Unexploded Ordnance Cleanup Costs: Implications of Alternative Protocols
(by Jacqueline MacDonald and Carmen Martinez)

RAND Corporation, 2005
ISBN 0-8330-3774-9
US$20.00
reviewed by Matthew Vogel | Mine Action Information Center

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

Considering there is no U.S. protocol on what UXO cleanup processes should entail in any given scenario, it’s not surprising that there are disagreements as to how the military and various governmental agencies on what measures are required to protect local envi-
ronments and populations. Consequently, the Department of Defense is not able to provide Congress with an accurate estimate of overall costs of clearing these bases. A long, expen-
sive 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, but detailed analysis on how the costs of UXO excavation correlate with varying standards levied for UXO cleanup. They discuss the specific procedures used to clean UXO and the protocols that influence the steps taken. Such practices are not specific guidelines for UXO removal including clearance depth, number of surveys with a metal detector and amount of excavation. Through in-depth dis-
cussion of the factors involved and a case study of one contaminated military base, this 77-page study from 2005 explains the need for 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 re-
search at hand, but also presents ample background information and details to give the reader a frame of reference. Instead of just re-
porting the results of the case study, the book examines previous estimates of UXO excava-
tion costs and how the absence of both a stand-
ard cost-estimation method and site-specific data have skewed past estimates for UXO re-
moval 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 con-
flicting UXO cleanup protocols, which inev-
itably 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 En-
gineering Requirements” or RACER. Authors MacDonald and Martinez conduct a “sensiti-

ty analysis” of the software to discover how well the program is able to account for vari-
ability in cost factors that can affect an overall estimate. They then investigate which vari-
ablesthe program indicates are the most in-
fluence on UXO cleanup costs.

The case study examines how certain types of cleanup protocol would affect costs. With many various charts and diagrams, the authors are able to display the results of their study in an easy to read format so that any reader, even those with no mine-action background, can understand the information. The authors conclude that the DoD’s stance on the U.S. federal government on how to: 1) Improve cost-estimation tools like RACER; 2) Create structural guidelines and pro-
tocols for UXO cleanup.