Cleaning Up Dioxin-Contaminated Soils

Agent Orange/dioxin residues in Vietnam can be and are being cleaned up, using well-known and cost-effective methods. Additional resources would allow scale-up and expansion of these best practices to all existing "hot spots."

How much of the Vietnamese environment was affected by Agent Orange/dioxin? Dioxin-contaminated herbicides were sprayed over about 5 million acres of upland and mangrove forests and about 500,000 acres of crops -- a total area the size of Massachusetts, about 24 percent of southern Vietnam. Some areas of Laos and Cambodia along the Vietnam border were also sprayed.

What are dioxin "hot spots"? Dioxin is not water-soluble. It breaks down in sunlight or clings to soil particles and is washed away in rainwater, so little remains in areas that were sprayed by air.[i] However, Hatfield Consultants (Canada) has found "hot spots" of high dioxin concentrations in areas where the dioxin-contaminated herbicides were stored, leaked or spilled. These are mostly on and around former U.S. military installations. Dioxin leached into the soil or was transported by runoff into the sediments of nearby rivers, lakes and ponds.

How many "hot spots" are there? Research continues, but as of September 2009, Hatfield and Vietnamese officials had located 28 dioxin "hot spots," primarily where the Ranch Hand program was based. The most significant are at the Da Nang, Phu Cat and Bien Hoa airports that were used by the U.S. military.[ii] [*See map.*]

Are the "hot spots" dangerous? Yes. Safety standards for dioxin vary from country to country and by substance tested – food, air, water or soil. As most exposure to dioxin is through the food chain, the greatest concern for human exposure is the dioxin level in soil and sediment.

- The general standard in most countries is that dioxin levels must not exceed 1,000 ppt (parts per trillion) TEQ (toxic equivalent) in soil and 100 ppt in sediments. Levels beyond that require immediate remediation. Average dioxin contamination in the soil of industrialized nations is less than 12 ppt.
- In Vietnam, researchers found dioxin levels of up to 365,000 ppt at Da Nang, 185,000 ppt on the Bien Hoa base and 236,000 ppt in former storage areas on the Phu Cat base.[iii]

How can "hot spots" be cleaned up? The U.S. Agency for Toxic Substance and Disease Registry has determined that dioxin levels higher than 1,000 ppt in soil require intervention, including surveillance, research, health studies, community and physician education, and exposure investigation.[iv]

The first step is to prevent access to contaminated areas by constructing fences and other barriers to protect the local population from further exposure. Second, containment measures such as concrete caps, filtration systems and sediment traps can prevent dioxin from being transported to secondary sites such as ponds and streams, and from there up the food chain to people. Then the isolated soils can be cleaned of dioxin through appropriate technical means.

What does dioxin cleanup cost? It depends on the severity of the contamination, the type of soil affected and later uses planned for the area. Hatfield Consultants and its Vietnamese counterpart, Office of Committee 33, estimate that a total of 234,780 cubic meters of soil and sediment need remediation

at Bien Hoa, Da Nang and Phu Cat, the worst known sites – enough material to cover a football field nine feet deep. In mid-2009, the remediation cost was estimated at $58.7 million.[v]

What have Vietnam and the United States done so far to clean up Agent Orange/dioxin "hot spots"? In 2003, the U.S. Environmental Protection Agency began a $2.4 million project in cooperation with the Vietnamese to investigate the situation at Da Nang, funding U.S. government agencies and their contractors. In 2007, the Joint Advisory Committee of U.S. and Vietnamese agencies began holding yearly meetings. In the same year, Congress allocated $3 million to address remediation of dioxin hotspots in Vietnam and to support public health programs in the surrounding communities.[vi] A second allocation of $3 million was included in the FY2009 Foreign Operations spending bill, and a third $3 million appropriation was approved for FY2010.

As of January 2010, the U.S. Agency for International Development, the implementing agency, had distributed $2 million to three non-governmental organizations for programs to support those with disabilities in the Da Nang area.[vii] In October 2009, USAID allocated $1.69 million to a U.S. engineering firm to assess dioxin contamination there and design a remediation plan. The remaining funds have not yet been released.[viii] No U.S. funds have gone directly to the Vietnamese, nor have any U.S. funds been spent on reforestation or other environmental remediation.

What have non-governmental organizations (NGOs) done? The lead NGO has been the Ford Foundation, which has provided $11.5 million in grants in Vietnam to test for and contain dioxin-contaminated soils, develop treatments and support centers for Vietnamese who have been exposed, restore landscapes, and educate the U.S. public and policymakers.[ix] Ford has also worked to increase awareness about Agent Orange/dioxin among donors and to encourage new donors such as UNICEF, The Atlantic Philanthropies and the Bill & Melinda Gates Foundation. Many U.S. and Vietnamese NGOs have projects that provide services to the disabled in Vietnam.

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[i] Dwernychuk, Wayne et al. "The Agent Orange Dioxin Issue in Vietnam: A Manageable Problem." Paper Presented at Dioxin 2006, Oslo, Norway http://www.warlegacies.org/OsloPaper2006.pdf.

[ii] Vo Quy, "Statement to the House Subcommittee on Asia, the Pacific and Global Environment," Washington DC, June 4, 2009, http://www.internationalrelations.house.gov/111/quy060409.pdf.

[iii] Committee 33 PowerPoint Presentation: "Overcoming consequences of toxic chemicals/dioxin: A difficult and long-term task." April 2009 http://www.warlegacies.org/Committee33_0209.pdf.

[iv] Hatfield Consultants "Summary of Dioxin Contamination at Bien Hoa, Phu Cat and Da Nang Airbases, Viet Nam." PowerPoint presentation for the meeting of the U.S.-Vietnam Dialogue Group On Agent Orange/Dioxin, Washington, DC June 2009. http://www.warlegacies.org/Hatfield-Dioxin-Presentation-DC-052809.pdf .

[v] Committee 33 PowerPoint Presentation: "Overcoming…

[vi] Michael Martin, "Vietnamese Victims of Agent Orange and U.S.-Vietnam Relations" Congressional Research Service Report. (May 2009) p. 9 http://www.warlegacies.org/CRSAO.pdf

[vii] The East Meets West Foundation, Save the Children and Vietnam Assistance for the Handicapped.

[viii] $500,000 is being used to finance a staff person for dioxin issues at the U.S. embassy in Hanoi and for more expert exchanges. If their programs are successful, $1 million more is expected to go to the three NGOs that received the first allocation.

[ix] Bailey, Charles: "Chronology of Key Events 1993 through June 2009." Ford's funded work includes research by the Hatfield Consultants, 10-80 committee and Committee 33; policy discussions and public education conducted by the U.S.-Vietnam Dialogue Group on Agent Orange; and mitigation projects by several U.S. and Vietnamese organizations, including the Vietnam Veterans of American Foundation, the East Meets West Foundation, Children of Vietnam and Vietnam Assistance for the Handicapped. Ford has also funded the public education work of the War Legacies Project. For more information go to http://www.fordfound.org/about/signature/agentorange/issue.