

# EPA JOURNAL

## EPA: A Regulatory Agency



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Pigeon River, Waupaca County, Wisconsin. Mike Brisson photo.



The national environmental policies called for in Earth Day 18 years ago are being implemented in regulations in that governmental bible, the *Federal Register*. This issue of *EPA Journal* explores the nature of EPA as a regulatory agency on the firing line in the controversial world of environmental protection.

In the first article, the Agency's Administrator, Lee M. Thomas, discusses the job of environmental regulation now and does some forecasting about future challenges. Then William D. Ruckelshaus, EPA's Administrator from 1970 to 1973 and 1983 to 1985, talks about the regulatory job in the early days of the Agency, when the nation's commitment to environmental quality was just getting into full swing.

The next three articles focus on regulations

themselves. The first takes a look at how an environmental regulation comes about, in this case, the asbestos-in-schools rule. The second explains cost-benefit analysis, a widely used technique in the preparation by EPA of its regulations. The third addresses the role of science in the making of a modern-day clean-up rule.

In the current arena of intense controversy about how to protect the environment, many of EPA's rules stir disagreement. Challenges in the courts are one common result, and an article from the U.S. Department of Justice describes this aspect of EPA regulations. Negotiation and mediation are also a way to handle environmental disputes, the subject of another article.

The next articles concern those affected by EPA's regulations. One piece

reports on the impact of regulatory requirements on small businesses, how it is felt, and how it is considered as the Agency develops clean-up rules. In another piece, an official with a large chemical company, Du Pont, looks at EPA—the rulemaker—from the point of view of a regulatee. A third piece looks at EPA from the vantage point of a state (states are responsible for carrying out many of EPA's regulations).

Next is a feature that puts environmental regulation in the context of government rulemaking from 1787 to the present, from the drafting of the Constitution to U.S. government today.

One of the most hotly debated topics—the deadlines by which EPA must issue its regulations and take other steps—is addressed in an *EPA Journal* Forum. In this feature, six

experienced observers with different interests comment on the question, "Are deadlines good or bad for cleaning up the environment?"

*EPA Journal* often includes some so-called non-theme articles after the main focus of the issue. In this case, an article from an EPA specialist in the Office of Solid Waste describes waste minimization—the idea of preventing pollution rather than trying to manage it. Another article, reprinted from the *Reader's Digest* and not necessarily representing EPA's views, asserts that the nation still does not have control of its sewage treatment problem.

This issue of the *Journal* concludes with a regular feature—Appointments. □

# EPA JOURNAL

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*Front Cover: A cartoon rendition of how it seems as EPA does its job amidst the swirl of debate in Washington, across the country, and internationally over the best ways to address environmental problems. The problems are many; the debate is inevitable; and EPA operates in a "fishbowl." It may be uncomfortable, but never dull. Drawing by Robert Flanagan.*

*Correction: In the January/February issue of EPA Journal, the roots pictured on the back cover were identified as being of black mangrove trees. In fact, the trees are red mangroves, known as Rhizophora. —the Editor.*

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# Environmental Regulation: Challenges We Face

Lee M. Thomas

In many ways, the Environmental Protection Agency is the most far-reaching regulatory agency in the federal government because its authority is so broad. It touches every aspect of American life. Our impact is felt by all segments of society—industry, state and local governments, and individuals.

When the Agency was created, our regulatory mission was clear. We were to address the air pollution that we could see, smell, and even feel in many cities. We were to put an end to the discharge of untreated sewage and industrial effluents that fouled our rivers and streams.

As our Agency grew, our mission evolved to include new challenges about which we had been unaware in the beginning. We added programs to change the way we managed hazardous wastes and toxic chemicals. And we

initiated a massive effort to clean up the contamination created through the improper disposal of dangerous substances in the past.

The record shows that we went about all of these difficult tasks aggressively. And we achieved significant results.

Today, EPA's regulatory mission is broader than ever. We have about a dozen major laws to implement. Many have very strict regulatory requirements, tight statutory deadlines, and other stringent provisions.

At the same time, however, the nature of EPA's regulatory business is changing. As we work to continue implementing our traditional environmental programs, we are also confronting the need to modify our approach in order to deal with new challenges coming over the horizon.

It is those future challenges that I would like to address in this brief article. There is a whole new generation

of issues before us that will require a new approach to environmental management.

I classify the challenges of the future into three categories: those that involve widely dispersed but very small sources of pollution; those that address problems of global consequence; and those that carry with them substantial impacts for individual citizens. To one degree or another, we have begun to address all three, but in the years ahead, I believe these new challenges will demand increasing attention from EPA.

The first of these challenges relates to pollution from an ever-increasing number of smaller and smaller sources. During the past 20 years, we have made substantial progress in regulating large, visible sources of air, water, and land pollution. Most major facilities must obtain complex permits and live up to stringent limits on the discharge of contaminants. Yet these facilities do not represent all pollution sources.

Trace amounts of toxic substances continue to find their way into the environment. And although some of those contaminants still come from large, regulated facilities, most are emitted by small, widely dispersed

One environmental issue of global import is the greenhouse effect, which could raise temperatures, change precipitation patterns, and cause ocean levels to rise. A one-foot rise in sea level would cause some beaches to erode 100 to 200 feet, leaving areas looking like this shorefront scene in Westhampton, Long Island, New York. Ramesh Das photo, NYT Pictures.



sources. Today's emissions of toxics come from such sources as gasoline stations, dry cleaners, and home-operated woodstoves.

Congress recognized the fact that small sources were an important future challenge when it enacted amendments to the Resource Conservation and Recovery Act (RCRA) in 1984. These amendments extended EPA's regulatory reach to include generators of relatively small volumes of hazardous waste. The new statutory requirements expanded the universe of RCRA-regulated facilities from about 15,000 to about 200,000.

Our underground storage tank program is another example. Literally millions of tanks are located throughout our country, in every imaginable setting. Regulating them requires us to consider new approaches in light of the fact that many owners and operators of these tanks may never have had to comply with federal regulations in the past.

Woodstoves are yet another example of the kinds of sources we will confront in the future as we move to achieve the next increment in pollution control. In some cities, they are the largest single source of toxic air pollutants. Yet controlling their emissions will have to be done in ways that are different from the approaches we have traditionally used for large factories and powerplants.

A second category of future challenges consists of those that require a global approach. These issues come in two principal forms: those that are caused by the worldwide production and use of pollutants that may have planetary impacts; and those that may be linked to a single geographic area, but carry worldwide implications.

Depletion of the stratospheric ozone layer is the best-known example of this type of challenge. Production and use of ozone-depleting chemicals, including chlorofluorocarbons (CFCs) and halons, is a worldwide phenomenon. Thus, developing the scientific basis for characterizing the problem and recommending solutions also has to be a worldwide activity. Last September, 24 nations—including the United States and all other major producers of CFCs—met in Montreal and signed an international protocol that will significantly reduce the use of these substances over a relatively short period of time.

A similar challenge confronts us with respect to the phenomenon of global warming. We are in the early stages of *understanding climatic change and its consequences*. But our experience with CFCs and ozone depletion should serve as an excellent model for work in this

new area. Again, scientists from around the world will have to work together to gain understanding of the problem and to devise solutions that will be both acceptable to the world community and effective in reducing the threat.

Finally, the third set of new challenges has to do with issues whose solutions will be felt, for the first time, by large numbers of individual Americans. For a long time, polls have indicated that citizens of this country are willing to pay more for pollution control. And they have. As a society, we estimate that more than \$70 billion is spent annually in the United States alone to reduce pollution. But these costs generally are hidden from the public as small increments in the overall prices of products and services.

In the future, those costs will be more visible. People will feel them directly. And, for the first time, we will be testing our willingness to pay for more environmental protection. In many cases, it will come down to a series of choices.

Individuals will confront choices between the convenience of new shopping malls and the luxury of waterfront homes on the one hand, versus wetlands protection and enhancement of coastal resources on the other. They will have the choice between further reductions of smog in their cities on the one hand, versus the inconvenience of inspection and maintenance programs and the awkwardness of mechanical controls on gasoline pumps on the other. Where air pollution is a particularly serious problem, they may have to change their driving habits and alter their lifestyles significantly. And they will have a choice between new requirements for drinking water filtration and monitoring systems and advanced wastewater treatment requirements on the one hand, versus substantially higher water and sewer bills on the other.

I believe we should pursue a systems approach to these issues. At the heart of EPA's programs in the future should be a risk-based approach to setting priorities; a concerted effort to involve all levels of government in problem-solving (including the international community where appropriate); an awareness that pollution can inadvertently be moved from one medium to another; and a willingness to take innovative approaches to regulation, including *negotiated rulemaking in certain instances*.

We will also have to spend more time educating the public to understand

more fully the nature of environmental risk and the role of the individual in solving pollution problems. At the same time, we will need to listen carefully to public views about the best environmental approaches. Finally, as we move to include smaller and smaller sources of pollution in our regulatory domain, we will need to pay more attention to development and implementation of programs to train environmental managers, to certify those providing specialized services, and to implement new control technology.

As has always been the case, we will rely on even better systems for collecting, managing, and assuring the quality of scientific data. We will also need to integrate our data management systems with those of the states so that we are all working from the same knowledge base.

And finally, we must continue to implement aggressive enforcement actions against those who choose to violate environmental laws and regulations for the sake of economic advantage. Here, too, in addition to using traditional judicial and administrative tools, we should look for opportunities to employ innovative new approaches to enforcement that will yield better environmental results more quickly and efficiently. One approach is the use of alternative dispute resolution.

Clearly, the future holds new challenges for EPA and the American people. I believe we can meet those challenges by recognizing that the issues of tomorrow will be different from those we have so far confronted. We're confronting the challenges posed by ever smaller sources of pollution dispersed widely throughout the nation. We're confronting global challenges as well. And, in the future, our actions will challenge individuals as never before to renew their commitment to environmental progress.

We can meet those challenges, as well as make continued progress in our traditional programs, by using risk to determine our priorities; working closer than ever with other levels of government to implement and enforce control programs; educating the public; expanding training and technology transfer programs; and developing appropriate innovative approaches that yield greater environmental progress more efficiently.

Taken together, these elements can serve as a framework for addressing the *environmental challenges of the 1990s and beyond*. □

(Thomas is Administrator of EPA.)

# Environmental Regulation: The Early Days at EPA

by William D. Ruckelshaus

The creation of the EPA in 1970 brought together a patchwork of federal programs concerned with various aspects of the environment under the control of a single regulatory agency. In the same year, Congress passed one of our nation's most complex and ambitious statutes, the Clean Air Act, directing EPA to set and America to achieve national air standards.

The challenges facing this new Agency were many. And while a regulatory framework was important, initially, it was not the most crucial challenge.

From a management point of view, the task was daunting: how to form a cohesive, integrated, functioning entity out of 15 different agencies and parts of agencies from throughout the federal government, two of which, in the case of pesticides, had conflicting missions.

The initial structure reflected the gross nature of the pollution problems

as they were then perceived. Air and water programs were under one Assistant Administrator. The Assistant Administrator for Categorical Programs had responsibility for almost everything else: pesticides, radiation, and solid waste.

As we began, our most important mission was to establish the credibility of this new Agency, to ensure that the public and the regulated community realized that the government was serious about its charge to protect the environment.

One way to do that was through enforcement. Shortly after opening EPA's doors, we filed suit against the cities of Detroit, Cleveland, and Atlanta for polluting their rivers with sewage. Similar actions against industry followed.

The result of these actions, years later, has been demonstrable improvement in water quality in these cities and massive progress in alleviating industrial

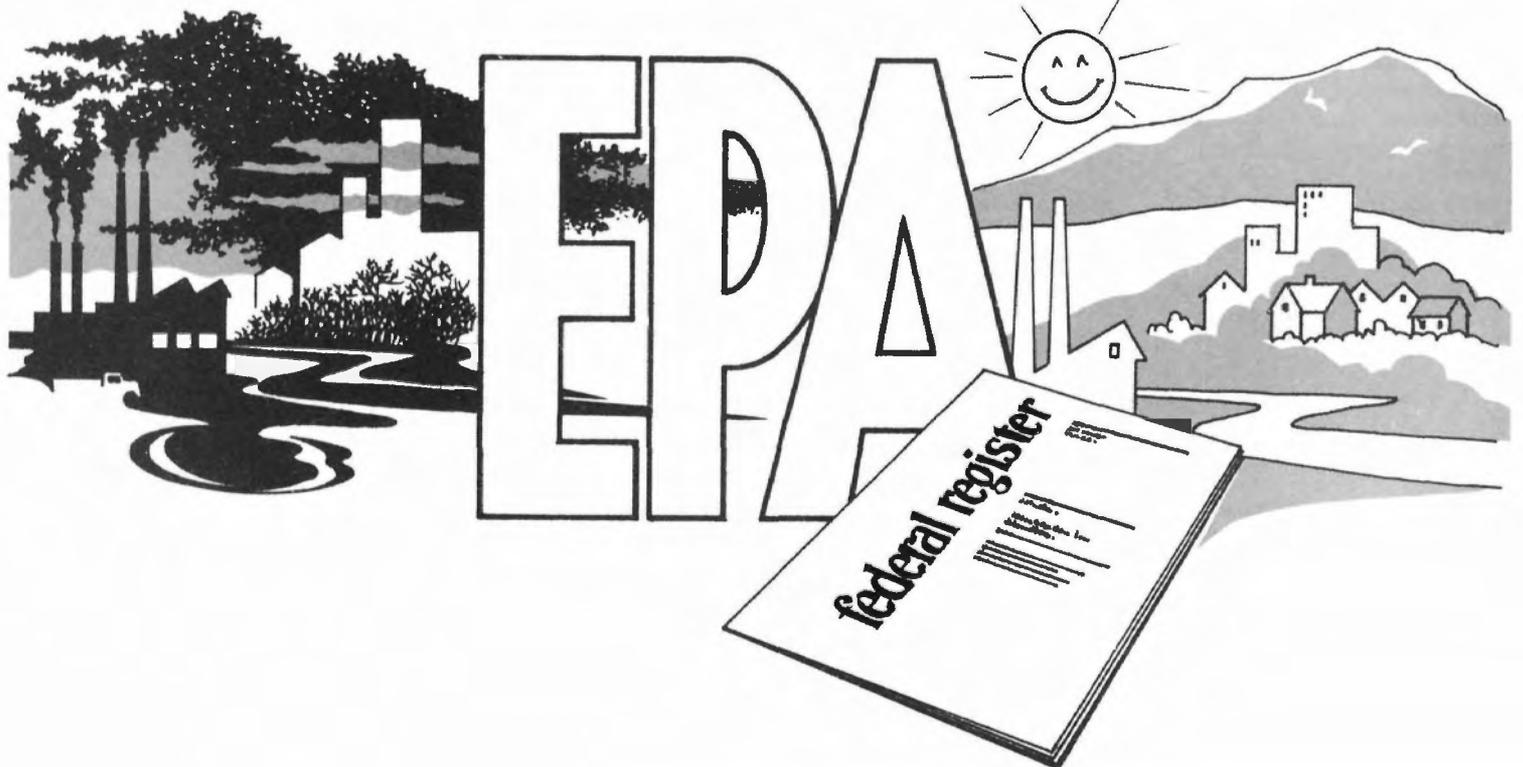
pollution. Those actions established EPA foresquare in front of the American people as an Agency committed to doing its job.

Equally important was the goal of educating and working with the public. EPA was, essentially, a response to many expressions of concern by the public about the quality of their environment. At the outset it rapidly became clear that the Agency would be able to carry out its mission only if the public understood these problems as well as EPA's mandate to address them.

The second immediate challenge to the Agency was to create awareness of and support for EPA. An aggressive public affairs program was undertaken at headquarters and in all the regional offices. Every senior agency official had a heavy schedule of speaking engagements to rally understanding and support for EPA.

Against this backdrop of aggressive enforcement and education, the regulatory efforts of the Agency began to play out. The Agency was already beginning to wrestle with Congressionally imposed deadlines as it began to implement the requirements of the Clean Air Act of 1970.

EPA was required to set criteria for national ambient air quality standards 120 days after the Clean Air Act passed and 150 days after EPA opened its doors. What was, in retrospect, so striking about that process was the paucity of sophisticated scientific data upon which to make sound regulatory judgments. To my dismay, in reviewing



the National Ambient Air Quality Standard for particulate matter during my second tour at EPA, I noted that much of the health effects data base for the new PM<sub>10</sub> standard (for airborne particles that are 10 micrometers or smaller) consisted of the same studies we used to set the first standard!

In addition, there was almost a total lack of economic analysis of the impacts

of such standards and regulations. We rapidly corrected that situation and created what I believe to this day is the most sophisticated regulatory impact analysis staff anywhere.

EPA, in those early days, spent much of its time creatively interpreting the statutes it had to administer. Prior to the passage of the Clean Water Act in 1972, EPA began implementing a discharge

permit program under the 1899 Rivers and Harbors Act. That effort led to such savage logic as defining hot water discharges from power plants as refuse.

One of the highlights of EPA's early water pollution control efforts was the signing of the Great Lakes Water Quality Agreement in 1972. This historic agreement, driven by a mutual cross-boundary decision to save a world treasure, has, over its lifetime, resulted in substantial improvement in the water quality of the Lakes.

It is a measure of how much we have learned today about the problems associated with the disposal of solid waste that in 1971, EPA's answer to the dumping of wastes was to initiate "Operation 5000." That was a program to close 5,000 open dumps and replace them with, or convert them to, sanitary landfills—requiring a 6-inch soil cover the end of each day!

With the mid-1970s, EPA began to assume its massive regulatory stance. The Clean Water Act and the reauthorization of the Federal Insecticide, Fungicide, and Rodenticide Act in 1972, the passage of the Resource Conservation and Recovery Act in 1976, and the reauthorization of the Clean Air Act in 1977 all set in motion the regulatory machinery we see in operation today.

What defined EPA in its earliest days was less the need to define a regulatory agenda than a need to convey a sense of mission and purpose to the public, the states, and the regulated community. The Agency set out to create a federal environmental presence, to set a uniform level of expectation that would end state-shopping by industry, and to ensure that people knew EPA meant business. I believe the achievement of those goals set the stage for the more sophisticated regulatory posture the Agency assumes today. □

*(Ruckelshaus, who has twice served as EPA's Administrator, is President of William D. Ruckelshaus Associates.)*

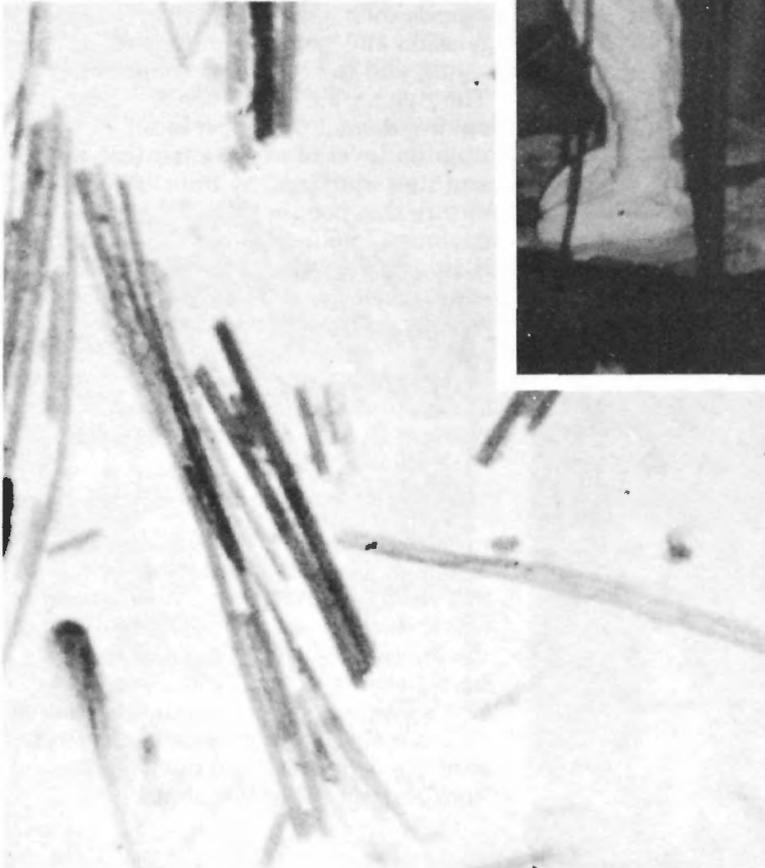
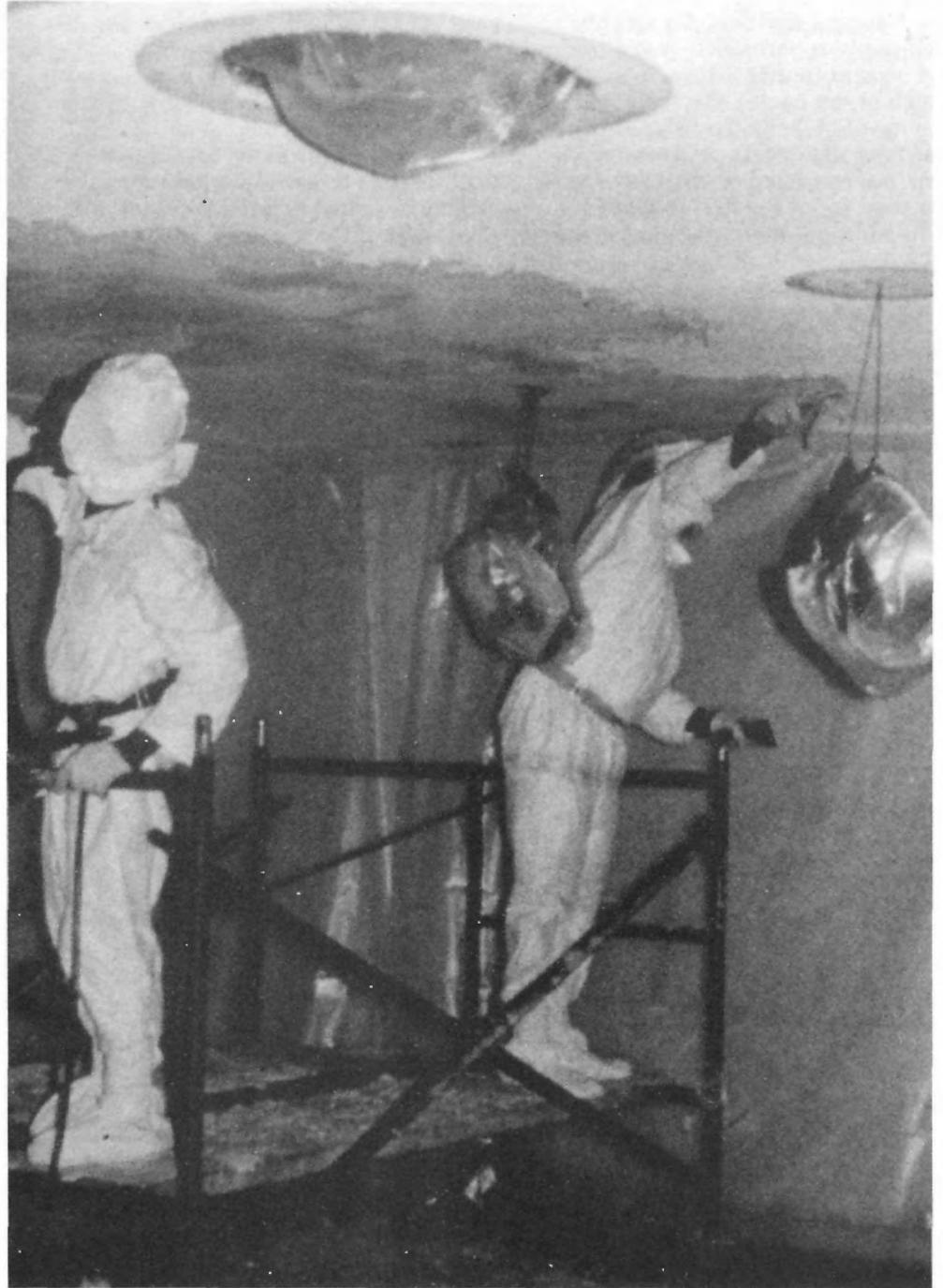
In the 1960s, air pollution scenes like this were common in some American cities. Here, in New York City in 1963, the Empire State Building's spire is barely visible at top center. One of EPA's first mandates was to set national ambient air quality standards 150 days after the Agency's 1970 opening. New York Journal American photo.



# Asbestos: The Birth of a Regulation

by Don Bronkema

Technicians must wear protective clothing when removing asbestos.



Asbestos consists of naturally occurring minerals that separate into fibers. This photograph of chrysotile asbestos is from a school air sample examined by transmission electron microscopy magnified 20,000 times.

Once upon a time there was a miracle fiber. It was cheap, easy to work with, and effective in preventing fires. The wonder fiber—which first became widely available during the early 1900s and which was used throughout the 20s, 30s, 40s, and 50s—was asbestos. This naturally occurring mineral was formed into flame-retardant insulation for merchant ships during the Second World War. After the conflict ended, asbestos was used as an ingredient in floor tiles, drapes, and wall coverings, as heating-system pipe or boiler insulation, and in fire-resistant pads in kitchens. It was applied liberally in thousands of homes, offices, factories, and schools across the nation. It was even used to make movies: the snow in *The Wizard of Oz* and *White Christmas* was made with white, fluffy asbestos.

Then we came to know a darker side to the miracle: some but not all uses could result in high exposures that could present serious health risks. Medical research, such as that begun by Irving Selikoff at Mt. Sinai Hospital in New York City more than four decades ago, gradually established that exposure to high levels of asbestos could cause a respiratory disorder known as asbestosis, lung cancer, and mesothelioma (a rare cancer of the lung-cavity lining). These cancers could take from 20 to 40 years to develop.

Today there are large numbers of buildings around the country that contain asbestos building material of some kind. Most of this "in-place" asbestos does not present a health hazard; however, asbestos can present serious health risks in certain cases where there is real or potential human exposure. For this reason, efforts are in motion under various laws to manage it properly or have it removed by experts who can do the job safely.

So where does EPA come in? The Asbestos Hazard Emergency Response Act (AHERA), which became law on October 22, 1986, requires EPA to regulate the inspection of schools to identify asbestos-containing materials, monitor the development of asbestos management plans by schools, and oversee corrective measures. The Act also requires EPA to develop a model program for training and accrediting personnel who inspect school buildings and develop management plans, and who take remedial action if that is necessary.

In 1984 an EPA survey had revealed that about 34,800 of the nation's schools contained some form of "friable"

(capable of being reduced to powder by hand pressure) asbestos, and that approximately 15 million students and 1.4 million school employees were potentially at risk from these materials. To develop the detailed regulations needed to put AHERA into action, EPA convened a regulatory negotiating committee of 24 people representing groups and interests affected by the new law. The committee was convened through the combined efforts of The Conservation Foundation staff and contractors and the Agency's Regulatory Negotiation Project staff. EPA had used negotiated rulemaking only six times before.

The committee members represented public school boards and administrators, teachers, service and maintenance employees, private schools, asbestos-abatement contractors and consultants, state attorneys general and asbestos program directors, former asbestos product manufacturers, and EPA staff. Needless to say, the interests and commitments of these parties were highly diverse, and sometimes conflicting.

There was also the problem of time pressure. The committee had to complete its work by the statutory deadline of April 30, 1987. That was just six months after AHERA was signed by the President. So from February 1 to April 3, the committee met five times for two- to three-day meetings, virtually around the clock. The participants sacrificed their evenings and weekends to make sure they could finish in time.

During these conclaves, the committee divided into work groups on specific issues, then reassembled in plenary sessions to review progress and approve proposals of the work groups. All sessions were marked by thorough analysis and spirited debate as members attempted to narrow disagreements and find common ground on substantive issues. At the end of this marathon, 20 of the 24 negotiating committee members agreed that the draft document should serve as the basis for the proposed AHERA regulations. EPA published these proposed regulations in the *Federal Register* of April 30, 1987, within the legislated time limit.

What accounts for such signal success in a regulatory arena fraught with potential for disappointment? EPA participants, looking back on the process a year later, cite a number of considerations:

- First of all, the panelists seemed to realize that EPA was determined to propose a rule on schedule, that they each, individually, had something to

gain from participating with the Agency, that friable asbestos was not a moot hazard, and that the country expected statesmanship of each of them, not partisan bickering, delays, and maneuvers. So they played the role expected of them.

- Second, EPA already had pretty good relations with many of the major players based on their testimony before Congress and other contacts.

- It was also clear that the various interests, though nominally in conflict, had a great deal in common behind the blaring headlines. The labor unions, manufacturers, and school districts may have been strange bedfellows, but they were bedfellows nevertheless.

- The EPA rule-writers included generalists and liberal-arts people who had no previous experience in writing regulations—and that gave them a fresh perspective. They weren't constrained by biases or expectations from the past, and they kept open minds.

- There was that looming deadline that everyone knew Congress would not extend.

- Participating groups were willing to have partial loaves instead of going away hungry from the table.

- There was, throughout, a spirit of tolerance and willingness to see the other guy's point of view.

- The panel members developed, with the facilitator's constant nudging, a capacity to keep the big picture in mind.

Finally, the EPA employees involved say they were fascinated by the dynamics of the group process and by the give-and-take among groups of such varied background. One said, "It was like a doctoral seminar in conflict-resolution or a summit conference on arms control." Another added, "With so much personal sacrifice of time, no one wanted to be accused of sabotaging the process." And another declared, "Everybody knew perfectly well what was being put into the sausage, so no one could easily refuse to consume the final product."

The EPA members were unanimous in believing that the whole process won friends for the Agency and gave it much-needed additional credibility with broad sectors of the public; the word would spread that EPA "is willing to listen" and "knows how to deal." They admit that the process wasn't perfect. The Safe Buildings Alliance, a group of former asbestos products makers, is suing the agency on the merits of the

rule. But many of the other groups have taken up the cudgels for EPA in court—and that is remarkable, if not unprecedented.

In any event, the outcome of all the heroic labor was that EPA wound up with a very sound set of regulations. During the 60-day public comment period, EPA received more than 170 responses, ranging from a one-page letter to volumes of hundreds of pages from various interest groups. EPA held a public hearing in August and took testimony from 30 witnesses. State officials were briefed in EPA regional offices.

After the comments were received and the hearings concluded, EPA staff analyzed the comments and revised the text as necessary. EPA Administrator Lee M. Thomas signed the final AHERA regulations on October 17, 1987, again in accordance with the statutory deadline. They boast four major provisions.

First, all public and private elementary and secondary school authorities must inspect all areas of their buildings for friable and non-friable asbestos. The inspection must include all interior areas and certain exterior portions. It must include an assessment of the condition of the asbestos materials so areas can be classified according to the degree of damage.

Second, schools must develop management plans that include the results of inspections and descriptions of any completed or planned abatement actions. These plans must be submitted to state governors by October 12, 1988 (a deadline set by the statute), released to the public, and presented to parents and employee organizations in writing.

Third, school authorities must take concrete steps to deal with any friable asbestos in their buildings, ranging from monitoring to encapsulation or removal in the most extreme circumstances. Responses must be based on the condition of the asbestos and must protect human health and the environment.

Fourth, only those accredited either through state programs or EPA-approved training courses can conduct inspections, develop management plans, or carry out remedial action. Of course, the effectiveness of these regulations depends upon school personnel, state officials, parents, abatement professionals, and EPA. Each of these

groups plays a vital role. School personnel must conduct building inspections and develop management plans at once to meet the statutory deadline of October 12, 1988, for submission of management plans.

Schools must embark on asbestos management programs that comply with AHERA regulations, though they have substantial leeway in choosing specific options. State officials must then review the management plans submitted by schools and compel necessary modifications. States should also adopt the Model Accreditation Plan (or a more stringent plan of their own) to ensure

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***“Everybody knew perfectly well what was being put into the sausage, so no one could easily refuse to consume the final product.”***

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that schools have an adequate supply of trained, accredited people who can inspect buildings, develop management plans, and make repairs.

Parents have the duty to exert their influence on school officials to ensure that tough control programs are put in place. They can read overall management plans. Abatement professionals must take steps to receive adequate training, become accredited, and take periodic refresher courses as required by the Model Accreditation Plan. Such training will ensure that all abatement activities will be carried out competently and in a manner that does not aggravate the problem. Any action by untrained amateurs could be hazardous.

EPA's task is to provide technical assistance to schools as well as vigorously enforce full compliance with the regulations. We were concerned that there might not be enough accredited inspectors to meet the nationwide demand, so we stepped up our efforts to approve courses for accreditation of inspectors and management planners. More than 50 such courses have been approved so far. In fact, as of December, eight EPA university centers had trained about 1,500 inspectors and management planners. The combination of the centers and the new courses should mean about 20,000 inspectors and planners trained and available by the end of 1988.

EPA also awarded cooperative agreements totaling more than \$1 million to 17 states to support the development of state-accredited training courses, and the number of available inspectors and planners is rising rapidly.

EPA has taken a number of other actions to help school districts and private schools deal with their asbestos problems as well. We have given \$5 million in grants to states for inspection and management plan assistance. The money is used to reimburse local education authorities for hiring inspectors and/or management planners, to purchase the services of inspectors/planners, or to pay accredited state employees to conduct inspections.

We have also provided technical assistance in thousands of schools, provided written rules and guidance materials, given out a total of \$157 million in grants and loans to help schools clean up asbestos, and made available model contractor and inspector certification programs for adoption by the states. To help protect maintenance and custodial workers, EPA has extended coverage of its worker protection rule to school district employees who are not protected by other federal or state standards.

Finally, EPA has conducted a study of the extent and condition of asbestos in public and commercial buildings, and sent its study conclusions to Congress. We found that friable asbestos is present in about one fifth of the nation's public and commercial buildings. EPA is not recommending a comprehensive AHERA-type regulatory program for such buildings at this time because there just isn't enough trained manpower to do the job right. We also need to gain some experience with the schools program and other federal, state, and private efforts to control asbestos and then determine what, if any, additional programs are needed.

What is learned from the effort to carry out the AHERA program will doubtless be valuable in dealing with asbestos hazards in other types of buildings. EPA developed the AHERA regulations in the open, but they are only a first step. The real work of compliance still lies ahead. With the commitment and cooperation of school personnel, state officials, abatement professionals, service workers, parents, and EPA—those who cooperated to develop the rule in the first place—we'll get there. □

(Bronkema is Editor of EPA Times, the monthly newsletter of EPA.)

# Weighing the Benefits of Clean-up Rules Against Their Costs

by Ralph A. Luken

**“Y**our money or your life”: If you’ve ever heard those words spoken over the barrel of a gun, you know that sometimes the benefits and the costs of alternative responses can be very easy to calculate, and the optimal response very clear. But when applied to environmental regulations, the equations are rarely so simple. Like apples and oranges, benefits and costs are not always expressed in the same terms. To compare them, we need a common factor, and that factor is usually dollars. But while estimating the dollar cost of control is routine, putting a dollar value on the benefits of environmental improvements is more complex.

In EPA’s lexicon, benefit-cost analysis simply means comparing the benefits from a proposed regulation with the costs. This seems neutral enough, but, surprisingly, such analyses are often the subject of considerable debate. Proponents argue that benefit-cost analyses promote efficient decision-making by laying out the economic pros and cons of regulatory alternatives. Critics argue that they cost too much, delay rule-making, and over-simplify complex decisions—and wind up favoring relaxation of environmental standards in order to reduce costs.

These debates are not new. EPA has been analyzing environmental regulations since 1971, when the Office of Management and Budget established a formal review procedure for economic analyses. Known as the “Quality of Life” review, the procedure required for every significant regulation a summary of the principal objectives, alternatives, benefits, costs, and reasons for going forward with the regulation as the best available option. Under President Carter’s Executive Order 12044, this review was expanded to require

consideration of the direct and indirect effects of a regulation and to force selection of the least burdensome alternative.

Despite a 10-year history of economic analyses, the debate heightened in February 1981 when President Reagan signed Executive Order 12291 requiring EPA and other federal agencies to prepare regulatory impact analyses (RIAs) for all major regulations. (Major regulations are those imposing annual costs of \$100 million or more.) Consistent with other legal requirements, each RIA must analyze benefits and costs for each regulatory alternative so that the one chosen maximizes net benefits to society. (Net benefits are the total benefits minus total costs.) Thus, Executive Order 12291 not only made benefit-cost analyses a required part of the regulatory process, it also established net benefits as the criterion for choosing among regulatory alternatives.

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***These benefit-cost analyses are not simply paper exercises. Environmental regulations can cost billions of dollars.***

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These benefit-cost analyses are not simply paper exercises. Environmental regulations can cost billions of dollars. The analyses in the RIAs are intended to ensure that these dollars are spent wisely. If successful, they can help realize billions of dollars in additional benefits or reduced costs.

One way to evaluate the efficacy of benefit-cost analyses is to subject them to a taste of their own medicine—to compare the net social benefits derived from conducting RIAs to the net cost of preparing them. The Office of Policy Analysis (OPA), within EPA’s Office of Policy, Planning, and Evaluation, recently reviewed 15 RIAs prepared

between January 1981 and January 1986. (For more background on this review, see the Agency’s 1987 report entitled “EPA’s Use of Benefit-Cost Analysis: 1981-1986,” which includes a more detailed discussion of the role of benefit-cost analysis in regulatory decision-making and a useful summary of the 15 RIAs reviewed.)

The results of this OPA review suggest that, in spite of the problems frequently raised by critics, the benefit-cost analyses in these RIAs were well worth their cost, time, and effort. For example, the dollar benefits accrued to society as the result of the implementation of regulatory alternatives proposed in just three benefit-cost analyses (for lead in gasoline, used motor oil, and premanufacture review under the Toxic Substances Control Act, or TSCA) add up to more than \$10 billion over a 10-year period. On the other hand, the 15 RIAs altogether have cost only about \$10 million. In other words, a \$10 million investment in benefit-cost analysis has generated benefits of over \$10 billion—a return of 1,000 to 1!

In addition to showing purely monetized benefits, the benefit-cost analyses have helped to improve regulations by identifying issues for regulatory development, offering regulatory options, and supporting regulatory decisions in areas where costs are not permitted to be considered. In fact, the formal consideration of benefits for each proposal has led to increased awareness of the improvements, both to human health and to the environment, that result from environmental regulation.

## **Identifying Issues**

Benefit-cost analyses played an important part in the 1985 revision of lead standards for gasoline. EPA had already tightened these standards in

1982, and there was no legislative or other pressure to revise them further. In 1984, however, new data convinced the Agency that reducing lead content in gasoline still further might produce substantial environmental and health benefits.

A benefit-cost analysis confirmed that reducing the lead in gasoline from 1.1 gram per gallon to 0.1 gram per gallon would achieve multiple results:

- Slash adverse health effects, medical care, and educational costs for children with high lead levels in their blood;
- Cut deaths, illnesses, and lost wages from cardiovascular and other diseases;
- Reduce emissions of other pollutants from cars;
- Boost fuel economy and lower motor vehicle maintenance costs.

EPA's benefit-cost analysis projected that, between 1985 and 1992, monetized net benefits to the nation would reach \$6.7 billion, even without taking into account the benefits of anticipated reductions in blood pressure. In large part, it was these calculations that convinced EPA in 1985 to tighten the leaded gasoline standard.

#### Offering Regulatory Options

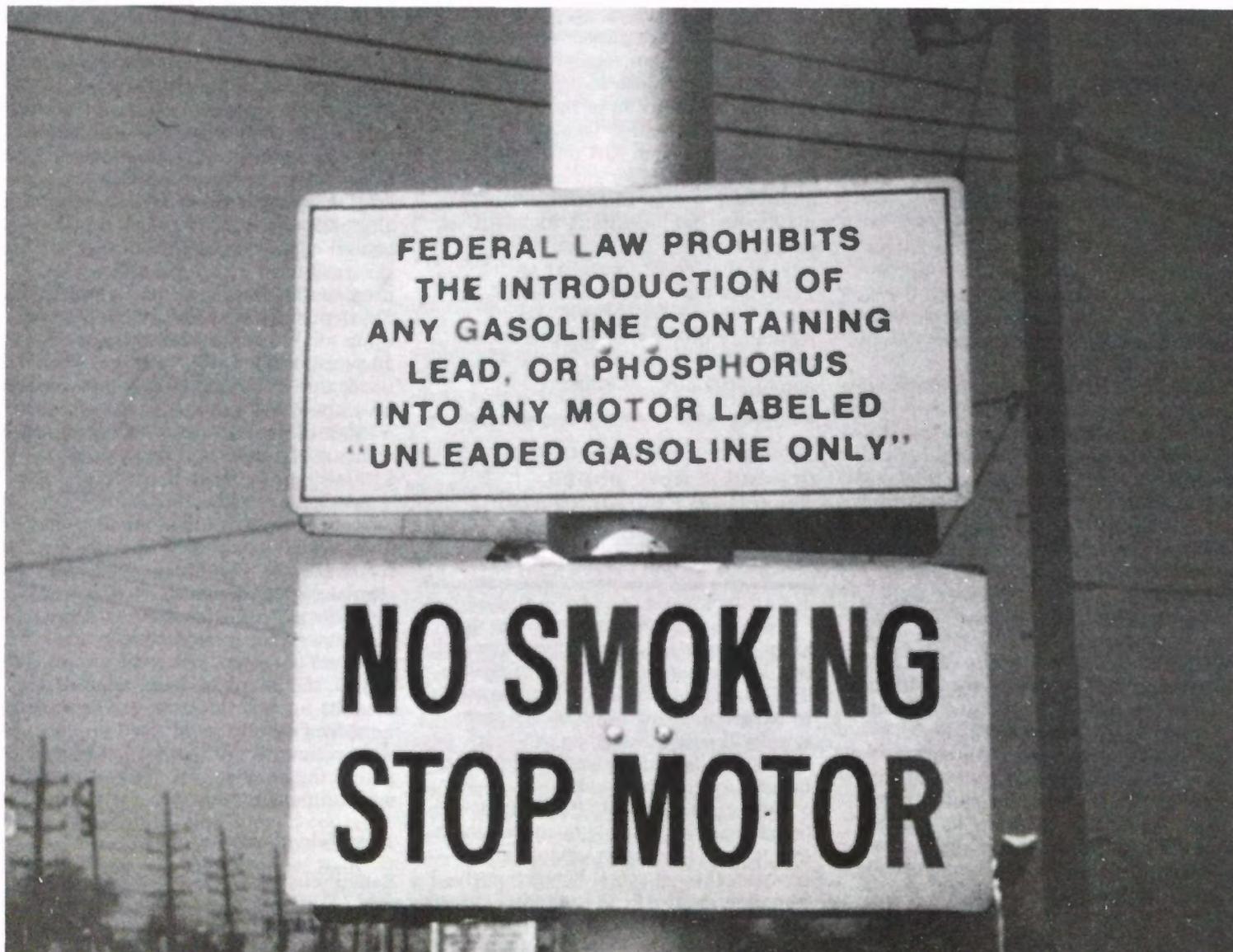
In addition to initiating regulatory actions, benefit-cost analysis can suggest alternative regulatory approaches. For example, in establishing requirements for EPA review of new chemicals under TSCA, a major issue was how much information the Agency should require on application forms. There was concern that high costs to comply with EPA review requirements might

discourage innovation in the chemical industry. With the help of a benefit-cost analysis, EPA's Office of Toxic Substances developed an alternative reporting format that provided sufficient information to protect public health, yet cost less than half as much as the original. Total savings were estimated at approximately \$4 million per year, or \$40 million over 10 years.

EPA's benefit-cost analysis of proposed rules for the disposal and treatment of used oil is another example of how these analyses can improve environmental regulations.

Most used oil is generated when people drain their automobile crankcases. There are various ways to dispose of it, but it is usually collected from service stations and taken to

Continued on page 12.



Although EPA had tightened lead standards for gasoline in 1982, new data in 1984 suggested that further lead reduction would provide additional environmental and health benefits. Benefit-cost analysis confirmed this.

## Economic Analysis at EPA

EPA has been preparing analyses of environmental regulations since its inception, both to provide information essential to fulfill its statutory responsibilities and also to comply with executive orders. Over the years, the scope of these regulatory analyses has gradually broadened to include not only costs incurred by industries affected by regulation, but also inflation and other economic impacts, effects on small businesses, cost-effectiveness benefits and net benefits. All of these components must be included in the "regulatory impact analyses" (RIAs) required by Executive Order 12291 to be conducted for major regulations. A variety of economic analysis techniques have been used to measure these different regulatory effects.

The most common form of economic analysis performed in EPA's early days was the "economic impact analysis," which encompasses measures of changes in prices, in production, industry profitability, capital availability (including plant closures), and employment, resulting from regulatory action. A subset of economic impact analysis called *closure analysis* uses simplified assumptions representing the costs and revenues generated by various plants in a given industry. The purpose of the analysis is to determine the point at which the incremental costs of new pollution control would force production lines or plants to close. The water program used this form of analysis in the 1970s in the process of developing effluent guidelines.

When used along with other types of economic analysis, closure analysis can be a valuable tool. For instance, the regulatory analysis completed last year for the effluent guidelines for the organic chemicals, plastics, and synthetic fibers industry included a closure

analysis of the affected plants; this analysis produced an estimate that 66 small plants would close if full "Best Available Technology" guidelines were followed in regulating the industry. As a result of these findings, EPA mitigated the stringency of BAT guidelines for small direct discharging plants, estimating that these exemptions would provide relief for 19 plants and save 162 jobs. (Exemptions were not, however, given to any of the small "indirect-discharging" plants—that is, plants that discharge into publicly owned treatment works, such as municipal treatment systems—because the aggregate amount of pollution discharged by these plants is significantly greater than that discharged by the direct dischargers.)

Closure analysis, however, provides no information about effects on the economy as a whole, or about the cost to society of health and environmental improvements. If used alone to set standards, this information can lead to undercontrolling pollution from marginally profitable industries and overcontrolling pollution from profitable industries, regardless of the amount of pollution each industry emits or the risk posed.

Beginning in the mid 1970s, EPA programs began using *cost-effectiveness analyses* to evaluate its regulatory decision-making. Cost-effectiveness analysis compares the costs to industry of pollution reduction with the amount of pollution reduced. This type of analysis provides a decision-maker with a proxy of the expected environmental results of a regulation in terms of pollution reduced, whereas closure analysis provides no such measure. EPA first used cost-effectiveness analysis in the effluent guideline program, where it remains one of the types of economic analyses used today. Cost-effectiveness analysis is also among the types of

economic analyses currently used by the air program in setting new source performance standards and hazardous air-emission standards, by the drinking water program in setting maximum contaminant levels, and by the toxics program as well.

From an environmental standpoint, a pound of one pollutant is not necessarily as significant as a pound of another. Yet cost-effectiveness analysis treats all pollutants as if they were alike. It provides no basis to judge what is an appropriate amount to "pay" for the unit of pollution reduced, so historic precedent became the benchmark in the past for individual programs in EPA. For example, the air program often considered \$1200 per ton to be an acceptable amount to pay to avoid certain pollutants through a new source performance standard, whereas the water program often considered \$300 per pound to be appropriate for toxics reduced through an effluent guideline. Cost-effectiveness analysis can in fact result in some pollutants being underregulated and others overregulated. To account for this limitation, the current water program, for example, in setting effluent guidelines, weights pollutants according to their toxicity to health and the environment.

Benefit-cost analysis, discussed in the adjoining article, has become institutionalized as a tool of regulatory analysis by the issuance of Executive Order 12291. Although it addresses many of the problems found in other types of economic analyses, it cannot serve as a substitute for them. Regulatory decision-making today takes into consideration economic information generated by a variety of analytical techniques, depending on the unique nature of each regulatory problem.

refineries for purification and recycling. The questions before EPA were whether to regulate used oil as a hazardous waste under the Resource Conservation and Recovery Act, and if so, whether such regulation would interfere with beneficial recycling.

The benefit-cost analysis for the rule-making showed that the cost of complying with full hazardous waste regulations would be very large for small businesses such as service stations, discouraging them from participating in recycling activities. Instead of enhancing environmental protection, the regulations just might increase illegal dumping. By proposing different standards for small, medium, and large generators of used oil, however—and by relaxing standards for some used-oil transporters—it would be possible to reduce environmental risks and regulatory costs, with annual savings estimated at \$358 million and 10-year savings at \$3.6 billion.

### Supporting Decisions

In some cases, environmental statutes specifically prohibit consideration of certain factors in setting standards. Under the Clean Water Act, for example, EPA must consider the economic feasibility of effluent guidelines, but may not consider the site-specific benefits of water-quality improvements. Even so, benefit-cost analyses can be helpful in supporting decisions reached under other criteria. The positive benefits of regulations developed for the iron and steel industry, for example, were confirmed by a benefit-cost analysis performed as part of a total RIA.

### Limitations of Benefit-Cost Analysis

Despite these very clear-cut examples of the effectiveness of benefit-cost analyses, EPA is the first to admit their shortcomings. EPA's guidelines, in fact, specify that each RIA must point out the limits of benefit-cost analyses and consider them in the context of other relevant factors.

Three major limitations in particular affect the validity of benefit-cost analyses:

- Limitations inherent in the nature of economic analyses in general. Such analyses can tell only part of the story where people's health and values are involved. The facts and figures produced by even the best analyses must always be tempered by real-world considerations.
- Limitations due to gaps in available information and deficiencies in analytic techniques. Benefit-cost analyses involve collecting large amounts of scientific data, modeling complex environmental phenomena, calculating human exposures, and estimating resulting diseases and deaths. When data are poor or analytic techniques deficient, the reliability of benefit-cost analysis deteriorates. To protect the soundness of environmental decisions based on such analyses, EPA's RIA guidelines call for full consideration of all analytical uncertainties.
- Limitation due to errors and omissions.

In light of the many complex analyses required for each regulation, it is not surprising that not all benefit-cost analyses are performed correctly. EPA's RIA guidelines provide guidance on how to perform benefit-cost analyses properly. If these guidelines are followed, the analyses will be as good as the underlying data and analytical techniques permit. But because time, budget, and other considerations do not always allow complete analyses, the guidelines also require that, at the very least, decision-makers be informed of the deficiencies in the data.

In spite of these acknowledged limitations, however, the Agency's review of RIAs has concluded that:

- Analysis pays. The benefit-cost analyses performed over the last five years have dramatically increased the net benefits to society from environmental regulations. Three of the RIAs showed potential net benefits of more than \$10 billion from recommended improvements.
- Benefit-cost analysis often results in stricter environmental regulations. Environmentalists often fear that economic analysis will lead to less strict

environmental regulations in an effort to save money. OPA's study reveals that the opposite is just as often the case. For example, the most dramatic increase in net benefits—\$6.7 billion in savings—resulted from the recommendation to virtually eliminate lead in motor fuels, rather than simply reduce it.

- Benefit-cost analysis may reveal regulatory alternatives that achieve desired environmental benefits at lower cost. Three of the analyses studied by OPA (used oil, TSCA premanufacture review, and FIFRA data requirements) showed that less costly regulations could achieve the same results as more expensive alternatives. And in at least one case (used oil), the analysis showed that the less costly alternative would also achieve greater reductions in environmental risk.
- The cost of benefit-cost analysis is low. The average cost of EPA's RIAs was \$685,000. This amounts to about 0.1 percent of the minimum cost of a major rule over five years.

Over the years since EPA was created, the Agency's use of benefit-cost analysis in environmental rule-making has risen considerably. Though recognizing the limitations of such analysis, EPA is finding it increasingly useful in helping to provide the balance needed in making complex regulatory decisions. □

*(Luken is Chief, Economic Analysis Branch, Office of Policy Analysis, within EPA's Office of Policy, Planning, and Evaluation.)*

# Science and the Regulatory Process

by Erich W. Bretthauer and Peter R. Jutro

**E**PA, as one of the world's largest regulatory agencies, exercises its enormous influence on our lives through its administration of about a dozen laws that give it authority over a broad range of our activities. These laws deal with emissions of pollutants into the air and water, disposal of material into landfills and the ocean, the management of toxic substances, and the use of pesticides—to name just a few of EPA's concerns.

Regulatory agencies were developed as a way to deal with social problems based on arcane technical information that required expertise for its understanding and interpretation. These agencies had as their charge to acquire information, update it, and apply it with discretion in a flexible fashion to achieve specified goals.

As a regulatory agency, EPA shares with its sister agencies certain obligations that have evolved in the American legal system. The Constitution, Congress, and the courts have, over the years, allowed enormous executive power to be placed in the hands of the administrators of executive agencies, but one tenet of law has remained firm and has been constantly reinforced: the decisions of Agency administrators may be neither arbitrary nor capricious. This legal concept, developed to protect the people from abuse at the hands of their own government, has in its own way become the foundation of EPA's operating philosophy. For it reinforces the notion that all EPA's decisions must be based on sound science.

This is not a recent concept at EPA. Research has been an integral part of the Agency since its founding, and recognition of the importance of research has increased over the years. In fact, the well-known development within the Agency in recent years of a framework that separates the management of risk from the assessment of risk was undertaken in large measure

to improve the scientific foundation of the Agency's regulatory decisions.

Science, however, cannot solve all of our problems. In fact, the nature of the scientific process itself will always create dilemmas for those who have to deal with science in a legal context. The reason is simple: for the most part, the law deals with certainty, while science deals with uncertainties. Scientists can offer information based on their current understanding of a problem or a situation, realizing that their knowledge and predictive power are uncertain. Senator Ted Kennedy once captured the spirit of the problem well when he called for more "one-armed scientists." He was referring to the fact that scientists' responses often begin: "On the one hand...."

This insoluble problem aside, it is clear that the conduct of science brings forth new information and new

understanding. Obviously, the more we know and the better we understand something, the better we can deal with it. As one looks at various laws that EPA administers, one sees different examples of the various relationships that can exist between science and law, or science and regulation. Perhaps the best introduction to this relationship can be found in the Clean Air Act (CAA).

Title 1 of the CAA deals with the ambient concentrations of certain pollutants in the air around us. It establishes what are known as National Ambient Air Quality Standards, or NAAQS for a particular set of pollutants that the framers of the Act considered to be of great importance as threats to human health. But of more interest is the fact that the law required EPA to periodically reexamine these standards, and as a result, we have stories to tell.



PM<sub>10</sub> apportionment studies are conducted at EPA's Air and Engineering Research Laboratory in Research Triangle Park, North Carolina. The plume formation of a plant's smokestack is simulated, and its "fingerprint" used to obtain source data.  
D. Bruce Harris photo.

One of EPA's early actions was to set NAAQS for particulate matter. EPA bases its NAAQS standards on "Criteria Documents," exhaustive summaries and assessments of data available on the health and welfare effects of a particular pollutant prepared by the Agency's Office of Research and Development (ORD). The Act itself requires these documents to be prepared, reviewed, modified, and reissued.

EPA established total suspended particulate, or TSP standards in 1971. These TSP standard were established to protect the public against health effects thought to be associated with a broad range of sizes of airborne particles. The specific concentrations and exposure-averaging times for the standard were based largely on two data sources. One dealt with the relationship measured between particles and health in Britain based on a technique known as the British Smoke, or BS method. The other was based on American epidemiological studies that associated health effects with total particle concentrations measured by high volume, or "Hi-Vol" samplers.

In the years that followed, as the Agency and states attempted to comply with the standard, ORD—working with the British—determined that the two sampling methods were not always yielding the same results when used together. Subsequent research showed that the Hi Vol method measured a much larger range of particle sizes than the BS method. Other research on human health and modeling of the regional deposition of particles in the

respiratory tract suggested that attention be given to the smaller particles which made their way deeper into the respiratory tract, as these seemed to be more likely to cause adverse health effects. It appeared, therefore, that it might be possible to better protect human health by focusing regulatory attention on the smaller particles.

As a result, in 1979, ORD decided to focus its particulate research on particles less than 15 microns in diameter. EPA then began a program to establish an inhalable particle network to collect the concentration data that would be needed to support a new NAAQS. ORD focused its attention on initiating studies to develop new and more accurate samplers. As this work was going on, a reassessment of the importance of particle size (conducted in the preparation of the next criteria document) lowered the size limit of interest from 15 to 10 microns. This made it necessary to redesign parts of what were to become the PM<sub>10</sub> samplers, and much of the work was done so as to make it possible to retrofit or modify the existing TSP samplers. This work resulted in the improved PM<sub>10</sub> monitors now commercially available.

Finally, last summer, the TSP measurement was replaced by a new indicator that includes only particles 10 microns in size or smaller. This new PM<sub>10</sub> standard will focus regulatory control in a fundamentally different and more effective way. It reflects the fact that science was brought to bear on an important regulatory decision. Health scientists came to conclusions about the implications of the size differences, engineers designed monitoring equipment to differentiate

different-sized particles, and others designed monitoring networks that allowed collected data to be more representative.

EPA's scientists work on a far broader range of issues than air pollution, but the entire NAAQS process is a classic example of the relationship between science and regulation. Scientists defined and assessed health effects, created the models needed to predict human exposure to pollutants, did the monitoring, often creating the equipment themselves, and developed the necessary control technology. All of this was done in close collaboration with the regulators, and each undertook their half of the partnership in synchronization with the other. As a result, and almost by accident, EPA managed to create an unusually successful long-term research program that often anticipated the needs of the regulators and provided information that was of use in unexpected areas as well.

Science can never anticipate all the needs that may arise. In fact it often discovers these needs itself. But science can be, as is the case at EPA, constantly reevaluating its skill mix, facilities, and relationship to the scientific community at large so that it is best positioned to respond to those needs which were not anticipated. As such it is best able to fulfill its peculiar environmental protection role in which both it and EPA's program offices are each others' clients. □

*(Bretthauer is EPA's acting Deputy Assistant Administrator for Research and Development. Dr. Jutro is Special Assistant to the Assistant Administrator for Research and Development.)*

# Disagreeing About the Rules: To the Courtroom

by Mark R. Haag



Steve Delaney

The Justice Department's Land and Natural Resources Division works closely with EPA on a wide range of cases, for when EPA goes to court, it is represented by the Department. Many of these cases are enforcement actions against persons accused of violating clean air, clean water, hazardous waste, or other environmental laws. Others are cases where the Agency's actions—including, occasionally, its regulations—are challenged. These defensive cases are probably less familiar to the public than enforcement litigation, but they can be extremely important, because the validity of entire regulatory programs is sometimes at issue. It is these cases—cases where a court determines the validity of EPA regulations—that are the subject of this article.

The process that culminates in judicial review of regulations starts in Congress. When legislating in areas that involve complex technical or scientific judgments, Congress frequently states its objectives, outlines a basic statutory scheme, and delegates to a government agency the task of promulgating regulations to implement the statutory scheme. Once promulgated, the regulations have the full force of law.

As simple and logical as this delegation concept is, it involves something quite remarkable: the transfer of the power to make law from Congress to the unelected heads of government agencies. Furthermore, delegation is often considerably more difficult in practice than it appears in theory. It is sometimes quite difficult for the agency

to determine what Congress intended in a particular statutory provision, and to realize that intent in a consistent and workable body of regulations. To ensure that agencies do not abuse their delegated authority, misapprehend the intent of Congress, or violate the Constitution, regulations promulgated by federal agencies are subject to review in federal court. Aggrieved individuals or groups can file suit challenging agency actions; it then falls to the court to decide whether the agency has acted properly.

A good example of the judicial review process is the saga of EPA's regulations governing lead in gasoline. The story begins in 1970, when Congress enacted a set of amendments to the Clean Air Act. Among other things, the amendments gave the newly created EPA authority to regulate the sale of any fuel additive the emission products of which "will endanger the public health or welfare."

Under this authority, EPA proposed regulations in February 1972 limiting the amount of lead in leaded gasoline and requiring gasoline retailers to offer at least one grade of unleaded gas. After taking public comment, EPA decided that its original analysis of the health effects of lead emissions required modification, and withdrew its proposal. The provision requiring retailers to carry unleaded gas was repropoed in January 1973, but the limit on lead additives was not.

An environmental group challenged EPA's failure to impose a limit on lead additives. In *Natural Resources Defense Council v. EPA*, the environmentalists argued that the Clean Air Act required EPA to promulgate regulations limiting lead additives. Without deciding whether the environmentalists' position was correct, the court ordered EPA to decide within 30 days whether it intended to promulgate such regulations. The Agency decided that it would regulate, and in November 1973

issued final rules requiring that lead in all gasoline be reduced over a five-year period to an average of 0.5 grams per gallon.

EPA's decision to regulate lead additives was, at least superficially, consistent with the intent of Congress. Although the Clean Air Act Amendments did not specifically mention lead—they refer broadly to "any fuel additive"—several members of Congress had made remarks during debate on the amendments indicating that the fuel additive provision was specifically intended to enable EPA to regulate lead. EPA's decision to regulate was also supported by three key facts: lead at high concentrations in the body is toxic; lead can be absorbed into the body from the air; and lead emissions from automobile engines accounted at the time for approximately 90 percent of the lead in the air.

There was some scientific uncertainty, however, about the precise connection between lead in automobile emissions and lead in people. Lead is a common element, present in soil, sea water, plants, animals, and people. While it can be absorbed from the air, it can also come from foods, and young children may ingest it by eating paint chips. The effects of lead from these various sources, once lead has been absorbed by the body, are identical and cumulative, making it difficult to measure the effect of any one source of lead on human health. Nevertheless, EPA concluded on the basis of the available information that lead emissions from automobiles presented a "significant risk of harm to urban populations." That conclusion provided the basis for its decision to regulate lead in gasoline.

The regulations issued in response to the court's order in *Natural Resources Defense Council* were promptly challenged by a group of gasoline refiners and lead additive manufacturers in *Ethyl Corp. v. EPA*. Among other things, the challengers claimed that the EPA Administrator had misinterpreted the Act's provision allowing EPA to regulate the sale of fuel additives whose emission products "will endanger the public health or welfare." The challengers read this language to mean that EPA could only regulate additives that caused "actual harm." The "significant risk of harm" found by EPA was not enough to justify regulation. Furthermore, they said, the harm must come from the additives in and of themselves. The Administrator's consideration of the cumulative impact

of lead additives together with all other sources of lead was not permitted under the Act.

The case was heard by the United States Court of Appeals for the District of Columbia—the same court that had heard *Natural Resources Defense Council*. The court evaluated the lead regulations under the standard of review that applies to most challenges to agency actions—a standard with a vaguely paradoxical character that is puzzling to the uninitiated (and

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***EPA, the Justice Department, the challengers' attorneys, and two panels of judges devoted enormous time and effort to answer a single question: What did Congress mean by the two words "will endanger"?***

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sometimes to experienced attorneys as well). Under this standard, the court must make a careful review of the factors considered by EPA, and a searching and careful inquiry into the facts. At the same time, it must give great deference to the Agency's decision. It may not substitute its judgment for the Agency's and must affirm the Agency if a rational basis exists for its decision. The court must, however, invalidate Agency action that is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law."

A three-judge panel of the court applied this standard and struck down the EPA regulation. The court held that there was not enough evidence of a causal connection between lead emissions from automobiles and harm to human health to justify the regulations. Absent such evidence, the Administrator's decision to regulate was arbitrary and capricious.

The government asked the court to reconsider. Such requests are not usually granted, but in this case the court agreed. Under a special procedure used for particularly important legal questions, the case was reargued before a panel of nine judges. The new panel reversed the first panel's determination and upheld the EPA regulations. The vote was five to four.

The court's opinion reflects the tension inherent in any delegation of authority. The court acknowledged the need to allow the EPA Administrator flexibility to deal with scientific uncertainty:

He must take account of available facts, of course, but his inquiry does not end there. The Administrator may apply his expertise to draw conclusions from suspected, but not completely substantiated relationships between facts . . . We believe that a conclusion so drawn . . . may, if rational, form the basis for health-based regulations under the "will endanger" language of [the Act.]

At the same time, the court was mindful of the need for Congress to limit the scope of the delegated authority:

All of this is not to say that Congress left the Administrator free to set policy on his own terms. To the contrary, the policy guidelines are largely set, both in the statutory term "will endanger" and in the relationship of that term to other sections of the Clean Air Act. These prescriptions direct the Administrator's actions.

The *Ethyl* case shows how carefully the courts scrutinize the exercise of delegated legislative authority by government agencies. It also points up how difficult delegation can be in practice. EPA, the Justice Department, the challengers' attorneys, and two panels of judges devoted enormous time and effort to answer a single question: What did Congress mean by the two words "will endanger"?

The outcome in *Ethyl* was a success for the Justice Department and EPA. The court upheld EPA's lead regulation, and the lead phasedown went forward. The government's legal success has turned out to be an environmental success as well. In the 10 years since the lead regulations went into effect, lead in the ambient air has decreased dramatically. Moreover, the regulatory process worked as it is intended to work: general policy guidance from Congress, technical expertise applied by the Agency, and review of the outcome by the court. As painstaking and time-consuming as the judicial review process may be, it is an essential element of the regulatory process and a necessary protection against the improper exercise of legislative authority by administrative agencies. □

(Haag is an Attorney with the Land and Natural Resources Division of the U.S. Department of Justice.)

# Disagreeing About the Rules: Negotiation and Mediation

by Gail Bingham and James Laue

**T**he clash of environmental conflict is familiar in nearly every locale. One such dispute sent a Long Island garbage scow on a nearly six-month cruise to seven states and three countries. Along the way, almost everyone agreed that something needed to be done with the waste it contained—as long as it was done somewhere else. No one wants the nation's school children exposed to asbestos fibers either, but the controversies over what to do when asbestos is discovered in a school can tear an individual school district apart.

Although these controversies and many others make frequent headlines, increasing numbers have an unusual

ending. Rather than proceeding to the courtroom, or facing a stalemate, many individuals and groups have been able to resolve their disagreements through direct negotiation, often with the assistance of a mediator.

Since 1974, mediators have been involved in hundreds of environmental disputes—some over large policy issues, others over local projects. The diversity of the issues resolved is remarkable, and the overall success rate is high, with agreement in 78 percent of the cases documented.

The U.S. Environmental Protection Agency has been among the leaders in initiating the resolution of

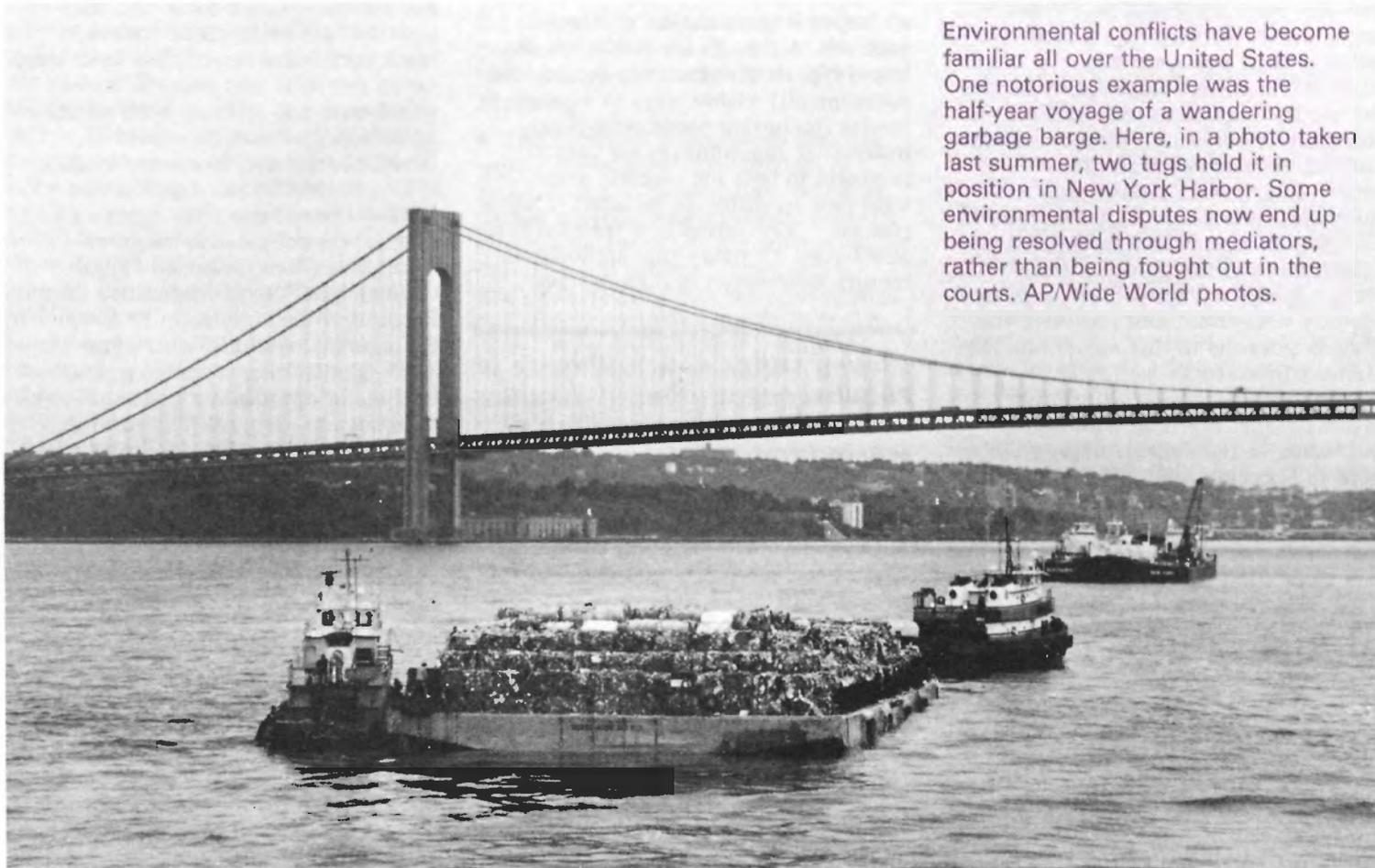
environmental disputes through negotiation and mediation. Dramatic examples of successful negotiation have occurred in rulemaking, permitting, and enforcement disputes.

## Negotiating Regulations

EPA has convened seven negotiated rulemaking efforts, known in the blossoming field of conflict resolution as "reg-negs." Most of them have been conducted under the auspices of the Agency's Office of Policy, Planning, and Evaluation's Regulatory Negotiation Project, directed by Chris Kirtz.

A notable example of the "reg-neg" process resulted in the proposed

Environmental conflicts have become familiar all over the United States. One notorious example was the half-year voyage of a wandering garbage barge. Here, in a photo taken last summer, two tugs hold it in position in New York Harbor. Some environmental disputes now end up being resolved through mediators, rather than being fought out in the courts. AP/Wide World photos.



regulations governing new source performance standards for residential woodstoves. This negotiated rulemaking effort has been analyzed by Philip J. Harter, an independent mediator, in a January 1988 report prepared for EPA.

Woodstoves have become a popular source of heating, particularly in areas of the country with plentiful wood supplies. (Sales of residential woodstoves increased from 220,000 per year in the early 1970s to over 2,000,000 per year by the end of that decade.) With increased use, residential woodstoves became the largest unregulated source of particulate matter and carbon monoxide. Woodstoves also accounted for nearly half of all polycyclic organic emissions nationwide. Following legal challenges by the Natural Resources Defense Council (NRDC) and the state of New York, EPA agreed to develop new source performance standards for residential woodstoves.

The NRDC, representing environmental concerns, and the Wood Heating Alliance, representing manufacturers, retailers, and others in the industry, approached EPA with the suggestion that these new standards be developed through negotiations involving EPA, environmental groups, industry, and states that had begun to implement their own regulations. They felt that such a process might be more likely to result in a regulation that met the environmentalists' interest in a stringent standard implemented quickly and the industry's interest in establishing test methods using independent testing laboratories and in avoiding inconsistent state regulations.

EPA worked closely with Philip J. Harter during the convening phase to identify who could best represent the diverse interests in this regulation. (Mr. Harter continued as facilitator throughout the process.) An initial organizational meeting, with notice published in the *Federal Register*, was held in February 1986. At this meeting, attendees recommended that EPA proceed with the negotiated rulemaking, discussed procedural issues concerning the negotiation process, and developed a list of issues for future meetings.

The negotiation committee originally planned to meet for five two-day

meetings from March through July 1986, but added a final meeting in August when it became apparent that additional time was needed. The issues were complex, and technical papers were prepared both by EPA and by other parties prior to each meeting. After a series of tough negotiations and caucus sessions, the participants reached an agreement in principle on the regulations at the last meeting.

A drafting committee continued to meet intensively following the August meeting to develop final regulatory language. Because the drafting process surfaced many specific issues, representatives consulted frequently with the other members of the full committee. Several versions of the draft rule were circulated over a period of two and a half months. Each member of the committee signed the agreement, and a Notice of Proposed Rulemaking was published by EPA in February 1987.

#### **Negotiating the Management and Cleanup of Waste Sites**

Management of the nation's solid and hazardous waste also generates intense controversy in hundreds of communities. Many municipal landfills are reaching their capacity, pointing to an impending escalation of siting conflicts. Although the public wants improved, environmentally sound, and economically viable ways to manage wastes (including waste reduction), individual communities are naturally reluctant to bear the impacts associated with new facilities. In an effort to allow concerns to be raised and resolved more effectively, 11 states now authorize or require negotiation of disputes over

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#### ***Eleven states now authorize or require negotiation of disputes over siting and permitting of waste facilities.***

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siting and permitting of waste facilities, either in statutes or regulations. They are California, Connecticut, Massachusetts, Minnesota, New Hampshire, North Carolina, Rhode Island, Texas, Virginia, Washington, and Wisconsin.

In Rhode Island, the city of Warwick reached a negotiated agreement in August 1986 with the ETICAM company over the operation of a hazardous waste treatment facility for the electroplating industry. These negotiations were mediated with support from EPA by Wendy Emrich of PennACCORD and Thomas Colosi of the American Arbitration Association.

ETICAM and the local assessment committee met jointly with the mediator four times during a period of 15 weeks, with numerous intervening technical meetings. The agreement reached addressed many issues, among them the types of wastes to be accepted by the facility, the establishment of a trust fund to ensure adequate closure, acceptable truck routes, public access to the facility, training for municipal employees, and liability insurance requirements.

Negotiation and mediation of disputes over the cleanup of hazardous waste sites are also showing promising results. For example, Clean Sites, Inc. has assisted EPA and private parties to reach settlement agreements in at least seven remedial and removal actions worth over \$80 million, with additional agreements reached on remedial investigations and feasibility studies.

EPA Administrator Lee Thomas further strengthened the Agency's support for cooperative dispute resolution when he issued "Final Guidance on Use of Alternative Dispute Resolution Techniques in EPA Enforcement Actions" on August 14, 1987. The Guidance encourages use of four major approaches to resolution of enforcement disputes (fact-finding, mediation, arbitration, and mini-trials), and asks each regional office to recommend at least one case in which these techniques could be applied in the current fiscal year.

#### **Mediating Resource Management**

The Missouri River drains a watershed covering 10 states and more than 500,000 square miles in the United States alone, as it flows 2,315 miles from Three Forks, Montana, to the Mississippi River just above St. Louis.

Many parties have a stake in management of the river: the 10 states, the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, Indian tribes, and a wide variety of groups representing agriculture, navigation, fish and wildlife, conservation, recreation, and railroads.

In the absence of interstate or state/federal guidelines to resolve questions that regularly arise concerning conflicting uses of the water, such disputes traditionally have been dealt with on an *ad hoc* basis, often involving lengthy and costly litigation. In 1983, South Dakota's proposal to sell water from the Oahe federal reservoir to the ETSI Corporation stimulated a law suit filed against the U.S. Bureau of Recreation by three downstream states: Iowa, Missouri, and Nebraska. John Murray of the Conflict Clinic, Inc., brought the four states and ETSI to the table to explore mediation of their dispute. They held six joint meetings in 1983 and 1984 which, all the parties agreed, were moving them toward a resolution until ETSI reluctantly dropped its proposed pipeline project because of financial infeasibility.

This experience led the 10-state Missouri Basin States Association (MBSA) to enlist the Clinic to help MBSA play fact-finding and convenor roles in identifying, analyzing, and providing mediation assistance for interstate water conflicts. The Association added these functions to its bylaws in 1985; completed an analysis and recommendations on eight types of major water issues in 1985-86; convened representatives of the 10 governors for a still-to-be-completed effort to develop a consensus on interstate guidelines or a compact for managing conflicts; and developed, with Conflict Clinic staff James Laue and Miranda Salkoff as mediators, a 10-state consensus on a proposed Corps of Engineers water-pricing policy.

Not every dispute in the Missouri Basin has been resolved—and there will be more. But the MBSA has demonstrated the utility of viewing its work in a conflict resolution framework, and of applying negotiation and mediation to specific conflicts in the Basin.

## What Have We Learned?

These and numerous other examples over the past decade have demonstrated that negotiation and mediation approaches offer useful opportunities for those affected by environmental problems to reach mutually acceptable decisions that can satisfy their interests and their sense of the public interest. However, the path to resolving conflicts may not be easy, and several clear lessons have been learned.

- Conflict makes some people uncomfortable. Effective conflict resolution does not allow the illusory benefits of avoiding differences, however. It is only by acknowledging and learning how to deal with differences that adversaries can challenge themselves and one another to invent more creative solutions to problems.

- Attention must be given to the assumptions on which conflict resolution processes are based. How the scope of an agenda for negotiation is defined, who gets to play, and what rules of the game are set are decisions crucial to whether the interests of all parties truly will be met. For example, negotiations over waste facility siting disputes will never get off the ground if the parties can't agree about whether the negotiations will be about how a facility will be sited or whether it should be sited.

- The choice of participants also can substantially affect the outcome of negotiations. What satisfies one set of parties may not protect the interests of others who are not at the table. Shaping the table and getting the necessary parties there is often a time-consuming and highly complex process. Who has a stake? Who doesn't? Is it possible to represent "the public interest" in any useful way at multi-party negotiations? Should those who oppose any settlement, but could snap off any agreement reached, be there?

- Environmental disputes can be significantly more complicated than the negotiations with which most parties

are familiar. Often environmental negotiations involve multiple parties (organizations not individuals), multiple issues with a high degree of technical and scientific complexity, and parties with greatly different resources to deal with the complexity. These problems can be handled; they just make resolving conflicts more difficult.

## Conclusion

The interest in "alternative" approaches for resolving environmental disputes seems to stem largely from dissatisfaction with the ability of traditional decision-making processes to deal satisfactorily with the real issues in dispute and the costs of delay in protracted conflicts. Rather than viewing negotiation and mediations as "alternatives," however—with the presumption that the traditional recourse to the courts is bad—voluntary dispute resolution processes are better viewed as *additional tools* that may or may not be more effective or more efficient in particular circumstances. It could be argued that informal negotiation has been the central, ongoing process in resolving differences in this multi-interest, decentralized society, and that litigation is the "alternative" when the ongoing processes of problem-solving break down.

Negotiation and mediation have demonstrated remarkably positive results, but litigation and other traditional decision-making processes remain important options. Environmental disputes are so diverse that no single dispute-resolution process is likely to be successful in all situations. With the growing sophistication and success of negotiation and mediation, there now is a broader array of effective options for resolving environmental conflicts. □

*(Bingham is the Director of the Program on Environmental Dispute Resolution at The Conservation Foundation and the author of Resolving Environmental Disputes: A Decade of Experience (Washington, DC, 1986). Dr. Laue is the Lynch Professor of Conflict Resolution at George Mason University and Senior Consultant to the Conflict Clinic, Inc.)*

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***Environmental disputes can be significantly more complicated than the negotiations with which most parties are familiar.***

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# Handling the Punches: Clean-up Regulations and Small Business

by Karen V. Brown

The classification of the dry-cleaning industry and automotive service shops as potential generators of hazardous waste profoundly shocked thousands of small "mainstreet" business proprietors, many of whom represent second and third generation owners of family-operated businesses. For the most part they grew up in the business, learning their trade from fathers, relatives, or friends. They work long hours doing everything from sweeping the floor to bookkeeping.

A typical owner of a dry-cleaning establishment must not only operate the huge cleaning and drying machines, the washer/driers and finishing equipment, but also does the tagging, garment spotting, garment repair, and/or

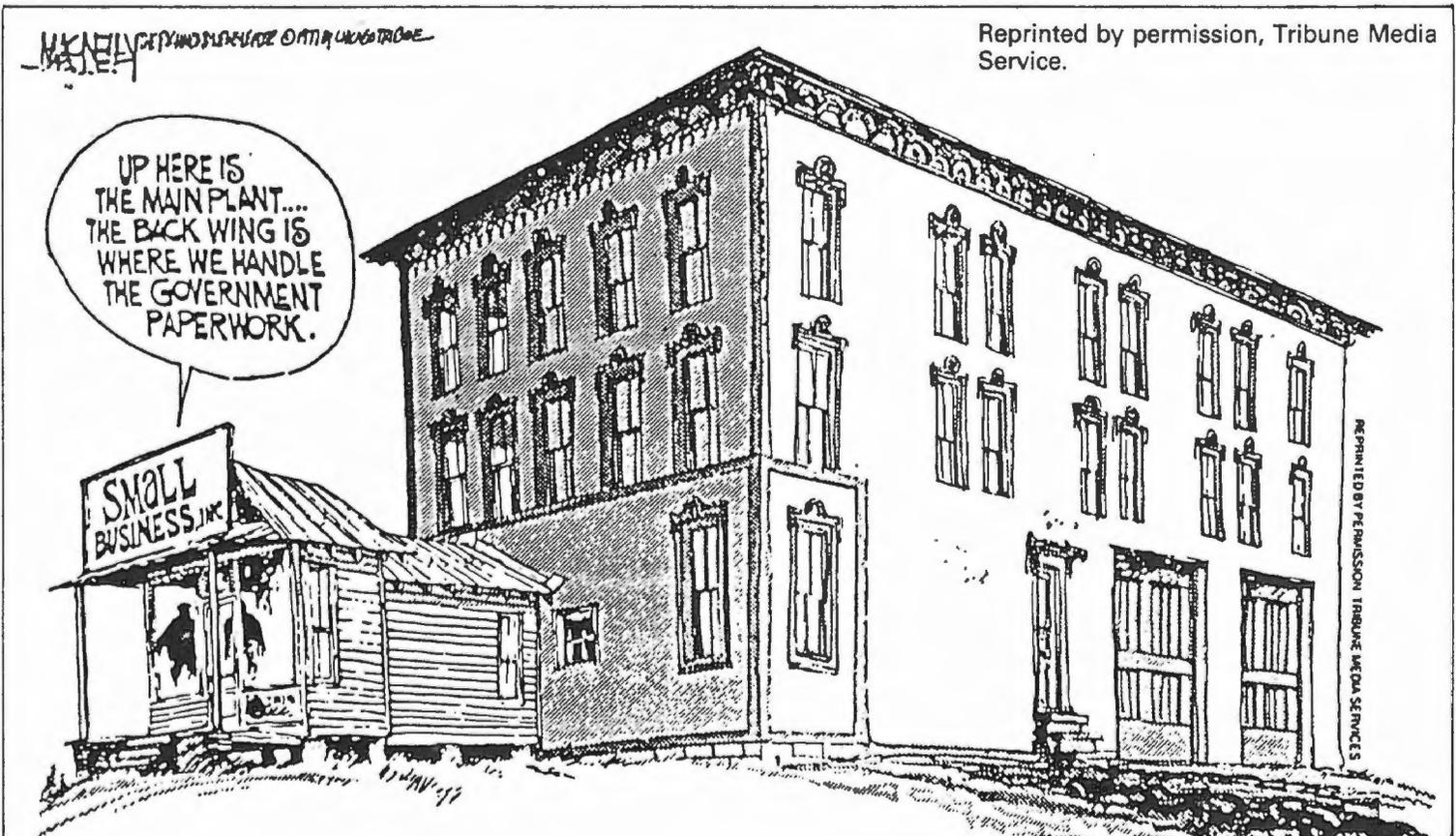
alterations along with cash accounting, tax reporting, buying, hiring, firing, deliveries, etc. The typical proprietor works 10 to 12 hours a day, grosses \$150,000 per year, employs six people, and (after salaries and expenses) makes a profit of \$5,000 to \$7,000 annually.

Automotive repair shops and service-stations boast an even greater range of diverse responsibilities that occupy the owner/operator from dawn to dusk and often beyond. Their profit margin is usually less than \$6,000 per year, and the average workday exceeds 12 hours.

It is against this backdrop of long hours of labor and marginal profits that

the small business community received the news that some of them might now be subject to new federal environmental regulations. One can well appreciate their reluctance to assume another reporting responsibility along with the higher costs of liability insurance that follow the designation "generator of hazardous waste"—albeit small in quantity. Any new and unforeseen expenditure to comply with environmental regulations would have to come from current revenues or directly out of the owner's pocket.

These and other business entities falling under the new regulatory umbrella began to seek out answers to their questions and help with their problems. The Small Business Ombudsman's toll-free hotline began to



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ring and ring and it's been ringing ever since! The small businessman wants to know: Is my company a small quantity generator? What wastes are hazardous? What regulations apply to me? What must I do to comply? Where can I get help and more information?

Of course, the Resource Conservation and Recovery Act (RCRA) isn't the only federal environmental legislation affecting small business. The Ombudsman's Office has provided assistance to hundreds of businesses and industries affected by water quality standards under the Clean Water Act, drinking water testing requirements authorized by the Safe Drinking Water Act, and automotive-import emission-control requirements and conversions under the Clean Air Act, to name a few.

### Considering the Impacts

The Regulatory Flexibility Act of 1980 requires federal agency decision-makers to take into account the effect of regulations upon small businesses before choosing among regulatory alternatives. "Regulatory impact analyses," which are performed for most major regulations, often include a discussion of effects on small businesses, and arguments for or against relaxing controls for some or all categories within the affected industries. However, impacts on small business are almost always weighed against estimates of the environmental benefits that would result from imposing controls on these entities. Consequently, small businesses in different industries can end up being treated differently. For instance, when the effluent guidelines for metal foundries were promulgated, magnesium foundries were exempted from regulations and some iron foundries received reduced controls. On the other hand, the effluent guidelines formulated for the electroplating industry did not include any exemptions, even though most of this industry is composed of small plants.

During a week, the Small Business Ombudsman (SBO) may receive requests for information and assistance from placer gold mines, photo finishing companies, metal finishing companies, pesticide formulators, waste recyclers, laundries, dry cleaners, service stations, muffler installers, meat packing houses, chicken farms, poultry processors, hot springs, mineral spas, paint stores, chemical plants, hospitals, and drug stores. A number of these enterprises are required to comply with several environmental acts and numerous federal regulations.

For example, one such enterprise is agribusiness—which often includes formulation and application of farm chemicals, grain warehousing, storage and sale of petroleum products, livestock buying stations, and general farm-related commercial sales. A typical agribusiness could be regulated under RCRA as a generator of hazardous waste and as an operator of underground storage tanks for petroleum and chemical products; the Superfund Amendments and Reauthorization Act (SARA) of 1986, which requires community Right-To-Know reporting; the Clean Water Act, which regulates liquid wastes, livestock feed lots, organic chemical production, etc.; the Clean Air Act regulating atmospheric emissions from chemical and fertilizer production, grain drying (blowers) etc.; the Toxic Substance Control Act (TSCA) requiring compliance with reporting toxic chemicals and premanufacturing product notices; and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requiring pesticide registration and approval, applicator training and certification, and worker protection standards for commercial farmers.

In addition, agribusinesses would be subject to any future Agency regulation on used oil, fuel additives, "user charges" for pesticide registrations, and waste-minimization requirements among others. The agribusiness sector is not atypical. Hundreds of small businesses and industries are subject to multiple environmental acts and regulations. The typical "mainstreet" dry cleaner may be impacted by provisions of RCRA, CWA, and CAA while the vehicle repair shops are subject to the same Acts along with guidance on brake asbestos exposure under the authority of the TSCA. The list goes on.

Considering that only a handful of these tens of thousands of business

entities has ever heard of the *Federal Register*, the government's traditional means of outreach, and that fewer than half of them belong to national trade associations, EPA must greatly expand its efforts to get the word out. Effective educational outreach is imperative because, with the numbers of entities involved, voluntary compliance is an absolute necessity if the Agency is to achieve its environmental goals!

Though environmental considerations maybe a burden on the entrepreneurial spirit, EPA pledges to work with small businesses to make the nation—and the small business workplace—safer and more salubrious than ever. □

(Brown is EPA's Small Business Ombudsman.)

### Small Business Ombudsman

Since its creation in 1983, EPA's Small Business Ombudsman (SBO) office has handled more than 45,000 telephone hotline and mail requests for advice, information, and assistance on compliance with Agency regulations. It has mailed hundreds of thousands of brochures and pamphlets to small businesses in search of information, and SBO staff have personally spoken to thousands of small business people in appearances before trade associations and organizations across the nation. Additionally, trade publications widely disseminate the SBO toll-free hotline number to the extent that it has become a standard listing in the directories of small business people.

# The Regulator as Seen by a Regulatee

by John A. Krol

In 18 years, EPA's scope and function have expanded from dealing with concerns about car exhaust, smokestack emissions, raw sewage, and chemicals in wastewater to administering major programs under about a dozen environmental statutes. These address a host of environmental concerns that have resulted from our growing industrial society.

In that expanding role, the Agency has had the difficult task of consistently operating as an objective scientific entity in a public, highly political environment. It has often found itself caught among the varying needs and agendas of the public, Congress, environmentalists, and industry. And, although EPA has had its ups and downs in publicity, credibility, and effectiveness, no one would deny that it has become a world-class organization, the standard for other nations.

How has the Agency earned this distinction?

- By making substantial progress in controlling the more visible environmental concerns.
- By striving to balance human health and environmental protection with political, economic, and other social needs.
- By setting near-term and long-term goals and priorities to better plan for and deal with issues.
- By giving attention to newer issues while dealing with older ones.
- By peering over the horizon for future concerns of local, national, international, and global importance.

In spite of good progress, important business remains unfinished. In the agricultural arena, for example, pesticide registration and reregistration, development of health-based pesticide



Cartoon by artist Virgil Armstrong of Wilmington, Delaware, commissioned by The Du Pont Company.

standards for food and water, and the design and implementation of comprehensive protection programs for soil, water, and endangered species are among the programs under way. Other federal and state agencies, lawmakers, agribusinesses, and the public are involved in these programs. Since each group has different perceptions and needs, regulatory effectiveness is dependent in part upon communication among these groups. Feedback is important, and the Agency asked us to comment from our point of view.

In this spirit, I'd like to look at industry's perceptions of the issues with respect to agricultural chemicals. Several of these comments may apply to other Agency activities as well.

### **Pesticide Registration**

- *Agricultural Experience:* To the extent resources permit, Agency scientists and regulators should visit agricultural sites, meet farmers, custom applicators, and other ag representatives to gain a personal understanding of pesticide risks and benefits and the societal implications of their decisions. This is true whether they're dealing with risk assessment or risk management, ground water, or endangered species.

- *Seeing the Big Picture:* It is important that the Agency carry its strategic focus throughout the organization. Staff scientists and regulators with a highly technical orientation need to have a clear view of the "big picture" of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) as a balancing of acceptable risk to obtain desirable benefits. Scientific rigor must be tempered with common sense. An example is repeated and costly requests for additional, often insignificant, data to further quantify potential hazard, without an appreciation that the risk *per se* may be negligible due to negligible exposure.

- *Outside Communications:* Technical balance should be achieved by frequent checks with scientific advisory panels and peer review scientists early in a given decision-making process.

- *Timeliness:* Should the Agency base its actions on timeliness or certainty? This question is raised here in the

context of the improved timeliness that the above measures could achieve.

### **Leadership**

The Agency has taken an important leadership step with its Comparative Risk Project. A team of 75 senior Agency managers, staff persons, and experts representing all EPA programs worked for nine months to identify priorities for their risk assessment and risk management efforts. Their report signals a significant initiative by the Agency to set its own agenda and should foster more rational discussion of environmental priorities by the public.

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***We all live in a rapidly changing society. Industry as well as EPA must change in order to keep up.***

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William A. Butler, former Director of the National Audubon Society, commented on the Comparative Risk Project in a recent issue of the *EPA Journal* (May 1987), "One of the most troublesome of the study's findings is that apparently EPA's current priorities most closely approximate mistaken public perceptions of comparative environmental risk, rather than those of EPA's own and presumably better informed management and scientific experts." For example, the report ranked ground-water concerns relatively low—clearly not the sentiment of the media, environmental groups, and significant portions of the U.S. public. We support EPA's efforts to protect ground water, but feel that the Agency could better set its own regulatory agenda with the support of an informed public and Congress. We believe that the Agency is in a unique position to set risk-reduction priorities and to influence societal behavior. But to do so will require an effective effort to eliminate mistaken public perceptions about comparative environmental risks.

### **Communication**

- *Informing the Public:* We believe that EPA has a role to play beyond hazard communication. It should talk about actual risk under real-life use situations.

Rather than just providing basic information on pesticide hazards and benefits and asking those hearing or reading media reports to fill in the rest of the picture, for example, the Agency should communicate objective information to the public. If this includes an occasional response to hyperbole and sensationalistic reporting, it would go a long way towards improving the quality of the debate.

- *Effective Communication:* The Agency operates in an open, public forum with many spokespersons, requiring both consistency and sensitivity in public comments. Consistency is needed so that published statements reflect commonly held positions, regardless of where in the Agency the quotation originates. Great sensitivity is needed as to the probable impact of public statements and news releases. For example, either the Agency believes that health-based dietary tolerances and margins of safety for pesticides are based on good science, or they do not. The Agency should strive to put their public comments on reported detections of pesticides into perspective for the public.

We all live in a rapidly changing society. Industry as well as EPA must change in order to keep up. Many of the pressures and challenges facing EPA are the same that we face in our own business. We strive to discover and bring to the marketplace new, safe, low use-rate pesticides. We also strive to address environmental concerns through product stewardship efforts, environmental monitoring, and effective communications with pesticide users, the public, social leaders, and the media. We realize that a wide gap exists between public perception and objective reality. The misinformation that presently fills this gap must be replaced with effective national programs of environmental protection and credible health-based scientific information. We encourage the Agency to continue its very positive direction. □

*(Krol is Group Vice President, Agricultural Products Department, at The Du Pont Company in Wilmington, Delaware.)*

# It Has to Be a Partnership!

by Fred Hansen

Both EPA and state environmental protection agencies recognize that their relationship needs to be refined and improved. This signifies what I trust will be the beginning of a new era of cooperation as we move into Phase 2 of the enormous task of preserving the environment and cleaning up past mistakes. I don't want to imply that there aren't major differences of opinion on such controversial topics as acid rain, ozone transport, and hazardous waste reduction, to name just three. Conflicts between states and EPA on such substantive issues are, however, beyond the scope of this article.

My intention here is to address three challenges: the changing state and federal relationship; institutionalized

cooperation and a general acknowledgement at all levels that we are co-equal management entities; and why the states must present a unified front to Congress.

## A Changing Relationship

Initially, the states were the only environmental regulators. Fifty years ago Oregonians voted to create one of the first water pollution control authorities in the nation, launching a successful cleanup of the nation's 12th largest river, the Willamette. Similar stories of pioneer action could be told by many other states.

But the 1960s saw a growing public concern for the whole environment,

culminating in Earth Day 1970. EPA was established because the magnitude and interstate nature of environmental problems made it clear that they needed to be addressed at the federal level too, not just by the states working separately.

This shift of focus was a natural response to the need for a nationally consistent policy. Congressional action and executive mandates were not only necessary but desirable to enhance existing programs and create tough laws

The states have a major role in environmental cleanup. Oregon, site of Mt. Hood, began working on water pollution control in the 1930s. Photo by David Falconer, Folio, Inc.



to deal with such interstate issues as clean air and water and for financing such big-ticket items as construction grants and the federal Superfund.

With the establishment of a major federal role, states were seen as the implementors of rules and programs financed by EPA. In fact, there was an unfortunate perception that EPA was "management" and the states were the "employees," and that all problems would be solved if only the states would attend obedience school. Partly because EPA was financing the programs and partly because states were willing to let EPA take responsibility for promulgating regulations, states found that they gradually played a smaller and smaller role in formulating policy and setting priorities.

EPA became less willing to delegate authority and, even when it did, used scarce resources to closely monitor state action—trying to ensure that we acted exactly as EPA would have. This lack of confidence in the states' commitment and abilities helped institutionalize a level of mistrust and over-reporting that is hamstringing environmental protection efforts and is proving nearly impossible to overcome.

This tendency is especially counter-productive now that states are boosting their role in financing and managing comprehensive environmental programs that not only comply with federal regulations but address issues that are state-specific. In addition, amendments to federal legislation such as the Clean Water Act, Safe Drinking Water Act, Clean Air Act, Resource Conservation and Recovery Act, and Comprehensive Environmental Response, Compensation, and Liability Act all mandate more involvement by state and local government in the details of implementation. EPA has not moved fast enough to recognize these new state roles and initiatives.

### **Institutionalizing the Change**

In the past few years, the public's expectations of government have undergone major revisions. Columnist David Broder noted recently that as federal participation in some problem areas has diminished, the states have stepped in to fill the void. Now states and EPA are beginning to agree that they are co-managers with different but equal responsibilities.

The importance of building a partnership based on parity, cooperation, and communication is reflected in such forums as the Training

and Technology Transfer Task Force (TF). Appointed by Lee Thomas, the TF saw early in its deliberations that the relationship between the states and EPA was strained and that steps needed to be taken to rebuild the state/EPA partnership before any other improvements would work. The groundwork for improving training and technology transfer had to be built in a manner that first acknowledged the two management entities as partners; without that perspective, attempts to improve the training and technology transfer programs would be hindered.

Indeed, there needs to be more of this type of cooperation at all levels if we are to institutionalize a more effective state-federal partnership. Both partners have strengths. EPA as a larger, national organization is ideally situated to take the lead in such areas as major research, providing technical expertise to states, and assuring consistency across state borders. States, on the other hand, should manage most environmental programs, coordinating them with specific state laws and regulations in the context of national goals and deadlines.

It is important to recognize this changing relationship and build it throughout the nation. EPA needs to place more operations centers near state environmental agency headquarters, thus improving communication by increasing daily contacts. The number of personnel exchanges between EPA and the states should also increase. That would not only improve communication but also validate the idea that competent, trained personnel can be found at all levels within the environmental agencies. Successful problem-solving is a two-way street, and no single party has all the answers.

### **The Assertive State**

States must be unified to present Congress a clear statement of what we need and don't need in environmental laws and regulations. We must make clear that we need flexibility, not to be less stringent but because we are in the best position to identify priorities and pursue pressing problems. States invariably ask for more flexibility to address a particular geographical community or political situation. And yet, when Congress charges that the flexibility has resulted in environmental damage or inconsistencies among states, it is EPA, not the states, that most often bears the brunt of Congressional wrath.

There are few EPA priorities that do not make sense if we had unlimited

resources. We do not. Naturally, we recognize that many of these priorities have been set by Congress. Congress hears often from EPA, the regulated community, and environmental groups. Congress does not hear a uniform voice from the states. When it hears from them it is most often about a state's individual problems. Exceptions such as recent work on Clean Air Act revisions should serve as a model for future efforts.

On the whole, the states are the most significant enforcers and regulators of environmental laws. We directors and commissioners need to participate more fully in the formulation of national policy and then articulate these views to Congress consistently and forcefully. We all too often rely on the work of the Association of State and Interstate Water Pollution Control Administrators, the State and Territorial Air Pollution Program Administrators, the Association of State and Territorial Solid Waste Management Officials, and the National Governors' Association to represent our views. And though they do a very good job, we are the ones with the necessary clout to be heard by our governors and congressional delegations.

There is no magic formula to make this all happen, but I know that it will require a "change of attitude" between EPA and the states and "institutionalization" of the partnership.

### **Conclusion**

I see the evolution of a new state and federal environmental agency relationship as a positive step. It will result in more efficient protection and preservation of our environment. Attitudinal changes already underway are the first step. It is important to continue this process by creating an institutional atmosphere that recognizes states as co-equal management entities. Personnel exchanges, more operational proximity, and expanding consultative programs to exchange ideas and expertise are only a few of the ways we can accelerate the process.

Lastly and most importantly, the states must recognize that when we ask for parity we must be prepared to work together to present to Congress and EPA our united approach. In this way, we will solidify our position as co-equal managers working together to protect the environment. □

*(Hansen is Director, Oregon Department of Environmental Quality.)*

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# Looking Backward: A Historical Perspective on Environmental Regulations

by Jack Lewis



Since EPA's founding in 1970, the Agency's regulatory powers and responsibilities have been the subject of intense debate. Much of that debate has been specific to EPA and the problems it handles: protection of public health and restoration of the natural environment. There is, however, a larger context: nothing less than the role of the federal government at large, and how that role should be defined and redefined as the nation's needs change.

Before we examine the major themes of the regulatory debate as they relate specifically to EPA, let's take a quick and very broad look at the historical context from which modern-day federal regulation has evolved.

The United States has come a long way since the drafting of the Constitution in 1787, a very long way indeed. The heavily urbanized and industrialized world power of 1988 would be unrecognizable to the Founding Fathers. If farmers, bankers, and merchants of 1787 could be resuscitated for a debate with today's presidential candidates, nearly all would sound libertarian to modern ears: fiercely hostile to any centralization of government, and adamantly protective of the rights of private individuals and local magistrates. Still fresh in their minds was the stinging indignity of enslavement to British rulemaking and taxation.

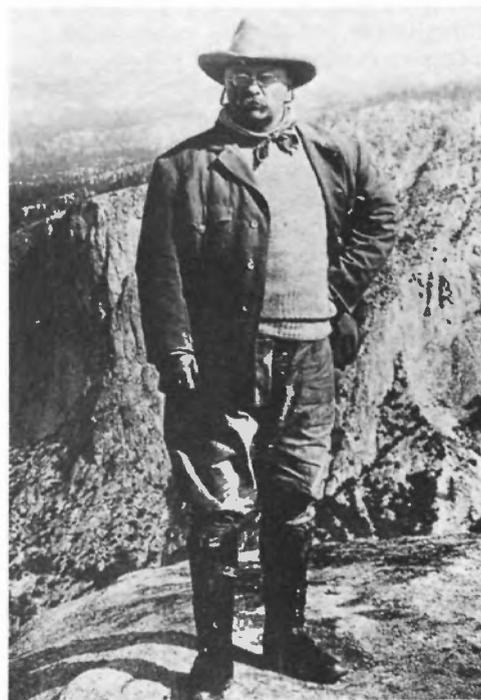
A central theme in the writings of Tom Paine and other firebrands of the day was the youth of the American republic and its happy freedom from the complexities of law and regulation characteristic of ancient Britain. Two hundred years later, it is hardly surprising to see the United States—and its governmental bodies at all levels—exhibiting many of the traits of a polity grown old, the tendency toward "gridlock" once vilified under other names by colonial pamphleteers.

Of course, there is a clearcut difference between federal regulations and their colonial antecedents of the 1700s: ours are the products of a democratic process, forms of restraint that we as a people have chosen to

Theodore Roosevelt National Park, Medora, North Dakota, includes scenic badlands along the Little Missouri River and part of what once was Roosevelt's Elkhorn Ranch. These sandstone formations are in the Wind Canyon South Unit. Roosevelt was instrumental in saving thousands of acres of land for parks and wildlife refuges. Jack E. Boucher photo, National Park Service.

assume. That they should appear alien to the average citizen, and in some cases incomprehensible, is largely a reflection of the fact that they have been written by experts for experts in a society that demands scientific standards of precision even in statements about uncertain or unpredictable trends.

It was not always thus. Between the formulation of the U.S. Constitution and the Civil War, state and local governments were zealously protective of their prerogatives. The federal bureaucracy remained miniscule in scale, and its laws often resembled treaties among sovereign powers more than modern-day statutes. Economic expansion was the order of the day, and



Theodore Roosevelt, conservationist and 26th U.S. President. Theodore Roosevelt Collection, Harvard College Library.

all levels of government hastened to distribute "sweetheart" franchises and charters to the builders of turnpikes, canals, and railroads. Virtually no effort was made to "regulate" any form of capitalist enterprise.

What little restraint the country was willing to throw in the path of progress took the form of the common law traditions the United States had inherited from its mother country, Great Britain. U.S. common law gave citizens the right to take legal action as a means of protecting themselves against nuisance or harm. If the court's ruling went in their favor, they could obtain compensation for injuries sustained.

Some common law actions from this era led to judicial rulings that "regulated" the activities of isolated transgressors against the environment or the public health.

War is another way of redressing grievances, as America's Civil War illustrates: the hard-won victory of the North was the triumph of industry and city over agriculture and slavery. For the next 35 years, during the so-called "Gilded Age," all-out competition raged among increasingly gigantic utilities, railroads, and other industries. Their lobbyists in fast-growing Washington saw to it that general and permissive grants replaced the exclusive franchises of the slower paced and more genteel antebellum world. The individual citizen was more and more a tiny David confronted with the monoliths of private enterprise.

The federal government, too, was beginning to grow, albeit at a much slower pace. Its powers were not really exercised, however, until the turn of the century when leaders, such as President Theodore Roosevelt, started using the federal statute book to shield U.S. citizens from the unbridled impact of "progress" run amok. Lawmakers decided it was impossible to turn back the clock to laissez-faire competition. Monopolies were a fact of American life, and the best that the federal government could do was to set up administrative commissions to control their worst abuses. First railroads, then public utilities, and other large-scale business entities fell under the purview of newly created federal commissions—ancestors of today's regulatory agencies.

One of President Roosevelt's favorite causes was the protection of America's wilderness territories. The conservationist mentality—given its first voice in the mid-19th century by Henry David Thoreau—had become much more popular by 1901 thanks to widely read nature writers such as John Muir. Roosevelt, himself a great outdoorsman and personal friend of Muir, used his presidential power to double the number of national parks and almost quadruple the national forest area: steps that gave a firm foundation to the conservationist tradition that, along with the parallel traditions of common law and public health, was so integral to the founding of EPA.

The public health tradition also took a giant step forward during this same period. In the first years of the 20th

century, preventive federal statutes were written to regulate the quality of food, drinking water, and sewage treatment.

At first *de facto*, then *de jure*, the U.S. Marine Hospital Service—an organization dating back to 1798—gradually expanded its functions to deal on a centralized basis with broad issues of public health. In 1902, Congress re-named it the “U.S. Public Health and Marine Service,” a name that was further altered in 1912 to the “U.S. Public Health Service” (PHS).

A large part of the PHS’s early work had to do with the prevention of waterborne disease, such as typhoid; in later years, that mission was expanded to include standard-setting for air quality in the industrial workplace. These early PHS water and workplace air standards became the prototypes for the first federal water and air programs of the 1950s and 1960s—both of which originated at the PHS. Lawmakers and health professionals in the states were also heavily influenced by precedents set by the PHS.



Rachel Carson, environmental pioneer. Erich Hartmann photo, Rachel Carson Council, Inc.

The Great Depression of the 1930s launched a new and even more activist phase in the evolution of the federal government. The New Deal policies of President Franklin Roosevelt caused a substantial increase in the size and power of the federal bureaucracy. Severe economic hardship opened the way for public works projects that regenerated the nation’s infrastructure, and in doing so led to improvements in the quality of U.S. drinking water, sewage treatment, and other services vital to public health. The Civilian Conservation Corps put some of the jobless to work on improvement projects in wilderness and forest areas.

In addition, New Deal leaders stressed the importance of national coordination and planning, objectives that were unrealizable without an increasingly intrusive range of federal statutes and regulations . . . and ever larger and more comprehensive bureaucratic entities. For example, in 1935 President Roosevelt opted for consolidation rather than diversification by assigning federal regulation of the trucking and busing industries to the Interstate Commerce Commission, which had been established in 1885 to control the railroads. Furthermore, he decreed that the regulatory actions of all U.S. commissions should be tailored to the achievement of national policy goals.

Coordination and planning of a military and economic nature had a major trial run during World War II. To some extent, this successful experiment in federally run mobilization laid the groundwork for the ambitious environmental statutes assigned to EPA one by one in the 1970s. At the very least, the idea was driven home that the federal government could regulate and coordinate disparate types of behavior to meet national policy goals.

By the 1950s, other factors were fostering a new regulatory climate. The unbridled growth of the nation’s booming chemical, plastics, petroleum, automotive, aviation, and munitions works was creating highly visible forms of pollution. As a result, the traditional method of individuals seeking redress of environmental grievances under the common law became inadequate.

The problem was not so much the quantity of environmental actions under the common law: it was their sheer difficulty from a legal standpoint. Expert witnesses could be found to argue both sides of any case, to the consternation and confusion of judges and juries. Also, quite a few cases involved tri-state and bi-state metropolitan areas, such as New York

City and Chicago, with a crazy quilt of conflicting state laws and local ordinances.

Not only citizens but the industries they were suing grew impatient with the lack of *a priori* environmental standards, both legal and scientific. Some states formed advisory commissions to offer technical advice to concerned parties. From more and more quarters came the suggestion that the federal government should step in and determine exactly what were “safe” levels of various pollutants.

Several federal programs were set up both to perform research on air and water pollution and to establish national standards. Their impact was blunted by several deficiencies, some of which were immediately apparent while others came to light only later. The Federal Water Quality Administration (FWQA) was formed in 1965. The National Air Pollution Control Administration (NAPCA)—although not given that name until 1968—originated as a research body in 1955 and had also acquired some standard-setting powers by the mid-1960s. Both FWQA and NAPCA were at first part of the Public Health Service, which was—as its name suggests—more committed to public health than to environmental protection.

The FWQA broke off from the PHS in 1966 and became part of the Department of the Interior. Since pesticides were already the concern of the Department of Agriculture, a pattern of administrative fragmentation along the narrow lines of single media (air, water, etc.) was being perpetuated at the very time when ecological themes of inter-relatedness were arising to challenge the limitations of earlier modes of thought.

The predominant climate from which EPA’s predecessor programs arose was, in fact, not ecological at all, but firmly entrenched in decades-old public health traditions. The Public Health Service had a pattern of not intervening in any problem unless invited by state officials; this did little to foster strong enforcement. The preventive, pragmatic, disease-specific nature of PHS traditions, though it had its own rationale in the public health sphere, was simply not interventionist enough to lead the fight for restoration of the biosphere. And this was a goal that had become extremely fashionable in the wake of *Silent Spring’s* publication in 1962.

The U.S. Environmental Protection Agency, formed in December 1970, was a hybrid of all these multifarious and frequently conflicting patterns. The fledgling Agency was saddled with a tremendously difficult regulatory mission: How should ecological goals be balanced with those related to public health and the common law rights of the individual? How should the atmosphere of public and media hysteria be dispelled? How should scientific findings be interpreted and correlated—and their gradations of uncertainty communicated to lawmakers, reporters, and citizens?

The regulatory challenge was so great, in fact, that it is hardly surprising that EPA quickly became and today remains involved in many of the most controversial issues in the federal government. Yet the Agency has made important progress over the past 17 years: great strides have been made in cleaning up America's air and water, especially the highly visible forms of desecration that fueled the crisis mentality of the late 1960s. The persistent, organochlorine pesticides of two decades ago, such as DDT, have been largely eliminated, and good

progress is being made in dealing with abandoned hazardous waste sites.

The challenges of the future involve extremely important but less visible problems of cross-media pollution, stratospheric ozone depletion, radon contamination, and protection of air and water supplies against ever-proliferating types of toxic chemicals in trace concentrations. Continued progress on such problems will be incrementally more expensive to the U.S. government and U.S. society than the gains made during EPA's first decade and a half: a 15-year period that has coincided with economic and energy problems totally unanticipated in 1970. Crises in those areas introduced constraints that spawned the "regulatory reform" movement of the late 1970s and the 1980s: an effort to divest the federal government of many of its recently assumed regulatory responsibilities and to let state and local governments as well as business take up the slack.

Yet, despite growing concerns over the size and cost of the federal government, public-opinion polls indicate that the American people are as firmly committed as ever to the fulfillment of EPA's public health and

environmental goals. Unfortunately, in many cases, the public's evaluation of what most needs fixing—an opinion EPA must under law solicit and consider—does not always square with expert scientific analyses of the most pressing dangers confronting the health of the nation's citizens and their natural environment. As a result, controversy continues over the appropriate direction and scale of EPA's future regulatory mission.

Ideal preconditions for a more coherent and successful future seem today as elusive as they have always been: EPA's laws are still reauthorized and amended one at a time in a manner inimical to cross-media and unified-field ecological thinking. As a result, EPA managers have become adept in bringing cross-media and cross-program perspectives to bear in their day-to-day implementation of the Agency's statutes.

Ingenuous adaptation to administrative challenges will become ever more imperative in the years ahead. EPA's legally assigned tasks have always seemed to dwarf its resources. As the nation's lawmakers strive to resolve the problem of the deficit, EPA managers will have to make sure they and their co-workers learn new ways to improve their effectiveness as regulators.

Fortunately, sophisticated computer hardware and software are already making it easier for federal regulators to stay abreast of huge volumes of data. Even so, there can be no technological substitute for dedication and farsighted thinking on the part of EPA managers and scientists as the Agency faces both the foreseen and the unforeseeable challenges of its third decade. □

(Lewis is an assistant editor, EPA Journal.)



This gnarled pine grows in Yosemite National Park, California. When the park was established in 1890, the federal government's responsibilities were starting to expand. At the turn of the century, newly created federal commissions, predecessors of today's regulatory agencies, began exerting control over monopolies and large business entities. Jonathan Blair photo, National Park Service.

# Speaking about Deadlines: A Forum

Max Baucus

Deadlines. We all live with them. And at times we all chafe under their burden. But in the area of environmental protection, deadlines are critical for carrying out the national demand for a cleaner and healthier environment.

Deadlines are necessary to spur movement by states, industry, and EPA towards the goals set by Congress. Congressional deadlines force action and help overcome the many obstacles to pollution control.

The deadline serves two very useful purposes. It forces us, whether we're individuals or a government agency, to bring discipline to our lives. And it helps us focus on the goals we're trying to reach. Abstraction is very difficult for most of us to live with, both in defining our tasks and in deciding when they must be completed. While deadlines are not the only way to make our tasks more manageable, they go a long way toward helping us to get a grasp on a project.

Still, Congress should be cautioned to remember some important points when deadlines are set. Otherwise deadlines can become the tyrant that actually suppresses action. First, our deadlines are tools to achieve a policy. We must be clear about what we want before we can decide how fast we want to go in a given direction. Second, deadlines



must be realistic. They should not be so numerous that their effectiveness is diluted, nor should they be so long-range that they encourage delay. Third, deadlines must be flexible. If meeting the mini-goal of the deadline means missing the overall goal of the policy, adjustment is demanded.

Congress will continue to impose deadlines. They can't be avoided. The question is, how do we make them stick. I believe the best approach is to diligently keep an eye on agencies to make sure they're doing what's required. We can do this through oversight or the budget process, whichever works better to convince an agency that we mean business with deadlines.

The natural inclination of any bureaucracy is to remain at rest. It's up to Congress to provide incentives, either through a carrot or stick approach, to make sure deadlines are met. And it's also up to us to provide leadership and guidance with clearly articulated goals and realistically attainable deadlines. □

*(Senator Baucus (D-MT) serves on the U.S. Senate Committee on Environmental and Public Works, where he is Chairman of the Subcommittee on Hazardous Waste and Toxic Substances.)*

Jerry Emison

The Clean Air Act was the first environmental statute to make extensive use of Agency-forcing deadlines. For this reason, it is useful to look at EPA's experience with it to see what lessons can be learned.

First, the Act's deadlines have resulted in action by EPA and the states. A recent study conducted by the Environmental and Energy Study Institute confirmed that deadlines play an effective role in speeding action by EPA, the states, and the regulated community. The study noted that court-ordered deadlines are more effective than statutory deadlines in speeding EPA action and setting priorities. This has been consistent with our experience, but it highlights one of the hidden problems with deadlines.

Statutes which establish deadlines implicitly assume that the resources, technical expertise, and public support needed to meet them will be available. EPA's experience under the Clean Air Act has shown that deadlines alone do not ensure that this occurs.

Resources are not always available to meet the multiple responsibilities established in complex and lengthy statutes. As a result, EPA necessarily finds itself choosing to meet some deadlines and neglect others. EPA tries to make these choices based on risk and environmental protection. However, the existence of detailed statutory deadlines means that such choices frequently become a function

*No environmental progress would be made without deadlines!*

*Deadlines are overkill, wasting everybody's resources!*

*Deadlines are the only way anything is going to get done!*

*Deadlines make EPA's life miserable and don't get results!*

*It depends on who you are talking to. The numerous deadlines that Congress has given EPA in environmental statutes have been praised and criticized. Yet there is one indisputable point: Deadlines—requirements for a certain action by a certain time—are a big fact of life in EPA's job.*

*Are deadlines good or are they bad for cleaning up the environment? EPA Journal asked six observers with different vantage points in the environmental arena for their opinions. They include a U.S. Senator, a lawyer representing industries subject to environmental regulation, an attorney with an environmental organization, the director of a state environmental department, an EPA official, and the director of a group which did a special study on the subject. Their commentaries follow:*



of who can sue the Agency most effectively. A further consequence is a steady erosion in the "infrastructure" of a program, when basic activities are neglected because resources must be shifted to deal with court-imposed "crisis" deadlines.

Technical expertise can also limit the ability of EPA and state or local agencies to meet deadlines. Technology-forcing deadlines have had some successes, most notably for automobiles. However, in other cases, deadlines force the Agency to issue regulations before all of the technical details have been determined. Even worse are cases where the Agency does not know how to achieve a given deadline, or can do so only by applying more resources than are realistically available.

Finally, statutory deadlines are no substitute for public support. When all segments of society work together systematically to reduce pollution, we accomplish more than if we build resistance to air-quality goals

because particular deadlines prove to be unreasonable. This was the case with Clean Air Act attainment deadlines in the mid-1970s. Ultimately, regulatory agencies cannot rely on deadlines to compel draconian action by regulated industries or by a public which is not prepared to accept it.

Deadlines, if few in number and properly applied, are a very good tool to focus attention on a problem and force action. However, deadlines that are far beyond the Agency's ability to accomplish can lead to chronic disrespect for deadlines. When there are too many deadlines, EPA can end up with no priorities because everything is a priority. It is important to clearly articulate what is important and then focus our energies on it.

Future deadlines should be set for only the most important environmental goals. They should be reasonable in terms of the time and resources necessary to meet them. Only this kind of deadline can produce permanent gains. □

*(Emison is Director, Office of Air Quality Planning and Standards, EPA Office of Air and Radiation, Research Triangle Park, North Carolina.)*

### John Quarles

The answer is "both." That may appear to duck the question, but it is the truth. Deadlines have been essential in spurring progress toward stronger environmental controls. The reason is that deadlines are a prod to action. They help to force decisions.

The need for deadlines stands out in the environmental field because of the complexity of most environmental regulatory



issues. The facts are rarely clear. Instead, uncertainty pervades all aspects—science, economics, technology, institutional capacity—you name it. Faced with that uncertainty, compounded by conflict as to the underlying social objectives, the urge is almost overpowering to defer decision-making and request additional data. One of the triumphs of early environmental statutes was their imposition of deadlines which forced government officials to bring their analyses to a conclusion.

The heart of the argument for deadlines is the need for action. Action-forcing deadlines are deliberately designed to require cutting through certain unresolved questions in order to make a decision and get on with the job. Their justification is that it is often better to assume the risk of making mistakes than to run what may be the greater risk of passively accepting an institutional structure that prevents taking any action at all.

The argument against deadlines is that the effectiveness of this device has been largely destroyed by abuse. To operate effectively,

deadlines must be credible and command respect. In the rush of the public to achieve environmental protection, impossible goals have been set. In the rush by Congress to pile one urgent priority on top of another—and another, and another—the use of deadlines has been excessive. Statutory provisions too numerous to count have imposed deadline after deadline, setting schedules totally out of relationship to the work required to meet them. As the tempo of this process has intensified over the past 15 years, the integrity of deadlines has been destroyed.

When the first environmental deadlines were established, they were respected, and they were met. By successive stages, however, the gap between statutory deadlines and realistic programmatic achievements has reached hopeless proportions. Regulatory officials are now often scornful of the deadlines. The Office of Management and Budget treats them with open contempt. Courts have learned that the deadlines are likely to be impractical and unenforceable. Even Congress has abandoned any real expectation that they will be met.

In short, environmental deadlines have lost the indispensable elements of credibility and respect. That is a misfortune, since when properly used, they served this country well. □

*(Quarles is a partner in the Washington office of Morgan, Lewis & Bockius and represents several corporations. From 1970-1973, he was EPA's General Counsel and Assistant Administrator for Enforcement, then EPA's Deputy Administrator through 1977.)*

*(Continued on next page.)*

## Jacqueline M. Warren

Since the early 1970s, statutory deadlines have been a prominent feature of the major environmental laws and have played an important role in their implementation. Questions are occasionally raised about their effectiveness and their impacts on Agency priorities and resources, as well as on the quality of regulations. But on balance they have been a constructive factor in directing EPA to carry out its statutory responsibilities. As a 1985 report on the issue concluded, "it is clear that deadlines are one of the critical factors necessary for action in the environmental arena. . . ."

In general, Congress imposes deadlines in order to circumscribe Agency discretion to disregard a legislative direction. Inclusion of deadlines in a statute provides a modicum of assurance that the appointed task will be acknowledged, included in the Agency's budget, and carried out on a schedule that is reasonably related to the statutory timetable. It also provides a legal mechanism by which outside organizations can compel the Agency to implement the provision in question.

The history of the Clean Air Act, the Clean Water Act, the Toxic Substances Control Act, and the Resource Conservation and Recovery Act (RCRA) shows that citizen suits to enforce compliance with deadlines have been central in directing EPA to implement major features of each statute. For



example, the 1976 Natural Resources Defense Council Consent Decree, involving implementation of the toxic pollutant discharge provisions of Section 307 of the Clean Water Act has shaped EPA's implementation of that Act for more than a decade. That Consent Decree (which was incorporated into the statute in 1977) terminated litigation in four deadline suits against EPA. Similarly, a 1978 suit by the Environmental Defense Fund put the Agency on a court-supervised schedule to implement the basic hazardous waste management program under RCRA.

Other examples can readily be drawn from different statutes to illustrate the same point. Looking back over EPA's history, it is clear that deadlines have played a constructive role in shaping both the timing and the substance of the Agency's implementation of these important environmental programs without compromising the quality of the regulatory effort. □

*(Warren is a Senior Staff Attorney with the Natural Resources Defense Council.)*

## Ken Murphy

"I can't help but believe that deadlines have been incredibly effective."

"I can't help but believe that deadlines have been incredibly ineffective."

This is how two long-time participants in the legislative debate view statutory deadlines, demonstrating how passionately people disagree about them. Effectiveness, like beauty, lies in the eyes of the beholder. Depending on what objectives you think deadlines serve, you can come to contradictory conclusions about them. And everyone has an example to support his opinion.

The debate over deadlines began with the Clean Air Act of 1970 and continues with a vengeance today as Congress considers what to do about the many areas of the country that have failed to meet clean-up deadlines.

Congress sets deadlines to accomplish multiple purposes: to force EPA action by a certain date, to set priorities, to blunt the influence of the Office of Management and Budget (OMB), and to make possible court suits to compel agency action, to name some of the most important.

In an effort to provide better information on the deadlines debate, the Environmental and Energy



Study Institute initiated the first comprehensive analysis of the deadline record and factors relating to effectiveness. (This 1985 report is available for \$10 from the Institute, 122 C Street, NW., Suite 700, Washington, DC 20001.)

Here's what we found:

- Deadlines play a necessary role in getting EPA, the states, and the regulated community to act, but they are not sufficient by themselves to guarantee action, and their bottom-line effectiveness is elusive.
- Congress imposes more deadlines on EPA than it can possibly meet, diluting the import of any one deadline.
- Many deadlines are unavoidably unrealistic because no one can anticipate what's involved in carrying out a proposed task. Deadlines perceived as more realistic are more effective.
- The cumulative load of deadlines on EPA means Congress seldom sets priorities. Instead, the real agenda is largely set by the courts and, ironically, by EPA management and OMB.

- The deadline load sets up EPA (and the states and the regulated community) for failure, increasing Congressional and public distrust, leading in turn to more deadlines.

- Deadlines have little impact on EPA's overall budget or the budgets of particular programs and provide only a limited check on OMB power.

So, should Congress stop setting deadlines? Our answer is no. There are no real alternatives, unless there are major changes in this country's "command-and-control" approach to pollution control and its legislative-administrative-judicial system, neither of which seems likely. And deadlines, however imperfect, serve many purposes for Congress, EPA, the states, environmental groups, and even the regulated community.

Still, there are significant opportunities to improve the effectiveness and efficiency of deadlines. Congress can, and should, take a number of constructive steps:

- Enact fewer deadlines, governing only the most important tasks.
- Set more realistic deadlines, to increase the chances that everyone will take them seriously and work to meet them.
- Make crystal clear which deadlines are really expected to be met, through sanctions, aggressive oversight, and other means.

- Have the authorization committee go to bat for their programs in the budget process in order to close the gap between Congressional expectations, as expressed in the authorization laws, and EPA funding levels, as provided in appropriations laws.

- Tackle head-on the issue of OMB involvement in EPA regulations and budget.

These steps will not be easy. But unless Congress takes them, deadlines will continue to be no more than a not very powerful first step—until they have passed and lead to litigation or legislative extension. □

*(Murphy is Executive Director of the Environmental and Energy Study Institute, an independent, bi-partisan policy development center which works closely with the Congressional Environmental and Energy Study Conference and its members.)*

## C.D. Besadny

There are deadlines everywhere. Reporters have them, and so do diplomats. If you borrow money, you must repay it by a certain date. So why are there questions about environmental protection deadlines?

The answer involves economics, politics, and science. But it also involves evenhandedness and a determination to follow through in an equitable fashion. Congress and state legislatures have passed numerous laws and accepted countless administrative orders to protect the environment. But the critics claim that enacting laws granting generous appropriations has not cleansed the environment.

Furthermore, they correctly state that by focusing on environmental media such as air or water, these laws and appropriations ignore the truth that everything is connected to everything else. The laws are not holistic.

Nevertheless, in my role as a chief state environmental administrator, I heartily endorse the concept of mandatory compliance deadlines in certain key areas:

- As we work toward specific quality levels for air, water, or land.
- For installation of pollution-control equipment, waste-reduction processes, or materials-handling practices.
- In reaching pollution permit conditions.
- In accomplishing mitigation or restoration.

Without deadlines, procrastination, misunderstanding, and litigation are more likely. It would be more difficult to bring environmental violators to justice.



In a larger sense, we need federally imposed deadlines to maintain a level economic playing field for states that are competing for jobs. Federal deadlines protect progressive states like Wisconsin from those that would cut environmental corners to attract jobs or investments. Perhaps it is possible to develop, enact, apply, and enforce environmental protection deadlines more efficiently and effectively. Thoughtful representatives from business, government, and public interest and academic circles should review the strengths and weaknesses of the existing deadline-forcing process and offer improvements.

But deadlines are necessary. Without them and their even application in every state, environmental progress and economic fair play will never be fully achieved. □

*(Besadny is Secretary, Wisconsin Department of Natural Resources.)*

# Heading Off Waste Before It Starts

by James Lounsbury

**M**odern industry has provided Americans with an unprecedented standard of living, but it has also generated massive amounts of chemical wastes and other waste products. Before there were environmental laws and pollution control technologies, most of these wastes were discharged directly into the environment with little thought for the consequences. Since the mid-1960s, the nation's environmental laws sought to reduce pollution through increasingly stringent end-of-pipe requirements that controlled waste generation and other discharges to the environment.

In the mid-1970s, EPA made a first attempt to redirect the nation's pollution control strategy away from end-of-pipe treatment and toward pollution prevention. EPA developed a waste management hierarchy that emphasized waste prevention over waste generation and management. However, EPA's initial policy had only a minimal effect since the priorities reflected in our major environmental statutes continued to focus on end-of-pipe pollution controls.

The 1984 amendments to the Resource Conservation and Recovery Act (RCRA) marked a strong shift in hazardous waste management policy. They required even more stringent restrictions on treatment and land disposal of wastes. But more importantly, the 1984 amendments presented, as the nation's top waste management priority, a call for waste generators to reduce or eliminate, where feasible, the generation of hazardous waste as expeditiously as possible. EPA has focused on several areas to accomplish this "waste minimization" policy goal. There are two basic waste minimization approaches that are the focus of this initiative:

- Reducing waste at the source by changing production processes so that less waste is generated in the first place.
- Recycling waste materials in whole or in part so that they can be reused in some way.

J. Winston Porter, EPA's Administrator for Solid Waste and Emergency Response, has some very strong views on what direction EPA should take:

I've been making tough waste management and cleanup decisions in the RCRA and Superfund programs for almost three years. I'm convinced that we can't continue to generate, treat, and dispose of such huge quantities of wastes. Waste minimization is an alternative that can certainly have a significant effect over the coming years. Waste minimization is very helpful from an environmental perspective, and can often be a real winner economically.

## Industry Incentives

Foremost among these are cost considerations as traditional forms of hazardous waste management become ever more expensive, some prohibitively so. Land disposal methods, while still the least expensive way of disposing of hazardous waste, have skyrocketed in costs from as little as \$10 per ton of waste a decade ago to well over \$240 per ton now. Incineration costs may be as high as \$1500 per ton. Moreover, these escalating disposal costs are only part of the bill that generators of hazardous waste are incurring for land disposal these days. They must also pay for administrative and reporting procedures and insurance coverage against a host of liabilities that are associated with accidents and/or the mismanagement of wastes. Under these

conditions, waste minimization is beginning to look like a better deal for more and more generators.

In the foreseeable future, many waste generators may find the option of shouldering the increased costs for treatment and land disposal less and less viable. Significant obstacles, including opposition from affected communities, are hindering initiatives to situate and construct new treatment, storage, and disposal facilities for hazardous wastes. Few new sites are being approved anywhere in the United States—assuring that adequate capacity for disposal of wastes will continue to be a concern in many states.

An incentive related to disposal capacity was added in the Superfund amendments of 1986. Congress directed that each state must assure that, by 1989, it will be able to provide adequate disposal capacity for hazardous wastes for a 20-year period. States are currently in the process of determining whether and how they can make those assurances. The potential for waste minimization is one of the key elements of their deliberations.

As an additional financial incentive, waste minimization techniques can reduce the financial liabilities that are associated with hazardous waste management. In the last 10 years, a number of law suits have been won by individuals and groups that were able to demonstrate harmful effects to their health as a result of exposure to wastes that were improperly managed. If less waste is generated, there is less chance for environmental releases that result in such litigation.

The American public, in general, has become increasingly intolerant of toxic chemical risks. Waste minimization is one way to boost the confidence of local residents that the environment can be protected.

## Disincentives

On the other hand, EPA recognizes that there are some pragmatic obstacles to waste minimization that have been identified by industry. For instance, many companies may want to reduce their production of waste, but lack the technical and financial information they need to select feasible waste minimization technologies. Such decisions sometimes demand specialized engineering expertise; many

small or medium-sized companies either can't afford or don't have access to this knowledge.

Another disincentive arises when initiatives to reduce waste at the source entail changing the way that products are made. Many companies are reluctant to take a chance that the quality of established products might suffer in the process.

Disincentives for waste minimization also occur when waste generators have already committed resources to other methods for complying with waste regulations and deadlines. Some have made major investments to install end-of-pipe treatment technologies. Many of these are very expensive and extremely difficult to alter once specific configurations are in place. Many industry managers are also reluctant to

consider minimization if they know that more familiar hazardous waste treatment strategies and techniques will meet regulatory requirements. As a result, they may lack the resources or motivation to explore additional or supplementary waste minimization techniques.

#### Success Stories

Despite such obstacles, waste minimization programs can eventually benefit most companies—even those that have already committed significant resources to more conventional end-of-pipe techniques. Over the long run, they will expedite permit procedures, significantly reduce long-term waste management and liability costs, raise public confidence in the ability of the generator to protect public health and the environment, and usually save money at the same time. Often, the costs of making changes to reduce or recycle waste are far outweighed by the savings in waste handling, treatment, and disposal costs that result. This isn't always the case, but it is usually worth taking a look. There are many low-cost or no-cost techniques that can be applied to many processes. Success in minimizing waste, however, is almost totally dependent on a firm and sustained commitment by a company's top management to set up a corporate program to reduce and recycle wastes in an economic way.

Such is the case with the Minnesota Mining and Manufacturing (3M) Corporation's "Pollution Prevention Pays" program. Since 1975, this aggressive program has reduced 3M's waste generation by more than 100,000 tons, and has saved the company an estimated \$250 million. Crown Fiberglass of Ohio implemented another highly successful waste minimization program. This one reduced 90 percent of the firm's waste volume by using an on-site solvent recovery process and substantially decreasing its purchases of virgin acetone.

These are only a few of thousands of possible examples. The important point is that these companies continue to look for and implement additional source-reduction and recycling techniques.

Even though finding ways to reduce and recycle wastes ultimately depends on conditions that are specific to each site or plant, basic approaches and procedures seem to hold promise for several different types of companies



Lancy International, Inc., Warrendale, Pennsylvania, manufactures electrolytic metal recovery equipment such as that shown here on site at an electronics plant. Using this equipment, the plant is able to extract about 75 pounds of copper per week from waste generated during the production of telephone-switching equipment. The recovered copper is then sold, and the cost of landfilling is also saved. Lancy photo.

since they have already been employed successfully at many locations across the country.

### Laying the Groundwork

A number of companies have made significant progress on their own. Several states have also made strides in providing the technical information that many medium or smaller-sized companies need to get the job done.

North Carolina, for example, stresses the economic and environmental benefits of waste minimization through the Pollution Prevention Program which encourages generators to reduce, prevent, recycle, or eliminate wastes before they become pollutants. The state funds research projects, provides on-site technical assistance for generators, and disseminates pertinent information on waste minimization to support the program's objective.

Several other states including Illinois, Minnesota, and California, to name a few, have very active programs. Some states, such as New Jersey and Massachusetts, are moving waste minimization legislation forward to provide the needed direction and resources. EPA believes states must play a critical front-line role in providing needed technical assistance to medium and small firms. To further this objective, EPA is making \$6 million available to states to develop technical training and industry technical assistance programs.

EPA's role has been clearly outlined by Congress. The 1984 RCRA amendments and several bills that have been introduced in Congress mandate that EPA must maintain a leadership role if national goals are to be achieved.

EPA's 1986 Report to Congress on Minimization of Hazardous Waste concluded that it would be counterproductive for EPA to establish a mandatory regulatory program for waste minimization at this time. It argued that incentives already exist for waste minimization and that regulations as such might only serve to hamper other critical aspects of hazardous waste management as well as perhaps being costly to develop and implement in the form of a regulatory program. The report did conclude, however, that federal and state governments have a critical role to play in promoting waste minimization

by collecting technical and general program information on the processes and techniques involved, and by distributing this material in a timely manner to waste generators.

Roger Schecter, Director of North Carolina's Pollution Prevention Program, believes that "EPA must provide the national focus in the areas of policy setting and promoting national programs. A key element is providing an information network at a national level to insure that technical information is developed and made available to firms which need the information and to states which are the front line advisors to many firms."

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***"I'm convinced that we can't continue to generate, treat, and dispose of such huge quantities of wastes."—J. Winston Porter.***

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To accomplish this objective, the Agency is piloting a "clearinghouse" operation that will collect and disseminate information on waste minimization to states and to industry waste managers. This clearinghouse will include a waste minimization bibliography that is accessible through EPA's library system. The references will also be available through an automated data/information retrieval system that is being developed by EPA through a cooperative venture with several state agencies including the Maryland Hazardous Facilities Siting Board. This project is also being supported by the Illinois Waste Resource and Information Center and by agencies of several other state governments. The clearinghouse will provide state technical assistance staffs and waste generators with critical information on waste minimization

techniques and advice concerning sources of additional information on a range of issues that pertain to waste minimization.

EPA is supplementing these activities by developing a comprehensive Waste Minimization Opportunities Assessment Handbook. This will help companies conduct a "self-review" of their production and waste management practices to identify appropriate source-reduction and recycling techniques. Waste minimization technology fact sheets are also being developed specifically for small-quantity generators that are associated with 18 industry processes.

Other EPA support material being developed includes a short manual for plant managers on improved hazardous waste operating practices and another manual on metal parts cleaning—an activity common to many industry categories. A manual is also being developed by EPA which includes a list of suggested procedures to help companies identify the full range of costs associated with evaluating promising waste minimization techniques or opportunities. The EPA/RCRA hotline (800-424-9346) can provide general information on the availability of these documents.

### Forging a Long-Term Strategy

EPA is committed to finding ways to reduce waste generation, or to recycle waste, through its various programs including air and water, as well as solid waste. The Agency will submit a report to Congress in 1990 with conclusions on the desirability and feasibility of issuing waste minimization regulations or other incentives based on information the Agency will be collecting and analyzing over the next two years.

EPA knows that waste minimization is an important element in forging an effective long-term strategy for managing America's hazardous wastes.

EPA is committed to working collectively with state and local governments and with waste generators to develop effective source-reduction and recycling programs. □

*(Lounsbury is Director of EPA's new Waste Minimization staff in the Office of Solid Waste.)*

# Swamped by Our Own Sewage

by Wesley Marx

Jogging along the Boston Bay shore one morning, William Golden noticed what appeared to be jellyfish exposed by the low tide. The next moment he was disgusted—then angered. "The jellyfish turned out to be shiny clumps of human fecal matter and grease," recalls the jogging lawyer. Like thousands of other shore lovers, Golden was getting a firsthand look at America's sewage system in action.

Across the nation, millions of gallons of murky, raw sewage are leaking through pipes, gushing out of manholes, backing up into basements and washing onto our shores. These wastes are alive with pathogens capable of killing us. And our ability to generate all these wastes is simply outracing our ability to control them. Consider:

- Thanks to 68 sewage spills in the last seven years, a popular recreational bay in San Diego has frequently been unusable. Another 60 spills there have transformed a wildlife refuge into a recurring public-health hazard.
- Because of hundreds of spills, overflows and bypasses each year, Boston can lay claim to one of the country's most polluted bays. Fecal and other organic matter has accumulated to levels of several feet at the bottom of the Inner Harbor.
- A 50-mile-long coastal slick of dumped garbage, sewage and hospital waste turned last summer into a public-health nightmare in New Jersey. Even blood-test needles turned up on beaches.
- Over 40 percent of the nation's municipal sewage facilities have public-health and water-quality problems. About 150 communities still dump raw sewage into bays, lakes and coastal waters.

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Partially treated wastewater is sprayed at the Crownsville Wastewater Treatment Plant in Maryland. With safeguards, land application of treated effluent can transform wastewater into a valuable resource. For example, it can help fertilize golf course greens.

**Disposal Breakdown.** In the 19th century, as our cities expanded, sewage began to overwhelm the disposal systems—outhouses, septic tanks and gutters that drained into the nearest river. New York, Chicago and San Francisco reeled from typhoid, cholera and other sewage-spawned epidemics. The solution? Modern treatment plants. These removed gross sewage matter, but they still used waterways to dilute and "purify" waste.

By the 1960s, reliance on water-borne disposal showed signs of breaking down. The sheer volume of waste was

exceeding the cleansing ability of our waterways. While waste loads spiraled, water flow in our rivers was being reduced by dams and other diversion projects. Polluted runoff from urban streets, toxic dumps and farmland was competing with sewage for the remaining diluting ability of our stressed waterways. From Coney Island to San Francisco Bay, quarantine signs reappeared on our waterfronts.

In 1972, Congress responded with the Federal Water Pollution Control Act, which came to be known as the Clean Water Act. The EPA was given the power to enforce discharge standards and dispense federal grants for sewage treatment. But, despite an infusion of

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***If unchecked, the nation's municipal waste flow, a staggering 27 billion gallons a day, will rise to 43 billion gallons daily by the year 2005.***

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\$43.7 billion in federal grants, our waterways are still staggering under the waste load.

While Lake Erie and certain other grossly polluted waterways have benefited from the EPA's help, the nation's overall water quality has remained about the same. Federal funds have made sewer plants bigger, thus increasing our reliance on conventional water-borne disposal. By 1981 a top environmental official was warning, "The existing grant program is a classic case of governmental failure. Billions of dollars have been spent, but improvement in water quality has been minimal at best."

**Massive Spills.** Today, each of us generates about 60 gallons of waste water daily. And the greater the waste loads pouring into treatment plants, the more cleansing steps are necessary before disposal. Primary treatment—removal of floating debris and some suspended solids—must escalate to secondary treatment, an elaborate process using bacteria to remove more solids. But this generates tons of sludge that settle out from the waste stream. And the waste stream itself can still contain nutrients that trigger messy "blooms" of pea-soup algae to crowd out native life in lakes and bays. Result: *another* chemical and biological treatment to remove nitrogen and phosphorus.

The whole process creates risks of larger and larger accidental spills from giant plants. The first truly massive spill burst from a model San Jose-Santa Clara, California, sewer plant in 1979. Fishermen in south San Francisco Bay first noticed the water turning brown. For 36 days, billions of gallons of marginally treated human sewage gushed into the bay. Fishing, boating and swimming had to be restricted. As the area fought to recover, still more spills occurred.

This was no crude, aging municipal system but one of the nation's modern "super" sewer plants. What happened? Changes in the composition of the sewage during peak waste loads changed the bacterial balance. Tiny bacteria used to consume pollutants were smothered by filamentous organisms that clogged up the works. The system had to "bypass" billions of gallons of sewage into the bay with little or no treatment. The spills were stopped, but only after San Jose had spent \$150 million more, including repairs, to ensure that the temperamental bacteria got the right amount of air and nutrients.

Big disposal plants also fall short of expectations when cities neglect to expand and maintain the lines that bring in the raw sewage. Aging sewer lines clogged with roots, along with inadequate pumping stations contribute to San Diego's infamous rate of coastal sewage spills. (Under state order, San Diego is repairing its leaking system.) Forty percent of the flow reaching the huge Blue Plains plant in Washington, DC, may consist of storm water that enters sewer lines. Such excess flow can also trigger overloads and spills. A rainy day in the Oakland, California, area often results in sewage overflows at more than 175 locations, because of storm water seeping into sewer-line joints.

Most older cities rely on combined sewer systems carrying sewage and storm runoff. When these systems were built, however, large amounts of open land were available to soak up rainfalls. Today, with the land paved over, stormwater flows quickly overload city plants. In Hartford, storm-induced overflows in summer pollute a 16-mile

stretch of the Connecticut River. In Boston, combined sewer overflows dump over five billion gallons of raw sewage and storm runoff into Boston Harbor each year.

**"Greening" of Sewage.** Must we become victims of our own waste? Some communities are resisting such a fate by shifting from conventional disposal to some old-fashioned alternatives. When you hike through a pine forest in Clayton County, Georgia, for example, it is hard to believe you are walking through a waste-treatment system. After partial treatment, sewage from the 150,000 residents is piped to a storage lagoon where the sludge is separated out; the treated waste water is then sprayed on 2725 acres of hilly woodland.

Such "land application" has certain critical advantages. The earth contains infinite numbers of tiny organisms that can decompose sewage impurities—so Clayton County will never have to worry about the nuisance nutrients that sewer authorities spend millions of dollars to remove. Instead, these nutrients are helping grass and trees grow faster.

"Why pay for something soil and plants will do for free?" asks Wade Nutter, a University of Georgia scientist who helped design the Clayton project. Trees from the irrigated forest are harvested and burned, to dry and pelletize the sludge that is then sold as fertilizer, which helps defray operating expenses. (The operation is possible only because county industries must remove certain contaminants from their waste water before discharging it into the sewer system.) After percolating through the soil, the purified waste water eventually drains into creeks to help renew the country's drinking supply.

The EPA now estimates that such land-treatment alternatives, when compared with conventional systems,

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***Must we become victims of our own waste? Some communities are resisting such a fate by shifting from conventional disposal to some old-fashioned alternatives.***

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can cut construction costs by 25 percent and operating costs by 50 percent—depending on the concentration of contaminants and the availability of land.

Today, in virtually every clime across the United States, the “greening” of sewage systems proceeds. Treated sewage from St. Petersburg, Florida, that once polluted Tampa Bay now irrigates 4400 acres of urban open space, from parks and residential lawns to a golf course. Revenues from water sales help offset operating costs. Tallahassee and Coral Gables have shifted to land application; Orlando is also shifting.

Western states short of waterways to dilute urban sewage are beginning to turn to land treatment and reuse. Lubbock, Texas, recycles waste water to sustain a six-mile-long community greenbelt. An arid canyon that once served as an urban dump hosts a new chain of fishing lakes that yield catfish and bass.

California has some 250 reuse projects. Bakersfield receives \$300,000 a year in income from a 5000-acre farm that irrigates with its treated effluent. The County Sanitation districts of Los Angeles, serving four million people, recycle ten percent of their massive wastewater flow to irrigate campus landscapes and recharge groundwater. Two paper companies use the effluent to process paper pulp.

**Low Flow.** Rather than make treatment plants bigger, some urban sewage agencies are refurbishing their sewer lines. Hagerstown, Maryland, cut excess flow from 14 million gallons

daily to six million by relining its sewer lines. Underground sewer repair no longer means tearing up streets; special tubing can be inserted in manholes to reline aging pipes.

Lansing, Michigan, and Bellevue, Washington, use detention basins to reduce pollutant loads in storm runoffs. Denver detains runoffs in decorative plaza ponds to reduce peak flows. Such efforts help close a glaring loophole in pollution-control strategy. While the Clean Water Act controls discharges from treatment plants, controls on storm runoff from urban streets and farmland remain largely voluntary, even though they contribute up to 50 percent of the pollutants that converge on our waterways. The EPA is now preparing guidelines to regulate urban storm-water systems and, in October, announced major pollution controls restricting the release of some of the worst industrial contaminants into normal bodies of water and sewage treatment plants.

Low-flow toilets and showerheads can cut waste loads too. The normal six-gallon toilet flush can be cut to two gallons or less. To save on the capacity of its water supply and sewer systems, Novi, Michigan, lowers its municipal connection fees for developers who install low-flow fixtures. In California, the Monterey-Carmel area is requiring low-flow devices with new construction.

More communities will have to adopt such self-reliant strategies, as Congress is replacing the costly federal sewer-grants program with state-run revolving-loan programs that must be paid back. And since 1984, the EPA has been cracking down, and has filed or settled over 60 lawsuits accusing

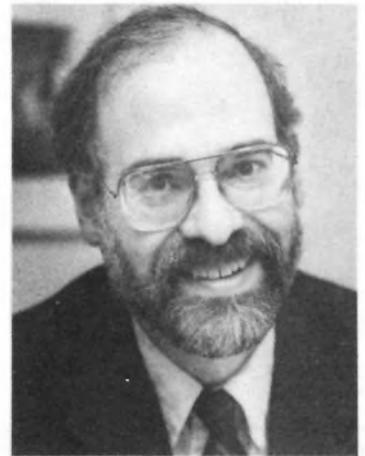
communities of illegal discharges. The City of Los Angeles agreed to a record \$625,000 fine for illegal spills and discharges, and also promised \$2.3 billion worth of sewage improvements over the next 12 years.

Under pressure from federal, state and private lawsuits—one brought by jogger William Golden on behalf of the city of Quincy—the Boston area is finally cleaning up its sewage act, upgrading its plants with federal, state and local financing. It may take almost \$3 billion and 11 years to render Boston's sewage system safe.

**WE CAN NO LONGER** rely so heavily on our waterways to dilute and contain our spiraling waste loads. If unchecked, the nation's municipal waste flow, a staggering 27 billion gallons a day, will rise to 43 billion gallons daily by the year 2005. Yes, we have improved our sewage-treatment plants and expanded their capacity. But unless we want soaring public-works budgets and massive disease-causing spills, we must create more “living filters” to purify sewage, more community greenbelts, more cleansing lakes and other alternative treatment methods—and we must act now.

*For information about alternative treatment methods, write: EPA National Small-Flows Clearinghouse, P.O. Box 6064-RD, West Virginia University, Morgantown, West Virginia 26506-6064. □*

# Appointments



**Greer C. Tidwell** has been selected as the new Administrator for EPA's Region 4.

Tidwell has been president of his own environmental management, planning, and engineering company in Nashville, since 1974. He has served as chairman of the Tennessee Solid Waste Disposal Control Board and has been involved in developing new technologies and approaches to wastewater treatment for municipalities and industries. From 1971-1974, he was chief of the EPA Tennessee-Kentucky Liaison Office in Nashville, and from 1964-1971 served as supervisor of the Special Projects Staff and chief of the Environmental Assessment Staff at the Tennessee Valley Authority in Tennessee and Alabama.

He received his bachelor's degree in civil engineering and a master's degree in sanitary engineering from Vanderbilt University and is a registered professional engineer. He completed a year of graduate study at Harvard University as a fellow of the National Institute of Public Affairs.

**Sylvia Lowrance** has been appointed as Director of the Office of Solid Waste (OSW).

Lowrance, who has been with EPA since 1979, has extensive experience in EPA's hazardous waste programs. Prior to being selected for this new assignment, she served since January 1987 as Director, Characterization and Assessment Division, in OSW. Before joining OSW, she worked in several policy and management positions within the Office of Waste Programs Enforcement and Office of Emergency and Remedial Response. Prior to her hazardous waste positions, she worked in EPA's Office of Water. She has also worked as a consultant and association executive.

Lowrance received her A.B. from the University of Michigan and her J.D. from the Catholic University of America. She has received EPA's Bronze Medal twice: in 1983 for her work on the Management of the National Contingency Plan and in 1987 for her contribution to the Strategy for Development of Hazardous Waste Program.

**Edward A. Klein** has been named Director of the Municipal Solid Waste Task Force.

Klein brings a broad base of environmental and legal experience with him to this position. He has been with the Agency since 1980 serving as Director, Chemical Control Division in the Office of Toxic Substances (OTS) until 1984. In that year, he became Director of the TSCA Assistance Office in OTS, where he was responsible for direct liaison with large and small businesses, Congress, the press, environmental and labor groups, and federal and state agencies. Before joining EPA, he served as a Special Assistant to OSHA's chief lawyer and was a successful attorney at the National Labor Relations Board.

Klein received his bachelors degree from Pennsylvania State University and his J.D. from New York Law School. He is a member of the U.S. Supreme Court bar and the New York state and Washington, DC, bars.

**Bruce Diamond** has been selected as the new Director of the Office of Waste Programs Enforcement.

Diamond has served as Regional Counsel in EPA's Region 3 Office since 1985, with responsibility for legal enforcement matters as well as legal and policy advice to the Regional Administrator and other senior managers.

During 1983-1984 Diamond served as Associate Professor of Law at Rutgers University Law School in Camden, New Jersey. From 1974 to 1983 he served in several positions at the Agency, including Acting Associate General Counsel for Water, Deputy Associate General Counsel in the Air Division, Deputy Associate General Counsel in the Toxic Substances Division, and Staff Attorney, Water Division. He worked as a law clerk for Judge Coffin of the U.S. Court of Appeals for the First Circuit from 1973 to 1974.

Diamond received his bachelor's degree in biology from the University of Pennsylvania and his J.D. magna cum laude from the University of Michigan Law School. □



Spring arrives. Mike Brisson photo.

Back Cover: Azalea blossoms—a closeup.  
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