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Partners In Progress

EPA Update on Federal Facility Cleanup and Reuse

Volume 2 Issue 1

The Buzz on Environmental Monitoring

BreakingNews

by Jerry J. Bromenshenk and Garon C. Smith

Honey bees are being used at the U.S. Army's Aberdeen Proving Ground (APG) in Maryland to monitor environmental conditions before, during, and after cleanup operations. Recommended as monitors of ecological and health hazards by EPA and the National Research Council, bees are multimedia samplers, indicators of chemical bioavailability, and assessors of the effects of stress such as exposure to chemical emissions.

Honey bees have the ability to pick up chemical residues. As they forage, bees collect bioavailable contaminants. During good weather, tens of thousands of bees forage daily from each hive. They bring back pollen and nectar for food, water for drinking and evaporative cooling, and anything that electrostatically clings to their body hairs. The bees return to their hives each night; thus hives can be sampled for the presence of environmental contaminants and measured to determine the effects of these substances on a colony's size, vigor, and activities.

Given that a colony of bees can easily forage as far as a mile from the hive, bees provide averaged samples for large areas. From an ecological perspective, anything adversely affecting bee foraging might also alter the pollination of crops and the native plants that rely on bees and other insects. From a human health perspective, toxic environmental chemicals readily available to bees also might pose a hazard to people. In Milltown, Montana, for example, after losses of bees in nearby commercial apiaries alerted officials of environmental contamination, children were found to have unacceptable levels of arsenic in their bodies.

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Celebrating Success

Loring Cleanup Paves the Way for Economic Growth

By using state-of-the-art technologies and thinking outside the box, the Base Realignment and Closure (BRAC) Cleanup Team (BCT) at Loring Air Force Base saved millions of dollars in cleanup costs. The base, located on approximately 9,000 acres in Maine near the Canadian border, supported long-range bomber aircraft for the Strategic Air Command for more than 50 years. Base activities included aircraft maintenance and refueling, munitions storage and maintenance, and flight-line operations.

Over time, these activities contaminated soil, sediments, groundwater, and surfacewater. By 1990, the base was listed on EPA's National Priorities List (NPL). In 1994, the base was closed and a BCT, consisting of representatives from the U.S. Air Force, EPA Region 1, and the Maine Department of Environmental Protection, assumed cleanup tasks.

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Message from the Editor

Outreach Activities Vital to Progress

Partners In Progress is just one of FFRRO's many initiatives to connect with stakeholders and engage citizens in the cleanup process. Other outreach activities include producing educational materials, supporting workshops, giving public presentations, and participating in conferences.

Through such activities, FFRRO forges new links for improving cleanup and reuse. We can achieve more by developing a network of contacts, forming partnerships, and leveraging resources. In doing so, we often strengthen efforts of other programs as well.

FFRRO's participation in the Brownfields '98 Conference in Los Angeles last November provides a good example of how we work proactively to establish new links with stakeholders. Sean Flynn, FFRRO's brownfields coordinator, and I hosted an exhibit where we spoke with representatives from consulting firms, the U.S. Department of Energy (DOE), EPA regional offices, and citizen advisory boards.

We also had the opportunity to describe the benefits of our program with people unfamiliar with FFRRO. During these discussions, Sean and I explained that federal facilities and brownfields face similar challenges and must comply with the same environmental laws. Further, because federal properties often encompass hundreds of acres and have large infrastructures, their cleanup and reuse can play a pivotal role in economic revitalization at nearby brownfields. For these reasons, partnerships between federal facility and brownfield stakeholders can be significant.

Deborah Leblang (center) and Sean Flynn (right) talk about federal facility cleanups with a conference participant.

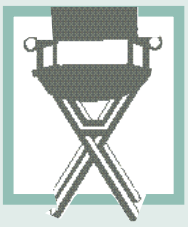
Sean and I informed participants about how to network, leverage resources, and share information. We also offered to help participants identify federal facility contacts in close proximity to their sites. Outreach efforts such as this are vital to the progress of our program.

Deborah Leblang is FFRRO's outreach coordinator and editor of Partners In Progress.

Partners In Progress Philosophy

Stakeholders involved in federal facility cleanups are diverse, with differing backgrounds, interests, and perspectives. All of these stakeholders, however, share a single, common goal—progress. *Partners In Progress* provides an open forum for stakeholders to exchange information, offer solutions, and share stories about what works and what doesn't. We encourage you—our readers—to write to us about your activities that foster teamwork, promote innovation, and strengthen community involvement. Only by working together, can we achieve "federal cleanups that put citizens first."

FromTheDirector



Working Together to Build Policy and Improve Cleanup

by Jim Woolford, Director of FFRRO

Welcome to our second issue of *Partners In Progress.* As this newsletter provides a forum for all parties to be heard, we are thrilled to include articles by some of our partners who have taken the opportunity to share information and discuss innovative approaches for improving cleanup and reuse. Karla Perri, the new Assistant Deputy Under Secretary of Defense for Environmental Cleanup at the Department of Defense (DoD), shares her take on DoD partnering efforts. We welcome Karla and look forward to working with her on the myriad issues confronting DoD's cleanup programs. Lenny Siegel, director of the Center for Public Environmental Oversight, is a major advocate for improving cleanup and stakeholder involvement.

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Hot Off the Presses

Hanford: A Cleaner Future

U.S. EPA, Solid Waste and Emergency Response
EPA505-F-98-006, July 1998

As many people know, the Manhattan Project involved the building of the world's first atomic weapon. Now, you can learn how various groups have been working during the past 10 years to clean up the site that first produced plutonium for the top secret project. A new fact sheet, *Hanford: A Cleaner Future*, describes the achievements and challenges of the world's largest environmental cleanup project and probably the most long-term effort of its kind. The fact sheet tells how representatives of EPA, DOE, the Washington State Department of Ecology, Native American tribes, and citizens' groups are searching for ways to achieve an accelerated and cost-effective environmental cleanup.

To obtain a copy of *Hanford: A Cleaner Future* contact Deborah Leblang of EPA's FFRRO office by e-mail at <leblang.deborah@epa.gov> or by calling 202 260-8302. The fact sheet also can be viewed at <www.epa.gov/swerffrr/success/hanford.htm>.

Accelerating Cleanup: Paths to Closure

U.S. DOE, Office of Environmental Management
DOE/EM-0362, June 1998

Compiled by DOE's Environmental Management (EM) Program, this report describes progress in the cleanup of 353 projects at 53 separate DOE sites located in 22 states across the country. Most of these sites were established during the early days of the Cold War for research, development, testing, and production of nuclear weapons and a variety of nuclear-related research projects.

In addition to remediation activities at specific sites, the report details the background and mission of the EM program; the six phases of the decision-making process; cost projections; and stakeholder, regulator, and tribal nation involvement.

A copy of the book can be obtained by calling 800 736-3282 and requesting document number DOE/EM-0362. This document also is available on the Internet at <www.em.doe.gov/closure/>.

An Analysis of Composting as an Environmental Remediation Technology

U.S. EPA, Solid Waste and Emergency Response
EPA530-R-98-008, April 1998

Composting is viewed primarily as a waste management technique that has the added benefit of enriching soil. Composting also has proven effective in helping to efficiently and inexpensively manage hazardous waste contamination. This report details the benefits and processes of innovative applications of composting in remediation efforts. Chapters include data on the use of compost in hazardous waste management; degradation of toxic organic soil compounds; application techniques; biofilter use; brownfields reclamation; and phytoremediation. These innovative composting applications and their results are gaining attention for the effective cleanup of federal facilities.

To receive a free copy of the report, call 800 490-9198 and request document number EPA530-B-98-008. This report also is available on the Internet at: <www.epa.gov/ epaoswer/non-hw/compost/index.htm#analysis>.

From the Director <continued from page 2>

Partners In Progress is produced by FFRRO at EPA Headquarters; however, it reflects the achievements of EPA regional offices as well. EPA has much to be proud of when it comes to the accomplishments of regional federal facility and base realignment and closure (BRAC) cleanup programs. Without their extraordinary efforts, FFRRO could not have pushed cleanups forward, identified ways to save time and money, and created the impetus to involve stakeholders in the cleanup process.

Not only do we look to EPA regional offices to implement cleanup programs, we rely on them to help craft policies and inform our judgements. The principal groups we work with are the Federal Facility Leadership Council (FFLC) and the Federal Facilities Forum, or "Fed Forum." The FFLC is comprised of regional federal facility program managers and legal counsels and EPA Headquarter's two main federal facility offices—FFRRO and the Federal Facilities Enforcement Office (FFEO). The FFLC is chaired by myself, Craig Hooks (director of FFEO), and Mary Sanderson and Joan Miles of EPA Region 1. Productive regional involvement allows us to use the FFLC as the major internal "sounding board" in policy deliberations.

The Fed Forum also provides substantial direction to our policy making. It is comprised of Federal Facility/BRAC Remedial Project Managers (RPMs) who work day-to-day at cleanup sites. They serve as our eyes and ears on issues such as monitored natural attenuation and UXO. Both the FFLC and the Fed Forum have been invaluable to our program.

FFRRO currently is calculating the annual performance of the federal facility and BRAC programs. A preliminary evaluation indicates that more than 90 Records of Decision were signed; 17 facilities reached the "all remedies constructed" phase of site cleanup; and 9 facilities were removed from the NPL.

While much work still remains, these accomplishments represent tremendous progress in cleaning up federal Superfund sites. I commend both the EPA regions and our federal partners in realizing these achievements.

Partnering: A Priority in the New Year

by Karla Perri, Assistant Deputy Under Secretary of Defense (Environmental Cleanup)

Since joining DoD, I have taken on the challenge of partnering. One of my main priorities for 1999 will be expanding and improving the quality of DoD's partnering activities. DoD's partnerships with environmental regulatory agencies, communities, Native Americans, and industry are essential to ensuring the success of our environmental restoration activities. DoD has been in the business of environmental restoration for well over a decade now, and partnering has been instrumental to our efforts.

The passage of the Superfund Amendments and Reauthorization Act (SARA) by Congress in 1986 formalized the preexisting Defense Environmental Restoration Program and established the Defense Environmental Restoration Account to fund DoD's cleanup efforts at operational installations and Formerly Used Defense Sites (FUDS). Later, BRAC laws created the BRAC account to pay for environmental restoration work at BRAC installations. While SARA granted authority and provided funding for DoD's environmental restoration program, it also brought additional changes and uncertainty, especially regarding listing on the NPL, Interagency Agreements, and the relationships among DoD, EPA, and the states. With thousands of sites in need of remediation, and millions of dollars in the balance, DoD soon realized productive working relationships had to be established and nurtured. The department, therefore, created several partnership arrangements to foster innovation and build teamwork and consensus among our stakeholders.

Our oldest and most successful partnering activity is the Defense and State Memorandum of Agreement/ Cooperative Agreement (DSMOA/CA) program. This program, established in 1989, facilitates active state and territory regulatory agency participation in DoD's environmental cleanup program, with the expectation of expediting cleanup at our operational and BRAC installations and FUDS. States and territories are reimbursed for technical services provided in support of DoD environmental restoration activities. The end result has been improved relations among the states and territories, military services, and defense agencies. To date, 48 states and territories have entered into DSMOAs with DoD. Between 1990 and 1998, more than $2 billion in cost avoidances have been documented.

Issues stemming from our DSMOA program have encouraged our partnership with the Association of State and Territorial Solid Waste Management Officials. We meet frequently, usually quarterly, to discuss a variety of issues of mutual interest. Some issues are general, such as improving the cleanup process and assessing the scope of UXO clearance. Other issues are more specific, such as the association's participation in our 1997 effort to "reinvent" the Defense and State Cooperative Agreement process.

Another example of our partnerships with state regulatory agencies is our association with the Environmental Council of States. In 1996, we created a permanent forum with the council to share information and address specific issues of mutual concern. Through this alliance, the senior leadership of DoD and the states have the opportunity to exchange ideas, views, and experiences, which serves to foster cooperation and coordination in environmental policy development and management.

With the advent of BRAC in 1988, it was evident that quick, efficient cleanups would be essential to community economic development and revitalization and to property transfers in communities. To accomplish these cleanup goals, BCTs were established at our BRAC installations where property would be made available to the community. The intent of the BCT concept is to foster partnerships at the installation level so decisions are made on a collaborative basis to speed cleanups. We also have been supporting EPA participation in BCTs by providing staff and funding resources.

On the community level, Restoration Advisory Boards (RABs) are a means to promote individual citizen input into our decision-making processes. There are 332 installations participating in the advisory board process across the United States and its territories, which creates a forum for members of nearby communities to provide input to DoD's environmental restoration program. Sharing information and providing tools is another facet of partnering we take very seriously.

Partnering with tribal nations in government-to-government relationships is another important part of DoD's partnering efforts. Over the past two years, we have been working in close consultation with federally recognized tribes to develop a DoD Native American Environmental Policy. Our efforts have been very successful, and we expect to have a final policy in place by spring 1999. Another example of our government-to-government relationship with tribes is the cooperative agreement initiative to provide a robust role in environmental mitigation activities on their lands. Under this initiative, a cooperative agreement mechanism provides funding for the specific technical services to be performed that are agreed to by DoD and the tribe. We currently have six such agreements in place.

Some of our partnership efforts are more narrowly focused. For instance, we have been funding and participating in the development of the Interstate Technology and Regulatory Cooperation (ITRC) Workgroup. In simple terms, the ITRC is a state-led national coalition with the mission of creating tools and strategies to reduce interstate barriers to the deployment of innovative hazardous waste management and remediation technologies. Developed in 1995 from a previous initiative by the Western Governors' Association, ITRC has expanded to include more than 25 states, three federal partners, public and industry stakeholders, and two state associations—the Western Governors' Association and the Southern States Energy Board. To date, ITRC has developed 22 guidance documents intended to help regulatory staff and technology vendors in the deployment of innovative technologies. We work closely with ITRC to ensure our technology priorities are compatible with that of ITRC and integrated into the ITRC work plan. We provide funding and offer our sites as demonstration projects for the many innovative technologies under study.

Partnering continues to be one of DoD's most successful initiatives and has resulted in millions of dollars in avoided costs, the acceleration of many cleanup projects, and enhanced teamwork with our stakeholders.

Partnering continues to be one of DoD's most successful initiatives and has resulted in millions of dollars in avoided costs, the acceleration of many cleanup projects, and enhanced teamwork with our stakeholders. As an example, the cooperative efforts of the BCTs and RABs eliminated 59 years of project work and avoided $60 million in costs. If done correctly, partnering helps all parties with a stake in environmental restoration to better understand each other, leading to cleanups that satisfy the majority of stakeholder concerns and resulting in faster, cheaper cleanups that protect human health and the environment.

During my tenure, I will continue to enhance existing relationships between DoD and our partners, and seek out new ways in which we can team with other stakeholders in carrying out DoD's environmental restoration obligations. To learn more about DoD's cleanup efforts and our initiatives, such as RABs, I invite you to visit the DoD Environmental Cleanup Home Page at <www.dtic.mil/envirodod/>.

Breaking News

<Continued From Page 1>

Honey Bee Monitoring of Chemical Releases at APG

A team of scientists from the University of Montana, the U.S. Army's Center for Environmental Health Research, and APG's Installation Restoration Program, continually monitor bees at APG to study the impact of the Army's past and current activities on the site's air quality and terrestrial environment.

Twenty-one electronic hives, outfitted with infrared counters, were installed at APG. They track bee flight activity, counting bees as they leave and enter the hive. Temperature probes inside each hive follow the ability of the bees to maintain a constant temperature to incubate their young. These electronics and other features, such as pumps for chemical sampling, gather and transmit data to a central processing system that, within minutes, delivers the data to any place around the globe via the Internet. The system detects and immediately reports anomalies in bee behavior that might signal exposure to toxic contaminants. This real-time monitoring provides an early warning of changing environmental conditions so that appropriate action can be taken. It also supplies a means of monitoring and determining the success of a site cleanup or remediation action such as the capping of a toxic dump.

In the past, chemical warfare agents, munitions, UXO, and wastes from industrial and research plants were landfilled in many areas at APG. The Army now is removing these materials, where possible, and capping larger landfills. Continuous monitoring of bees has been used to identify possible chemical releases during removal activities at APG's West Branch Canal Creek (WBCC), J-Field, and Carroll Island sites. Bees also have been released at the Old O-Field and J-Field to profile conditions before, during, and following landfill capping.

At WBCC, for example, where a chemical weapons plant had been removed, bee flight activity was high, colony condition good, and only trace levels of solvents, such as perchloroethylene (PCE), occurred in the hives. For three summers, the colonies at WBCC were indistinguishable from those at a reference site in rural Churchville, Maryland, indicating the effectiveness of the cleanup actions. During landfill capping efforts at Old O-Field, in 1996, bee flight activity was low, queens disappeared, and hive temperatures began fluctuating in more than half of the colonies. These behavioral anomalies coincided with very high levels of PCE in the affected hives. During the two years following the installation of the cover, bee behaviors reflected a more normal state and the levels of PCE dropped. The bees enhanced hazard evaluation by signaling an initial release and then verifying a reduction in bioavailable PCE following the capping. Bees still are on the job at the J-Field landfill where digging and capping actions are ongoing.

Honey bees in small, nonelectronic, minihives also are being used to survey a large number of sites at APG not previously evaluated for chemicals in the air or terrestrial environment. Additionally, bees are being used to survey boundary areas including 12 sites in the residential communities surrounding the APG Edgewood area. For this form of monitoring, the bees, pollen, air inside the hive, and ambient air are periodically sampled. Colonies are inspected to assess overall condition.

Real-time monitoring of bee colony activities and conditions can be an integral part of early identification of environmental threats.

In addition to APG, trace levels of solvents have appeared in beehives in three nearby Maryland counties. Although these same solvents do not appear in comparable hives in Montana, automobile repair shops, other local industries, and agricultural applications, not APG, appear to be the primary source of many of the hazardous chemicals. Low levels of chemicals derived from tear gas and explosives are found only in some of the hives on the grounds. Finally, although the levels of toxic metals are slightly elevated in bees and pollen at some APG locations, none of these hives displayed the toxic levels of metals often found in bees in comparable hives in ore mining and smelting regions of Montana.

To date, the chemical monitoring of hives has demonstrated a high degree of correlation to standard chemical monitoring. Large areas can be screened quickly and relatively inexpensively, indicating where to focus more stringent remediation techniques. Real-time monitoring of honey bee colony activities and conditions can be an integral part of the effort toward the early identification of environmental threats so corrective action can take place.

For more information on honey bee monitoring, including the development of microchips for tracking of individual bees, contact Dr. Jerry Bromenshenk (University of Montana) at 406 243-5648; e-mail <jjbmail @selway.umt.edu> or visit the Web site at <www.umt.edu/biology/bees>.

Jerry J. Bromenshenk, Ph.D, is adjunct professor with the Division of Biological Sciences at the University of Montana-Missoula. Garon C. Smith, Ph.D., is associate professor of chemistry at the University of Montana.

CyberNews

<www.clu-in.org>

A wealth of information about innovative remediation technologies is now available at your fingertips. The Hazardous Waste Cleanup Information Web site, developed and maintained by EPA's Technology Innovation Office, describes remediation programs, organizations, publications, and other tools. The site is geared toward federal and state personnel, consulting engineers, technology developers and vendors, remediation contractors, researchers, community groups, and citizens. Featured on the site are "Citizen's Guides" to various innovative technology remedies. These guides are written in plain English and provide information and illustrations of technologies being used across the country to clean up federal and private facilities.

<www.epa.gov/year2000>

The countdown to the new millennium is well underway. In the midst of the excitement is the fear that computer systems will crash at the stroke of midnight, unable to interpret the two-digit 00 year code. On this special Web site, you can learn how EPA is safeguarding its operations by implementing a Year 2000 (Y2K) strategy. In addition to an outline of the strategy, the site offers information on EPA's date standard, Y2K assistance and guidance, compliance status of EPA's mission critical systems, Y2K environmental sector action plans, and much more. The days to the new millennium continually click down in the upper right corner of the home page, so check it out today.

<www.cpeo.org>

Visit The Center for Public Environmental Oversight's Web site and you'll find the Technology Tree, an original "front end" for researching environmental remediation technologies. Also available on this new home page is the organization's newsletter, *Citizens' Report on the Military and the Environment.* Visitors also can access other publications, information on current stakeholder issues, and a list of upcoming events.

Team Effort Keeps Rickenbacker on Track

FromTheField

Laura Ripley, from EPA Region 5, explains how she is participating in the cleanup and reuse of Rickenbacker Air National Guard Base in central Ohio.

Q: You're currently managing the base closure and realignment of Rickenbacker Air National Guard Base. What's the history of this base?

A: Rickenbacker provided airfield support for the Air Force, Ohio Air National Guard, and Army National Guard. Installation activities included operation, maintenance, and repair of aircraft, vehicles, and equipment. It also was used as a training center for pilots and carried out some pesticide spraying missions at other bases.

Q: What contaminants are on the site as a result of these activities and what remedies will you use to clean them up?

A: There is a blend of contaminants that includes fuel components, chlorinated solvents, and some inorganic metals. They're evident in both the soil and groundwater at certain sites on the base. Recently, we've reviewed the draft feasibility study, a document compiled by the Air Force, which provides a number of alternatives to be considered for cleanup. Remedial actions will likely include a combination of hot spot [soil] removal and monitored natural attenuation as well as a permeable reactive wall in one area to keep pollutants contained. Until these remedial actions are put in place and operating successfully, the site cannot be considered suitable for transfer. Unless the Air Force opts for early transfer, the base probably won't be completely transferred until 2002.

Q: Is Rickenbacker a typical base cleanup?

A: For the most part, Rickenbacker is the norm for environmental investigations and cleanup. The base is somewhat unusual, however, in that it involves both a closure and a realignment. The Ohio Air National Guard and Army National Guard will retain 300 acres while the remaining 1,700 acres will be handed over to the Rickenbacker Port Authority (RPA) through a public benefit transfer. RPA plans to use this property, including the airfield, for a commercial industrial airport. RPA also is trying to get related industries to take over some of the other areas. Currently, RPA has leased the property from the Air Force.

Q: When you transfer a base to a business that conducts similar operations, in this case an airport, how do you ensure the same contamination issues do not recur?

A: Regulations for underground storage tanks have been strengthened, requiring fuel tanks and associated piping to be properly designed and constructed to include spill and overfill prevention equipment. Any underground portion of a tank that routinely contains fuel products must be protected from corrosion.

In addition, we're taking out some of the fuel lines, oil/water separators, and storage tanks. Fuel capacities are being reduced, and the hazardous waste storage areas are being cleaned up and closed down. Also, RPA is considering upgrading the stormwater drainage system as well. Thus, with minor changes and alterations before reuse, new contaminants should not be reintroduced into the environment.

Q: How has partnering played a role in the cleanup at Rickenbacker?

A: Partnering brought together the key players from each organization involved as well as their technical support staffs. Working together as a team has helped prevent disagreements and thwart potential problems. Additionally, representatives from the Air Force, state, and EPA have not changed. Continuity of key individuals has allowed us to develop a strong rapport and the ability to move things forward without having to wait for new team members to familiarize themselves with the facility.

Q: How has the community been involved?

A: The community has been informed of the issues concerning Rickenbacker since 1991. Members of the community have toured the site and are aware of the contaminants found there. They've given some input on cleanup and reuse but have not been heavily involved. At this point, the RPA has been the only nongovernment agency actively participating in the process, attending the working team meetings, and commenting on work plans and reports. The proposed work plan, which is a public document on the cleanup alternatives for the base, was published in December 1998. Following its release, the community was informed of the actions chosen for base cleanup and was invited to comment and offer suggestions.

Q: What have been the challenges of cleaning up and transferring Rickenbacker?

A: The main challenge of cleaning up and transferring Rickenbacker has been to utilize available resources in an expeditious and cost-effective manner. RPA wants to redevelop the land; therefore, the project schedule has been expedited. To accommodate this condensed schedule, the coordination and cooperation of all parties involved has been crucial. These strong, cooperative partnerships have allowed the Rickenbacker cleanup plan to proceed quickly and efficiently.

On Being an EPA Remedial Project Manager

Q: What challenges does an EPA Remedial Project Manager (RPM) face?

A: The primary challenge of the position is working with industry, federal facilities, and/or the state in implementing environmental cleanup programs. Because each entity can have different goals and objectives, the EPA RPM assumes the role of negotiator. RPMs try to ensure all partners have sufficient information on which to base their decisions when selecting the best cleanup method. They need to select methods that protect public health and the environment in a reasonable time frame.

Q: What is the learning curve for an EPA RPM once assigned to a base closing?

A: An effective RPM must learn the ins and outs of the base as well as its past activities and how those activities have affected the environment. This learning comes from extensive document review and site visits. We learn a great deal in the field by participating in work plan discussions and development, environmental investigations, field modifications, sample location determination, and data evaluation.

Q: How many EPA staff members work on a site?

A: In order to make informed and practical decisions, I work with an EPA in-house technical support staff. This group includes a chemist, geologist, risk assessor, toxicologist, and ecologist. An engineer also is involved during the remedial action stage to review the design, construction, and operation of the remedy as it takes place.

Like the RPM, technical support members learn about a site through document review and site visits, as necessary. I think it's extremely beneficial to have these experts with me at meetings when we need to discuss issues and come to some conclusions regarding those issues. Tapping into that technical expertise on the spot is invaluable.

Institutional Controls: The Emperor's New Clothes?

by Lenny Siegel

Two hikers wander past a "no trespassing" sign into a contaminated area. A public facility is built on top of a forgotten capped landfill. These are just two scenarios that demonstrate the potential ineffectiveness of institutional controls. Institutional controls are restrictions on the use of land or water, imposed by environmental regulators and state and federal agencies, that complement or substitute for removing or treating contamination.

All too often, regulators choose these restrictions with minimal stakeholder involvement and to save on short-term expenses. In addition, they are being used more and more on sites with contamination or UXO, which could pose significant threats for decades. Once in place, institutional controls are often inefficiently monitored or enforced. Like the fabled emperor's new clothes, merely saying that institutional controls are in place does not guarantee their effectiveness or long-term stability.

Sometimes, institutional controls are necessary and unavoidable. For example, they are useful in limiting exposure while cleanup remedies are being put in place and before these remedies are operating effectively. In addition, where complete cleanup is technically infeasible, prohibitively expensive, or likely to cause irreparable environmental damage, institutional controls might be the only option. Beyond these situations, institutional controls should only be used when they are reinforced by geographic or physical reality. In an area likely to remain a wildlife refuge indefinitely, for example, restricting construction on a capped landfill is suitable. (Of course, the land management agency should keep track of that landfill if it decides to build a visitors' center or install a pipeline.)

When institutional controls are adopted, all parties should consider ways to enforce these restrictions. Local governments, for example, could restrict land use through zoning and other measures that restrict specific activities such as excavation. For property remaining in federal hands, facility management plans should specify the controls.

No matter what strategy is used, however, regulators should be aware of potential loopholes. In most states, for example, deed restriction language written into transfer documents cannot easily be enforced against subsequent owners. Zoning can be vetoed or changed by a city council vote and there is no long-term enforcement mechanism.

The following simple steps can help solve these problems:

- **Memorialize institutional controls in legal documents.** For instance, restrictions can be written into decision documents (such as records of decision and action plans) and property transfer documents. Properties should be subjected to overlapping restrictions in which cleanup decision documents, property documents (for nonfederal property), and official plans (whether drawn up by local governments or federal property owners) should all simultaneously memorialize the same institutional controls.

- **Establish a single registry.** Many different agencies regulate cleanup for each geographic area; therefore, data on controls are currently fragmented and, in some areas, simply anecdotal. Regulatory agencies can establish a single, unified list or registry of institutional controls imposed to limit exposure to toxic waste, radioactive substances, and explosives. A registry would make it possible to quantify and analyze the use of institutional controls.

- **Provide easy public access to the registry.** The people who are at risk—or who care about the species at risk—have a long-term stake in the effectiveness of controls. Just as information on toxic releases has allowed the public to press for increased compliance and pollution prevention, an institutional control registry would give public stakeholders the information they need to monitor limitations on use and pathways.

- **Require registry consultation when considering property transfer.** For properties transferred from federal ownership, local governments should be required to consult the registry when considering zoning changes, building permits, and other actions that could compromise controls. This sounds simple, but it might be difficult for local governments to limit owners' use of their land without compensation, particularly if the controls were imposed by other agencies such as state or federal environmental regulators.

- **Ensure long-term auditing and enforcement.** The federal government and/or states should establish an agency to audit and enforce institutional controls at affected properties. This monitoring should go beyond the typical five-year review mandated by the Superfund law.
- **Ensure long-term protection.** Property law must be revised to ensure that institutional controls "run with the land" forever. Sites also should not be "closed out" until there is no longer a need for institutional controls. As long as the protection of public health and natural ecosystems requires limits on the use of land and other resources, those sites and their associated restrictions should remain on the environmental and legal "radar screen."

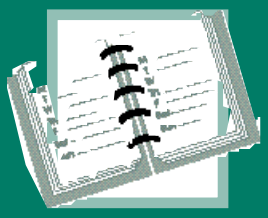
Even if all the above steps are applied evenly across all relevant jurisdictions and are backed with the necessary long-term funding, institutional controls should still be considered unreliable. Understandably, those responsible for cleanups want to save money and assume restrictions will be effective. Arbitrarily implementing institutional controls, however, does not ensure the most effective means of remediation. Property owners have too much incentive to use their land to the fullest extent possible. Others often have good reason to enter restricted property. As time passes, there is a likelihood that even the best laid controls will be breached.

Lenny Siegel is the Director of the Center for Public Environmental Oversight, a program of the San Francisco Urban Institute, San Francisco State University.

A Closer Look at Institutional Controls

Typical institutional controls used for environmental cleanup projects include deed restrictions and zoning ordinances. When implemented and enforced properly, these controls protect human health and the environment by interrupting the pathway of contamination (e.g., soil, groundwater, surfacewater) from receptors—people, fish, and animals. For example, if groundwater is contaminated, an institutional control would prohibit drilling a well for drinking water in that area. Institutional controls should remain in place as long as the pathway continues to pose a risk. If remediation renders the pathway safe for exposure, however, the control can be lifted.

OnTheAgenda



National Defense Industrial Association (NDIA) 25th Environmental Symposium and Exhibition

March 29 through April 1, 1999
Denver, Colorado

The theme for this year's symposium is Privatization and Outsourcing of DoD Environmental Operations. For more information on session topics and how to register, call NDIA at 703 522-1820 or visit <www.ndia.org/events/brochure/944/944.htm> on the Internet.

The National Town Meeting for a Sustainable America

May 2 through 5, 1999
Detroit, Michigan

The President's Council for Sustainable Development will host this "town meeting" to recognize and encourage sustainable development activities across the United States. For more information, visit the National Town Meeting's Web site at <www.sustainableamerica.org>.

UXO Forum '99 — Strategies for Tomorrow, Tactics for Today

May 25 through 28, 1999
Atlanta, Georgia

Session topics for this global conference include UXO detection, policy and regulations, case studies, UXO clearance, risk assessment, partnering and transitions, and more. Worldwide UXO experts will be in attendance. For more information, call 888 808-5303 or visit <http://www.denix.osd.mil/denix/Public/News/UXOCOE/Conference/Atlanta/atlanta.html>.

*Tree*ting Contamination: A Natural Cleanup Alternative

by John Wrobel, Steve Hirsh, and Harry Compton

Poplar trees are turning out to be a natural choice for cleaning up a U.S. Army site in Maryland. A stand of 184 hybrid poplars, planted in 1996, are helping to contain toxic substances in the soil and groundwater, through a process called phytoremediation, on the J-Field at Aberdeen Proving Ground (APG). No ordinary field of trees, the poplars are the subject of a five-year project conducted by a team of representatives from EPA Region 3, EPA's Environmental Response Team, the U.S. Army, and the Maryland Department of the Environment, to investigate pilot-scale applications of innovative technologies.

The J-Field site was once a pit burning location for munitions and chemical agents. During the burning process, large volumes of chlorinated solvents, used as decontaminating agents, were discharged onto the ground. As a result, a plume of chlorinated solvents, predominantly 1,1,2,2-tetrachloroethane and trichloroethene, contaminated the groundwater in and around the burning pits in concentrations exceeding 500 parts per million in some areas.

The project involved several initial steps. First, the team collected and analyzed soil samples for levels of chlorinated organic compounds, metals, and chloride. The soil was then prepared by digging holes; adding fertilizers and nutrients, such as nitrogen and phosphorous, to aid tree growth; and mixing the soil. Next, the team planted the trees to depths allowing coverage and data collection from the root capillary zone during groundwater seasonal highs and lows. Located on 1 acre southeast of the toxic pit, the trees soak up the groundwater flowing from the contaminated area. The team continually monitors the groundwater quality and level using wells and lysimeters installed nearby.

Each season, the team conducts various monitoring tests. The tests include measuring the effects of weather, including precipitation, solar radiation, temperature, humidity, and wind speed; tree growth measurements; soil vapor and air quality samples; levels of metals, chlorinated organic solvents, and degradation products in plant tissues; sap flow; transpirational gas and condensate water; and soil content and characteristics. The data collected help the team determine how the trees are responding to and influencing their surroundings.

With each sampling event, the team has observed noteworthy results. In an ongoing test of condensate water samples, the team recently noted a correlation between concentrations of chlorinated organic compounds found in condensate water and transpirational gas given off by the trees. Further studies of this relationship will help the team determine the trees' ability to contain and remove contaminants. Another important test of the remediation capability of the trees, is a study of the soil community. In a recent sample, the team noted increased numbers and diversity of nematode populations inhabiting the area. These findings suggest the trees are having a positive affect in the area.

The team has measured the trees' groundwater intake at rates of 2 gallons/day/tree, with peak flows of 10 gallons/day/tree. Higher flows are anticipated as the trees mature. Increasing concentrations of chemical compounds and byproducts in plant tissue samples during the growing season indicate that the trees are able to remove more and more toxins during this time.

Thus far, the team has collected increasing evidence that supports the use of trees for soil and groundwater remedia-tion. The inherent benefits of phytoremediation at the J-Field site include low cost, low maintenance, and low impact, compared to more traditional remedies such as a pump-and-treat system. Though additional data and interpretations are needed to conclusively prove its effectiveness, preliminary conclusions have demonstrated that phytoremediation is a natural cleanup choice.

John Wrobel of the U.S. Army at Aberdeen Proving Ground Directorate of Safety, Health, and Environment; Steve Hirsh of EPA Region 3; and Harry Compton of EPA's National Risk Management Research Laboratory; shown above at J-Field, are members of the phytoremediation project team.

New Trees

The phytoremediation team at APG planted new trees in November 1998. Native species, such as silver maples and tulip poplars, were planted to gauge their effectiveness in containing the J-Field contaminants. Based on lessons learned in the first two years of the project, these trees were planted with more sand around the roots to encourage growth and to attract groundwater. Additional trees also were planted in an uncontaminated site in order to compare test data.

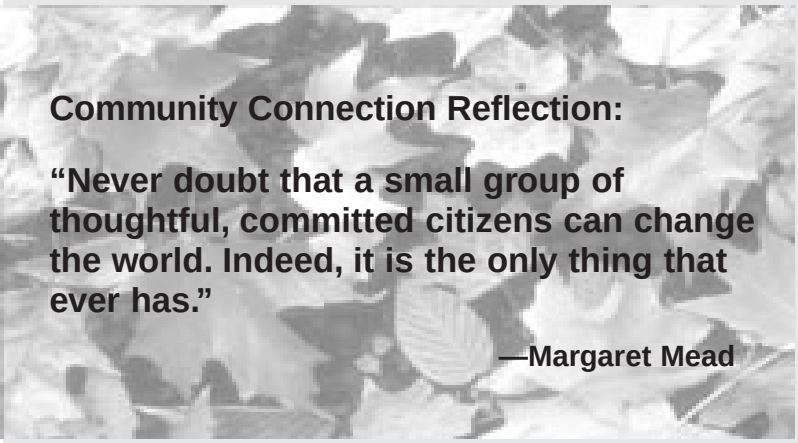
Inspiration Sparked at Community Involvement Conference

The Community Connection

by Marsha Minter, FFRRO Community Involvement National Program Manager

This column's icon—people linked arm-in-arm—illustrates EPA's goal of helping all parties become involved in environmental decision-making at federal facilities. This two-part article shares highlights from EPA's National Community Involvement Conference, an event that provided inspiration and insight on how we can work together to achieve this goal.

Held in Boston in August 1998, the conference focused on EPA's commitment to help communities find solutions to environmental concerns. The conference brought together community involvement directors, Restoration Advisory Board (RAB) members, public affairs specialists, military officials, site supervisors, and representatives from government and academia.



Through workshops and dialogue, the participants learned innovative techniques and approaches for fostering community involvement. In her keynote address, Susan Seacrest, president of the Groundwater Foundation, shared her inspiring vision for community involvement. As the founder of the Groundwater Guardian Program—a national program that promotes community involvement in groundwater protection—Ms. Seacrest has found that even the smallest step toward community involvement is a step in the right direction. Said Ms. Seacrest, "a journey of a thousand miles begins with a single step."

Ms. Seacrest emphasized that, to succeed in effective community involvement, we must have the following:

- **Promise:** According to Ms. Seacrest's "spark plug" theory, a single, inspirational moment is all that is needed to spark the journey of a thousand miles.
- **Process:** After the spark has fired, the journey must be encouraged and nurtured. Sound science, reliable information, and accurate data are essential.
- **Partnerships:** Information and data without human relationships will not achieve success. People power is needed to make the process work. Partnerships must be forged at all levels and reach beyond city or county limits.
- **Products:** The end results—the products—should be sustainable, results-oriented solutions to problems.

Ms. Seacrest reflected that by following the above "Ps," as she calls them, people learn to value the differences among themselves and eventually master the fifth "P"—patience.

EPA is committed to increasing community involvement, supporting RABs and SSABs, and fostering partnerships with other stakeholders. Together we can ensure the success of our nation's cleanup programs. Arm-in-arm, the journey will become easier each step of the way.

Portions of this column were reprinted from the U.S. EPA National Community Involvement Conference Proceedings Supplement, with permission from the Groundwater Foundation. This article will be continued in the spring issue of Partners In Progress. *Questions or comments on this article or other community issues can be directed to Marsha Minter at 202 260-6626; or e-mail: <minter.marsha@epa.gov>.*

The Military Range Cleanup Debate

by Douglas A. Bell

To ensure military readiness, DoD has operated more than 10,000 sites for troop training or testing of munitions and other weapons. Many of these sites are defined by DoD as military ranges. Due to tremendous site assessment and cleanup costs, most of the ranges have not been thoroughly investigated and still contain unknown amounts of munitions including UXO. Since the 1950s, many contaminated ranges have been transferred and are no longer under DoD control. These properties are now in the hands of private citizens, industry, States, and tribal nations, who, in some situations, might not be aware that UXO or hazardous chemical contamination is present.

EPA, DoD, states, and military range stakeholders are working to develop policies for addressing military munitions and UXO. In February 1997, EPA finalized the Military Munitions Rule, a federal regulation that provides requirements for storage, transport, and disposal of military munitions. Initially, military ranges were to be included within the broad authorities of the Military Munitions Rule. In 1995, however, DoD began developing its own regulation specifically for closed, transferred, and transferring military ranges. DoD proposed this rule in September 1997. While this rule is under development, when finalized, it will set forth a process for investigation and cleanup actions at these types of military ranges.

Various parties have expressed different perspectives on DoD's proposed rule and the risks associated with military ranges. DoD stated in the draft Range Rule Risk Methodology that "risk is defined as the product of the probability of detonation and the consequences of detonation" [of UXO]. This DoD position indicates that UXO are only dangerous if enough force is applied to cause detonation. Some regulators, stakeholders, and tribal parties disagree with DoD's stated position. These parties also feel the proposed regulation does not adequately address assessment and remediation, citing the tremendous risks involved with any exposure to munitions, particularly UXO. This is only one example of the difficult issues that face DoD and all involved.

Evaluating the risks posed by military munitions is a complex and difficult task. Risk, danger, and exposure to UXO, for example, cannot be easily measured with traditional risk assessment methods. Lifetime exposure to UXO, as compared to hazardous chemicals, has no meaning since just one detonation is all that's needed to cause a fatality.

In addition to determining risk, DoD must collect range-specific information. Some of the affected properties are extremely large, spanning more than 100 square miles. Making matters even more complex is that many of the activities performed on ranges during their lifetime are still unknown. General records might serve as a guide, but they often lack sufficient detail about how much ordnance was used or where it was used and disposed of following training activities. Without this crucial information, the DoD task of cleaning up and stabilizing the ranges is much more difficult.

To overcome these challenges, DoD is engaged in a number of efforts to address military ranges. The enormity of DoD's tasks makes progress difficult, but DoD has committed to resolving the issues involved. In conjunction with DoD, EPA will continue to work with all parties. EPA is assisting in these efforts to deal with situations at closed, transferred, and transferring ranges through existing authorities, like the EPA Munitions Rule, the Superfund law, the Resource Conservation and Recovery Act, and the Safe Drinking Water Act. All involved will continue to work toward establishing a higher level of protection for human health and the environment.

Douglas Bell is an environmental scientist at FFRRO where he manages military range issues nationwide.

Photo by Harry Craig, EPA Region 10

UXO found at the Umatilla Army Depot in Hermiston, Oregon.

DEFINITIONS

Military Munitions: Ammunition products and components produced or used for national defense and security. Examples include propellants, explosives, pyrotechnics, chemical and riot control agents, chemical warfare agents, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, grenades, mines, and torpedoes.

Military Range: A land or water area used to develop, test, and evaluate military munitions, or to train military personnel in their use and handling. Ranges include firing lines and positions, buffer zones, maneuver areas, firing lanes, test pads, detonation pads, and impact areas.

UXO: Military munitions that have not detonated. These include damaged, decomposed, and dud-fired munitions.

Full, legal definitions of these terms can be found in the proposed DoD Range Rule at <www.acq.osd.mil/ens/draft/rangrule.doc>.

<Continued From Page 1>

Excavating Big Savings

First, the BCT tackled the contaminants in Greenlaw Brook and the Little Madawaska River, which it feeds. Stormwater drainage and runoff from the base's industrial and flight-line activities areas contaminated these nearby surfacewaters. The contamination was so severe that, in 1996, the Maine Department of Human Services issued an advisory against eating fish from the river.

To treat the contaminated area, the BCT excavated the banks of the brook. Once excavation was underway, the team discovered the contamination was more than twice the originally projected levels. Undaunted by these findings, the BCT establishing a state-of-the-art, on-site laboratory for analyzing water and sediment samples. Daily tests enabled the BCT to direct the excavation crew quickly and efficiently. In addition, the BCT expedited the excavation process by accelerating decision-making procedures and cutting through red tape wherever possible.

The BCT excavated an additional two feet of sediment beyond the treated area to ensure all contamination was removed. The remaining sediment not only met required standards but was considered an excellent wetland soil. In fact, the quality of the remaining soil was so good that backfilling the area with replacement soil was unnecessary, saving $2 million in backfill costs.

Consolidating Waste

The BCT also saved more than $30 million in solid waste transportation and disposal costs by consolidating waste on the base. Initially, the team planned to close the landfills in the southwestern section of the base. A closer evaluation, however, showed using the landfills to handle contaminated soil excavated from the base cleanup would be more efficient and cost-effective than paying a firm to transport and dispose of the wastes.

The excavated wastes pose minimal risk on the base since the landfills utilize a double-layer capped system to prevent leakage. All the landfills are situated well above the water table, eliminating the risk of potential groundwater contamination. Currently, approximately 750,000 cubic yards of excavated soil have been placed in the landfills from more than 100 sites.

A Brighter Future

Today, the base is home to the Loring Commerce Center, a thriving hub of jobs, services, and recreation. Employment at the center reached approximately 1,200 by the end of 1998. With a well-established infrastructure of transportation, utility, and telecommunications systems in place, the state of Maine is confident it can fill the commercial, industrial, and aviation space still available at Loring. These new endeavors are helping to stimulate economic growth and ensure long-term stability in the area.

Write To Us

We encourage your questions, comments, and contributions. Please send your input to Deborah Leblang by mail at U.S. EPA/FFRRO, Mailcode: 5101, 401 M Street, SW., Washington, DC 20460; e-mail at <leblang.deborah@epa.gov>; or fax at
202 260-5646.

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Acronyms Explained

APG	Aberdeen Proving Ground
BCT	BRAC Cleanup Team
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DSMOA/CA	Defense and State Memorandum of Agreement/Cooperative Agreement
EPA	U.S. Environmental Protection Agency
EM	Environmental Management
FFEO	Federal Facilities Enforcement Office
FFLC	Federal Facilities Leadership Council
FFRRO	Federal Facilities Restoration and Reuse Office
FUDS	Formerly Used Defense Sites
ITRC	Interstate Technology and Regulatory Cooperation
NPL	National Priorities List
RAB	Restoration Advisory Board
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act
SSAB	Site Specific Advisory Board
UXO	Unexploded Ordnance
Y2K	Year 2000

For More Information

Do you have questions about federal facility cleanup and reuse? Do you want to learn more about FFRRO's partnerships and latest projects? If so, call FFRRO at 202 260-9924.

Also, look for information on the Internet at <www.epa.gov/swerffrr/>. You'll find information on innovative cleanup technologies, current guidance, links to Web sites of FFRRO partners, and more.