United States Environmental Protection Agency | Office of Solid Waste and Emergency Response | Publication 9203.1-02I February 1993

EPA

Superfund Accelerated Cleanup Bulletin

Presumptive Remedies for Municipal Landfill Sites

Office of Emergency and Remedial Response
Office of Waste Programs Enforcement

Intermittent Bulletin
Volume 2 Number 1

The Presumptive Remedy Selection Initiative

Since Superfund's inception in 1980, the removal and remedial programs have found that certain categories of sites have similar characteristics, such as the types of contaminants present, past industrial use, or the environmental media that are affected. Based on a wealth of information acquired from evaluating and cleaning up these sites, Superfund is undertaking an initiative to develop **presumptive remedies** that are appropriate for specific types of sites, contaminants, or both. This initiative is part of a larger program, known as the **Superfund Accelerated Cleanup Model (SACM)**, which is designed to speed all aspects of the Superfund clean-up process.

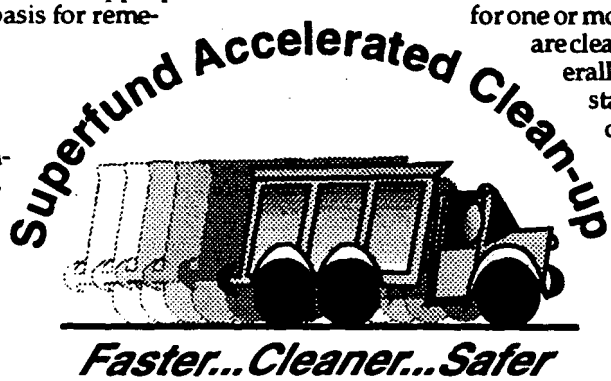
The objective of the presumptive remedies initiative is to use clean-up techniques shown to be effective in the past at similar sites in the future. The use of presumptive remedies will streamline removal actions, site studies, and clean-up actions, thereby improving consistency, reducing costs, and increasing the speed with which hazardous waste sites are remediated.

Purpose

The Superfund Municipal Landfill Expert Team has completed four site visits under the Municipal Landfill Pilot Project.[1] The pilot project implements a 1991 streamlining manual, "Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites" (hereafter referred to as "the manual"). This bulletin presents key findings from the pilots completed to date, particularly with respect to the level of detail that was appropriate for establishing risk, and therefore a basis for remedial action, at two of the sites.

Background

The preamble to the National Contingency Plan (NCP) identifies municipal landfills as a type of site where treatment of the waste may be impracticable due to the size and heterogeneity of the contents. Because of this, containment will often be the appropriate response action for the source area of municipal landfill sites. Such containment remedies are likely to include a landfill cap; ground-water treatment or control; leachate collection and treatment; and landfill gas collection and treatment, as appropriate.



The municipal landfill manual states that baseline risk assessments at municipal landfill sites may be streamlined or limited in order to initiate early remedial action on the most obvious landfill problems (e.g., ground water/leachate, landfill contents, and landfill gas). One method for establishing risk using a streamlined approach is to compare contaminant concentration levels (if available) to standards that are potential chemical-specific applicable or relevant and appropriate requirements (ARARs) for the action. The manual states that where established standards for one or more contaminants in a given medium are clearly exceeded, remedial action is generally warranted.[2] The manual further states that ultimately it is necessary to demonstrate that the final remedy addresses all pathways and contaminants of concern, not just those that triggered the remedial action.

Pilot Project Findings

The experience of the expert team supports the usefulness of a limited risk assessment to initiate early action at two of the pilot sites. Specifically, for the source area of these two sites (i.e., the discrete landfill area), a quantitative risk assessment that considered all chemicals, their potential additive effects, etc., was not necessary,

[1] See "Superfund Accelerated Cleanup Bulletin, Presumptive Remedies for Municipal Landfill Sites," Publication 9203.1-02I, Volume 1, Number 1, April 1992.

[2] See also OSWER Directive 9355.0-30, "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, which states that if MCLs or non-zero MCLGs are exceeded, [remedial] action generally is warranted.

either to establish a basis for action or to establish clean-up levels. For these two sites, the justification for early remedial action was based on existing ground-water data. Ground-water data are not available for the other two sites.

Sites with Ground-water Data

For the source areas of the two sites with existing ground-water data, the basis for action was ground-water contamination at levels exceeding non-zero MCLGs or MCLs; therefore, a complete quantitative risk assessment was not necessary to establish risk (and therefore a basis for action) at these sites. Furthermore, a quantitative risk assessment was not needed to evaluate whether the containment remedy addressed all pathways and contaminants of concern associated with the source. Rather, all potential migration pathways were identified (using the conceptual site model) and compared to those addressed by the containment remedy as follows:

- direct contact threat and surface water run-off addressed by capping;
- exposure to contaminated ground water (including any contaminated ground water moving off-site) addressed by ground-water treatment/control (including assessment of current exposure); and
- exposure to landfill gas addressed by gas collection and treatment, as appropriate.

This comparison revealed that the containment remedy addressed all pathways associated with the sources at these sites.

Finally, a quantitative risk assessment was not required to determine clean-up levels for the source areas, since the type of cap will be determined by closure ARARs, and ground-water clean-up levels may be based on MCLs, non-zero MCLGs, or more-stringent, promulgated, state levels.

NOTE: In some cases, a risk assessment may be required to determine the risk associated with contaminants in landfill gas. Landfill gas collection will frequently be a necessary component of the remedy to insure cap integrity. There may be an additional need for treatment of the collected gas based upon the contaminants present. In some cases, state ARARs may identify clean-up levels for such contaminants, and in some cases health-based levels will be appropriate. This issue will be addressed in further detail in future guidance.

Sites with No Existing Ground-water Data

Ground-water data are not yet available for two of the pilot sites; for these sites, the following tiered approach was recommended. Once ground-water data are obtained, a clear basis for action may be established, and the remedy selection may be streamlined as described for the two sites with available ground-water data. If contaminants are not identified above MCLs or non-zero MCLGs, however, additional pathways, such as surface contamination and landfill gas, will be characterized next, and a focused quantitative risk assessment conducted to establish a basis for remedial action.

Areas of Contaminant Migration

One of the expert team's key findings is that almost every municipal landfill site has some unique characteristic that may require additional study. Unique characteristics encountered during the pilot visits include leachate discharge to a wetland at one site and significant surface water run-off due to drainage problems at another. These pathways will require characterization and conventional risk assessment to determine whether remedial action is warranted beyond the source area, and if so, the type of action that is appropriate.

Pilot Study Findings and Conclusions

The expert team's conclusions from the four pilots, then, are that:

(1) a quantitative risk assessment was not warranted for the source areas of the two pilot sites where ground-water data were available and contaminants exceeded chemical-specific standards; justification for action was the exceedance of the standards;

Further, streamlining the risk assessment eliminated the need for sampling and analysis of these source areas to support the calculation of current or future risk.

(2) a focused risk assessment generally will be necessary for areas other than the landfill source itself (such as areas where contaminants have migrated from the source) to determine the need for additional remedial action beyond areas normally addressed by the cap; and

(3) a focused risk assessment generally will be necessary to determine the need for remedial action at sites where ground-water concentrations do not exceed MCLs or non-zero MCLGs, unless other conditions provide a clear justification (e.g. unstable slopes).

These conclusions are directly applicable to the four pilot sites only; however, based on these findings, the municipal landfill expert team is developing an Agency directive that will provide additional guidance on conducting baseline risk assessments at municipal landfill sites. For additional information on the directive or the municipal landfill pilot project, please call Andrea McLaughlin at 703-603-8793.