THE CLEANUP OF CHEMICAL WASTE SITES - A RATIONAL APPROACH

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ABSTRACT

A conceptual hazard assessment design is presented here for addressing waste site cleanup. Three main steps to be carried out in an evaluation of any potential waste site include, identification of potential chemical exposure, assessment of that exposure in relation to established 'safe' concentrations, and control measures to remediate the exposure. Hazard assessment techniques are used to establish the appropriate 'how clean is clean enough' endpoints based on calculated margins of safety (MS), where MS = toxicologically safe concentration/exposure concentration. A successful remedial action endpoint is achieved when the targeted exposure reduction action results in a margin of safety that is greater than 1.0 (MS > 1.0) including the uncertainty of the estimate. This assessment program is carried out in a cost effective step by step tiered approach to guide selection of a remediation endpoint.

INTRODUCTION

There are estimated to be well over 20,000 solid and contained liquid waste sites (both legal and illegal) in the U.S. (1-3). Many of the sites have been abandoned and are perceived as or are known to be sources of chemical contamination. Costs for cleanup of these sites has been estimated at up to $10-20 billion. The 1984 RCRA amendments (4) are forcing review of current waste disposal practices and are geared towards prevention and reduction of future problems from hazardous waste facilities. The 1980 'Superfund' Law is aimed at cleaning up those past sites which are or may threaten human health and the environment. Technically sound, cost effective approaches are needed to determine 'how clean is clean' for remedial or corrective action under both programs. A hazard assessment based approach is presented here to utilize rational decision making in addressing the cleanup of any contaminated site. The hazard assessment approach suggested here addressed the critical issue of how extensive the remedial practices must be to protect the ecosystem and humans from exposure to toxic chemicals (5).