

United States
Environmental Protection
Agency

Office of
Public Affairs (A-107)
Washington DC 20460

Volume 11
Number 10
December 1985

EPA JOURNAL

EPA and the Community





Sunnyvale, Calif., resident Elaine Davidson, shares her comments at a "toxics town meeting" attended by EPA and other government officials.

EPA and the Community

In carrying out its responsibilities, EPA affects nearly every person in America. This issue of the *EPA Journal* explores the question of how public understanding and community involvement can be achieved in environmental decision-making.

EPA Administrator Lee M. Thomas begins the issue with a perspective-setting article pointing out that citizen

awareness and participation are the foundation of success in environmental accomplishment. The history of EPA's efforts over the years to build effective public participation is reviewed in another article. The results of the agency's program to encourage public input in Superfund decisions are also described.

An outside observer views the agency's public participation efforts in another article. An industry

perspective regarding the community's right to know about environmental hazards in manufacturing is presented. The outcome of EPA public participation efforts in two communities is described in articles from agency regional offices.

In other articles, some creative responses from children are featured in a light-hearted look at the meaning of the initials E-P-A. A report on an environmental

problem receiving increasing attention—indoor air pollution—is included, and the recently announced plan to restore the Chesapeake Bay is explained. Developments in converting the hazardous pesticide EDB into useful chemicals are reported.

Two regular features in the *Journal*—Update and Appointments—are included. □

EPA JOURNAL

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EPA is charged by Congress to protect the nation's land, air, and water systems. Under a mandate of national environmental laws, the agency strives to formulate and implement actions which lead to a compatible balance between human activities and the ability of natural systems to support and nurture life.

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Front cover: A view of the town of
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The Challenge of Community Involvement

by Lee M. Thomas

Everybody knows that citizen awareness and participation are the bulwark of democracy. Nowhere is this more certain than in the realm of environmental management. EPA is on the firing line in hundreds, if not thousands, of communities all across the nation. It is probable that we attract more intense interest—in the form of letters, phone calls, and attendance at local hearings—than any other agency of the federal government. It's not hard to see why.

EPA is a relatively small agency compared with most in government, but our impact is profound. The decisions we make will affect the quality of life in this country for generations, maybe centuries, to come. It is essential, therefore, that we stay in close touch with the people, keep them informed, and listen carefully to what they have to say.

As the head of EPA's hazardous waste management program for two years before becoming Administrator, I saw first-hand how vital it is to ensure candid two-way communication between the people and their government. This is, of course, true for EPA's air, water, and toxics control programs as well. But abandoned, uncontrolled hazardous waste dumps are uncommonly capable of provoking public alarm.

Most people weren't aware that these dumps posed any special problem until the infamous Love Canal episode exploded into the headlines in 1978. But that event was soon followed by the Valley of the Drums and numerous others. Congress responded by passing the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, which provided a federal trust, commonly known as the Superfund, to identify and clean up all dump sites presenting a significant threat to human beings or their environment.

But where life, health, and economic survival may be at stake, good legislative intentions are not enough. The public demanded to know which sites would get priority treatment and how the cleanup process would work.

We set up a special community relations program to answer these questions and to guarantee citizens a meaningful role. It has helped persuade people to work with government to resolve the complex issues surrounding the cleanup of abandoned dumps.

Citizens who live in the vicinity of unsightly and dangerous chemical repositories often want instant remedies. That expectation is unrealistic. However, when people understand how complex the cleanup process is, they are usually willing to give us their

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cooperation in designing solutions consistent with good planning, available technology, and our necessarily limited resources. They need to know the truth in order to understand the hazards they face and what government can and cannot do to help them.

The first step is to gather information about each community where an abandoned hazardous waste dump is located or where a hazardous spill has occurred. We then inform the public about the nature of the hazard, without seeking either to exaggerate or minimize it. Next, we hold meetings to explain what our cleanup strategy will be and how long it will take. We encourage people to come forward and comment on our proposed solution, present new facts, or raise questions we may have overlooked. We revise the cleanup plan as necessary to meet substantive objections.

We are moving in the same direction under the Resource Conservation and Recovery Act, which authorizes us to regulate currently operating or planned hazardous waste disposal facilities. Each of our 10 regional offices is developing a program that will encourage citizens to play an active part in reviewing and issuing facility permits. Public participation is essential to successful siting and community acceptance of hazardous waste operations. Without it, we will never overcome the NIMBY

syndrome: "Not In My Back Yard."

This open, cooperative attitude is definitely paying off. In numerous cases, Superfund response actions have been significantly and constructively modified as a result of public input.

In southwestern Missouri, for instance, an open approach to citizens' questions enabled us to demonstrate high-efficiency thermal destruction of dioxin-contaminated soils using our state-of-the-art mobile incinerator. In Lackawanna County, Pa., the people persuaded us to upgrade our original proposal for treatment of a site contaminated with PCBs by excavating to a greater depth and down to lesser concentrations than planned. In Hamilton, Ohio, in response to residents' concerns about threats to their property from airborne contaminants, we performed additional sampling at private homes beyond the established site boundary. This procedure was not required by law or regulation but won the support of a broader constituency and proved that EPA was concerned and not bound by bureaucratic norms. Such examples are legion.

In the years ahead, we expect continued expansion of the Superfund program, especially as sites currently in the analytical or feasibility phases move into design and construction. The National Contingency Plan requires that citizens living around Superfund sites be fully informed of the cleanup process. I personally have asked all Assistant Administrators to think about how to further develop community relations and public participation activities as integral parts of their programs.

The American people clearly want to safeguard themselves from the avoidable risks of contamination by pollutants in all media: land, air, and water. They are willing to pay for these benefits. We at EPA intend to merit the confidence they have placed in us as we move toward our common goal of a safe, clean, and healthy environment. We will do everything we can to elicit their involvement in all our pollution control programs. For us, community participation is no mere abstraction, but a policy objective we pursue every day, one that is vital to our continued success. □

(Thomas is Administrator of EPA.)

EPA and the Public: A Long Relationship

by Jack Lewis



Women marching for clean air. Over the years, citizen involvement has focused on clean air, clean water, and toxic wastes.

themselves, and that is far from easy when even scientists disagree over the relative health effects of tiny doses of obscure chemicals. Some activists are turning to a new book called *The Health Detective's Handbook* (Johns Hopkins, 1985) for a crash course in statistical sampling and chi square analysis.

EPA, like the American public, has been hard-pressed to keep up with the unfolding panoply of environmental problems—from the highly visible pollution of the early 1970s to the more insidious perils of toxic waste in the 1980s. In part because of the

In 1985, the environmental activist is far less likely to be on the street than in conference with consulting attorneys and engineers.

idiosyncrasies of its legislative mandate, in part for other reasons, the agency has been uneven in its support of the public participation process. But compared to other parts of the federal government, EPA can be said to have public participation in its blood.

The very existence of the agency owes a great deal to citizen involvement. President Nixon acknowledged the growing wave of environmental protest in May 1969 when he included a Citizens' Advisory Committee in his newly formed Environmental Quality Council. In all likelihood, he would not have approved the formation of EPA had not 20 million Americans made their feelings known on Earth Day in 1970.

Since its founding in December 1970, EPA has been given the task of implementing a wide range of environmental statutes. Many of these statutes owe their very existence to years of citizen lobbying, so it is no surprise that some should specifically mandate "public participation." The Federal Water Pollution Control Act of

Community involvement encompasses all of EPA's efforts to involve the public in its decision-making processes. The process was more wide-ranging when the agency was first finding its footing in the early 1970s. In those days, community involvement was known as "public participation." The phrase was appropriate because a broad range of the citizenry nationwide was up in arms over air and water pollution.

Today grass roots agitation is more likely to occur in individual communities alarmed over isolated problems like hazardous waste dumps. But in some ways, community involvement as practiced today is more challenging than the public

participation of the 1970s. Environmental problems have grown more complex over the past 15 years, and citizen awareness has had to become much more sophisticated just to keep up.

Fifteen years ago, it was fairly typical for environmental concern to take an emotional and rather diffuse form. In 1970, for example, a group of irate housewives in Missoula, Mont., organized "Gals Against Smog and Pollution." They then proceeded to picket the local paper mill with signs screaming such messages as "Pollution Stinks" and "Emphysema Kills."

In 1985, the environmental activist is far less likely to be on the street than in conference with consulting attorneys and engineers. Citizens who cannot afford expert help are finding there is no alternative to learning the skills

(Lewis is Assistant Editor of the EPA Journal).

1972 (later known as the Clean Water Act), the Safe Drinking Water Act of 1974, and the Resource Conservation and Recovery Act of 1976 all contain language requiring EPA to involve the public in their implementation.

The philosophy behind public participation found expression in Section 101(e) of the Federal Water Pollution Control Act of 1972: "A high degree of informed public participation in the control process is essential to the accomplishment of the objectives we seek—a restored and protected natural environment." In what way essential? Legislators—inspired by the dedication of clean air activists in the so-called "Breathers' Lobby"—envisioned the public as the conscience of EPA. Their hope was that concerned citizens, both individually and in groups, would monitor EPA and ensure that the agency actually did its job.

It was clear from the outset that the public could not put persistent and informed pressure on EPA without a steady flow of information and guidance from the agency. Meeting that need has been the purpose of EPA's public participation programs. Their mission is threefold:

- To keep the public informed of important developments in EPA's program areas.
- To provide technical information and, if necessary, translate that information into plain English.
- To ensure that the agency takes community viewpoints into account in implementing these programs.

The public participation "hotspots" in the agency have changed as EPA has matured. In the early 1970s, the air programs required intense public liaison. Americans feared for something very precious: their cars. From the mid to late 1970s, EPA focused its public participation efforts on the water programs. In the 1980s, the public participation pendulum swung back to an extremely controversial program area: Superfund and toxic waste.

With the changes in program emphasis have come some changes in the techniques of community involvement practiced by the agency. There has also been an attempt over the years to formulate these techniques in handbooks and regulations.

EPA's earliest public participation efforts were in the area of air pollution. EPA drew personnel and ideas for this initiative from the National Air Pollution Control Administration (NAPCA), which prior to 1970 handled air pollution as part of the Department of Health, Education and Welfare. NAPCA played an active role in sponsoring the "Breathers' Lobby" of the late 1960s. NAPCA's Community Support Program made grants to non-profit institutions such as the American Lung Association and the Conservation Foundation, which in turn disseminated funds to citizen groups.

Community relations is the indispensable bridge between the agency and a public which still holds the final veto power in the American political system.

EPA made its continuation of these NAPCA grants its first major public participation initiative. Unlike NAPCA, EPA awarded some of its grants directly to citizen groups with air quality concerns. The Metropolitan Washington Coalition for Clean Air, the Better Air Coalition of Baltimore, and the Group Against Smog and Pollution of Pittsburgh were among the better known recipients. These groups wanted to influence the State Implementation Plans required of their states under the Clean Air Act. They did so with a battery of tools ranging from newsletters and hotlines to demonstrations and lawsuits.

The original target of the State Implementation Plans was the pollution generated by smokestack industries. In 1972, however, attention turned to the private automobile. EPA proposed 19 "transportation control measures" for consideration at the state level. These included carpooling, mass transit, fringe

parking, and traffic flow improvement. EPA awarded grants to organizations such as the League of Women Voters to raise awareness of these measures at the local level. Through such grants, the agency fostered the formation of citizen advisory groups to help EPA and the states keep in touch with the views of various public constituencies: business, labor, and environmentalists.

Once it became clear that the Clean Air Act would impinge directly on the everyday life of America's drivers, public interest was not hard to generate. EPA Administrator William Ruckelshaus generated banner headlines when he stunned Los Angeles with a list of draconian reforms he wanted that car-centered metropolis to adopt. Public opposition, in Los Angeles and elsewhere, led to significant modifications in the control measures actually adopted. But EPA's public information drive, helped in no small part by soaring gasoline prices, did succeed in raising awareness that the car was a pollution culprit.

The automobile control measures campaign taught EPA four major lessons:

- No matter what the laws say, they won't work if they lack public support or are based on unreasonable expectations.
- In the long run, federal environmental objectives and programs must have the support and understanding of top state and local officials if they are to succeed.
- Broad polling data is usually an insufficient and often a dangerous indicator upon which to base specific measures or programs. Restrictions people endorse in theory to protect the environment may be soundly rejected by them when put into practice.
- Governments and the public essentially need one another to fashion workable environmental protection programs. Public participation programs at all levels of government have an excellent track record of producing reasonable public consensus and improved programs.



Today the public demands to be part of the environmental decision-making process.

The agency's experience with the air program was put to valuable use in the mid-1970s when work began on the Water Quality Management Plans authorized under Section 208 of the Clean Water Act. President Nixon had impounded 208 funding. That meant that individual sewage treatment projects were approved under the Construction Grants Program without prior formulation of the multi-jurisdictional plans required by law. Not only were the plans behind schedule, but an institutional assessment in 1975 criticized EPA's water programs for making no more than a "minimal" effort at public participation.

As a public participation project, 208 planning was not nearly as volatile as the air issue had been. The public supported construction of sewage treatment plants, and the formulation of management plans was just that—a managerial issue not calculated, in most

cases, to hit close to home. Other issues, such as land and energy use, were more charismatic than water in the mid-1970s.

Thus, from the public's point of view, EPA's preoccupation with 208 planning was less than thrilling. But the agency learned some valuable lessons from the 208 program. Foremost among them were:

- The importance of early involvement as a means of mitigating conflict. An ongoing exchange of views and information works much better than a last-minute quest for consensus.
- The value of small meetings for the exchange of views and information. Large public hearings "involve" citizens in environmental decision-making, but frequently in a way that leads to confusion and controversy.

EPA's experience with the 208 program formed the nucleus of its later public participation regulations. Specifically, it generated much of the expertise and many of the methods now

in use in the Superfund and RCRA community relations programs. When public participation regulations were developed for the Safe Drinking Water Act and the Clean Water Act, they were coupled with those for RCRA. The joint regulations became final on February 16, 1979.

The regulations spoke of the need for "open processes of government and efforts to promote public awareness in the course of making decisions." The specifics of public participation strategy were left to the individual programs, but the regulations did call for:

- The formation of citizen advisory groups to represent "an informed core group of citizens."
- The drafting of "responsiveness summaries . . . intended to appear immediately after specific decision points to indicate briefly to the public how decision-makers responded to their participation."
- The training of agency personnel as preparation for public participation work.

Budget cutting during the early years of the Reagan Administration caused a temporary retrenchment in public participation programs. In May 1983, when William D. Ruckelshaus returned to the agency, public participation once again became a priority item. The new Administrator promised an open door policy at the agency. To dispel public distrust, he vowed to work in a "fishbowl."

Ruckelshaus named EPA's first Assistant Administrator for External Affairs to ensure that the various EPA program offices would speak to the public with one voice. To strengthen communication skills, EPA also sponsored public participation training in all its regions early in 1984.

Two new concepts have become integral to the new task of communicating risk to the public in the 1980s: risk assessment and risk management. Risk assessment is the scientific analysis of the risk a substance poses to human health and the environment. Risk management is

the managerial decision based on an evaluation of the social and economic implications any given level of protection against that risk will have.

Communicating the subtleties of risk assessment and risk management to citizens intent on zero risk is a very risky business in and of itself. To see how the concepts of risk assessment and risk management can be applied at the local level, the EPA headquarters Office of Policy, Planning and Evaluation and Region 9 are co-sponsoring an Integrated Environmental Management Project in San Jose, Calif. San Jose, located in the heart of Silicon Valley, thrives on high-tech industries that use a wide variety of solvents. Many of these have been stored in underground tanks that are now leaking and contaminating vital sources of ground water.

The San Jose case is a true test of community involvement because it does not involve highly visible pollution of the belching smokestack variety. Instead, the residents of San Jose must try to weigh the effects of parts per billion of esoteric solvents on invisible aquifers. To facilitate citizen understanding of these issues, the project managers have set up a Public Advisory Committee that includes representatives from industry, academia, state and local government, and environmental organizations. This committee meets once a month with EPA Region 9 and also sponsors "toxics town meetings" open to the general public.

Another EPA initiative strongly rooted in public participation is negotiated rulemaking. Negotiated rulemaking builds on one of the key insights culled from 208 water planning: reduce antagonism by beginning public participation as soon as possible. The history of EPA is littered with lawsuits; in fact, no fewer than 80 percent of all EPA regulations are challenged in court, by industry or by citizen groups. It is hoped that this costly and

time-consuming process can be avoided by involving interested parties in the rulemaking process. Early trials of negotiated rulemaking have been very promising.

By far the biggest public participation efforts now under way at EPA are the community relations programs of Superfund and RCRA in the Office of Solid Waste and Emergency Response (OSWER). The staff of these programs,

A country that got its start dumping tea into Boston Harbor is not likely to take any government edict lying down.

which have been growing steadily for several years, now totals nine people at EPA headquarters plus 50 in the agency's 10 regions.

It was the agitation of citizens near Love Canal in Niagara Falls, N.Y., that first brought the problem of hazardous waste to national awareness in the late 1970s. Even though the Comprehensive Environmental Response, Compensation and Liability "Superfund" Act of 1980 contains no public participation provisions, the agency has found it imperative to develop and gradually expand a Superfund Community Relations Program.

Otherwise, it would have been all too easy for relations between EPA and communities affected by Superfund cleanups to degenerate into conflict. As explained elsewhere in this issue (see next page), citizens affected by Superfund cleanups need all the reassurance they can get when their security is suddenly threatened on so many different fronts.

The potential for conflict also exists when EPA grants RCRA permits for new or existing hazardous waste sites. Here the jurisdictional problems become particularly complex: state and local authorities control the actual siting of such facilities while EPA sets the standards for their operation. The "Not In My Backyard" syndrome is something RCRA community relations

staff has to deal with even though EPA is not directly responsible for putting hazardous waste facilities near anyone's backyard.

By developing community relations plans specific to each unique case, the hazardous waste community relations staff tries to avoid pitfalls inherent in excessively formal and rigid approaches to public participation. Responsiveness to local needs is heightened by the use of a team concept for site inspections. Technical and legal staff work closely with communications staff at every stage in the inspection process.

EPA's efforts over the years to involve the public in its decision-making speak well of the strength of participatory democracy. It is not easy for the average citizen to understand the highly technical reasoning of the scientists and engineers who formulate so many of EPA's policies with respect to air, water, toxic chemicals, and hazardous waste. But a country that got its start dumping tea into Boston Harbor is not likely to take any government edict lying down.

American citizens want to have their say in the way programs affecting their lives are implemented, and EPA managers want to build a consensus for realistic enforcement of sometimes unrealistic laws. Community relations is the indispensable bridge between the agency and a public which—even more than Congress and the President—still holds the final veto power in the American political system. □

Community Involvement in Superfund: The Results

by Daphne Gemmill and Edwin Berk



Daphne Gemmill

The local community's involvement in Superfund actions has often had striking consequences. For example, in May 1983, EPA recommended the installation of a new water supply at the New Brighton/Arden Hills site in Minnesota where organic chemicals had contaminated two wells used by the city for its water supply. Citizens objected to EPA's recommended alternative because they expected taste and odor problems from the new water supply. Both the New Brighton water department and the city council agreed. The council asked for treatment of the wells by granular activated carbon. After careful consideration, EPA changed its recommendation to the alternative preferred by the community.

EPA encourages this kind of input from local residents because, as in this

(Gemmill is Superfund Community Relations Coordinator for EPA, and Berk is the Community Relations Project Officer with ICF, Inc., an environmental consulting firm.)

California citizen activist Penny Newman pauses in front of the Stringfellow Community Information Center. At this state-funded center, local residents maintain files of technical documents about the Stringfellow hazardous waste site for citizen review.

case, the result can be Superfund actions that better meet the needs of the local community. To encourage citizens to participate in Superfund decision-making, EPA instituted the Superfund community relations program soon after the enactment of the statute in 1980.

With over three years of experience in implementing the Superfund community relations program, EPA can now offer answers to some of the basic questions that arose when planning began. Who is likely to become involved in pressing for action on a hazardous waste problem, and why? How can the local community have some voice in decisions about cleanup actions? What are the best approaches to ensuring

good relations with the local community? What counts as success in community relations? The answers to these questions provide valuable insights into the workings of an effective community relations program.

Public Involvement in Superfund

The citizens involved with the Superfund community relations program are often very different from the environmental activists of the 1960s and 1970s, who tended to be associated with national organizations. Public involvement in hazardous waste problems is almost always a grass roots phenomenon. Groups of citizens organize locally around a single issue. National environmental groups are rarely involved at the local level.

Most citizens involved with hazardous waste problems have had little previous experience in governmental decision-making and little previous interest in environmental issues. Concern for personal health, the health of one's children, medical

expenses, and property values—all matters of self-interest—are invariably the major issues, and they are never treated dispassionately.

Whatever their backgrounds, people who become involved are usually able to educate themselves rapidly and deal with hazardous waste issues in a sophisticated manner.

There is a great deal of variability, however, in the amount of community involvement with hazardous waste sites and government responses. Some of the most threatening sites have aroused only minimal interest in the local community. To effectively plan a community involvement program, EPA must understand the causes of local opposition to government response plans.

Public involvement in hazardous waste problems is almost always a grass roots phenomenon.

Often concern over possible effects on human health or property values does not, in itself, lead to extensive citizen involvement in hazardous waste problems. A high level of community involvement in a hazardous waste problem and the development of opposition to government plans are usually linked to the way citizens believe they have been treated by the government. If citizens hear conflicting stories about the severity of the health threat at a site, if they believe information is being withheld, or if they do not see any sign of progress in responding to their problems, they may become distrustful of everything the government says or does.

The combination of these factors seems to have been part of the impetus for substantial citizen involvement at the Stringfellow Acid Pits Site in Riverside, Calif., a site that has received considerable national media attention over the years. Located in hills overlooking the residential community of Glen Avon, the Stringfellow site is a series of artificial ponds once used for hazardous waste treatment and disposal. Although the site was voluntarily closed in 1972 after heavy rains caused runoff into Glen Avon, its presence has remained a concern to local residents.

This concern has resulted in the formation of two citizens' groups dedicated to the goal of complete

removal of wastes from the Stringfellow site. The groups' high level of visibility at the site has been directly related to their admitted lack of trust in the government agencies responsible for the remedial action at Stringfellow. This dissatisfaction was most obvious in the citizens' request for a technical adviser in 1983 to help them understand—and evaluate—the studies conducted by EPA and the state.

In contrast to the situation at Stringfellow, where citizens perceived the government's attention to their needs to be inadequate and consequently took steps on their own to press for action, a tradition of government responsiveness in an area may incline citizens to believe that any problems are under control and that there is no need for involvement on their part. The same factors also influence attitudes towards private firms.

In recognition of such public concerns, the Superfund community relations program has the following objectives:

- To provide citizens and local officials with prompt and accurate information about environmental problems and government response plans.
- To ensure that citizens are aware of the limits of the Superfund program and do not form unrealistic expectations.
- To bring public concerns to the attention of government decision-makers so that these concerns may be considered in developing response plans.
- To enable the community to comment upon plans and influence decisions.
- To ensure early and frequent opportunities for public involvement in government decision-making.

Thus, the program aims at two-way communication between government and citizens. By enabling response plans to be tailored to local needs, the community relations program should increase the likelihood that Superfund response actions will meet with public understanding and acceptance, reducing delays caused by public opposition, and thereby benefiting the overall quality of the Superfund response program.

Because the best ways to provide information to the public, and to obtain citizen opinion, depend upon the particular circumstances of the community, few specific activities are required for a community relations program at a Superfund site. What

works well at one site might not work elsewhere. Each community relations effort, therefore, is individually planned on the basis of on-site discussions with local citizens and officials.

In general, however, the Superfund community relations program emphasizes small-scale, informal activities. For example, when important developments occur, EPA's regional offices often establish information centers and frequently hold "open houses" in motel suites or trailers near sites. Staff are stationed in the area for several days, during well-publicized hours, to answer questions. The Superfund community relations program stresses the need for face-to-face discussions with citizens and local officials, not only to keep them informed and to solicit their input, but also to help in planning community relations activities.

The mainstay of traditional public participation requirements—the large formal public meeting—is used in Superfund, but sole reliance on large formal meetings is discouraged because these meetings may easily become mere opportunities for unproductive oratory when issues as highly emotional as hazardous wastes are under discussion. It is also important not to rely totally on intermediaries such as newspapers and television to inform citizens of test results and other information that has an effect on the community health and welfare.

Community interest in Superfund will intensify in coming years, in part because more long-term remedial actions will be moving from the study stage to the design and construction stages. This increased interest will challenge the program in several ways.

- Experience shows that citizen involvement often peaks when a long-term cleanup or construction proposal is announced.
- Cleanups will cause potential hazards—in addition to inconveniences—for residents and businesses.
- Not only states, but also other federal agencies—the Army Corps of Engineers, the Centers for Disease Control—will have expanded roles, making it difficult to ensure that the government "speaks with one voice."

To meet these challenges, the Superfund community relations program will continue to emphasize public participation in government decision-making. There will also be



The Lehigh Electric site in Lackawanna County, Pa. As a result of citizen involvement, EPA upgraded its proposal for treatment of PCB contamination here.

special attention to devising new approaches to resolving any conflicts that do arise between government and citizens. In addition, EPA will seek to develop better methods to communicate to citizens the health risks associated with hazardous waste sites.

The Results of Citizen Input for Superfund Responses

People who invest time and energy in a community relations program hope to see results. Most important, they want to know that EPA's stated objective of soliciting public input to decisions will have consequences for those decisions. The public wants to know that its comments were not only solicited, but were heard and acted upon. EPA staff responsible for soliciting public comments and maintaining communication want to know that their efforts have resulted in better Superfund actions.

Have citizen inputs provided through the agency's community relations efforts, then, made a difference for Superfund responses?

The answer is clearly yes. Almost every regional office can cite one or two Superfund actions that were changed as a result of citizen input. The New Brighton example is representative, but a look at two additional sites may prove informative. At the first site, as at New Brighton, EPA selected a different remedial alternative in response to citizen concern. At the second site, the agency modified its recommended remedial alternative as a result of public involvement.

At the OMC site bordering on Lake Michigan in Waukegan Harbor, Ill., EPA began a remedial investigation and feasibility study because of excessive

levels of PCB contamination in the harbor. At a public meeting in March 1984, EPA introduced its proposed action. Over the three-week public comment period, citizens, environmental groups, and affected businesses expressed overwhelming disapproval of the proposed action, particularly through mail and telephone campaigns. The proposed action, they objected, would drastically reduce the use of the lake shore and harm the town's economy.

In response, EPA devised an alternative that was basically a mixture of two previously suggested plans. This alternative preserved the use of the harbor for private and commercial purposes. The final decision on the OMC hazardous waste site was acceptable to Waukegan Harbor residents and businesses.

EPA conducted a remedial investigation and feasibility study at the Lehigh Electric site in Old Forge, Pa., after indiscriminate handling and disposal of fluid containing PCBs led to soil contamination at the site. At a public meeting in January 1983, six remedial alternatives were discussed. During the public comment period that followed, EPA received letters and petitions from the community and elected officials urging implementation of the most expensive alternative, which called for removal of PCB-contaminated soil to 10 parts per million (ppm) followed by installation of a cap over the site.

Residents insisted that excavation to the 10 ppm level would lower future risks to the community. EPA maintained that this alternative was neither cost-effective nor necessary, recommending instead that only soil contaminated above the level of 50 ppm be removed.

As a result of public comment, EPA was persuaded to modify the recommended alternative to allow excavating soil to a PCB concentration below 50 ppm where it was cost-effective. The estimated capital cost of the changes made because of the compromise alternative was over \$100,000 more than EPA's initial proposal but over \$1 million less than the citizens' suggested alternative.

In each of the above examples, local public preferences led to a substantial revision of the proposed response. Some EPA regional staff, however, argue that there should be very few, if any, visible changes in responses as outcomes of public involvement, if a community relations program is operating effectively. They explain that when the lines of communication between EPA and the community have remained open from the start, highly noticeable modifications are unlikely because planning can be continuously responsive to community needs. Consequently, EPA's recommendations will never be a surprise to citizens, and there will be little need for local citizens to urge mid-course changes in response plans. An effective community relations program will result in a Superfund response that meets the needs of the local community.

"Success" in this program is very difficult to measure. The government and citizens may have good relations even without a good community relations program. Alternatively, relations between citizens and the government may break down even with the best community relations program. Often the only thing a community wants is relief from a hazardous waste problem, which the finest community relations program, by itself, can never provide.

The real mark of a successful community relations program, we suggest, is that community relations does not itself become an issue. There is no reason why people distressed over a hazardous waste problem should become further distressed because they cannot get information from the government and cannot voice their concerns. The prevention of such unnecessary problems may be the best indication of success in a community relations program. □

The View from Outside EPA

by Dana Duxbury

Ever since George Washington set up our nation's first citizen advisory committee to seek solutions to the problem popularly called the "Whiskey Rebellion," government leaders have sought public advice. James Madison emphasized the need for public information when he wrote, "A popular government without popular information, or the means of acquiring it, is but a prologue to a farce or a tragedy: or perhaps both."

You may remember that the word "democracy" is derived from the Greek and defined as "people rule." But who are the people, and how much should they rule? These fundamental questions are still being asked.

As democracy has evolved, more people have been granted the right to rule. Slavery was abolished relatively recently in history. Women were given the right to vote just 64 years ago. At the turn of the century, many states established initiatives and referendums, which broadened the concept of "people rule." Then in the 1970s, public participation in environmental programs was mandated by Congress. Laws were enacted that required EPA to provide and assist in public participation activities.

It is important to look back on the 1970s. We must remember that citizens launched the environmental movement. It was, and is, a truly leaderless, spontaneous movement. But where are we today?

A group of inner-city residents marched recently into one of EPA's regional offices carrying 35 buckets of soil. Their actions dramatized a deep concern about lead-contaminated soils in the urban environment. They feared that their health and that of their children were being affected by lead. These citizens demanded EPA action. They perceived a serious problem. Across the country, other groups of

citizens are reacting forcefully to Superfund sites, to contaminated water, to the siting of unwanted facilities, and to the transportation of hazardous materials. And since perception is reality, EPA must maintain and significantly strengthen its public involvement programs.

The reality we all face today is that the general public has a limited knowledge of environmental laws, regulations, health effects, and scientific information. It is fearful of chemicals and lacks trust in government, industry, machines, and science. Consequently, agency programs to protect the nation's water and air quality and to manage our

Public education must precede public participation.

wastes, toxic substances, and pesticides, appear to be struggling under the weight of public pressures.

This is seen all over the country in demands by local citizens to be part of the decision-making process. It is seen by citizens banding together with like-minded groups elsewhere. It is seen by demands such as "not in my backyard," "not until there are zero emissions," "not until they reduce their wastes," and so on. It is seen in strong proposals on Capitol Hill. We are at a moment in time when fiscal pressures to reduce EPA's budget because of a large deficit are in conflict with a serious need for the agency to invest in a concerted effort to expand public involvement programs.

In the past, the agency has undertaken different public education and public involvement efforts: the Chesapeake Bay planning process, sewage disposal siting efforts, negotiated rulemaking, a Superfund community relations program, and the 208 water program. Some of these have contributed to increased public understanding and acceptance. Others could have gone much further.

No environmental agency can achieve its mandate when there is an overwhelming need to provide the public with a greater understanding of the issues, and when fear and a lack of

trust must be overcome. EPA must regulate toxics, pesticides, drinking water, ground water and surface water, wastes, etc., in a manner the public can understand, accept, and support. Our citizens are willing to pay the price of protecting their health and environment.

The agency must develop a comprehensive public involvement program to regain public confidence. Due to the critical nature of hazardous wastes, I believe that priority attention should be given to this area. There are four essential elements that must be included in a meaningful public involvement program. They are: trained personnel, an extensive public education program, sufficient funding, and citizen involvement.

I believe EPA and state personnel must receive sufficient training to be effective listeners, communicators, and educators, especially when they are dealing with fear and distrust at the local level. We need a sufficient number of trained personnel who can effectively communicate complicated technical issues, and they must communicate with the public regularly to build public trust and understanding.

Secondly, I feel public education must precede public participation. Merely offering citizens the opportunity to comment on a 20-page technical document—in two weeks—without giving the time and the resources to understand and interpret the information is hardly worth the effort. There once was a period when the agency took the responsibility of public education seriously. Those days should return quickly. How else will the public find out what is in a law or regulation, how the agency is implementing a program, or details about technical issues presented in a comprehensive manner? The public will only be able to judge recommendations on the basis of sufficient information. Confidence in solutions will only come when the public is provided with a way to be part of the decision-making process.

Thirdly, there must be sufficient funding to cover the costs of developing

(Duxbury is currently the Waste Specialist for the League of Women Voters of Massachusetts. She also has been active in the League at the national level, and is a consultant for the Center for Environmental Management at Tufts University.)



The stack of Tacoma's arsenic smelter looms in the background as retired smelter workers Richard Ullanich, left, and John V. Susan discuss emissions from the plant. In 1983, EPA asked the Tacoma community for input in setting arsenic emission levels for the smelter.

How to "inform their discretion" is what public participation is all about. Public participation is not an exact science. It is an interactive process. It is more than establishing an advisory committee, writing a pamphlet, issuing a news release, conducting a public hearing, or attending a conference. In its broadest sense it is "governance." In its simplest sense it is public service.

There are easy ways for citizens to participate: by voting, serving on juries, or paying taxes. But public participation in the activities of the executive branch of government, as it implements laws, is very complex, very new, and very difficult.

The public needs to know that the agency cares.

Public participation is needed in environmental programs. It is an essential element to achieve change. And change is the basis for environmental laws and regulations. As a result of mandated change we no longer consider it acceptable for rivers, lakes, and streams to be the depository of wastes. It is no longer acceptable for the ambient air to be polluted by smokestacks and car exhausts. And it is no longer acceptable for land or ground water to be contaminated by toxic chemical wastes.

The public demands to be included. It wants to be part of the solution; not part of the problem. I feel EPA cannot succeed in protecting public health and the environment without educating and involving the public. I encourage the agency to reach out and bring us all into the process today. Too little too late will doom us to failure. □

educational material and to pay for the requisite numbers of employees and their administrative expenses.

And lastly, the circumstances today are serious enough that such a new public involvement effort cannot be conducted just at the grass roots level. Public involvement initiatives must include programs to deal with concerns at the national, state, and local levels simultaneously. Citizens need to know that the agency cares, that it is willing to share information and to include them in the process. If the agency focuses its efforts on only one level at a

time, the trickling up or trickling down process will be too slow or ineffective.

We must build a strong new foundation of public participation, not forgetting the power of public opinion. Thomas Jefferson once said:

I know no depository of the ultimate power of the society but the people themselves, and if we think them not enlightened enough to exercise their control with wholesome discretion, the remedy is not to take it from them, but to inform their discretion.

Di-Methyl-Doorknob and the Right to Know

by Harold J. Corbett

Di-methyl-doorknob. A new chemical for home builders? No. It's a term often used by chemical industry and government officials to stand for chemicals generally. But there is an aspect to the term that makes it particularly appropriate as an introduction to discussing a community's right to know about the hazards and safety precautions of chemical manufacturing.

Di-methyl-doorknob hints at the strange sound and unpronounceable nature of some chemical names. And it is this strangeness that contributes to the concern many people have about the safety of certain chemicals, their health

To maintain public acceptance of our operations, we will have to continue being visible, informative, and responsible companies in our towns.

effects, and whether the chemical industry is taking these factors into account as it goes about its daily business.

Of course, much more than a vague concern about the language of chemistry motivates the public's currently intense interest in the safety of chemical manufacturing. The tragic gas leak at Bhopal, India, and much less serious leaks last summer in West Virginia are causing chemical industry managers, labor officials, regulators, legislators, citizen groups, and just about everyone else to ponder how to satisfy the public's right to know about chemical hazards and how to allow their participation in developing emergency response plans.

Bhopal did not make the chemical industry a newcomer on the issue of community right to know. For years, chemical plants that are a major presence in their communities have been providing to local fire, police, and emergency preparedness officials

information on chemicals that could pose a sudden health threat to the populace. Plant and local officials have met to coordinate emergency response actions and occasionally have trained together in mock chemical disasters.

In addition, information developed by chemical companies to educate their employees on the hazards and safety precautions for specific chemicals often reached a broader audience: commercial customers and others directly involved with chemicals. Soon after Bhopal, this kind of information became much more broadly available. A number of firms decided to publicly release "material safety data sheets" for high-hazard chemicals. Occupational Safety and Health Administration (OSHA) rules mandate these sheets for chemical workers. The sheets typically are three to four pages long and describe a chemical's physical properties, its health effects, safety precautions, and initial response steps for a spill or leak.

The Bhopal disaster also caused a number of firms to consider public outreach efforts that extend well beyond the release of data sheets. Monsanto, for example, instituted an "open gates policy" that encourages citizen groups, the news media, and other organizations to tour our plants and discuss potential hazards and safety systems.

No thoughtful people in the chemical industry regard this greater community involvement as a "one-shot" effort. We know that to maintain public acceptance of our operations we will have to continue being visible, informative, and responsible companies in our towns.

As a result, the industry's principal trade organization, the Chemical Manufacturers Association (CMA), is enlisting member companies in two major new community information and emergency response programs. These are called the Community Awareness and Emergency Response (CAER) effort and the National Chemical Response and Information Center (NCRIC). The July/August issue of the *EPA Journal* covered these innovative programs in some detail, so I'll simply summarize them.

CAER calls on chemical plant managers to become the catalysts in their cities and towns for integrating plant and community emergency

response plans. NCRIC supplements the industry's long-standing emergency response telephone service, CHEMTREC, with "on scene" experts, training materials for local fire and police officials, and a toll-free telephone referral service for citizens to obtain information on chemical products.

These CMA programs, coupled with the public outreach efforts of individual companies, are making available more information on chemical hazards and safety measures than occurred before. These programs are galvanizing cities and towns into planning for a variety of emergencies, including natural disasters, mishaps at oil and gas facilities, and transportation accidents involving toxic substances. They reflect a good faith effort to meet the community's right to know.

Nonetheless, numerous legislative proposals at the federal and state levels are seeking more detailed information on emissions figures, materials balances, storage quantities and locations, and still more fact sheets on chemical properties and hazards. Much of this information appears to be sought without an opportunity for public comment on its usefulness for public health protection.

As I've indicated, the chemical industry supports public disclosure of information on the potential hazards of our raw materials and products. We also think that certain principles ought to guide further action in this area so that the public gets wheat, not chaff, in terms of usable information and so that the industry is not inundated in new, perhaps conflicting paperwork requirements that are expensive to meet but yield no measurable public safety benefit.

I'd like to discuss some of these principles:

1. Existing requirements for reporting chemical accidents and providing emergency response should be recognized. For example, the Superfund law already requires reports to EPA on releases of hazardous materials. In addition, numerous federal agencies, including EPA and the Department of Transportation, have prescribed roles to play in local emergency preparedness related to chemical accidents. Care must

(Corbett is Senior Vice President for Environment, Facilities, and Materials at the Monsanto Co.)



Monsanto emergency response teams help local police and fire officials respond to chemical accidents.



At the scene of an accident, workers transfer a leaky chemical drum to a safety container.

be taken to ensure that any new fiats do not duplicate or conflict with those already on the books.

2. Information should be tailored to the needs of specific groups. For example, those living near chemical plants should be informed about potential dangers, health effects, and community involvement with emergency response plans. City officials and emergency responders will need more detailed information on quantities of high-hazard substances, storage locations, and specific manufacturing practices. Thought must be given to filling discrete information gaps for specific audiences. The danger of swamping people with superfluous information is that they will despair of plowing through or absorbing any of it. In

addition, certain chemical identities will need trade secret protection, but this should not be allowed to compromise the release of all health effects data.

3. A national community right-to-know law, built upon OSHA's existing hazard communications program, makes more sense than 50 different state laws. The OSHA program, requiring data sheets on every hazardous chemical, is in place and working. The data sheet contents are as meaningful to a citizen in California as to one in Maine. Companies like Monsanto which operate in every state would face a costly compliance nightmare in

attempting to meet dozens of different fact sheet, labeling, and reporting requirements. To the extent that certain parts of the country have additional information needs, chemical makers are ready to meet these needs on a case-by-case basis. We don't have to be locally legislated into these kinds of actions.

4. The issue of immediate, life-threatening harm from accidental releases should not be confused with the issue of whether low-level emissions may cause chronic health harm. The information and protective measures needed to safeguard the public from sudden releases of high-hazard substances are fundamentally different from those needed for substances that may pose a long-term health threat. Legislative proposals that lump these two issues together will yield programs that fail to adequately address either of them. As I've indicated, much is now being done voluntarily to prevent Bhopal-type accidents, and EPA is developing a sensible, effective approach to the issue of chronically hazardous chemical emissions. These efforts should be allowed to continue down their separate tracks.

A final element that I hope will not be lost in nationwide efforts to strengthen the safety of chemical manufacturing and to better inform the public, is the recognition that chemical manufacturers do not handle certain highly toxic materials to be adventurous. We handle them to make a living by providing beneficial products, such as medicines, agricultural chemicals, fibers, and plastics. Obviously, this is no excuse for reckless conduct on our part, nor do we indulge in it, as demonstrated by our generally superb safety record.

The industry's commitment to working with citizens, regulators, and legislators in meeting a community's right to know is genuine and substantive. We ask that, as we join them in this work, all of us keep in mind the broader purpose and contributions of the chemical industry. □

Anticipating Fears from a Dioxin Study

by Nanci L. Sinclair

Bicycle enthusiasts, joggers, and business people in downtown Alexandria, Va., who want a quiet hour away from the hectic demands of the day often go to Oronoco Park. The park is a grassy area along the Potomac River directly opposite new luxury townhouses and a new four-story office building.

But what kinds of fears could have arisen in the minds of townhouse residents or office workers if they looked out at the park and Oronoco Bay and saw figures in white coveralls and wearing respirators digging in the soil and the shoreline mud? And what if the observer had read in the morning paper that those figures were looking for dioxin? Would they think about Times Beach or Love Canal? Would they worry, "My property will lose its value. . .I'll have to move. . .what have I been exposed to?"

This kind of reaction is what EPA Region 3 wanted to prevent when plans were made to use Oronoco Park as one of the agency's National Dioxin Study sites. The location was selected because the townhouses, office building, and riverside park were on land where the R.H. Bogle Co. pesticide manufacturing plant once stood. The aim of the study, which began in 1984 and was to be completed in 1985, was to examine such sites to find out more about the nature and extent of dioxin contamination.

To ward off potential fears on the part of the city of Alexandria and the residents living by the park, the Region 3 dioxin coordinator and a community relations specialist went to Alexandria before the work at the Bogle site began. They explained the purpose of the study to local officials and discussed the city's concerns about how people's fears of dioxin, coupled with the park's high visibility and the impact of media publicity, could create problems for the community. The EPA team decided that an advance informational meeting with nearby homeowners and the office building management could ease the

(Sinclair is Superfund community relations specialist for EPA Region 3.)

In Alexandria, Va., near the Potomac River, workers drill for soil samples as part of EPA's National Dioxin Study.



James C. Corne

fears. It was also decided that the press should be officially informed at the same time.

During the meeting, residents said they did understand the sampling in their neighborhood would be part of a national study, and that Alexandria was not another potential Love Canal or Times Beach. Nevertheless, they were concerned that news media reports should be accurate so that the value of their homes would not be needlessly hurt. They agreed with the EPA staff that informing them and the press together before the work started would reduce the chance of inaccurate stories.

As part of EPA's response to these concerns, a community relations specialist was at the park during all three days of sampling. Reporters, TV crews, and curious onlookers started coming to the site at 6:30 each morning. People gathered at the park until early evening to ask questions.

Passing motorists pulled over to the curb to watch the white-suited sampling crew dig into the muddy shore of the bay. One woman, walking a Labrador Retriever, expressed concern because her dog often swam in the bay. She, like all the other onlookers, was told about the study and its purpose. All were relieved to hear that the sampling was being done as part of a broad national

research project and not because EPA believed their neighborhood had a serious dioxin problem.

This was confirmed when the sampling results from the Bogle site came in. Alexandria officials and the news media were notified, as were interested residents and the office building management. The results of the soil analysis were negative for dioxin, but positive for arsenic (at levels later determined by the Centers for Disease Control to be non-hazardous). Residents and officials who had been apprehensive about the selection of the Alexandria site for the National Dioxin Study were relieved by the results. Many agreed with EPA that it is better to know now whether a dioxin problem exists than to find it out years later when it might be too late to take corrective actions.

As a result of EPA's communicating with the public and the press before the work started, the frightened homeowner scenario was avoided. And after the sampling crew had gone, all that could be seen in Oronoco Park were the bicyclists, runners, and people taking time to relax near the Potomac River. The homeowners and office workers continued to enjoy the view. □

Community Says No to Incinerator

by Hagan Thompson

Well, the community certainly was involved.

That's the Baldwin community in north Florida, just west of the city of Jacksonville in Duval County. At the last of a series of public meetings, some 200 persons let it be known very clearly that they wanted no part of a mobile incinerator that would burn liquid PCBs and PCB-contaminated soil at the Yellow Water Road site.

Incineration of the wastes was intended to be the final chapter in a long-running story taking place in an area where hazardous waste sites are not uncommon. (There are four National Priorities List sites in and around Jacksonville/Duval County and environs.)

True, the county had approved an ordinance prohibiting the burning of hazardous waste. But the Regional Response Team (local, state, and federal officials) had met and decided that the mobile incinerator would be by far the best way to deal with the 150,000 gallons of contaminated liquid and 4,000 tons of contaminated soil. The ordinance, it was hoped, could be rescinded or somehow overcome for this one-time burn. Economics alone dictated burning at the site rather than hauling the material hundreds of miles to an incinerator in Texas or a landfill in Alabama.

The wastes would be totally destroyed in the burn: 99.9999 percent. There would, of course, be a test burn. The community could choose a committee of citizens to monitor the operation.

The alternative to using the mobile incinerator and burning at the site was to leave the waste there, in a pasture off Yellow Water Road near Interstate Highway 10 . . . leave it for consideration in the remedial phase of the Superfund program.

That's exactly what happened. The site has been scored and proposed for inclusion on the National Priorities List. A final solution may be a long time coming.

No amount of knocking on doors, no meetings, technical presentations, and reassurances could change their minds.

The lesson here is simple. We thought we had covered everything. It's clean, it's safe, the wastes are destroyed totally, and it's the least expensive course of action.

That was all well and good, but an essential element was lacking. The people said no. No amount of knocking on doors, no meetings, technical presentations, and scientific reassurances could change their minds.

With one voice, the community said, "we didn't bring the waste here, and we want it out of here. Move it, don't burn

it here, not in my back yard."

The feeling was that somehow EPA wanted to test an unproven technology in the Baldwin community. Questions arose as to what might happen if the incinerator didn't perform as advertised. Could there be public health consequences?

One of the Baldwin community members opposed to the on-site burning put it this way in a *Florida Times-Union* news story: "I know one thing: they aren't going to burn out there," he said, "I don't care how many studies they do, the people are scared to death. They could bring 100 scientists out here, and I don't think they could convince these people it's safe." □

The Yellow Water Road PCB contamination site near Jacksonville, Fla. The surrounding community objected to recommendations to incinerate contaminated soil and liquids on-site, and chose instead to wait for long-term cleanup.



Chuck McPherson

(Thompson is Chief, Public Affairs Branch, in the Office of Congressional and External Affairs in EPA Region 4.)

What Does "EPA" Mean? Some Little Surprises

by Susan Tejada

When we did the "Man on the Street" interviews for the last issue of the *EPA Journal* we encountered one gentleman who remarked to us as follows:

"For all the forward movements and the backward movements of the Environmental Protection Agency, the one thing that comes through is that everybody around, anywhere, knows the meaning of those three letters: E-P-A."

Unfortunately, we learned, the gentleman was mistaken.

We know because we asked several classes of third, fourth, fifth, and sixth graders two questions:

1. What do you think the letters E-P-A stand for?

2. What does EPA do?

A few students actually did know the correct response. Most, however, had absolutely no idea what the letters stood for. They took some wild guesses.

The most popular reply to the first question was: Educational Parents Association. As to the duties of this little-known group, answers varied. One child explained that, "It makes kids more educated." A fifth-grader with a rather sophisticated vocabulary stated that the Educational Parents Association "educates parents to avoid critical mishaps of the child." Another concluded that "EPA sort of helps the school to do various things, such as arranging carpools."

A little boy obviously wrapped up in his dislike for a female classmate named Andrea surmised that EPA could mean only one thing: Eggy Potatoes for Andrea, a delicacy he no doubt thought she deserved.

Another child wasn't exactly sure what each of the letters stood for, but knew that, overall, EPA was some kind of learning disability.

No doubt due to the colorfully illustrated alphabet books of pre-schoolers, the letter E stood for Elephant in a number of young minds.

Here, with a few spelling corrections, are some of the other imaginative answers the students provided to our queries:

What do you think the letters E-P-A stand for?

What does EPA do?



Elephant Park Association:
Takes care of elephants at the EPA zoo.

Eternal Problem Association:
EPA always solves problems and always gets them right.

Especially Provided Attention:
It helps you more than others when you need help.

Entomology Practice Association:
It studies different science measures.



Expert Personal Appliances:
Tools to help your household.

Ear Piercing Agency:
It's like for giving and getting ear piercings.

Elephants' Physical Agency:
EPA makes sure the elephants' muscles are in shape.

Extra Parents Association:
A program that lets kids discard any parents they don't need.

Electric Potomac Airlines:
An electronic airline a mile away from the Potomac River.

Exit Popcorn Area:
Directions in a movie theater.

Elderly Persons Association:
It helps old people have a good life, like homes and food and no burglary.

Expensive Pie for my Aunt:
It's a way to get a pie for aunts.

(Tejada is Associate Editor of the EPA Journal.)

Extra Plaster Aftertaste:
It makes bad food.

Eternal Pitching Association:
It throws fast balls forever.

Elephant Police Academy:
Elephants teach elephants how to be
police elephants.

Education Period Altered:
It changes the school time.

Ecological Plant Adaptor:
EPA adapts plants ecologically.

Earth's Public Area:
It allows people to use or do what there
is to do for free.

Eggplant Plops Around:
It plops around.

Education Department of
Pennsylvania Agriculture:
It educates people (presumably
Pennsylvania farmers).

Eating Paper Airplanes:
It makes you sick.

Ethiopian Penthouse Association:
Publishes Ethiopian Penthouse
Association magazines.

Elephant Private Ladies Association:
Holds elephant meetings.

Exercise and Punching for Artichokes:
An exercise program for artichokes.

Every Pupil Alive:
It means living.

Economical Pantyhose Association:
Sells cheap pantyhose.

Eat Plenty Apples:
Advises people about nutrition.

"Enturnal" Printing Association:
Prints movies and music videos.

A total of 20 students gave the correct
definition of EPA and described its
duties pretty accurately: "cleans up
waste," "protects the environment from
oil spills," "prosecutes anyone who
does damage to the environment," "tries
to keep the air clean," "fights
pollution," and "tests mileage on
automobiles." But our favorite of the
correct answers was the following:

"EPA protects the environment by
finding out about the things that are
hurting the wilderness and then they
will try to get rid of it. My mother
works for EPA." □

*For helping us compile this list of
definitions, we would like to thank Judy
Baxter; Principals Carolyn Gold,
Particia Greer, and Joseph Vicuera; and
the teachers and students of Olde Creek
Elementary School in Fairfax, Va.;
Somerset Elementary School in Chevy
Chase, Md., and John Eaton Elementary
School, Phoebe Hearst Elementary
School, and The Maret School, all in
Washington, D.C.*



A Growing Concern with Indoor Air

by Ronald A. Taylor

You are coughing, wheezing, and sneezing, and your eyes are burning. You are suffering from air pollution—yet you haven't even gotten out of bed.

Today, the front line in the battle against poisoned air is far from industry smokestacks and bus exhaust pipes. It's in your house.

The Environmental Protection Agency reported on September 11 that toxic chemicals found in every home—from paint to cleaning solvents—are three times more likely to cause cancer than airborne pollutants, even in areas next to chemical plants.

EPA scientist Lance Wallace, who evaluated the data from a five-year study, said chemicals ingested indoors "make the home more of a toxic waste dump than any chemical plants nearby. It was difficult to accept for a while, but a number of similar studies concluded the same thing."

Wallace acknowledged that researchers cannot say for sure whether toxics in the home have directly caused even a single death. He said scientists are hard-pressed to determine the role that any particular home-use substance plays in a cancer-related death.

However, these data and other studies have shown that Americans are exposed to surprisingly high levels of toxic chemicals in their houses through breathing, eating, drinking water, and skin absorption.

Hazardous chemical vapors in the average American home now have become so bad, reports EPA scientist Wayne Ott, that "if you found these levels outside, you'd demand to know where they were coming from."

In your house, the polluter is you.

The nationwide drive to save energy by weatherproofing has made the air inside many homes and offices more polluted than the air outside. Sealing windows and doors and insulating walls and roofs keep heat or cold out but often trap unwanted gases inside.

(Taylor is Associate Editor, Environment, for U.S. News and World Report. This article is reprinted with the permission of the magazine.)

EPA tests in Bayonne, N.J., and Devils Lake, N.D., found levels of benzene and tetrachloroethylene ranging two to five times higher than outdoor readings.

Bayonne is close to chemical plants; Devils Lake is not near heavy industry. Yet researchers found little difference in the levels of indoor contaminants between homes in the two towns.

Contact with these two cancer-causing agents is as routine as the Saturday chores: You inhale benzene and get it on your skin and clothes during a fill-up at a self-service gas station; your body slowly releases these fumes later in your home. You bring tetrachloroethylene into your house on clothes fresh from the dry cleaners.

In your house, the polluter is you.

Even taking a shower is suspected of elevating levels of chloroform—a possible causer of cancer—in nearly every home because of chlorine in the water.

Other known household sources of cancer causers are insecticide, oven fumes, air freshener, hair spray, paint thinner, fingernail polish, cosmetics, and even the dirt and rock surrounding the foundations of thousands of homes.

One of the worst indoor pollution problems of all is cigarette smoke. A Department of Health and Human Services survey of homes in six cities last year determined that roughly 60 percent of the nation's children are exposed to cigarette smoke from one or both parents. The survey found that respiratory illness among these children is 10 to 20 percent higher than in the homes of nonsmokers.

That view is countered by Tobacco Institute spokesperson Anne Browder, who says a 1983 University of Arizona study on the subject "found no relationship between children's lung function and parents' cigarette smoking."

EPA is just beginning to learn the dimensions of what Americans breathe at home. Between 1980 and 1984, some 600 residents in six cities were given monitors, which they wore by day and

kept beside their beds at night, that registered minute amounts of 11 of the most volatile synthetic chemicals. The profile that emerged from this study showed traces of substances ranging from industrial solvents in air fresheners to nitrogen oxides released from gas stoves during cooking. Some toxic chemicals were found to be 70 times more prevalent in houses than outdoors.

The results don't surprise building-ventilation experts. "There are 45 aerosol canisters, each containing 15 different compounds, in the average home today," says James Woods, senior scientist at The Honeywell Corporation. The total of chemicals found in common household products tops 50,000.

At work, employees face widespread exposure through recycled air to a witches' brew of poisonous fumes from photocopying solvents, typewriter correction fluid, and carpet cleansers.

For many people, indoor contaminants produce headaches, dizziness, and flulike symptoms. When more than 30 percent of workers complain of such ailments that disappear within eight hours after leaving their jobs, engineers characterize the problem as the "sick building syndrome."

Scores of office buildings around the country have been closed while toxicologists cope with this problem. In Knoxville, a Tennessee Valley Authority building remains closed four years after nearly 200 workers suffered chest pains, shortness of breath, and muscle aches that abated on weekends and vacations.

Similar complaints surfaced in June at a state Department of Labor office in Toms River, N.J., where 20 of the 30 employees complained of respiratory problems. The microbiologist-engineer hired to study the building and organize the decontamination says he found a fungus in the ventilation system.

In Boston, a faulty furnace caused carbon monoxide poisoning at a downtown motel last February during a convention of lawyers who specialize in prosecuting toxic-liability cases. More than 50 were treated for poisoning.



Sometimes, sick buildings are responsible for death. Legionnaires' disease led to three deaths in June in a hotel at the Detroit airport. Legionella

bacteria were discovered on the building's air-conditioning coils.

"Including transportation, people are spending 85 to 90 percent of their time

Cigarette smoke, along with fumes from photocopying solvents, typewriter correction fluid, and carpet cleansers, all contribute to the "sick building syndrome" which some office workers suffer.

indoors," worries Dr. Joel Nobel, who tracks indoor pollutants for the National Indoor Environmental Institute near Philadelphia.

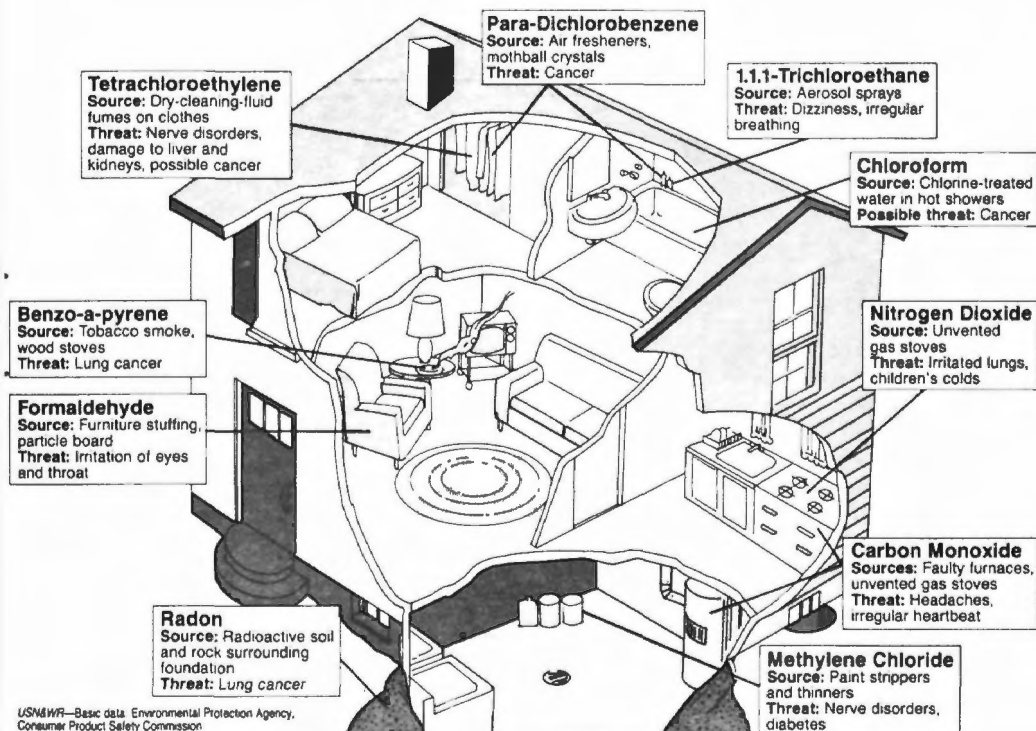
Nobel and his wife found that their own house in Montgomery County, Pa., was filling up with an odorless, colorless gas called radon. The naturally occurring radioactive product that causes an estimated 5,000 to 15,000 lung-cancer deaths each year among nonsmokers was seeping into their subterranean house from the earth and rocks.

The problem was fixed by adding suction blowers to direct the radon gas away from the house. Nobel recommends that all would-be home buyers invest \$400 to \$500 in a radon test. He and other building-pollution experts also recommend the use of heat exchangers to maintain a flow of fresh air into homes. These devices range in price from \$500 to \$1,500 and conserve up to 80 percent of conditioned air.

Nearly as efficient and a lot cheaper, however, are \$8 spider plants. National Aeronautics and Space Administration scientists found that these house plants, with long tendrils, will remove formaldehyde and other toxic gases from the average home.

The advice most often offered by experts is to use more care in handling toxic products inside the home. Follow labels carefully, use products sparingly, and open windows to ensure adequate ventilation, they recommend.

"A frightening number of things are being introduced into our homes without thought. We have wonder products, and they do nice work. But they are dangerous," explains Ralph Goldman, a Natick, Mass., environmental scientist. The quality of human health is at stake, adds John Spengler, Harvard professor of environmental health, who says, "The end points range from irritation to illness to death." □



A Plan to Restore Chesapeake Bay

by Patricia Bonner

On September 20, the Chesapeake Bay Program took a major step forward. The Governors of Pennsylvania, Virginia, and Maryland, the Mayor of the District of Columbia, the EPA Administrator, and representatives of several other federal agencies gathered at the Hall of States in Washington, D.C., to present the first Chesapeake Bay Restoration and Protection Plan for the region.

The plan is designed to improve and protect the water quality, habitat, and living resources of the Chesapeake

The plan is to be a "living" document, that will be refined and expanded to reflect what we learn about the Bay.

Bay estuarine system; to restore and maintain the Bay's ecological integrity, productivity, and beneficial uses; and to protect public health.

The plan provides a framework for integrating the work of the numerous agencies cooperating in this effort. It establishes goals in the areas of phosphorus and nitrogen loadings, toxic materials, and the restoration and protection of living resources and their habitats. It addresses the management of programs that are not Bay-specific yet can affect the ecosystem (e.g. dredging, ground water, and atmospheric deposition).

Goals are explained and the strategies to achieve them are outlined; a second volume describes each of the projects and programs of the federal and state agencies, their purposes, and what they are expected to achieve.

The plan is to be a "living" document, one that will be refined and expanded to reflect what we learn about the Bay and how cleanup and restoration work affect the Bay's ecosystem. Through the collection of monitoring data, state and federal agencies will be able to evaluate the effects of their strategies and modify them to work even better. Both point source and nonpoint source pollution control programs will be better defined with more quantification of the requirements and more specific targeting.

The document is a beginning, a first step in what will be a continuing, cooperative Bay improvement process. As that process evolves, it will provide numerous opportunities for people concerned about the Chesapeake to be involved in decisions which affect their future and that of the Bay.

Over the next three years, interested publics and the agencies and

jurisdictions involved in the Chesapeake Bay Program will refine water use objectives, determine the water quality criteria necessary to support those uses, and set objectives for the Bay and its primary tributary rivers. Work has already begun to develop mathematical models that will eventually assist managers in deciding what pollution loadings will be required to achieve the water quality objectives.

The process of evaluating the alternative technologies and control programs available to achieve the objectives will start early in 1986. Finally, the costs and the expected results of achieving the water quality objectives will be defined and each objective and the alternative control programs to achieve it will be evaluated in the social/political arena.

By July 1988, all those who participated in the planning process should be ready to recommend a

Bay Cleanup Background

In September 1983, when EPA published the results of its seven-year study of the Chesapeake Bay, findings clearly indicated that the Bay and its living resources were in trouble.

Declines in living resources paralleled changes in water quality which included increases in nutrients (phosphorus and nitrogen) and harmful chemicals, and more soil particles in the water blocking light from reaching aquatic plants and animals. Trends included declines in submerged water plants (Bay grasses), declines in young oysters and landings of many types of fish, a 15-fold

increase in areas of the Bay where there is low dissolved oxygen during the summer, and high concentrations of toxic chemicals in the bottom of the Bay near major industrial facilities.

To save the living resources, immediate action had to be taken. On December 9, 1983, the Governors of Virginia, Maryland, and Pennsylvania, the Mayor of the District of Columbia, the EPA Administrator, and the Chesapeake Bay Commission signed the Chesapeake Bay Agreement. The Agreement pledged them to work together to improve and protect the Bay and its resources, to accommodate growth in an

(Bonner is Information Officer for EPA's Chesapeake Bay Program.)



Steve Delaney

management program for the future, a program which federal, state, and local governments will implement during the 1990s.

environmentally sound manner, to assure a process of public input and participation, and to support and enhance a regional, cooperative approach toward Bay management.

The Agreement is serving as the framework on which to build cooperative and effective revitalization of the Bay and its tributaries. Working with the states and EPA in the cleanup are the Soil Conservation Service, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, U.S. Geological Survey, Army Corps of Engineers, and Department of Defense. □

Nearly two years ago, the Chesapeake Bay Agreement was signed. Citizens who use and care about the Bay cannot yet see improvements in the waters or rebounding living resources. Some wonder aloud when they will see real change. Those involved in cleaning up the Bay and its tributaries and bringing back their productivity know that a great deal of work has been and is being done, and are convinced that improvements will occur.

The Bay will respond, but it is still too soon to be able to measure change. Improvements will be gradual, not dramatic. They will come in small increments as pollution loads to the Bay are reduced.

As Administrator Lee Thomas told those gathered for the release of the plan, "Now is the time for patience and support for the Bay and those working to protect her; the hard work has only begun." □

Copies of the plan and its appendix are available from: Chesapeake Bay Program, 410 Severn Ave., Annapolis, MD 21403.

Two oystermen on Carters Creek in Virginia display their catch to a group that includes, from the left, Gov. Harry Hughes of Maryland, Gov. Charles Robb of Virginia, and EPA Deputy Administrator A. James Barnes. The stop was one of several on a September tour of the Chesapeake Bay Basin.

Getting Some Good Out of EDB

by Margherita Pryor

Remember ethylene dibromide, also known as EDB? As a pesticide, it had satisfyingly lethal effects on nematodes and insects. Unfortunately, studies showed that its effects on people could be pretty bad, too—effects such as tumors, genetic mutations, and reproductive problems.

In light of these studies, EPA several years ago suspended and canceled all uses of EDB as a fumigant for soil, grain, and grain milling machinery and halted the sale and distribution of EDB products for this purpose. Grain-based foods with EDB residues above certain levels were pulled from grocery shelves, and all suspended pesticide products were recalled for disposal as hazardous wastes.

As far as the public was concerned, another chemical of the month had come and gone. EDB was EPA's headache.

It still is. Stored around the country are millions of pounds of fumigants, with concentrations ranging from 1.2 to 95 percent of their weight. Some of these products also have high concentrations of other suspect chemicals, including carbon tetrachloride, ethylene dichloride, and methyl bromide. It's EPA's thankless and difficult task to dispose—safely—of these materials.

But this is one headache where relief is on the way. By January of 1986, the agency expects to begin disposing of stockpiles of EDB with a process developed by EPA's Hazardous Waste Engineering Research Lab in Cincinnati. And if all goes well, EPA may even make a profit from the operation.

These rosy possibilities weren't apparent at first. Early last year, the Office of Pesticide Programs began to look at EPA's options for disposing of 200,000 to 500,000 gallons of

formulations left on its hands, and it was not a heartening prospect. Incineration was out because EDB is very corrosive, and other disposal methods, such as land disposal, were also environmentally unacceptable. So in a case of necessity mothering invention, the Cincinnati lab came up with the novel idea of treating EDB—or its constituents—as a resource to be recovered. Instead of destroying the canceled fumigants, they could be reprocessed to recover their commercially valuable materials.

In the method developed by Charles Rogers and Alfred Kornel of the Cincinnati lab, the end products are acetylene and potassium bromide. According to Rogers, potassium bromide is a valuable "commodity" chemical—that is, it is used by the chemical industry to make other chemicals, as well as products such as pesticides, drugs, and plastics. At potassium bromide's current market value of about \$.65/lb., Rogers estimates that reprocessing EDB for its bromine contents could yield up to \$1.75 million worth of materials.

In addition to paying for itself and perhaps even making a profit, the process is both fast and simple. A mixture of tetraethylene glycol and potassium hydroxide (the reagent) is added to a tank (the reactor) containing the EDB formulation. The reaction from this produces acetylene gas, which is simply burned off, and potassium bromide. By eliminating the need for heat and complex equipment, the process can be used in the field or at various EDB storage sites. It even can be



Raymond Krueger

Stacked floor to ceiling in a walled-off section of a chemical company near Kansas City, Mo., packaged pesticides containing EDB await disposal.

used to treat other chlorinated hydrocarbons.

EPA's contractor for this operation is the GARD division of the Chamberlain Manufacturing Corporation. Phil Saigh of GARD estimates that once processing starts, disposal of the entire stock will take about 12 months. He expects that processing will probably begin in Kansas City, Mo., because that is where many of the grain fumigant products are stored.

Does the whole thing seem too good to be true?

GARD doesn't think so. The company is betting that it can produce enough marketable materials from the process to earn a good profit over and above its disposal fees.

EPA doesn't think so, either. The agency has applied for a patent on the process and will receive half of any profits earned from recovered materials by the contractor who will dispose of the EDB products.

Chemical reprocessing is an effective, perhaps profitable disposal method. But beyond that, according to Ray Krueger of the Pesticide Office, it's also the wave of the future. "From now on", he says, "the approach will be to produce as little waste as possible. If you do produce it, reuse it, and what's left, you treat."

It just might be the beginning of the end for the chemical of the month. □

(Pryor is Contributing Editor of the EPA Journal.)

AIR

Cadmium and Ethylene Dichloride

The agency has announced its intent to list both cadmium and ethylene dichloride as hazardous air pollutants under the Clean Air Act.

This action triggers further evaluation of public health risks and control techniques that could lead to the proposal of standards limiting ambient emissions of these pollutants.

Both cadmium and ethylene dichloride are classified as probable human carcinogens (cancer-causing substances) by inhalation.

Though the risk estimates for cadmium and ethylene dichloride are preliminary, EPA has concluded that they are sufficient to warrant further study to determine the need for regulation.

HAZARDOUS WASTE

Recycled Used Oil

EPA is implementing new controls over the selling and burning of contaminated used oil and hazardous waste for fuel. The agency is also proposing controls on the collection, transportation, storage, and disposal of all used oils.

The agency is prohibiting the selling and burning of contaminated used oils and hazardous wastes for fuel in residential, institutional, and commercial boilers.

EPA has determined that contaminated used oil burned in boilers in urban areas may pose a cancer risk to urban residents. If contaminated with lead, an additional risk may be posed, especially to children. EPA expects the proposed standards and their associated costs to affect nearly 50,000 used oil generators and recyclers.

Superfund Cleanup Procedures

EPA has incorporated new procedures to speed up and improve cleanups at Superfund hazardous waste sites.

The procedures have been incorporated into the agency's National Contingency Plan (NCP).

The additions to the NCP, which were proposed in February 1985, are:

- Remove certain restrictions that hindered quick response at sites in some situations, such as detailed investigative work;
- Clarify and expand the authority of local on-scene coordinators, states, and other federal agencies directly involved in response actions;
- Require application of federal public health requirements in determining the appropriate final remedy for hazardous waste cleanups; and
- Require public involvement through community relations programs at Superfund sites.

PESTICIDES

Carbofuran Review

EPA has begun a special review of granular formulations of the pesticide carbofuran after determining that use of this product is highly toxic to birds.

Carbofuran is a broad spectrum carbamate insecticide used to control various species on corn and sorghum as well as other crops.

The agency's action is based on numerous field monitoring studies which show an extensive number of bird fatalities in fields treated with granular carbofuran. The consumption of as little as a single granule of

carbofuran may be fatal to many small birds. Birds of prey which consume smaller birds have also been poisoned with carbofuran granules.

Between 10-11 million pounds of carbofuran are used annually on agricultural sites.

TOXICS

Investigation of Methylene Chloride

EPA will investigate methylene chloride to find out if it poses an unreasonable cancer risk to humans.

Methylene chloride, also known as dichloromethane, is a non-flammable, colorless, volatile liquid with an ether-like odor, used widely in industry and in consumer products.

EPA believes methylene chloride is a possible human carcinogen. Studies have found that it causes malignant liver and lung tumors (cancer) in mice. Under EPA's cancer policy, a chemical that causes cancer in animals must be considered a possible human carcinogen.

There is potential for methylene chloride exposure from a wide range of environmental sources. Some examples of methylene chloride use are as a degreaser, aerosol propellant, and solvent in paint removal.

WATER

Wastewater Discharge Rule

A final rule has been issued by EPA to control the discharge of wastewater pollutants from the metal molding and casting industry.

The rule covers effluent limitations for four metal categories: aluminum, copper, ferrous metal, and zinc.

The rule sets direct discharge and pretreatment standards for existing and future molding and casting plants. The regulations represent a 99 percent reduction in the total amount of pollutants discharged in raw wastewaters. The principal pollutants detected or likely to be found in untreated process wastewaters from the industry are: suspended solids, oil and grease, toxic metals, including copper and lead, and toxic organic chemicals.

Implementation of this rule will remove annually an estimated 250 million pounds of pollutants, including 12.8 million pounds of toxic pollutants.

Requirements for Fluoride

EPA is taking action which will lead to revised drinking water standards for fluoride.

These actions include issuing the final recommended maximum contaminant level (RMCL) for fluoride, proposing a maximum contaminant level (MCL), and proposing to amend the interim MCL for fluoride. All actions set the level of fluoride at 4 milligrams per liter.

At levels of 1 to 2 milligrams per liter, fluoride helps to protect against tooth decay. Above this range it also causes dental fluorosis, which results in discoloration and pitting of teeth. At 4 milligrams per liter and above, it can cause changes in bone density which cause no detectable health effects. At 10 milligrams per liter, long-term exposures cause skeletal disorders similar to arthritis.

The proposed maximum contaminant level will lead to enforceable standards. The MCL for fluoride will protect the consumer from the adverse skeletal effects of fluoride. □

Appointments at EPA



Erich Bretthauer



Jeffery Denit



Dr. Roger Cortesi



Dr. James Falco



Lloyd Guerci



Dr. Gary Foley

Erich Bretthauer has been named Director of EPA's Environmental Monitoring Systems Laboratory in Las Vegas, Nev. Previously, he was Director of the Office of Environmental Processes and Effects Research in the agency's Office of Research and Development (ORD).

Bretthauer is a commissioned officer in the U.S. Public Health Service. From 1978 to 1980, he was Director of the Laboratory's Nuclear Radiation Assessment Division, with responsibility for a radiation research and monitoring program. In 1979-1980, he directed the agency's emergency monitoring activities at Three Mile Island. During 1981 and 1982, he served on legislative assignment with the U.S. Senate Committee on Environment and Public Works.

Bretthauer received his B.S. in Chemistry from the University of Nevada-Reno in 1960 and his M.S. from the same university in 1962. He is a member of the American Chemical Society, the American Water Works Association, and Sigma Xi.

Jeffery Denit, formerly Director of the Industrial Technology Division in the Office of Water, has been appointed Deputy Director of the Office of Solid Waste. Denit has been with EPA since 1972; before that, he was a captain in the U.S. Army Medical Service Corps and a sanitary engineer with the Federal Water Pollution Control Administration.

Denit earned a B.S. in agricultural engineering in 1964 and an M.S. in agricultural economics in 1966, both from Clemson University. In 1967, he also received an M.S. in sanitary engineering from the University of North Carolina. He is a member of the Water Pollution Control Federation, the American Water Works Association, and the American Chemical Society.

Dr. Roger Cortesi has been named Director of ORD's Office of Exploratory Research. He had been Deputy Director of ORD's Office of Health Research.

Before coming to EPA in 1972, Cortesi worked for several engineering firms.

Cortesi received his B.A. in mathematics from Harvard University in 1956, and his Ph.D. in physics from the University of Virginia in 1961.

Dr. James Falco has been named Deputy Director of the Office of Environmental Processes and Effects Research.

He had been Director of the Exposure Assessment Group. Falco has been with the agency since 1971, with a one-year break for a stint with the U.S. Army Corps of Engineers.

Falco received his B.S. in chemical engineering from the University of Tennessee in 1964, and his M.S. and Ph.D. from the University of Florida in 1969 and 1971. He is licensed as a professional engineer in the state of Georgia, and is a member of the American Chemical Society and the American Institute of Chemical Engineers.

Lloyd S. Guerci has been appointed Director of the RCRA Enforcement Division in EPA's Office of Solid Waste and Emergency Response.

Since 1973, Guerci had been an attorney with the Land and Natural Resources Division of the U.S. Department of Justice. While there, he managed environmental enforcement litigation for EPA and other federal agencies, particularly in the area of hazardous waste enforcement.

Guerci received his B.S. in Electrical Engineering from Lehigh University in 1969, and his law degree from Rutgers University in 1973. He is a member of the bar associations of New Jersey and the District of Columbia, as well as Vice Chairman of the Solid and Hazardous

Waste Committee of the American Bar Association. Guerci is also a member of the Institute of Electrical and Electronics Engineers.

Dr. Gary Foley has been appointed Director of the Acid Deposition and Atmospheric Research Division of ORD. His responsibilities will include planning and managing all phases of the agency's acid deposition research program, as well as coordinating this program with the other agencies of the Interagency Task Force on Acid Precipitation.

Foley has been with EPA since 1973. From 1976 to 1979, he was on assignment from EPA to the Organization for Economic Cooperation and Development in Paris, where he specialized in air pollution problems.

Foley received his undergraduate degree in chemical engineering from Manhattan College in 1964. He earned his Ph.D. in chemical engineering from the University of Wisconsin in 1968.

Foley is a member of the American Institute of Chemical Engineers. Since 1981, he has served as Executive Secretary for the International Air Pollution Advisory Board of the (U.S.-Canada) International Joint Commission, and recently has been appointed a member of the Board. He also has served as a member of several other delegations to international organizations. □



S. Tejeda

The future of public participation: who knows what issues will be "hot" by the time these Washington, D.C., schoolchildren are old enough to become involved in environmental decision-making? (See page 16 for related story on what these children think about EPA today.)

*Back cover: winter frost.
Photo by T.C. Flanigan, Folio, Inc.*

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