Hazardous Substances Technical Liaison Program

Putting Science to Work for EPA's Regions

2004 – 2006

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U.S. Environmental Protection Agency
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Contents

HSTL Mission Statement

The mission of the national Hazardous Substances Technical Liaison (HSTL) Program is to facilitate the sound use of science and technology in decisionmaking for hazardous waste programs. The HSTLs accomplish this mission by:

- Providing general and site-specific technical support to the Superfund, Resource Conservation and Recovery Act (RCRA), and Brownfields Programs.

- Coordinating general and site-specific technical support through the U.S. Environmental Protection Agency (EPA) Office of Research and Development's (ORD) Technical Support Centers and other Agency sources of expertise.

- Working with regional staff and ORD to facilitate the planning and implementation of ORD's research program.

- Facilitating technology and information transfer through:
  - Planning and conducting training and conferences,
  - Publishing technical information, and
  - Participating in technical workgroups and forums.

- Serving as liaisons for the Office of Solid Waste and Emergency Response (OSWER)-related homeland security research.

HSTLs congregate at the National Risk Management Research Laboratory in Cincinnati, Ohio, for their annual meeting. (left to right) Brian Caruso (Region 8), Jon Josephs (Region 2), Bob Mournighan (Region 7), Mike Gill (Region 9), Felicia Barnett (Region 4), Steve Mangion (Region 1), Ken Sala, HSTL Coordinator, Norm Kulujian (Region 3), Terry Burton (Region 6), John Barich (Region 10) and Mimi Dannel, Chief, Regional and Tribal Science Staff, Office of Science Policy. Not pictured, Charles Maurice (Region 5).

Introduction

Hazardous Substances Technical Liaisons (HSTLs) are Office of Research and Development's (ORD) senior scientists and engineers located in the 10 EPA regional offices. They interact on a daily basis with Superfund Remedial Project Managers (RPMs), On-Scene Coordinators (OSCs), Resource Conservation and Recovery Act (RCRA) Project Managers, Federal Facility Project Managers, regional management, and other regional scientists and engineers.

The HSTLs function in three broad areas as liaisons between ORD and the regions: site-specific technical support; general technical support and technical assistance; and workshop/seminar participation and planning.

In addition to their own areas of individual expertise, HSTLs play an important liaison role because of their in-depth knowledge of ORD researchers and technical experts in the ORD laboratories and technical support centers. As a result, they serve as effective liaisons to these resources.

The following case studies are recent examples of the wide variety of roles that HSTLs assume within the three functional areas. In these examples, they provide a cross-section of support, including liaison support between ORD and the EPA regions, individual technical expertise and, in some unusual cases, going beyond the normal job description to provide support to the region in a time of need, as occurred following Hurricane Katrina.

Site-Specific Technical Support

The major role of the Hazardous Substances Technical Liaisons (HSTLs), as illustrated by the following case studies, involves providing technical support to regional staff for programs administered by EPA's Office of Solid Waste and Emergency Response (OSWER). In this role, HSTLs review and identify the research and technical needs associated with cleaning up specific waste sites and provide either direct support or liaison with Office of Research and Development (ORD) technical support centers (TSC) for assistance. In a typical year, HSTLs are involved in providing technical support for approximately 200 Superfund, Resource Conservation and Recovery Act (RCRA), and Brownfields sites.

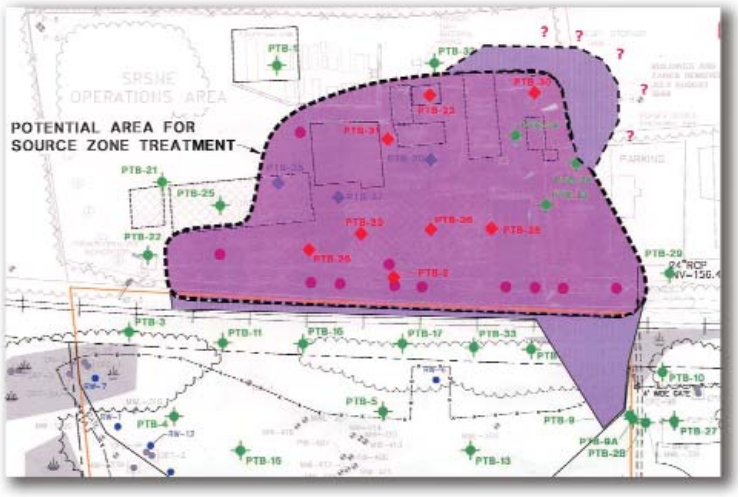
Case Study

Non-Aqueous Phase Liquid Source Zone Delineation

Southington, Connecticut

Nature of Issue/Problem

For more than 35 years, an estimated 60 to 100 million gallons of spent solvents were processed on a 4-acre facility, using drums, tanks, lagoons, and an incinerator. Previous evaluations of the contaminated volume of soil in the vadose zone supported a Technical Impracticability (TI) waiver because of the estimated large volume (200,000–800,000 cubic yards) of soil contaminated with non-aqueous phase liquids (NAPLs). For the TI waiver, the Responsible Parties (RPs) defined "probable" (200,000 cubic yards) and "potential" (800,000 cubic yards) NAPL zones in the vadose zone above bedrock. The extent of the probable/potential zones was based on known historical disposal practices, the direct observation of NAPL, and certain ground water "indicator" criteria or "lines of evidence." The EPA Case Team, Superfund Remedial Project Manager (RPM) Karen Lumino, and Region 1 HSTL Steve Mangion had a much different conceptual model of where NAPL was likely located.



Shaded area shows extent of NAPL delineation, reducing estimated NAPL-contaminated overburden from 800,000 cubic yards to 50,000 cubic yards.

Requested Technical Support

Delineating the extent of NAPL-contaminated soils generally is a significant challenge at Superfund sites. HSTL Steve Mangion worked with the RPM to assemble an EPA team that

included experts from EPA Headquarters and ORD's Robert S. Kerr Environmental Research Center in Ada, Oklahoma.

Lumino and Mangion contended that, for the purpose of defining the NAPL source zone for treatment, indirect indicators should not be used for delineating the extent or proximity of NAPL. Indicator parameters could be used to show that the site contained NAPL. Primarily on the basis of geology, site history, and direct observation of NAPL only, Mangion and Lumino believed the volume of contaminated soil source zone to be approximately 65,000 cubic yards, a volume that would be amenable to active treatment of the contaminants, nullifying the justification for a waiver.

The EPA team worked with the RPs and their consultant to design and implement a program to delineate the volume of contaminated soil using elements of the Triad Approach (defined by OSWER to be the integration of systematic planning, dynamic work plans, and real-time measurement technologies to achieve more cost-effective hazardous waste site clean-up strategies).

The EPA team and the RPs negotiated a 1-week field program to refine the estimated volume of the NAPL source zone. Representatives from all parties, including Mangion, were in the field so that on-the-spot decisions and interpretations of the data could be made. Two drilling platforms were used to obtain continuous cores of the overburden at 39 locations, with coring terminating at bedrock. The cores were scrutinized visually for NAPL and by photo identification detector. Simple shake tests of soils mixed with water and Oil Red O dye also were performed to determine whether NAPL was present in core samples with high volatile organic compound readings (>100 ppm). The results of these simple procedures were used to judge whether NAPL was present and to select subsequent coring locations. No offsite laboratories were used for chemical analysis. When mapped, the samples yielded a coherent data set that both EPA and the RPs agreed defined the NAPL source zone (shown in the diagram) with a volume of about 50,000 cubic yards. The cost of the investigation was less than $100,000.

Results/Impacts

As a result of the field program, the RPs and EPA reached agreement on the location and volume of pooled and residual NAPL. Active remedies that treat source zone soils seemed possible and were evaluated for treatment in a feasibility study. A Record of Decision for the site was issued in 2005. For treatment of the NAPL source area, a thermal technology was selected. A consent order was prepared by EPA that formally committed the RPs to implement source zone treatment and performance monitoring. The team, consisting of the RPM, HSTL Steve Mangion, ORD scientists, and Superfund staff, will continue to be involved in the development of a work plan to implement the remedy.

This case study illustrates that NAPL source zones can be delineated in a timely, cost-effective manner; that source zone remedies may include treatment as a viable, cost-effective option; and that there are considerable benefits from making in-the-field decisions. HSTL Mangion's hydrogeologic background and his understanding of the resources available from ORD were instrumental in forging a solution that led to active remediation of the site.

Case Study

Diamond Alkali Superfund Site

Lower Passaic River, New Jersey

Nature of Issue/Problem

The Lower Passaic River Study Area of the Diamond Alkali Superfund Site is an urban waterway that is highly contaminated by numerous pollutants, including dioxins. There are many sources of dioxins that impact this waterway, with each category of sources (e.g., combustion sources, polychlorinated biphenyls [PCBs] sources) having a distinctive distribution of dioxin compounds (i.e., dioxin fingerprint). The dioxin compound contributing most to the risk is 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), which is considered to be one of the most toxic organic chemicals. Because the mixture of dioxins in the sediments at any location can result from multiple sources, the individual source fingerprints are not apparent. Statistical techniques, however, can be used to separate the dioxin fingerprints mathematically.

Sampling at the Diamond Alkali Superfund Site near the Pulaski Skyway Bridge

Contractors, hired by parties potentially responsible for releases from the former Diamond Alkali Company factory, used a statistical technique called polytopic vector analysis (PVA) to identify dioxin fingerprints from sediment sampling data collected in the Passaic River and vicinity. One fingerprint, identified in relatively few samples, was similar to the fingerprint expected from the manufacture of the herbicide 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), which was produced at the Diamond Alkali Superfund Site. A peer-reviewed paper presenting the results of this study suggested that the impact from the Diamond Alkali releases is relatively small compared to the impacts of other dioxin sources. EPA Region 2 called on ORD for technical assistance in addressing this issue.

Requested Technical Support

Jon Josephs, ORD's HSTL in Region 2, met with statisticians at the Environmental Sciences Division of ORD's National Exposure Research Laboratory (NERL) in Las Vegas, Nevada, to discuss potential technical support for the Passaic River site. Although the statisticians provided useful references and insights into the issue, they did not have access to PVA software and were unable to determine the validity of the published findings. Josephs then discussed the issue with Drs. Peter Adriaens and Noemi Barabas from the University of Michigan, who had performed bioremediation research with Passaic River sediments, which was funded partially by ORD and EPA Region 2.

Since traditional PVA only allows for positive fingerprint components, modification to the program was proposed. Josephs coordinated with the region and the National Science Foundation to have additional research conducted by the University of Michigan on Passaic River sediments, which led to the develop-

ment of a modified PVA program that accounts for fingerprints that contain both positive and negative components.

Results/Impacts

The findings of the University of Michigan study were significant. Contrary to previous research, a fingerprint corresponding to the production of 2,4,5-T was identified in nearly all of the samples and was calculated to be the greatest source of 2,3,7,8-TCDD in Passaic River sediments. In addition, a fingerprint corresponding to microbial dechlorination of dioxins was identified, as were other dioxin fingerprints. The University's research refuted previous research, which had concluded that releases from the Diamond Alkali Company activities were a relatively minor contributor to the dioxin contamination. In addition, these findings were the first based on field sampling data to yield strong evidence of naturally occurring *in situ* dioxin dechlorination in sediments. As a result, the findings have implications for dioxin fate and transport modeling, as well as risk assessment at this site and at others. Josephs' efforts to review and evaluate the technical issues and to coordinate new research helped provide a more accurate assessment of the Diamond Alkali Superfund Site.

Case Study

Technical Review of Risk-Based Preliminary Remediation Goals

for the West Branch of the Grand Calumet River

Nature of Issue/Problem

Data on the West Branch Grand Calumet River (WBGCR), a RCRA Enforcement Corrective Action site located in northwest Indiana, revealed sediments throughout the river that were highly contaminated with heavy metals and various organic compounds, including semivolatile organic compounds, chlorinated pesticides, and PCBs. Through comparisons of contaminant concentrations with established ecotoxicity benchmarks, several investigations demonstrated that the WBGCR sediment contaminants of concern (COCs) concentrations were sufficient to affect a variety of ecological receptors, including benthic invertebrates, fish, and aquatic-dependent wildlife. Additionally, results of whole-sediment and pore-water toxicity tests confirmed that WBGCR sediments were toxic to benthic invertebrates and fish. It was found that the benthic invertebrate community structure was altered throughout the WBGCR, as evidenced by a shift toward pollution-tolerant species and a loss of preferred fish food organisms (e.g., mayflies, caddis flies, and stoneflies). Together, these studies showed that natural resources in the WBGCR had been injured as a result of exposure to sediment-associated COCs and that contaminated sediments posed unacceptable

Charles Maurice, Region 5 HSTL, is involved in ecological assessment field work.

risks to certain ecological receptors. Accordingly, there was a need to identify, evaluate, and implement one or more remedial alternatives to address the risks.

Technical Support Requested

The Region 5 RCRA Enforcement Corrective Action Project Manager (CAPM) asked HSTL Charles Maurice to provide eco-risk support to formulate EPA's position on, and response to, the remediation approach proposed by the U.S. Fish and Wildlife Service (FWS). With support from sediment experts from the U.S. Geological Survey (USGS) and an environmental consulting firm, the FWS prepared a document entitled "Development and Evaluation of Risk-Based Preliminary Remediation Goals for Selected Sediment-Associated Contaminants of Concern in the West Branch of the Grand Calumet River." This document presented remedial action objectives and risk-based preliminary remediation goals for ecological receptors, both of which were developed to support the remedial alternatives analysis for the clean up of contaminated sediments in the WBGCR.

Results/Impacts

Maurice, an eco-risk expert, reviewed the document and provided written comments, which were used by the CAPM in a formal response to the FWS. After revision of the document, Maurice participated in the second round of review and provided additional written comments, which were submitted to the FWS. Subsequently, Maurice provided support for EPA's position during a meeting with the FWS. The CAPM stated that the expert review by Maurice resulted in substantial improvements to the FWS technical document.

Case Study

Upper Tenmile Creek Mining Area Superfund Site

Montana

Nature of Issue/Problem

The watershed of the Upper Tenmile Creek Mining Area Superfund Site in Rimini Mining District, southwest of Helena, Montana, consists of abandoned and inactive hard rock mines that produced gold, lead, zinc, and copper from around 1870 through the 1920s. The watershed also is the primary municipal drinking water supply for the City of Helena and has more than 150 mines with tailings, waste rock, and draining adits. Although a Superfund Record of Decision was completed and some priority remedial actions were implemented, additional alternatives involving restoration of natural flows in Tenmile Creek are being evaluated.

Acid mine drainage from hardrock metal mines in the Upper Tenmile Creek watershed.

Technical Support Provided

Brian Caruso, ORD's HSTL in Region 8, provided technical support to the region by modeling the effects of natural flow restoration on metals fate and transport at the Upper Tenmile Creek Mining Area Superfund Site in the Rimini Mining District, southwest of Helena, Montana. An application of the EPA Water Quality Analysis Simulation Program (WASP) model had been developed previously for the site and used for steady-state conditions. The model was based on simple equilibrium partitioning of metals concentrations and a June 2000 data set for calibration under base flow conditions. Total and dissolved arsenic, cadmium, copper, lead, and zinc originally were modeled in the mainstem to help evaluate and select eight remedial alternatives and to determine whether Applicable or Relevant and Appropriate Requirements (ARARs) could be met.

Results/Impacts

Caruso worked closely with the Remedial Project Manager and the NERL Watershed and Water Quality Modeling and Technical Support Center in Athens, Georgia, to modify and implement the model for evaluating metals fate and transport under natural flow restoration conditions. The improved model is being used to evaluate metals under both natural low-flow conditions in August and high flows/snowmelt in June. Because so much flow is diverted by the city for water supply during these months, natural flow estimates for model input were provided by the USGS.

Modeling has shown that under natural low-flow conditions most metals loads and concentrations decrease but, subsequently, some concentrations may not meet ARARs because of continuing sources and relatively high concentrations or loads in some tributaries and from non-point ground water sources. Under conditions of high water flows, some metals, such as cadmium and zinc, become diluted and are reduced to near ARAR levels. Other metals that are adsorbed more highly to sediment, such as copper and lead, can be mobilized with increased loads and concentrations if no further remediation is implemented. A dynamic version of the WASP model may be developed in the future to provide more detailed estimates of metals fate and transport under high-flow conditions.

Case Study

Region 3 Optimization Study of Fund-Lead Pump-and-Treat Superfund Sites

A major Superfund Program initiative to optimize operation and reduce costs associated with remedial sites has identified potential opportunities for substantial long-term savings for the operation and maintenance costs of fund-lead pump-and-treat sites.

Optimization studies were conducted in Region 3 in two phases, involving two Superfund sites in phase one and eight Superfund sites in phase two. The Region 3 review team identified potential annual cost savings of $54,000 per year per site for the two sites in the first phase and savings of $130,000 per year per site for the eight sites in the second phase.

As a member of the optimization study team, Norm Kulujian, the HSTL in Region 3 was a significant resource in the optimization study, having provided direct technical support in his role as a HSTL to

10 fund-lead Superfund sites reviewed in the study. It was Kulujian's comprehensive background in the region with the Superfund Program that led to his selection for the study team.

Background

An initial nationwide study was conducted by EPA as part of OSWER's 2001 Superfund Reform Strategy to identify and gather information on the 88 pump-and-treat systems, which were financed by the Superfund Program. Twenty sites were selected to perform Remediation System Evaluations (RSE). The process involved a team of engineers and hydrogeologists conducting rigorous, independent evaluations of the sites, including site visits and follow-up discussions with EPA and site contractors. The RSE is designed to optimize the remedies in operation at a Superfund site. Optimization recommendations usually fall into the following categories: (1) improvement of system effectiveness; (2) reduction of operation and maintenance costs; (3) identification of technical improvements; and (4) attainment of site closeout. Norm Kulujian was asked to participate on a select committee to conduct RSEs of regional pump-and-treat Superfund sites. A team comprised of HSTL Kulujian, a member of OSWER's Technology Innovation and Field Services staff, a regional senior hydrogeologist, and contractor staff planned a detailed RSE for the first two sites: Greenwood and Havertown Superfund Sites. The team reviewed site documents, conducted a site visit, and prepared several drafts that were discussed with the RPM, site hydrogeologist, and management prior to writing the final report. Subsequently, the remaining eight fund-lead pump-and-treat sites were evaluated over the next 3 years.

Treatment facility at Greenwood Chemical Superfund Site, Newtown, Virginia

Conclusions

The optimization project accrued benefits beyond the long-term savings of operations and maintenance costs. Additional value was derived from review of the hydrogeology and sampling of each site, whereby changes in site conditions and more recent advancements in ground water plume delineation methods could be factored into the optimization scenarios.

There were specific technical recommendations to reduce cost at each site. These included treatment system changes such as streamlining the UV oxidation system and the volatile organic carbon removal and/or air stripping process. Cost considerations also included reducing process and ground water sampling frequency, reducing laboratory analysis of certain parameters, reducing operator labor, and eliminating unnecessary data validation.

With respect to system effectiveness improvements, the RSE team identified several sites that had no formal capture zone analysis. It was unknown whether the extraction system provided the intended containment. There were instances of insufficient information for ground water flow analysis to compare the amount of water flowing through the site to the amount of water extracted for treatment. The study team suggested using a conceptual model to establish a target capture zone and determine whether further site characteri-

zation was necessary. The team suggested that the potential for vapor intrusion should be evaluated at several sites.

The Region 3 Optimization Studies are being reviewed for applicability in other regions with the hope that the knowledge gained from the Region 3 experience can be transferred to other regions to provide more long-term savings for the Superfund Program.

General Technical Support

The Hazardous Substances Technical Liaisons (HSTLs) provide a wide array of general technical support to regional office staff. Most often, support involves the transfer of technical information from EPA's Office of Research and Development (ORD) laboratories and centers or from other sources to assist regional staff in implementing regulatory requirements of the waste programs. HSTLs also serve as technical resources to the regions and facilitate the discussion and resolution of generic technical issues that may apply to a number of waste sites. Some of the examples in this section describe situations where particular background and technical expertise enabled the HSTL to provide direct support to the region.

Case Study

Hurricane Katrina Response

HSTL Provides Leadership for Regional Response Center

Terry Burton, HSTL in Region 6, was tasked with multiple duties to support the region's response to this natural disaster. His initial duties were to compile hurricane-related information into daily reports for onsite responders and management. Soon those duties expanded to include preparing charts, graphs, and other data for presentations to EPA senior management at Region 6 and at Headquarters. Later Burton became Assistant Situation Unit Leader for the Region 6 Response Center's Incident Management Team, gathering necessary information for the daily Situation Reports and the Incident Action Plans, fielding calls from Headquarters and regional staff about daily progress and numerical reporting, and supporting response activities. In early September 2005, Burton also served as a Forward Observer, a role that required separating rumor and innuendo from fact, communicating with On-Scene Coordinators (OSCs) and serving as an information conduit between Dallas and Louisiana.

Terry Burton, Region 6 HSTL, reviews operations maps in Metairie, Louisiana, to determine mission-completion status of the hurricane-affected parishes.

Community Involvement Coordinator

HSTL Burton became part of the initial hurricane response team of EPA Community Involvement Coordinators from around the nation. The 30 members arrived in Louisiana in late September 2005, just as area residents who had evacuated were beginning to return. The team's initial task was to find out what environmental information the residents in this area needed most, set up innovative means to distribute such information widely, and finally, deliver that information in a timely and appropriate manner.

Mass communication faced several obstacles. Electrical service was disrupted in much of southern Louisiana. Many parts of the state lacked mail or newspaper delivery. Telephone and cell phone coverage was unreliable, if working at all. The team built a communication network from scratch by driving to rural churches, police and fire stations, and other community meeting places and enlisting the help of priests, ministers, firefighters, police officers, and others with existing social networks. Among various activities, the team members conducted impromptu interviews to determine the most pressing information needs as well as unforeseen re-entry hazards. Team members then revised EPA information to be appropriate for the target audiences.

Situation Unit Leader and GIS Unit Leader

In April 2006, Burton began serving as Situation Unit Leader and Geographic Information System (GIS) Unit Leader for the Unified Command for hurricane response and recovery activities in Louisiana. The Unified Command currently consists of EPA, the Louisiana Department of Environmental Quality, and the U.S. Coast Guard. The Situation Unit, under the Incident Command system, is responsible for the collection, organization, and processing of mission-related information.

Case Study

Kentucky Tie and Timber Site

Mayfield, Kentucky

Nature of Issue/Problem

In 2005, Hurricanes Katrina and Rita devastated the Gulf Coast region of Mississippi. It became evident that long-term deployment of Region 4 personnel, specifically OSCs and Response Corps volunteers, would be required to address the environmental issues caused by the hurricanes' destruction. When the need for extended response time became apparent, Region 4's Waste Division requested that qualified project and technical managers provide backup for OSCs, overextended because of hurricane response efforts. OSC duties of coordinating and managing field work at sites required certain technical expertise and contracting skills, with a limited number of available, qualified regional staff.

Requested Technical Support

Felicia Barnett, ORD's HSTL for Region 4 and a member of the regional Emergency Response Corps, was chosen to fill in as an OSC. Barnett's previous position as a project manager and years of involvement providing ORD technical support on numerous wood treatment facilities in the region made her a good candidate to serve as the OSC task manager for the ongoing Kentucky Tie and Timber emergency removal. Kentucky Tie and Timber, an abandoned wood treatment facility in Mayfield, Kentucky, which was regulated by the state through RCRA, was contaminated largely with creosote and related substances.

Immediate removal of exposed waste was required to protect children and others with access to the exposed and uncontained creosote, metals, and polycyclic aromatic hydrocarbon-contaminated material. Barnett met onsite with the regular OSC and the emergency contractor to discuss the actions required and the budget and timeframe under which the project would be completed. Mobilization to the field occurred during the first week of October 2005.

Barnett was onsite for more than 2 weeks to begin the removal. She returned numerous times for 1- to 2-week periods during the next 4 months, until the major removal of hazardous substances and contaminated

material was completed at the end of January 2006. Barnett established and coordinated directions, clean-up goals, and objectives with the OSC. She also managed the project through the removal and oversight support contractors during the 4 months of remediation operations.

Results/Impacts

A temporary water treatment system was developed and started operating onsite, treating contaminated water from the drip pad, sump, and creosote tank containment areas. It was used throughout the removal to treat contaminated water generated during the clean-up operations. From October 10–20, 2005, five tractor trailer loads of creosote product were collected and shipped offsite for reuse at another facility.

Felicia Barnett, Region 4 HSTL, surveys removal progress at the Kentucky Tie and Timber RCRA site.

During the 4-month period, all liquid/sludge material was removed, disposed of, or treated through the onsite water treatment system. Two jars of mercury product and one building contaminated with mercury were identified, analyzed, cleaned or contained, and shipped off for disposal. The creosote-contaminated tanks and piping were broken down, cleaned, and sold for scrap, and the contaminated buildings were cleaned and/or removed. Contaminated soil was stockpiled, contained, and covered awaiting disposal; sand blasting of the remaining contaminated concrete pads and supports was completed; and the site was graded to remove any remaining physical hazards. Breakdown, decontamination, removal of site equipment, and demobilization from the site occurred in late January 2006.

Case Study

Providing Technical Information Exchange Opportunities on Landfill Closure in Region 9

From a general request of a Region 9 RPM, HSTL Mike Gill planned, coordinated, and hosted two informal information exchange meetings in the region on the topic of closure practices at landfills. Through his familiarity with ORD resources, Gill was able to work with regional staff to identify landfill issues and enlisted ORD researchers, non-EPA landfill experts, and staff from the Office of Solid Waste and Emergency Response (OSWER) to participate. The technical information exchange provided Region 9 attendees with a valuable opportunity to interact with experts and get direct feedback in a small group setting.

In the first meeting, ORD researchers Dave Carson, Thabet Tolyamet, and Steve Rock discussed current ORD research and guidance, including the long-term performance guidance released in 2002: Assessment and Recommendations for Improving the Performance of Waste Containment Systems, December 2002 (http://www.epa.gov/ORD/NRMRL/pubs/600r02099/600r02099.htm). The presenters discussed how ORD presently is working on four issues: (1) performance of ground cover liners and

cover systems; (2) National Academy of Sciences/OSWER collaboration on examination of waste containment systems; (3) landfilling of construction demolition material in Region 5; and (4) work with the Interstate Technology and Regulatory Council on bioreactors and alternative covers. Region 9 staff discussed 11 different landfill sites where closure presented challenging technical issues.

Group interest then evolved to whether ORD had catalogued observed failures of landfill covers and liners and how this information would be very helpful and applicable to 5-year reviews and performance monitoring design. Because pressure to redevelop closed landfills has become a driver on regional responses to landfills, it was determined that the next technical session should focus on how to avoid failure in landfill closure.

A second meeting focused on technical and financial challenges, financial assurance, cap aging, clean closure, and what environmental professionals saw as the biggest challenges for avoiding failures at closing landfill sites. Among the biggest challenges discussed were: (1) whether financial assurance can be obtained beyond 30 years; (2) what to do when Potentially Responsible Parties want to relax monitoring requirements; (3) what to do when there is a disconnect between cap designers and monitoring companies; (4) how to prevent erosion; (5) what to do about arsenic-bearing residuals; and (6) making the 5-year review process part of the evaluation of landfill sites in the RCRA Program.

Through this technical information exchange, Gill was able to assist Region 9 in developing greater understanding of the dynamics of landfill closure and establish common understanding on how to respond to the region's aging landfills.

Case Study

Collaboration with the U.S. Department of Energy

Management in Region 10 requested that HSTL John Barich explore means of improving the flow of science support from the Idaho National Laboratory (INL) to Region 10. Because ORD has a major technical support interagency agreement with INL and Barich is the Project Officer, he became central to the effort.

Through collaboration and dialogue, new projects were developed, including: identification of air deposition of mercury in Idaho and determination of probable sources through back-trajectory models (likely sources include mining sites in adjoining regions); development of bioaccumulation factors for arsenic in freshwater fish (that could lead to future ARAR applied to mining sources); asbestos field sampling methods/technology development; and vermiculite fingerprinting techniques. The asbestos projects enhance the region's capability to manage asbestos waste sites, one of the new, rapidly expanding classes of sites in the Northwest.

Regional management also requested that Barich manage a $90,000 selenium information system project, the objective of which is to provide state-of-the-science GIS-based information tools to assist in the management of numerous mining waste sites in Idaho. HSTL Barich became the Project Officer for the selenium information system, completed in 2006. The importance of the new projects has attracted funding from both EPA's Office of Water and OSWER.

Communicating Science

HSTLs are involved in the transfer of technical information, particularly research information produced from EPA's ORD laboratories and centers. A major vehicle for technical transfer often involves HSTLs coordinating or participating in the planning of workshops and seminars. These technical transfer events range from small group briefings and seminars to large national workshops and conferences. Additionally, the HSTLs produce a newsletter of timely technical support topics. Recent science communications examples are described below:

HSTL *Technical Support Times* Newsletter

The HSTL Program publishes the *Technical Support Times* newsletter three times each year on timely technical support issues of interest to the regions and to OSWER. The newsletter is written by HSTLs on technical support they have provided or coordinated and incorporates information about ORD research in the topical area. Since 2005, the *Technical Support Times* has addressed the oxygenate methyl tertiary butyl ether, phytoremediation, contaminant fingerprinting, and mine waste characterization and remediation. Issues of the *Technical Support Times* can be found on the EPA Intranet at http://intranet.epa.gov/ospintra/ and on the Internet at http://www.epa.gov/osp/hstl/techsupp.htm.

Health and the Environment Conference Series, 2005 - 2007.
The first Central and Eastern European Conference on Health and the Environment (CEECHE) was convened in 2005 and attracted delegates from 18 countries. Region 10 HSTL John Barich co-organized the conference with colleagues from the National Institute of Environmental Health Sciences (NIEHS) and the Superfund Basic Research Program. The conference objectives included bringing the environmental health traditions (exemplified by the medical universities and national health institutes) together with the risk management/remediation traditions (exemplified by the technical universities and environmental protection agencies) to address problems of common interest and to provide a strong student emphasis/opportunity program. The 2006 CEECHE conference was held in Bratislava, Slovak Republic on October 22-25, 2006. Another conference will be scheduled for 2007, and Barich again will serve as the co-organizer.

EPA Region 5 Nanotechnology for Site Remediation Workshop, September 6-7, 2006, Chicago, Illinois. HSTL Charles Maurice co-chaired this workshop with his Region 5 Superfund Division colleague, Warren Layne. Maurice provided opening comments and chaired the platform presentation sessions for the 2-day workshop, which addressed both the technology and the implications of applying nanotechnology products at hazardous waste sites. Planning for the workshop was catalyzed by HSTL Program extra-

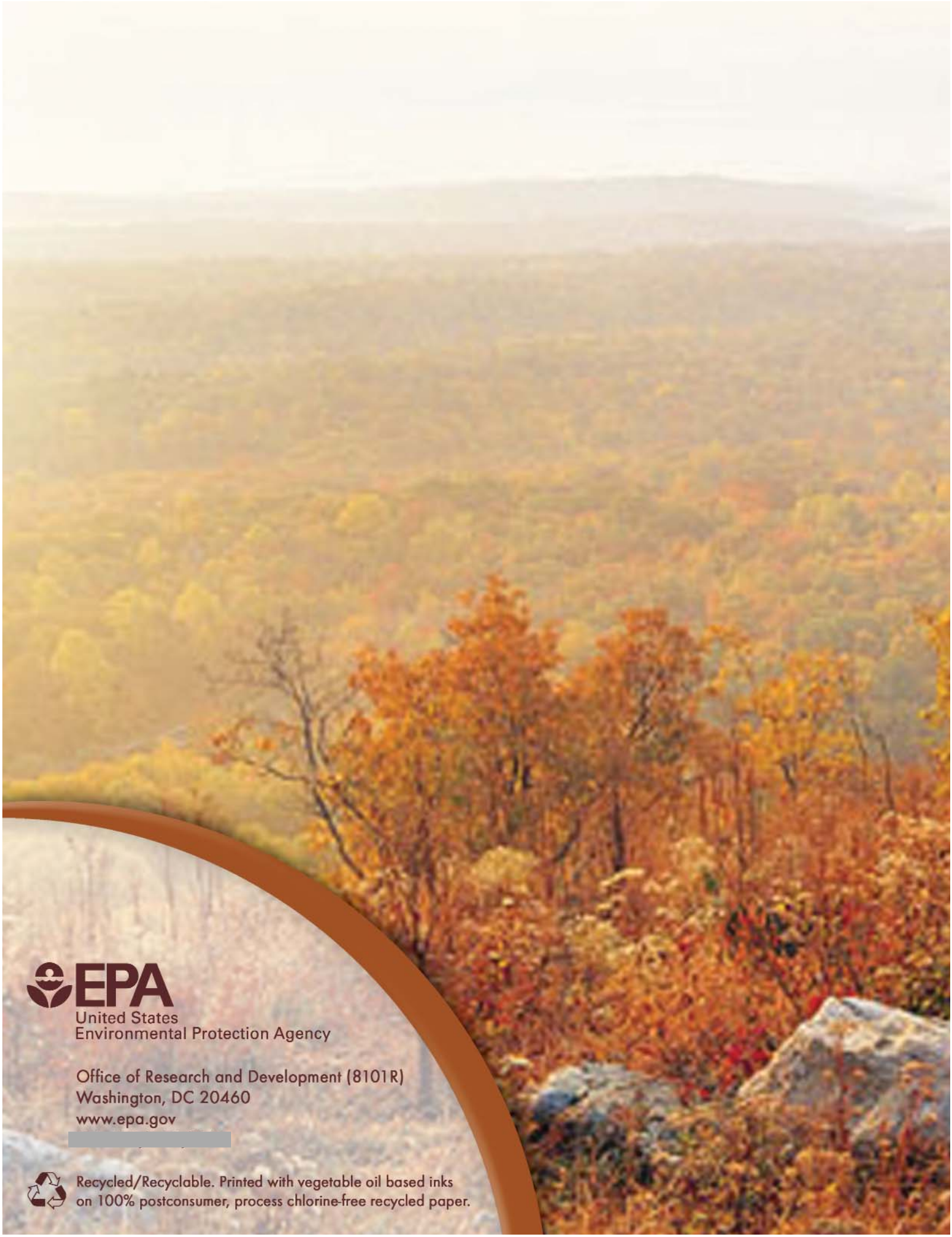
mural funds, which were supplemented by Region 5 Superfund Innovative Systems and Technologies Branch funds. More than 100 scientists and engineers from government, academia, and the private sector attended the workshop.

International Conference on the Future of Agriculture: Science, Stewardship and Sustainability, August 7-9, 2006, Sacramento, California. Bob Mournighan, HSTL in Region 7, Mike Gill, HSTL in Region 9, and John Barich, HSTL in Region 10, were on the planning committee, providing opening comments to plenary sessions and serving as session chairs for this international, cross-media conference on agricultural issues and the environment. The conference provided separate tracks on the topical areas of pest management, clean-up technology transfer, resource management, and environmental management. ORD's Office of Science Policy provided significant financial support for the conference, which was hosted by Kansas State University, one of the NIEHS Superfund Basic Research Grant recipients. There were approximately 230 international participants at the conference.

Regional Customer Feedback on Research Products Developed by ORD's National Homeland Security Research Center in Regions 6 and 7, spring and summer 2006. Terry Burton, HSTL in Region 6, and Bob Mournighan, HSTL in Region 7, were involved in workshops in their regions designed to showcase research products developed by ORD's National Homeland Security Research Center. Burton and Mournighan managed a primary planning feature of the workshops by soliciting regional interests on the current research program, which molded the workshop agenda. The workshops also served to provide a venue for regional staff to make proposals for future research projects.

EPA Conference on Nanotechnology and Remediation, October 21-22, 2005, Washington, DC. Jon Josephs, HSTL in Region 2, Terry Burton, HSTL in Region 6, and Mike Gill, HSTL in Region 9, were members of the organizing committee for this conference. Mike Gill chaired a topical session and Jon Josephs chaired two breakout groups. Terry Burton organized the non-poster exhibits.

Third International Phytotechnologies Conference, April 20-22, 2005, Atlanta, Georgia. Felicia Barnett, HSTL in Region 4, was a member of the organizing committee and chaired a session of this conference. More than 300 participants from 20 nations were in attendance.



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