



ATSDR
AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

**U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry**

4770 Buford Hwy NE, Atlanta, GA 30341

TEL: 800-232-4636 PUBLIC INQUIRIES: 1-800-CDC-INFO

WEB: www.atsdr.cdc.gov

ATSDR

Safeguarding Communities from Chemical Exposures





Agency for Toxic Substances and Disease Registry

Safeguarding Communities from Chemical Exposures

ATSDR responds to oil
contamination of floodwaters
in Coffeyville, Kansas, 2007.



ATSDR
AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

Environmental factors contribute to more than 25% of all diseases worldwide. In the United States, the yearly cost of just four childhood health problems linked to chemical exposures—lead poisoning, asthma, cancer, and developmental disabilities—is greater than \$54 billion.

Chemical exposures occur in homes, schools, workplaces, and throughout communities. Accidental releases, certain household products, or hazardous sites are all possible causes of chemical exposures. Exposures that occur in the community may be difficult to identify and control.

The Agency for Toxic Substances and Disease Registry (ATSDR) works to safeguard communities from chemical exposures. ATSDR investigates community exposures related to chemical sites and releases; works closely with federal, tribal, state, and local agencies to identify potential exposures; assesses associated health effects; and recommends actions to stop, prevent, or minimize these harmful effects.

Many times, exposures occurred in the past and are difficult to evaluate. ATSDR scientists can estimate exposures based on previous similar situations (called modeling), test individuals in the area to determine whether exposures have occurred (biomonitoring), and use cutting-edge technology to understand these exposures. State-of-the-art assessment methods—such as new sampling techniques and cancer modeling—help ATSDR evaluate the health effects of emerging contaminants such as perfluorochemicals.

ATSDR also responds during chemical spills and other emergency events. Agency scientists quickly advise local officials about when to evacuate communities, when to allow residents to return, and how to ensure the safety of responders and medical professionals.

In all of these efforts, ATSDR builds upon and strengthens the work of other health and environmental agencies and community groups. Importantly, it supports environmental justice work, which addresses disproportionate impacts on certain populations, notably low income communities and members of ethnic and racial minority groups, with implications in the social, economic, and health arenas. Such a cooperative approach helps ATSDR achieve its goal: safeguarding communities from chemical exposures.

CONTENTS

4

Love Canal
Started It All

7

PART ONE
Founding an
Agency to Protect
Americans

11

PART TWO
Reaching
Communities
Through
Partnerships

19

PART THREE
Translating
Science Into
Action

27

PART FOUR
Working for a
Safer and
Healthier
America

32

Useful Resources

34

Acknowledgments

Love Canal Started it All.

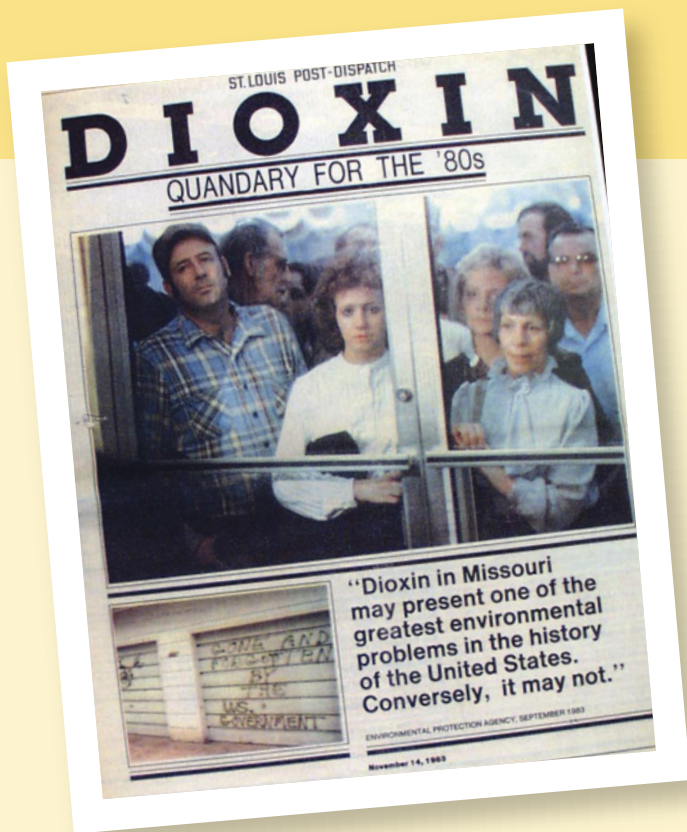
“I visited the canal area at that time. Corroding waste-disposal drums could be seen breaking up through the grounds of backyards. Trees and gardens were turning black and dying. One entire swimming pool had been popped up from its foundation, afloat now on a small sea of chemicals. ...Everywhere the air had a faint, choking smell. Children returned from play with burns on their hands and faces.”

Eckardt C. Beck
EPA REGIONAL ADMINISTRATOR

The Love Canal Tragedy, *EPA Journal*, January 1979

A bulldozer pushes soil away from one of the tanks used to hold toxic waste in Love Canal, New York, May 1980.





In 1983, the U.S. government permanently relocated the citizens of Times Beach, Missouri, a small town on historic Route 66. The move followed a Centers for Disease Control and Prevention (CDC) investigation into the health effects of widespread dioxin contamination. The health concerns identified by CDC galvanized action and set the stage for what would become ATSDR.

Founding an Agency to Protect Americans

It has been more than 30 years since Eckardt C. Beck, a regional administrator for the Environmental Protection Agency (EPA), offered a chilling statement in reference to Love Canal: “We suspect that there are hundreds of such chemical dumpsites across this Nation.”

Actually, Beck understated the size of the problem. In the decades since the discoveries at Love Canal, thousands of hazardous waste sites—ranging from dumps to accidental spills—have come to light around the United States. Extensive contamination of Love Canal’s homes, yards, gardens, and the community school, together with evidence of miscarriages and low birth weights, led the U.S. government to move more than 800 families and demolish their homes and school. Today, the community of Black Creek Village resides on the edge of the former waste site at Love Canal, but a majority of the original town remains closed.

Seeking to avoid another Love Canal and compelled by the Times Beach, Missouri, dioxin disaster, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) in 1980. Superfund gave EPA primary responsibility for identifying, investigating, and cleaning up what became known as National Priorities List (NPL) sites. Superfund also created a new nonregulatory entity, the Agency for Toxic Substances and Disease Registry (ATSDR). Formally organized in 1985, ATSDR serves as one of the key federal agencies responsible for preventing toxic exposures, determining human health effects associated with exposures, and minimizing health risks.

ATSDR is one of 11 federal agencies within the Department of Health and Human Services (HHS). To accomplish its goals, ATSDR works with other federal, state, and local agencies; tribal governments; local communities; and health-care providers. Although ATSDR is an independent agency, CDC

ATSDR works with partners to:

- prevent chemical exposures,
- determine human health effects from exposures, and
- reduce risks to human health.

performs many of its administrative functions, and the CDC director serves as the ATSDR administrator. Changes in recent years have further linked the programs of ATSDR with those of CDC's National Center for Environmental Health (NCEH).

ATSDR's role is less visible at Superfund and NPL sites than EPA's cleanup work, but it is every bit as important. ATSDR investigates existing or possible health effects and seeks solutions to prevent or control them not only at hazardous waste sites on the NPL but also at other sites and communities throughout the country.

ATSDR faces many complex challenges. Often sites are contaminated by a variety of chemicals, have the potential for several types of exposures, and lack adequate exposure data. Scientific understanding of how many of these chemicals can affect health—alone or combined—is very limited. In addition, environmental justice concerns—disparities in exposure, resources, and social supports—are important considerations in addressing sites.

To meet these challenges, ATSDR employs approximately 300 individuals, with headquarters in Atlanta, field staff in each of EPA's 10 regional offices, and offices in Alaska, Montana, and Washington, D.C.

ATSDR has a significant presence throughout the United States with world-class scientists from various fields, as well as close relationships with CDC, EPA, and HHS regional offices. These attributes give ATSDR flexibility, response capabilities, and a degree of expertise valued in environmental and public health agencies and communities all over the United States and the world.

Many of ATSDR's activities are possible only through partnerships. As an example, ATSDR often identifies the health effects of chemical exposures through data provided by EPA or state partners. It must then rely on EPA to implement its recommendations, obtain additional samples, and clean up the chemical waste. Likewise, health studies are often completed by working with state health agencies and universities. ATSDR also plays a primary communication role by sharing environmental public health information with health-care providers; federal, tribal, state, and local leaders; and affected communities.

ATSDR at a glance

ATSDR strives to prevent chemical exposures and related health effects every day in communities across America.

2008 by the numbers:

- Acted on 30 community petitions for assistance
- Responded to 132 chemical emergency events
- Completed approximately 400 health assessments or consultations and 45 health studies at sites throughout the nation
- Took action at 590 site and chemical release investigations
- Educated more than 250,000 community members
- Trained nearly 74,000 health professionals, including individuals from 19 foreign countries

2008 resources:

- 10 regional offices
- Hazardous substance release tracking in 14 states
- 29 funded states and one tribal government
- A staff of more than 300, including support staff and scientific experts such as:
 - :: Engineers :: Geologists :: Epidemiologists :: Industrial Hygienists :: Communication specialists
 - :: Physicians :: Statisticians :: Toxicologists :: Health educators :: Environmental health scientists
- Total budget of \$74 million
- Partnerships with CDC, Chemical Safety and Hazard Investigation Board (CSB), Department of Defense (DoD), Department of Energy (DOE), Department of Homeland Security (DHS), EPA, Federal Emergency Management Agency (FEMA), National Institute for Occupational Safety and Health (NIOSH), National Institute of Environmental Health Sciences (NIEHS), Occupational Safety and Health Administration (OSHA), and many other agencies



Safeguarding communities from chemical exposures is ATSDR's ultimate goal. ATSDR experts and funded partners meet with individuals through community gatherings, in open forums, and even at their homes to listen to their environmental health concerns, provide information, and conduct investigations. By working with communities, ATSDR helps to ensure that the places in which people live and play are safe.

Reaching Communities Through Partnerships

One of ATSDR's most important responsibilities is working with communities to investigate exposures and provide information and materials to address residents' concerns. ATSDR is among the few federal agencies that work directly in communities. In addition to working at more than 500 NPL, Resource Conservation and Recovery Act, and federal, tribal, and state sites, ATSDR receives approximately 30 requests each year from citizens concerned about exposures in their communities.

To meet community needs, ATSDR staff with expertise in various areas—exposure assessment, epidemiology, toxicology, community involvement, and health education—work together at headquarters, in regional offices, and in state health agencies. ATSDR experts work closely with communities to identify concerns, provide updates on ongoing activities, and offer education as needed. For example, health education specialists have created toolkits that explain exposures to asbestos and lead, which are common in many areas. These educational materials contribute to a body of information on chemical exposures that is valuable for employers, health-care professionals, parents, and communities.

ATSDR also works closely with other federal, tribal, state, and local agencies to reach its goals. Partnerships enable ATSDR to gather environmental data, conduct health studies, identify research needs, engage communities, and collaborate with public health professionals in developing and implementing recommendations to protect health and eliminate disparities in exposure.

MAINTAINING A REGIONAL PRESENCE TO SERVE COMMUNITIES

ATSDR has employees in each of EPA's 10 regional offices and in field offices in Alaska, Montana, and Washington, D.C. ATSDR regional staff connect with EPA and HHS regional

“The Division of Regional Operations is essential.

They are in the trenches with us—they are there when

we need them.” :: **Christina Bush** Michigan Department of Community Health

offices and with tribal, state, and local health and environmental agencies. Regional staff also link to NCEH and ATSDR personnel in Atlanta to draw in broader, technical expertise to accomplish ATSDR’s mission. Perhaps most important, regional offices place the agency close to the communities it serves.

Regional representatives maintain strong relationships with federal, state, and local partners. They act as key resources on site-related technical and community issues. As ATSDR’s local representatives, regional staff are involved in some capacity in the preparation of nearly all site work completed by ATSDR.

Regional representatives work closely with other ATSDR staff, aiding in such activities as collecting data for health assessments and gathering information for health studies. They also link local health-care professionals to medical information generated by ATSDR’s health and professional education specialists.

Although each community and area of the United States has unique needs, regional staff work to identify common concerns across regions, such as brownfields redevelopment, construction and demolition landfills, and asbestos and lead exposures. These efforts allow ATSDR to make the most of resources and expertise both within the agency and across the nation to develop and implement solutions. In this process, regional staff contribute to a body of scientific evidence to support national policies that will reduce the impact of chemical exposures in communities.



CONSTRUCTION AND DEMOLITION LANDFILLS

Complaints to ATSDR and its partners about construction and demolition (C&D) landfills have escalated over the past few years. C&D landfills accept debris such as drywall, concrete, and wood from construction sites. Because these materials are not considered hazardous, EPA does not regulate them. Instead, they are regulated by individual state laws. Communities near these landfills contacted local and state agencies and ATSDR about rotten egg odors and potential health effects. Hydrogen sulfide gas, the source of the rotten egg smell, can result from the breakdown of drywall in landfills. Investigations at some of the sites revealed hydrogen sulfide gas at levels known to cause adverse health effects, including headaches, nausea, and fatigue, and to exacerbate existing conditions such as asthma. As a result, ATSDR took the lead in bringing public health and environmental professionals together to identify and discuss options for reducing the impact of C&D landfills on the health and quality of life in these communities. Based on data from ATSDR, Ohio passed legislation in 2005 to regulate these landfills better and prevent health effects.

“There are very few resources for air monitoring. Toxic vapors are a major issue around waste sites, especially C&D landfills.” :: **Randy Merchant** Florida Department of Health

REVITALIZING NEIGHBORHOODS

Across the United States, redevelopment is occurring at more than 450,000 brownfields sites, transforming abandoned or neglected areas into vibrant communities. ATSDR’s brownfields initiative supports community expansion, reuse, or redevelopment by involving environmental public health professionals in the process. ATSDR provides funds and technical expertise to tribal, state, and local agencies to identify potential health issues and resolve public concerns related to brownfields and land reuse sites.

ATSDR joined the national brownfields effort by providing funds to start the redevelopment in 12 showcase communities shortly after EPA launched its Brownfields Program in 1995. Since then, ATSDR has assessed more than 400 land reuse or brownfields sites and continues to provide funds to support affected communities.

Recognizing the potential for communities to improve their environments, ATSDR developed a site inventory tool to help track community information and an action model to guide redevelopment in a way that incorporates public health. Funded brownfields projects may include evaluation of possible environmental exposures, mapping and analysis of data in affected communities (geospatial analysis), health monitoring, risk communication, and health education activities. In these

BROWNFIELDS SITE

A property slated for expansion, reuse, or redevelopment that may be complicated by a hazardous substance.



Photo by Peter J. Keating

MILWAUKEE'S 30TH ST INDUSTRIAL CORRIDOR

In 2004, Milwaukee's 5-mile-long 30th Street Industrial Corridor began a much-needed redevelopment. The corridor had an unemployment rate of 19%, vacant lots, and lingering contamination from shuttered factories, foundries, and tanneries. Working with the Wisconsin Urban Reinvestment Initiative, ATSDR brought together a "Development Community" of public health officials, city planners, economic development specialists, bankers, residents, and other parties interested in redeveloping the corridor. With the Development Community, ATSDR devised a 1-year revitalization model to address key public health concerns related to environmental hazards. The Development Community created measures to track health outcomes and land usage, gathered baseline data, and identified approaches to revitalization that could improve public health and wellness.

“ATSDR’s cooperative agreement program has developed capacity in states—it has been an essential vehicle to deal with new and emerging issues.” **:: Rita Messing** Minnesota Department of Health

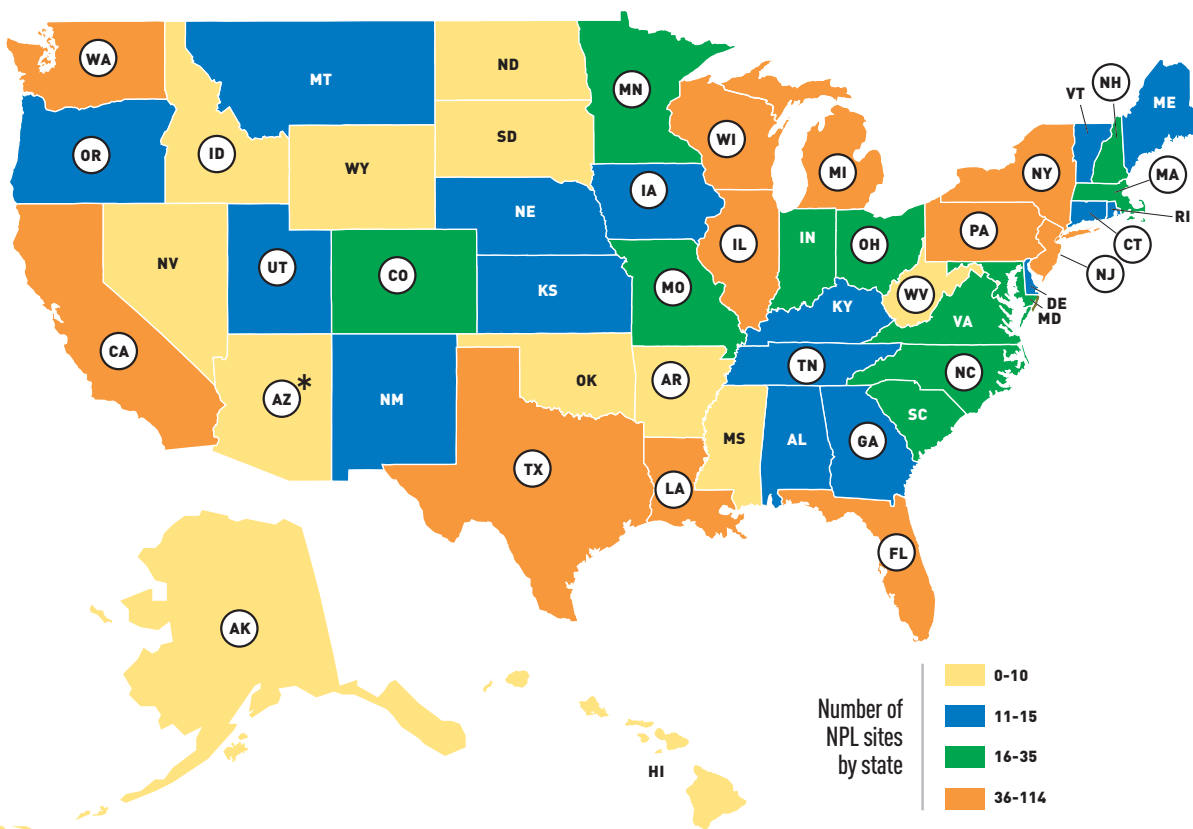
efforts, ATSDR plays a key role in identifying and involving all stakeholders and encouraging a community-wide approach to addressing and resolving public health issues at brownfields sites.

SUPPORTING STATE AND TRIBAL INVOLVEMENT AT SITES

ATSDR’s cooperative agreement program provides the most direct opportunity to reach states and communities. Cooperative agreements build much-needed capacity among public health partners to assess exposures and implement actions to protect their communities.

ATSDR Partnerships to Reach Communities

National Priorities List (NPL) sites and funded tribes and states



(LA) Indicates funded state
 * Indicates funded Gila River Tribe

“ATSDR provides good regional and central support on scientific issues and has done an outstanding job building capacity in the states.” :: **Jerald Fagliano** New Jersey Department of Health and Senior Services

Through this program, ATSDR provides technical assistance and funding to help 29 states and one tribal government respond to and assess community environmental health concerns. Funding also allows partners to provide health education to communities and engage in outreach. The program supports approximately 85 environmental public health professionals in tribal and state agencies across the nation.

The cooperative agreement program is one of ATSDR’s greatest assets and has strong support from partners, many of which would not otherwise be able to address community needs. More funding could expand the program to include all states and tribes, further enabling partners to protect all Americans.

PARTNERING WITH TRIBES

ATSDR includes tribal voices and concerns in its work to protect the health and natural resources of tribal communities. The Office of Tribal Affairs serves both ATSDR and NCEH in providing environmental health services to American Indian and Alaskan Native peoples across the United States and its territories. ATSDR recognizes the sovereign rights of tribes and ensures that site assessments consider their diverse environmental health concerns. It is vital that ATSDR efforts continue to call attention to these concerns, in order to meet the needs of disproportionately exposed tribal communities. The Office of Tribal Affairs also supports capacity building and provides training, education, and outreach to tribal professionals to engage their respective communities.



Photo courtesy of Courtney M. Toller

TAR CREEK, OKLAHOMA

“Life was luxurious and sound, until the day when the brownish orange goo rose from the ground,” reads a line of poetry from a Tar Creek, Oklahoma, student.* ATSDR’s efforts to protect the health of children living near the Tar Creek Superfund site have proven successful, even though cleanup of the primarily tribal lands continues. Today, fewer than 3% of children in the area have elevated blood-lead levels—down from more than 30% in 1996. This success is due in large part to ATSDR’s health education program targeting the community and its health-care providers. Blood-lead monitoring and educational activities continue in the community to protect children’s health.

**Tar Creek Anthology—The Legacy: Poems, Songs, Essays and Research Papers*, 1999.

FEDERAL COLLABORATION FOR SUCCESS

From its beginning, ATSDR has worked closely with EPA, the primary agency charged with cleaning up, or ordering the cleanup of, hazardous waste sites through the Superfund program. Ties between the two agencies continue to be close. ATSDR coordinates areas of intersecting responsibility with those of EPA and other federal agencies, developing coordinated messages and information for communities about the risks of chemical exposures.



LEAD IN ARTIFICIAL TURF

In 2007, the New Jersey Department of Health and Senior Services and ATSDR tested an athletic field located near a scrap metal facility for possible lead contamination. Finding lead-contaminated dust at the field was not surprising. Finding out that the lead came from the artificial turf fibers was very surprising. Further testing at other fields revealed a much more widespread problem and sparked national interest from New York to Alaska.

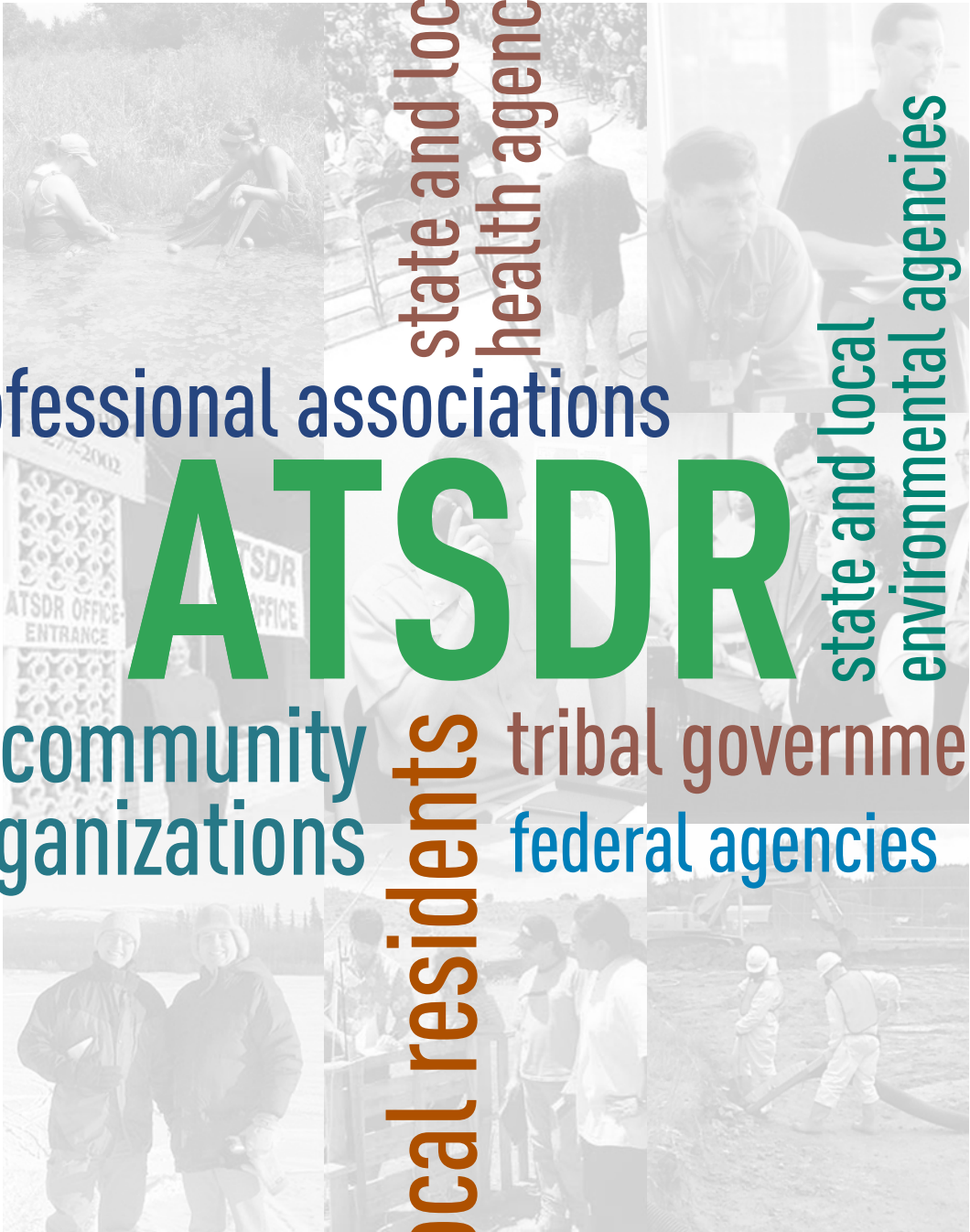
ATSDR and New Jersey health scientists determined that certain types of turf contained high levels of lead from pigments used to color the turf products. As turf broke down over time, it formed a lead-contaminated dust. In addition, they found that some of this lead could be absorbed by individuals exposed to it. The Consumer Product Safety Commission conducted a separate investigation and declared artificial turf safe for use. But at the request of the commission, manufacturers agreed to voluntarily reduce the amount of lead used in their turf products. As a precaution to protect children's health, CDC and ATSDR issued an alert recommending periodic field testing and hygienic practices to reduce dust exposure.

ATSDR shares responsibilities with other federal entities such as DoD, DOE, and NIOSH. Because DoD and DOE own several NPL sites, ATSDR works closely with both agencies to assess the hazards associated with these facilities. It coordinates with DoD and DOE as well as NCEH and NIOSH to perform health studies, conduct public health activities, and identify research needs. As part of this effort, ATSDR has prepared numerous toxicological profiles for DoD and DOE on substances specific to their sites.

Under CERCLA, ATSDR works with the National Toxicology Program, a federal interagency program, to coordinate research on substances in the environment that may be harmful. In addition, other agencies such as OSHA make extensive use of ATSDR toxicology reference documents (Toxicological Profiles).

PARTNERSHIPS

enable ATSDR to play a role in safeguarding communities from environmental contaminants.



state and local health agencies

state and local environmental agencies

professional associations

ATSDR

community organizations

tribal governments
federal agencies

local residents



More than 5,000 residents were evacuated from Graniteville, South Carolina, in 2005 when a train carrying chlorine gas crashed overnight. ATSDR mobilized its experts to help EPA, the U.S. Coast Guard, and state health and environment agencies conduct sampling activities and monitor health effects. Once the community was safe for residents to return, ATSDR continued to work. Using the lessons learned in Graniteville and national data on hazardous spill events, ATSDR developed recommendations and resources for medical personnel, emergency planners, public health professionals, and the public to limit future effects.



Translating Science Into Action

Scientists at ATSDR provide the technical resources and tools the agency needs to safeguard Americans from chemical exposures. These experts work to advance science and search for answers at sites and during emergency events. Their experiences assist other professionals throughout the nation in preparing for and preventing chemical exposures and related health effects.

RESPONDING TO EMERGENCIES

ATSDR plays a critical role in protecting the public's health during chemical releases and other emergencies by providing resources, expert responders, and technical assistance. With employees in regional offices around the country, ATSDR can mobilize and coordinate quickly with other partners, such as CSB, EPA, and the U.S. Coast Guard, to respond to emergency situations involving chemical threats. ATSDR experts support CDC's Emergency Operations Center and regional emergency centers. ATSDR personnel from the U.S. Public Health Service Commissioned Corps (a team of uniformed officers headed by the U.S. Surgeon General and trained to respond to public health crises and national emergencies) are organized into teams and sent to emergency locations when their help is requested.

Calling on their unique expertise, ATSDR specialists developed Medical Management Guidelines (MMGs)



COFFEYVILLE, KANSAS

In 2007, the Verdigris River flooded Coffeyville, Kansas, leaving thousands temporarily homeless. Oil from a local refinery contaminated the floodwaters, adding further to cleanup concerns for residents eager to return home. ATSDR responded immediately, doing neighborhood walking tours with employees from the Kansas Department of Health and Environment to advise returning residents about using masks and protective equipment. ATSDR experts supported the EPA emergency response center and mobile command center in Coffeyville. Along with EPA, ATSDR established environmental screening levels and analyzed sampling data to make sure homes and businesses were safe for returning residents. Health and safety messages broadcasted on local radio stations and shared through a public availability session and the FEMA disaster claims center helped prevent illness and injuries. When flooding occurred in Iowa, Missouri, and Nebraska the following year, ATSDR drew upon the experiences and materials created during the Coffeyville response to help other communities recover.

to help emergency responders and doctors treat acute exposures and decontaminate patients and workers during responses to chemical emergencies. MMGs include basic chemical information, possible health effects, and specific decontamination instructions and indicate whether health-care providers treating patients may be affected as well.



Photo courtesy of Minnesota Department of Health

PERFLUOROchemicals IN MINNESOTA

In 2001, Americans became aware of perfluorochemicals (PFCs), which are very stable chemicals used in everyday products such as nonstick pans, firefighting foams, and stain-resistant materials. Studies of Red Cross blood donors and CDC biomonitoring data showed that PFCs were in nearly everyone's blood, yet there are very few studies on the health effects in humans. The Minnesota Department of Health (partially supported by ATSDR) and the Minnesota Pollution Control Agency investigated environmental contamination surrounding PFC manufacturing facilities and waste disposal sites. Minnesota also conducted extensive testing of public drinking water systems, private wells, and fish. As a result, the Minnesota Department of Health developed drinking water standards and advice about eating fish to limit future exposures. It also conducted widespread community health education to prevent exposures. ATSDR cooperative agreement specialists assisted with a 2008 biomonitoring study that measured PFCs in the blood of residents who drank contaminated water. Staff are helping to share the study results with the community.

The agency also strives to prevent or minimize exposures and health effects from hazardous spills and emergency events. ATSDR works with state agencies and the National Response Center to collect and analyze information through the Hazardous Substances Emergency Events Surveillance (HSEES) system. Together, they track, report, and study chemical releases, using the information to plan for prevention and response.

Using HSEES data, many states and partners have developed legislation or policies to protect the public. For example, HSEES data have supported several state efforts to prevent the growing problem of methamphetamine ("meth") lab exposures and to minimize mercury releases in schools. HSEES data also support the counterterrorism and response planning of agencies or facilities that make or store chemicals in the United States.

Beginning in 2009, the HSEES program transitioned to the National Toxic Substances Incident Program, uniting similar efforts from many agencies. ATSDR developed the program with the HHS Office of the Assistant Secretary for Preparedness and Response, NIEHS, and other agencies, including CSB, DHS, EPA, and the Department of Transportation.

The new program will create an integrated national system to track spill events across the United States and their public health effects. Working with NCEH, ATSDR will use its expertise to investigate the health effects of large events. Together, the agencies will collect biological samples to assess exposure and follow up with individuals and their health-care providers. ATSDR expects to support 5–6 states through the program in gathering data and identifying vulnerable populations. Additional resources would enable greater state participation, creating a truly national surveillance system.

PROVIDING ANSWERS TO AMERICANS

ATSDR’s site work may be broad in scope (for example, evaluating an entire site that may affect several communities and include multiple exposure pathways) or specific to a portion of a community or particular contaminant. If data are inadequate, ATSDR can conduct an exposure investigation. This involves sending experts to collect environmental samples (such as soil, water, or air) or biological samples from potentially exposed individuals. Exposure investigations provide limited sampling to fill in information gaps and better describe exposures. ATSDR shares the results of these investigations through summary reports—health assessments or health consultations—with the community and other partners. These reports may recommend medical testing or site cleanup activities. They may also recommend that ATSDR conduct additional health studies.

Translating Science into Activities that Protect Americans

- Exposure investigations to collect environmental or biological samples
- Site and chemical release evaluations—health assessments, health consultations, or technical assistance
- Mapping services to identify areas of contamination and affected communities
- Dose reconstruction and models to estimate exposures
- Studies to identify health effects and patterns in exposed groups
- Health education for health professionals and community members



CAMP LEJEUNE, NORTH CAROLINA

Activities at Marine Corps Base Camp Lejeune and at a nearby dry-cleaning company released volatile organic compounds (VOCs) that contributed to contamination of the water supply system serving different areas of the base's housing. In 1997, ATSDR identified the need for a greater understanding of the degree to which water contaminated with PCE (perchloroethylene or tetrachloroethylene) or TCE (trichloroethylene) had reached family housing areas on the base. As a result, ATSDR began a series of studies and investigations at the base.

ATSDR is conducting a study to examine health effects among children born from 1968 through 1985 to mothers exposed to the contaminated water during their pregnancy. The ongoing study, which includes the use of complex water models, is looking for relationships between exposure to PCEs or TCEs during pregnancy and certain birth defects and childhood cancers. As part of this effort, ATSDR's Exposure-Dose Reconstruction Program is developing computer models to estimate past exposures to TCE, PCE, and benzene through drinking water at the base. The program works with water-modeling experts to ensure that the best science is used. In 2009, ATSDR updated its findings about exposures at the site based on new data indicating that exposures were greater than previously thought. ATSDR continues to work with the Camp Lejeune Community Assistance Panel, made up of members of the base community, to direct activities and complete health studies.

In further support of site assessment work, the ATSDR Exposure-Dose Reconstruction Program combines the use of computer modeling with known environmental and human health data to develop exposure estimates. Using groundwater and surface water data, information about drinking water systems, geographic information system (GIS) technology, and computer calculations, ATSDR scientists have helped estimate exposures in Toms River, New Jersey, and at Marine Corps Base Camp Lejeune, in North Carolina. Such exposure-dose reconstruction may help to estimate the potential health effects of past exposures to chemicals on individuals and communities.

ATSDR's Geospatial Research, Analysis, and Services Program brings expertise in GIS, geospatial analysis, and cartography (mapmaking) to bear on health studies and site investigations. Geospatial scientists use demographic, health outcome, and environmental hazard data to evaluate possible exposures, identify communities at risk, and attempt to show the complex relationship between health and the environment.

ATSDR also provides technical assistance reports in response to specific agency and public requests concerning hazardous waste, hazardous chemicals, and other environmental public health issues.

TRACKING HEALTH EFFECTS

ATSDR maintains records of people who were exposed to specific toxic substances (registries), tracks them over time to understand health effects, and provides new health information to registrants and their physicians as it becomes available.

ATSDR ON THE JOB AFTER 9/11 In response to concerns about the possible health effects of the attack on the World Trade Center on 9/11, ATSDR in 2003 launched the World Trade Center Registry. The registry, a team effort by ATSDR, the New York City Department of Health and Mental Hygiene, and FEMA, tracks long-term health effects among workers, residents, and schoolchildren who were exposed to smoke, dust, and debris from the disaster. Through gathering of data on many exposed individuals, information can be drawn from the registry and used to help researchers identify health effects that may not be apparent to physicians treating only one or two affected individuals. This information may also help physicians identify those more likely to develop health effects and treat them earlier.

PROTECTING THE HEALTH OF FORMER WORKERS AND THEIR FAMILIES In response to investigations at the Libby, Montana, asbestos site, ATSDR created the Tremolite Asbestos Registry. The registry tracks the health of former workers who lived and worked in Libby before 1990, along with their families and members of the community. It helps ATSDR quickly communicate with affected individuals and provide information on dealing with asbestos-related disease.



LIBBY, MONTANA

In 1999, at the request of EPA and Montana's congressional delegation, ATSDR began to evaluate public health concerns related to the mining of vermiculite that was contaminated with tremolite asbestos in Libby. ATSDR worked with multiple partners to screen and identify affected residents. ATSDR epidemiologists conducted a review of deaths in the community and discovered that the rate of deaths attributed to asbestosis, a lung disease caused by breathing asbestos particles over a long period of time, was 60 times higher than the U.S. average. As a result, ATSDR created a registry of community members affected by asbestos, offered health screenings to community members, and began a campaign to notify exposed residents and educate them about asbestos. Advancing the state of science, ATSDR studied the usefulness of CT scans to identify lung problems related to asbestosis and helped to identify tremolite asbestos as a toxic substance. Based on the results of these analyses, ATSDR reviewed more than 200 locations across the nation that received vermiculite from Libby and conducted exposure evaluations at 28 of these sites. A final report identified groups within these communities with greater past exposure levels and recommended activities to prevent future exposures from any remaining asbestos.

UNRAVELING A MYSTERY Amyotrophic lateral sclerosis (ALS), or Lou Gehrig's disease, is a devastating neurologic disease of unknown cause. The ALS Association is working with ATSDR to complete projects that will help create a national ALS registry. Projects are underway in Georgia, Minnesota, and South Carolina. ATSDR is integral in identifying ways to share data and better track ALS throughout the United States.

EQUIPPING PROFESSIONALS TO PROTECT THEIR COMMUNITIES

Widely used by health and scientific professionals around the world, ATSDR's ToxProfiles™ summarize and evaluate all of the available data and possible health effects of hazardous substances found at different sites. The profiles provide information on each substance's

chemical and physical properties as well as the potential for health effects related to exposures. In addition, they include details on the production, import, use, and disposal of these substances. Nearly 300 ToxProfiles™ exist or are being developed on hazardous substances ranging from complex synthetic materials such as pesticides and polychlorinated biphenyls (PCBs) to naturally occurring substances such as arsenic and lead. ATSDR regularly updates and revises the profiles to include new information.

Through partnerships, ATSDR educates health-care providers about the health effects of chemicals. This environmental medicine support helps physicians diagnose and treat exposed patients quickly and effectively.

PEDIATRIC ENVIRONMENTAL HEALTH SPECIALTY UNITS (PEHSUS) are a source of medical information and advice on children's environmental health issues.







Photo courtesy of Dawn Gibbons, First Lady of Nevada

TRIBAL HEALTH PROVIDER EDUCATION

Partnerships among ATSDR, the American College of Medical Toxicology (ACMT), and tribal governments help to ensure that tribal health-care providers can identify and safely treat patients with environmental exposures. In 2009, ATSDR and the Indian Health Board of Nevada hosted a summit for tribal, state, and local agencies to provide education about the health impact of "meth" labs. High-level support from Nevada's first lady and attorney general, who both spoke at the summit, helped ATSDR succeed in reaching the medical community. Attendees reported that the training they received was very informative and increased their awareness of the dangers of "meth" lab exposures, adding that they would recommend the training to others.

ATSDR Professional Resources

	ToxProfiles™	Summary of best available science on chemicals and their health effects
	ToxFAQs™	Condensed ToxProfile™ information for the general public
	ToxGuides™	Pocket references for health professionals in the field
	Case Studies in Environmental Medicine	A series of self-instructional medical education publications
	Grand Rounds in Environmental Medicine	Scripted presentations and Internet-based videos
	Community Health Education Presentations	Scripted community-oriented presentations and Internet-based videos

PEHSUs are located at leading academic medical centers throughout the United States, Canada, and Mexico. PEHSUs form a network that responds to requests for information, offering advice and clinical consultations on the prevention, diagnosis, management, and treatment of environmentally related health conditions among children. ATSDR and EPA together fund the Association of Occupational and Environmental Clinics to manage the PEHSU network. From hosting regional training sessions to creating factsheets on breaking issues such as melamine in infant formula, PEHSUs fill an important role—equipping health professionals to protect children from chemical exposures.

THE AMERICAN COLLEGE OF MEDICAL TOXICOLOGY (ACMT) provides medical toxicology education on important topics, such as “meth” lab exposures, and regional consultations to support health professionals across the nation. It supports ATSDR in creating Case Studies in Environmental Medicine, an important tool for health-care providers. Partnering with ATSDR and the PEHSU network, ACMT developed monographs about two recent pressing pediatric exposure issues—pesticides in food and phthalates in food and medical products.



ATSDR's primary goal is to keep communities safe from harmful exposures and related diseases. To do this, the agency continues to assess hazardous waste sites, educate communities, and seek new ways to better protect Americans. The appearance of new and emerging challenges calls for ATSDR and other federal agencies to rethink how they can prevent unnecessary exposures. ATSDR and NCEH have started to involve partners, other federal agencies, and the public to find ways to better protect the nation from chemical exposures. This effort is called *The National Conversation on Public Health and Chemical Exposures*. ATSDR is a key player in this effort to ensure that the places where people live and play are safe.



Working for a Safer and Healthier America

Over the past 25 years, ATSDR has matured and greatly expanded the field of environmental health. Its very presence gives Americans a forum to share their environmental health concerns. ATSDR has educated hundreds of thousands of community members and health professionals by developing educational tools, training programs, and outreach strategies. Working closely with federal, tribal, and state partners, the agency has reduced or eliminated toxic chemical exposures at numerous sites across the nation. Applying the best science to investigate community health concerns, ATSDR

Before ATSDR

Communities had no centralized federal agency to turn to when they suspected health problems from toxic exposures.

Tribal governments and state and local health agencies lacked resources to investigate community concerns.

Health-care providers had limited knowledge about chemical exposures and their health effects.

Public health professionals had limited information about the health effects of exposures.

Many public health professionals were not equipped to prepare for or respond to emergency chemical releases.

No standard approach to monitoring and analyzing exposure-related health effects existed.

NOW

People can directly request that ATSDR investigate and address health concerns.

Through grants and technical support, ATSDR has built programs and skills in 29 states and one tribal government.

A network of health-care experts educates and supports local clinicians on children's environmental health issues.

ToxProfiles™ and other publicly available resources give clear information about specific chemicals and health effects.

24-hour support and professional training from ATSDR have enabled public health agencies to improve responses to emergency events such as 9/11.

Exposure registries exist and emergency chemical events are tracked, reported, and studied. ATSDR can analyze this key information to identify any related health effects.

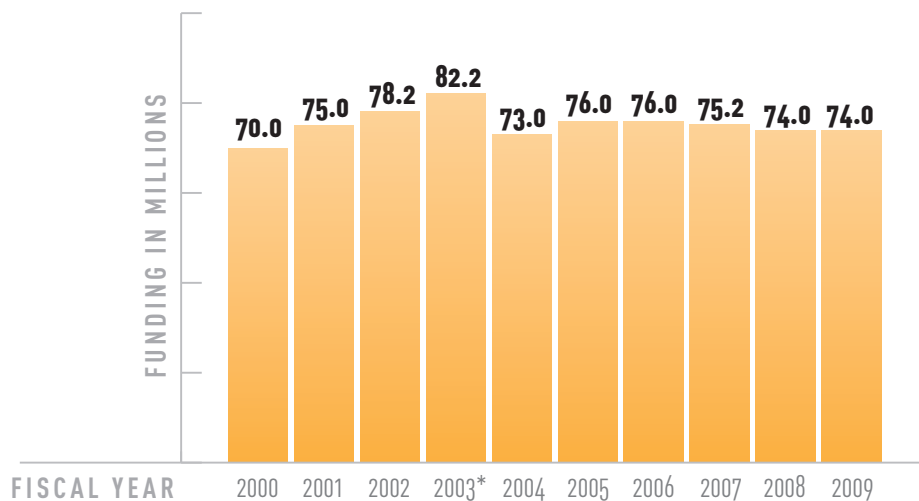
implements health studies, conducts exposure-dose modeling, and employs a variety of experts across the nation to protect Americans from chemical exposures. ATSDR also helps partners build their internal programs and skills so that they can lead in their own communities.

ONGOING CHALLENGES

Today, ATSDR continues to respond to requests from communities, health and environmental agencies, and elected officials for public health information and exposure assessments as originally outlined in the Superfund legislation. However, long-standing challenges—limited resources, complex sites, continued environmental justice concerns, incomplete data, and gaps in scientific understanding—continue to prevent the agency from fully reaching its goals.

Americans come into contact with thousands of chemicals in their lifetimes. The health effects of many of these substances are not well understood. In the past, national attention

ATSDR Budget FY 2000 - FY 2009



* 2003 increase in funding included reimbursement for 9/11-related activities.

focused largely on hazardous sites. Today's headlines feature stories about exposures to toxins in toys, candy, foods, and other consumer products.

ATSDR receives funding from Congress each year to support its activities and partnerships at more than 500 sites and communities. ATSDR also receives limited funding from DoD and DOE to use for federal site assessments. ATSDR's annual budget changed very little from 2000–2009. In fact, in real dollars, its funding in 2009 was substantially less than that in 2000. In comparison, the cost of diseases linked to environmental contaminants is more than \$50 billion each year and rising.

ATSDR has accomplished much since 1985. However, these challenges underscore the need for strong federal action to protect the health of all Americans and strive to achieve environmental justice in addressing chemical exposures.

WHERE DO WE GO FROM HERE?

Imagine a nation where communities know that their water, air, homes, and recreation sites are safe for everyone. Imagine consumer products and technologies that are free from chemical hazards. This vision inspired ATSDR and NCEH in 2009 to launch an 18-month project called *The National Conversation on Public Health and Chemical Exposures*.

The National Conversation

The National Conversation is a critically important opportunity to improve and modernize ATSDR. It includes other partners and the public in an effort to strengthen the national chemical safety system. ATSDR is in a key position to foster these changes. First, it has a long history of working with partners in communities to address health concerns and disparities in exposure. Second, it has expertise in chemical exposures. Third, the agency has close ties to NCEH, which is home to CDC's environmental health laboratories, bio-monitoring program, and many other programs. This cooperation between ATSDR and

NCEH offers better opportunities to study the links between exposure to chemicals in the environment and health effects.

The national system that protects Americans from exposure to harmful chemicals is very complex. It includes laws that protect the environment and consumers. It also includes the work of staff in government agencies, industry, research, and nonprofit groups. Because many different organizations share these responsibilities, good communication and cooperation are necessary. In addition, the entire system needs to be assessed and improved to truly protect Americans. In doing so, *The National Conversation* is gathering ideas from many different professionals, agencies, organizations, and communities, with the intent of addressing current challenges and building a world-class national chemical safety system.

ATSDR is looking ahead with renewed commitment to prevent and minimize harmful chemical exposures. Through its actions and those of its partners, the agency strives to safeguard the health of all Americans.

Providing Americans a World Class Chemical Safety System

- Accurate information on chemical use and exposures
- Scientific understanding of how chemicals affect health
- Policies and practices that prevent and reduce harmful exposures
- Prevention of and response to chemical emergencies
- Elimination of inequities in exposure
- A well-informed public
- An informed and engaged health-care provider network
- Cooperation among partner organizations and agencies

ATSDR Activities Safeguard Americans from Chemical Exposures

ATSDR takes part in a variety of activities, working with many partners to protect Americans from harmful chemical exposures.

- Investigating exposures by collecting environmental or biological samples
- Evaluating site and chemical releases through health assessments, health consultations, or technical assistance
- Mapping areas of contamination and affected communities
- Modeling dose reconstruction exposure estimates
- Studying health effects and patterns in exposed groups
- Educating health professionals and community members
- Responding to emergency release and spill events
- Ensuring that cleanup efforts protect health
- Monitoring exposure effects through registries and surveillance systems
- Supporting medical and scientific research and innovations
- Developing policies and practices to prevent exposures

Useful Resources

Agency for Toxic Substances and Disease Registry (ATSDR). Asbestos exposure in Libby, Montana. Atlanta GA [accessed 2009 June 8].

Available from: www.atsdr.cdc.gov/Asbestos/sites/libby_montana/.

ATSDR. ATSDR background and congressional mandates. Atlanta GA [accessed 2009 June 8].

Available from: www.atsdr.cdc.gov/about/congress.html.

ATSDR. ATSDR home page. Atlanta GA [accessed 2009 June 8].

Available from: www.atsdr.cdc.gov.

ATSDR. 2008. Building healthy communities: a baseline characterization of Milwaukee's 30th Street Corridor. Atlanta: ATSDR.

ATSDR. Camp Lejeune, North Carolina. Atlanta GA [accessed 2009 June 8].

Available from: www.atsdr.cdc.gov/sites/lejeune/.

ATSDR. Statement before the House Energy and Commerce Subcommittee on Environment and Hazardous Materials, United States House of Representatives: ATSDR's emergency response activities and Hurricane Katrina efforts. Atlanta GA [accessed 2009 June 8].

Available from: <http://archives.energycommerce.house.gov/reparchives/108/Hearings/09292005hearing1646/Falk.pdf>.

ATSDR. Tar Creek Superfund site—Ottawa County, OK. Atlanta GA [accessed 2009 June 8].

Available from: www.atsdr.cdc.gov/sites/tarcreek/index.html.

ALS Association. The ALS Association National ALS Registry efforts underway. Calabasas Hills CA [accessed 2009 June 8].

Available from: www.alsa.org/policy/article.cfm?id=1094&CFID=2&CFTOKEN=68144428.

Association of Occupational and Environmental Clinics. Pediatric Environmental Health Specialty Units. Washington DC [accessed 2009 June 8]. Available from: www.PEHSU.net.

Centers for Disease Control and Prevention. 2005. Public health consequences from hazardous substances acutely released during rail transit—South Carolina, 2005; selected states, 1999–2004. *MMWR Morb Mortal Wkly Rep* 54(3):64–7.

Available from: www.cdc.gov/mmwr/preview/mmwrhtml/mm5403a2.htm.

Colledge M, Wilder L. 2008. Construction and demolition (C&D) landfills: emerging public and occupational health issues. *J Environ Health* 71(2):50–2.

Environmental Protection Agency (EPA). NPL site narrative for Times Beach site. Washington DC [accessed 2009 June 8].

Available from: www.epa.gov/superfund/sites/npl/nar833.htm.

EPA. The Love Canal tragedy. Washington DC [accessed 2009 June 8].

Available from: www.epa.gov/history/topics/lovecanal/01.htm.

EPA. CERCLA overview. Washington DC [accessed 2009 June 8].

Available from: <http://epa.gov/superfund/policy/cercla.htm>.

EPA. Final National Priorities List (NPL) sites—by state. Washington DC [accessed 2009 June 8].

Available from: www.epa.gov/superfund/sites/query/queryhtm/nplfin.htm.

Frumkin H. 2009. The public health approach to chemical exposures: a national conversation. *J Environ Health* 71(7):26–7.

Miami High School Cherokee Volunteer Society, Concerned Youth and Citizens of Miami, Oklahoma. 1999. Tar Creek anthology—the legacy: poems, songs, essays and research papers. Miami OK: Miami High School Cherokee Volunteer Society, Concerned Youth and Citizens of Miami.

Minnesota Department of Health. Health risk limits for perfluorochemicals, report to the Minnesota Legislature 2008. St. Paul MN [accessed 2009 July 22].

Available from: www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/finalreport011508.pdf.

New York City Government. WTC Health Registry. New York NY [accessed 2009 June 8].

Available from: <http://nyc.gov/html/doh/wtc/html/registry/registry.shtml>.

New York State Department of Health and ATSDR. Love Canal follow-up health study. Albany NY [accessed 2009 June 8].

Available from: www.health.state.ny.us/environmental/investigations/love_canal/docs/report_public_comment_final.pdf.

U.S. Department of Health and Human Services. Agency for Toxic Substances and Disease Registry justification of estimates for appropriation committees: fiscal year 2010. Washington DC [accessed 2009 June 8].

Available from: www.cdc.gov/fmo/topic/Budget%20Information/appropriations_budget_form_pdf/FY2010_ATSDR_CJ_Final.pdf.

U.S. Department of Health and Human Services. America's health responders: U.S. Public Health Service Commissioned Corps. Washington DC [accessed 2009 June 8].

Available from: www.usphs.gov/.

Acknowledgments

ATSDR would like to thank the American Public Health Association and Zeigler/Dacus for their support in developing this book.

Inks used in this document contain 20% or more vegetable-based inks.
Paper used in this document is made with 100% post-consumer fibers.
Fonts used in this document are Filisophia, Din and Din Condensed.



