and is followed by the reporting phase, which results in the final product the GPO report. The ITRC final report documents the system's abilities to meet the previously established performance objectives for the MRS.

Visit the ITRC Web site, www.itrcweb.org, for more information regarding geophysical prove-outs and how they are improving the efficiency and effectiveness of munitions response.

Reference

ITRC (Interstate Technology & Regulatory Council). 2004. Geophysical Prove-Outs for Munitions Response Projects. UXO-3. Washington, D.C.: Interstate Technology & Regulatory Council, Unexploded Ordnance Team. Available on the Internet at http://www.itrcweb.org.