



LAND RESEARCH PROGRAM

COMPARING WAYS TO REDUCE RISK ASSISTS WITH REDUCTION OF HIGH-PRIORITY CHEMICALS

Issue

EPA has identified 31 “high-priority chemicals” in waste that are of particular concern because of their toxicity, persistence, and tendency to bioaccumulate. Having achieved its goal of reducing the presence of these chemicals in hazardous waste by 50 percent, EPA set a new goal: an additional 10 percent reduction of priority chemicals by 2008.

EPA is engaged in a national initiative to encourage public and private organizations to form voluntary partnerships with EPA to reduce the use or release of any of the 31 priority chemicals.

Under the National Partnership for Environmental Priorities (NPEP) initiative, EPA and its volunteer partners are working to reduce four million pounds of priority chemicals used or released into the environment by 2011.

Science Objective

To support the NPEP initiative, the Land Research Program in EPA’s Office of Research and Development initiated a study in 2005 to compare risk-reduction efforts at waste-management units (e.g., landfill, waste pile, aerated tank, surface impoundment, or land-application unit) to show the expected benefits of reducing the use and release of priority chemicals. Scientists selected these five waste-management units for study because they exemplified waste-management scenarios at industrial facilities across the United States.

The Multimedia, Multipathway, Multireceptor Risk Assessment (3MRA) modeling system was used for the risk assessments.

The study was designed to provide an integrated assessment of the benefits of reducing priority chemicals by predicting

increased protection across a wide range of waste concentrations.

This research has enabled scientists in the Land Research Program to generate important risk-assessment information. This research effort:

- Identified which human health or ecological receptor will be at greatest risk
- Identified dominant media (e.g., air) and exposure pathways (e.g., inhalation) for each waste-management unit and chemical
- Demonstrated the usefulness of the 3MRA modeling system for conducting national exposure and risk studies

Application and Impact

Decision-makers can use this comparative risk-reduction analysis to weigh their concerns against anticipated scenarios in order to select a waste-

continued on back



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LAND RESEARCH PROGRAM

continued from front

management plan that leads to the least risk. Regulators and policy makers can use the analysis to determine waste-minimization strategies for a given chemical and waste-management unit.

The analysis is being used by the EPA office of Solid Waste to establish a performance metric of priority chemical reduction. In addition, consideration can be given to the benefit of pursuing voluntary reduction programs for selected chemicals. For example, the Office of Solid Waste's Resource Conservation Challenge uses the analysis to supplement the objectives of the Resource Conservation and Recovery Act.

Calculating the percentage increase in the number of protected waste sites and comparing it with the percentage reduction in the concentration of high-priority chemicals in the waste stream will inform waste-management solutions that enhance environmental protection.

REFERENCES

Babendreier, J.E., W. Brandes, Z. Saleem, et al. (2005). "A Comparative Risk Reduction Analysis of the Office of Solid Waste's Waste Minimization Priority Chemicals (WMPC) Initiative Using the 3MRA Multimedia Modeling System." Presentation for the Board of Scientific Counselors Land Goal Research Program Review Panel, Cincinnati, OH, December.

Priority Chemicals Web site:
<http://www.epa.gov/osw/hazard/wastemin/priority.htm>

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