

Unexploded Ordnance Cleanup Costs: Implications of Alternative Protocols

(by Jacqueline MacDonald and Carmen Martinez)

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reviewed by Matthew Voegel [Mine Action Information Center]

Unexploded ordnance contamination on American soil? Yes, it's true. After the closing of several United States military bases due to downsizing, it became apparent that unrecovered UXO remained on these properties where personnel were trained to use various weapons. To prevent unwanted accidents, the military must now remove the undetonated bombs, grenades, rockets and other explosives tested on these bases before transferring or selling the land to civilians.

Considering there is no set U.S. protocol on what UXO cleanup processes should entail in any given scenario, it's not surprising that there are disagreements between the military and various governmental agencies on what measures are required to protect local environments and populations. Consequently, the Department of Defense is not able to provide Congress with an accurate estimate of overall costs of clearing these lands. A long, expensive process is required for federal and state officials to agree on clearance requirements at each site.

In *Unexploded Ordnance Cleanup Costs: Implications of Alternative Protocols*, authors Jacqueline MacDonald and Carmen Martinez of the RAND Corporation provide a short, yet detailed analysis on how the costs of UXO excavation correlate with varying standards levels for UXO cleanup. They discuss the specific processes used to clear a location and the protocols that influence the steps taken. Such protocols aim to set specific guidelines on UXO removal including clearance depth, number of surveys with a metal detector and amount of excavation. Through in-depth discussion of the factors involved and a case study of one contaminated military base, this 77-page study from 2005 explores how changing the processes necessary for UXO cleanup might affect costs.

While the monograph is composed of only six short chapters, it is crammed with

information that not only explains the research at hand, but also presents ample background information and details to give the reader a frame of reference. Instead of just reporting the results of the case study, the book examines previous estimates of UXO excavation costs and how the absence of both a standard cost-estimation method and site-specific data have skewed past estimates for UXO removal compiled by the DoD. The authors also enlighten readers about the clash between the Environmental Protection Agency and the DoD over UXO cleanup standards and how limitations of metal-detector technology have only made things worse. By asking, "How clean is clean?" they are able to highlight how and why the two parties have developed conflicting UXO cleanup protocols, which inevitably lead to invalid cost analyses.

To validate their study, the authors provide an evaluation of the cost-estimation tool that is most widely used by the DoD to approximate environmental cleanup costs, a software program known as "Remedial Action Cost Engineering Requirements" or RACER. Authors MacDonald and Martinez conduct a "sensitivity analysis" of the software to discover how well the program is able to account for variability in cost factors that can affect an overall estimate. They then investigate which variables the program indicates are the most influential on UXO cleanup costs.

The case study examines how certain types of cleanup protocol would affect costs. With various charts and diagrams, the authors are able to display the results of their study in an easy and convenient way so that any reader, even those with no mine-action background, can understand the information. The authors conclude with a list recommendations to the U.S. federal government on how to:

1. Improve cost-estimation tools like RACER
2. Create structured guidelines and protocols for UXO cleanup

3. Establish a database of all UXO incidents

This book provides intricate details to make the topic more understandable to the average person. A glossary of acronyms in the beginning helps readers understand what is being discussed. The various charts and graphs help present information in an easy-to-understand manner. Lengthy explanations of background information allow readers to absorb the content of the text and put it into context. The RAND Corporation's study into UXO cleanup costs is impressive and informative. ♦



Matthew Voegel has been working as an Editorial Assistant for *The Journal of ERW and Mine Action* since October 2006. He is currently a student at James Madison University pursuing a Bachelor of Arts in print journalism at the School of Media Arts and Design. He is also pursuing minors in both Spanish and in Middle Eastern communities and migrations. He plans to graduate from JMU in May 2009.

Matthew Voegel
Editorial Assistant
The Journal of ERW and Mine Action
Mine Action Information Center
Center for International Stabilization
and Recovery
James Madison University
E-mail: maic@jmu.edu