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# EPA JOURNAL

**Introducing  
William K. Reilly,  
EPA's New Administrator**



**The Garbage Crisis: — Understanding It — Finding Answers**



# Preface

This issue of *EPA Journal* begins with a special section on William K. Reilly, EPA's new Administrator. First is an interview with Reilly; the subject is his policies and priorities, along with some reminiscences. Then an article profiles Reilly, describing his career and his education and providing some information on his family and personal interests.

The *Journal* then focuses on the solid waste crisis. The coverage begins with an interview with Sylvia Lowrance, Director of the Agency's Office of Solid Waste, in which the *Journal* asked questions about the country's garbage problems and about EPA's steps to help deal with them. An article follows on the solid waste stream—what's in our garbage; where is it coming from?

Then three features take a look at major aspects of solid waste control—recycling; landfills and incinerators, and source reduction.

First is a *Journal* Forum, in which six observers from diverse vantage points were asked their views on how we as a society can become recyclers.

Then three writers—a waste industry leader, an environmentalist, and a state official—each address a controversial question: Are landfills and incinerators a valid, workable part of solid waste management in the United States?



Seattle Solid Waste Utility photo

Recycle Seattle picks up comingled recyclable trash from South Seattle residents. After delivery to the plant, trash is separated by machines and a sorting crew and then it is baled. In January 1989, 1,333 tons were handled. Northern Seattle uses trucks with separate compartments for newspapers; mixed papers; cans and glass. Residents do the sorting.

Next, an article explains "source reduction," an aspect of solid waste control that is receiving increased attention.

Then, taking an overview, an article by Bruce Weddle, Acting Director of EPA's Division of Municipal Solid Waste, and his deputy, Ed Klein, suggests a strategy which could help get control of the garbage crisis.

Following this piece, an article by a specialist with the Natural Resources Defense Council suggests what the individual can do to help curb waste. The possible steps range from changes in grocery shopping habits to composting yard clippings.

Five short "situation pieces" follow, each describing a situation at the grass roots involving garbage problems. The locales include Indianapolis, Indiana, which accepted a facility to burn waste; Prince George's County, Maryland, which rejected an

incinerator; East Lyme, Connecticut, which has focused on recycling; Florida, which launched a solid waste control program with unusually broad political support; and Islip, New York, which had its garbage returned after a long, famous trip on a barge on a fruitless disposal journey.

The issue then takes an international turn, with a report on how Japan has learned to handle its garbage after that country started running out of landfill space 35 years ago.

Returning to a U.S. emphasis, two articles concern first, the incentives that could make it pay to start curbing the garbage tide, and second, mediation techniques that helped settle a landfill dispute, this one in East Troy, Wisconsin.

An article by John A. Moore, EPA's Acting Deputy Administrator as this issue went to press, discusses a controversial topic, medical waste, explaining the problem and what is being done about it.

The issue concludes with an article by Joel S. Hirschhorn, Senior Associate at the Congressional Office of Technology Assessment, which makes the case for pollution prevention, a calculated effort to stop waste before it gets into the environment in whatever medium or form. □



# EPA JOURNAL

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*Front Cover: Stranded by political squabbles, the famous barge with Islip, New York, garbage, and the tug "Break of Dawn" sit near the Verrazano-Narrows Bridge in the*

*New York City area in March 1987. See article on Page 40 about Islip's waste handling program after the garbage barge saga. Photo by Bill Davis for Newsday.*

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# An Interview with William K. Reilly

In an interview, EPA Journal asked William K. Reilly about his policies and priorities. It was one of the first such sessions granted by Reilly in his new role as EPA Administrator. The questions and answers follow:



Steve Delaney photo.

**Q** You've been praised as "the Great Includer." What does this phrase mean to you? Will that be your management style at EPA?

**A** For a long time I've thought that when you try to deal with very complex issues, such as regulatory policies that have social and economic impacts, particularly as you get beyond the environmental objectives the nation set in the early 1970s, you have to listen to the stakeholders. You have got to do a better job of consulting the various interests in the society and being attentive to their fundamental interests and concerns.

My impression from the history of environmental legislation, whether at the national level or at the state and local level, is that only those policies endure that have gone through the crucible of extensive negotiations, conversation, and analysis across the interest spectrum. Now, very often particular interest groups are not going to be satisfied with the policy that comes out, but at least we'll know why, and we'll know why before we get the policies rather than afterwards.

To me, it's a fact of life that in a very complex area of policy-making that reaches so many people's lives as fundamentally as EPA does, you have

got to be sensitive to the full spectrum of impacts. To me that's what being "the Great Includer" means.

By the way, that's not a phrase I chose for myself. I think it appeared for the first time, to my knowledge, in the *Washington Post* and was attributed to Frank Loy, the President of the German Marshall Fund. I don't reject it, but it's not a self-description.

**Q** In September 1988 you criticized the fragmented state of today's environmental policies, and noted the need to integrate them. Are we going to see The Conservation Foundation's cross-media model Environmental Protection Act introduced in Congress in some form in the near future?

**A** I would say that there is a serious need to simplify and integrate environmental legislation. We need to recognize that EPA and the statutes that govern it have grown on an ad hoc basis. They have not been considered as they relate one to another, and they are not administered that way.

Yet increasingly we know that pollutants, particularly toxics, move around among the media in ways that we didn't understand years ago. It's important for us not to congratulate ourselves that we've solved a pollution problem when, in fact, we've only shifted it from one medium to another.

So my feeling is that legislation that asks "What is the most effective place to intervene in the system to get at a particular pollutant?" is the way we should go. I don't for a minute think I understand how to do this across the board. I don't think we'll solve all these problems with one piece of legislation. We'll probably work incrementally, and as each new legislative proposal comes up for reauthorization, we'll ask the questions: "Is there a better way to relate it to its cross-media effects? Is there a way to simplify it any?"





Steve Delaney photo

I must say it worries me that much of pollution regulation has become so arcane and so specialized that only a smaller and smaller community of people understands it. I think that's a problem.

Those are the kinds of things that I'd like to see addressed. I suspect, I might add, that many of the cross-media concerns that we face can be addressed through program administration rather than legislation.

There are, I have been warned by so many people, very sensitive political issues that are raised when anyone tries to integrate legislation. EPA responds to many Congressional committees, and every issue that arises has its proper jurisdiction. We surely won't be able to go with one single proposal that all of a sudden unites all of our programs in a much simpler way and expect that to be passed in this Congress or in the next few years. But that's a direction I'd like to see us move.

**Q** You've talked with the President several times. Could you share with us your impression of whether EPA is likely to be elevated to Department and Cabinet status sometime during the next four years?

**A** I don't know. There has been legislation introduced in Congress to create a Department and to elevate EPA to Cabinet status. As a conservationist, I have supported those initiatives. The President has made clear to me that he is not in favor of the idea for the simple reason that he would like a smaller, more manageable Cabinet. He has, in fact, moved some people out of the Cabinet who once had Cabinet rank.

I don't know what is likely to happen. There's considerable feeling in the Senate in favor of making EPA a Department; I've been exposed to the idea frequently during my courtesy

hearings. I think we'll just have to wait and see. The President, I believe, is not going to actively oppose those efforts. He has an open mind on them.

**Q** Your predecessor at EPA, Lee Thomas, has said that one of his major goals in recent years has been to restore a natural resources orientation to EPA decision-making after so many years spent focusing almost exclusively on human health issues. Do you share this goal and will you take further steps to restore a balance there?

**A** I expect that we will continue to respect Lee's priority for natural systems and perhaps even elevate it. To me, the environment has always meant both the protection of human health and the stabilization of natural systems on which all activity, including all economic activity, fundamentally depends.

I believe that both of these concerns are important to EPA. As a conservationist, I have worked in my own career on ground-water protection, on wetlands management, on hazardous waste control, and a number of other issues that cut across both human health and natural systems concerns. In the future I would expect EPA to be more involved in some of the natural systems and traditional environmental protection concerns.

We have a society that is changing very, very rapidly. The choices that people make about where to settle and how to organize development and economic activity often have their first consequences on natural systems, and those have often served to warn us about what's to come. Congestion is



Steve Delaney photo

very often followed by air pollution problems and the rest. I think that EPA can do an effective job of environmental leadership, but it's going to have to involve itself across the spectrum, focusing not just on human health but on natural systems.

**Q** Many people at EPA still remember Russell Train's years as Administrator. You're known as a Train protege. Would you share with us any lessons you might feel you've learned from your mentor?

**A** I've learned so much from Russ Train, it would be hard to put it all down. We've had a great relationship. I was privileged to work for him on the Council for Environmental Quality (CEQ) in the early 1970s, and I've been close to him ever since.

Russ gave me great advice on the day of my appointment. He said, looking





Steve Delaney photo.

back on his own tenure, that when he left EPA, he could hardly walk; his back was bothering him so much due to both lack of exercise and stress. So he advised me, "Get the exercise. You're going to need it."

That was one bit of advice he gave me; he also made a second suggestion. A day or two before, I had had 35 minutes alone with President-elect Bush, and Train said, "When you get to be my age, you'll want to remember exactly what the President said to you at a meeting like that. You won't be able to unless you write it down. So keep a diary. Sit down every now and then and jot down the significant things that take place."

That's been the kind of relationship we have had. I think Train has been an extraordinarily graceful and reassuring public servant in the time that I've known him. I've always had the sense with Train that the right considerations, the right values, were being brought to bear on the problem. More than anything else, I've learned from him that you want to get your values clear first. You want to know what you believe about where public policy can best serve the public and how it can do it most effectively. A lot of the other questions are subsidiary to the question of bringing good values to bear—trying to really make a difference.

Trying to make a contribution is the way Russ thinks of his public service. I can recall very early on when I was a young lawyer on the CEQ staff. There was a stockpile of nerve gas at a military base in Alabama, and a chemist said that this stuff was going to become increasingly volatile and had to be disposed of within about six months. The question was whether it should go into the ocean or how else it might be disposed of.

I remember that I gave Train some advice about the politics of it, how sensitive the situation was, and how important it was for the CEQ to be a good watchdog on all this and not give in. We had made all sorts of commitments that we would not dispose of anything in the ocean; that was a big Nixon priority at the time. But Train responded by asking, in essence: "What about when we go up to Congress? The Congress is going to want to hear what is the safest course and the best choice for this stuff." We ended up saying that, if we really had as little time as this chemist said, ocean disposal was the only way to get rid of the stuff.

I remember that Train just bit the bullet on that one without any apprehension. As soon as it was clear that that was the best choice among a lot of bad ones, even though it was unpopular and embarrassing, that's where we came out. The experience taught me a lot about how best to ask questions when problems come up, irrespective of politics and the rest.

**Q** Some people are not too familiar with the work of The Conservation Foundation, which you were President of until your appointment as EPA Administrator. Could you share with us the special mission of that organization which you had been with for about 15 years, and your view of its major achievements?

**A** I see the role of The Conservation Foundation as being one of identifying and advancing emerging ideas for resolving environmental problems. We don't have a membership. We have been

largely free of a lot of the political pressure that affects interest groups in our field. We have tried to see ourselves as objective within the conservation spectrum. We are a conservation organization, but we believe that our particular task is to identify and advance policies that are sensitive not just to improvement of the environment, but to the social and economic impacts environmental policies entail.

In other words, we have considered what we do as "real world" kind of work. In the 1970s we got heavily involved in dispute resolution through a business environment program, largely as a way to advance public policy. We saw at that time that a number of important issues were stalemated, and the level of polarization and confrontation in the society looked like it might seriously impede our environmental progress. We then went out and enlisted people to do work on all sorts of things: on toxic substances regulation, on export of hazardous materials to the Third World, and most recently on ground-water policy in a forum chaired by Governor Babbitt of Arizona, and then on wetlands policy in a forum chaired by Governor Kean of New Jersey.

In each case, our role was to bring together a variety of people representing different backgrounds and interests, and then try to forge a consensus position on divisive issues of environmental policy.

In most of the instances I mentioned, the efforts were marvelously successful. For instance, the "no net loss" of wetlands proposal that President Bush picked up came right out of The Conservation Foundation's forum. It was the principal recommendation among a hundred or so recommendations in the national wetlands policy forum. We also did three reports on the state of the environment in the United States in the 1980s. Those were, I believe, the most comprehensive analyses of





Steve Delaney photo.

William Reilly testifying before the U.S. Senate Committee on Public Works and the Environment. At confirmation hearings, Reilly stressed that EPA should be an advocate for the environment and enforce pollution cleanup laws.

environmental conditions and trends ever undertaken by a private organization. They were expensive. We didn't want to do them, but we thought that with all of the acrimony, particularly in the early 1980s, and the severe budget cuts that afflicted the CEQ, reducing their capacity to do this kind of comprehensive report, it was necessary for somebody to step into the role, an organization that could speak with reasonable objectivity and credibility on these questions. We took on that challenge.

I think that's the emblematic function of The Conservation Foundation: to speak clearly, objectively, with sensitivity about a whole range of considerations that are involved in making environmental policy, but always forthrightly as conservationists.

**Q** We've spent some time exploring your past. Now we'd like to explore your views on issues facing EPA right now, and likely to dominate the work of the Agency in the years to come. One of those issues is the fate of the world environment. International environmental problems are now more prominent than ever: CFCs, the Greenhouse Effect, and so on and so forth. Will EPA have to change to be able to cope with them, and are you thinking of specific changes now?

**A** I think we will want to give a much higher priority to international activities in the future. I've had two conversations with the President since my appointment. On both occasions, he has brought up with me questions of international environmental policy.

That's a sign of the times. It's no longer sufficient to think in terms of our domestic responsibilities being insulated from international concerns, whether you're talking about acid rain and our relationship with Canada, or the Greenhouse Effect and our relationship with the Third World. There are going to be many things for us to do to carry out our responsibilities vis-a-vis the rest of the world.

We are very significant producers of carbon dioxide and other major pollutants, and we have to be aware of our international impact. We also have to maintain our role of international environmental leadership. I've noticed that even in those countries where the United States is not so popular and it might not be politic to acknowledge U.S. leadership, there is a demand for our expertise. They want our health research. They want our epidemiological information. They want to know about the history of our legislative requirements and pollution-control technology. They want everything we've done. They recognize that would be valuable to them, whether it's work we've done on air pollution or hazardous waste or toxic substances. I'd like to see us continue to play that role, and do it much more actively and aggressively in the future.

I think that to the United States, it's an important part of foreign policy for us to be genuinely helpful to other nations as they try to manage their environments. After all, it's in our fundamental interest to help other countries protect the part of the planet they share with us anyway.

**Q** At present, the American economy appears to be doing well, but federal funds are in short supply. How will you cope with the austerity that is expected? What will your top priorities be?

**A** I see a number of priorities. I think a very important area where EPA can play a leadership role is in helping the public and Congress understand present-day choices affecting the environment. We should help them understand what are the more serious environmental problems and play a role in educating people to prepare for the future.

The United States is going to undergo significant changes in the years to come. Managing our environment will require major investments. It will require changes in behavior. It will require some reasonably significant changes in our life-styles. At EPA we are going to have to take a leadership role in helping define some of those choices, and delineating what the future will bring us if we fail to take action.

One thinks particularly of municipal waste. This society is going to have to become much more disciplined in dealing with waste, whether organizing waste for recycling and re-use, or for disposal and incineration if that's got to be the result. We've got to be more disciplined about generating less waste in the future and thinking of ways to do that. Pollution prevention will, I expect, be a very important priority of mine, though government regulation is only one way of achieving that.

There is a very important educational role that we've got to play at the same



At confirmation hearings, Reilly told the committee, "It is in everyone's interest to protect the only planet we share, at a time when evidence is mounting of the Earth's vulnerability to destabilization."



Steve Delaney photo.

time, and there is also a very important function of working with states, localities, environmental organizations, and businesses to get the society pulling together and making sure that the \$80 billion or so of funds that are spent annually on pollution control in the United States are spent intelligently on the things that really matter and improve the environment for us.

**Q** How do you expect the atmosphere of environmental debate in the 1990s to differ from what you've encountered in the 1970s and 1980s? And, of course, you've been involved and exposed a long time. Will there be more confrontation or less?

**A** It's very hard to say at this point. We are taking office at a time when I think public expectations of the Bush administration have suddenly become quite high. We have moved from a period when certainly the environmental community was skeptical to a moment when many of our environmental group leaders are speaking with great excitement and anticipation about a number of the initiatives that the Bush administration has identified, whether it's "no net loss" of wetlands or an international conference on global warming or the prospect of encouraging reauthorization of the Clean Air Act with significant tonnage reductions of sulfur oxides. All of these things are promises that the Administration intends to keep.

I would hope that, in that vein, we can move to address some of the really

difficult and historically divisive issues in environmental policy with a little less confrontation than we've had in the past. But when one looks at the history of Superfund—and it's going to continue to be controversial for the next couple of years—I don't want to be naive or suggest that there are not going to be some very difficult choices to make: for example, budget choices, and choices about economic impacts and where they should be distributed in society and who should pay for what.

Issues such as these are bound to generate confrontation and contention. But in Congress there's been a change in the spirit of our relationships on environmental policy, and that's encouraging to me. I just hope it lasts.

I have been tremendously encouraged by my conversations with Senator Mitchell, Senator Moynihan, and other members of the Senate Environment and Public Works Committee, as well as with other senators and members of the House. I get the sense that they agree with me on the need to get on with things, that they want to see the Administration be an active player on environmental issues.

A key part of that will be greater involvement by EPA in future legislative debates. The President and I are committed to that, and they're very encouraged that that's the role I've said we want to take and expect to take. So I think Congress is going to welcome our participation. They may not support all the proposals we make in every case, but I think that they are pleased that we are planning to stay actively involved. That understanding has won us a good deal of trust starting out. I hope we can live up to it and maintain it.

**Q** From a more short-term standpoint, what issues do you expect are going to dominate your agenda during the next six months?

**A** During the next six months we are going to have some very significant legislative and budgetary concerns.

We are, first of all, now looking at some new budget priorities, changed from the budget that the Reagan Administration sent up just a few weeks ago, and I suppose by the time this appears, those will be known to the public.

Secondly, we are preparing for the reauthorization of the Clean Air Act and looking at options on acid rain, particularly on non-attainment and on air toxics that we would hope to have reasonably clear, at least from the point of view of the Administration's position, within the next 90 days.

We are then going to be involved in the RCRA reauthorization debate, and we expect to work out positions on that and discuss them with Congress. These things will dominate our near-term agenda.

We'll also begin to prepare the budget for the next fiscal year very shortly and go into determining our priorities for submissions to the Office of Management and Budget and negotiations with them. That will take us well into 1989.

We have, as you know, a number of other things coming along. I am particularly interested in Superfund, which accounts for a very large portion of the EPA budget; I want to get very heavily involved in that as soon as I can, but not before the Clean Air Act issue is well resolved.



# A Profile of the New Administrator

by Jack Lewis

**W**illiam K. Reilly, the widely respected President of World Wildlife Fund and The Conservation Foundation, takes EPA's helm at a pivotal moment in the Agency's short but eventful history. President George Bush has promised to be more of an environmentalist than his predecessor, and many interpret his choice of Reilly as EPA Administrator as a sign of sincere commitment to that goal.

Reilly himself gave resounding credence to that belief at his January 31, 1989, Senate confirmation hearing. The Administrator-designate spoke fervently of the need for a "new era" in EPA's history: "We are at an historic moment, characterized by urgency and opportunity . . . Rarely, if ever before, has there been such a need for leadership on the environment . . . [and] I expect to be a strong advocate."

EPA's new Administrator has leadership traits that suit him for this challenging role. It is expected that EPA, already the scene of negotiated rulemaking and other non-confrontational administrative strategies, will greatly benefit from Reilly's special gifts, both as an individual and a manager.

Reilly's proclivity for drawing people together will not just be directed outward, toward the regulated community: it can also be expected to bring new cohesion to the internal operations of EPA. In September 1988, two months before his appointment, Reilly criticized the "heavily fragmented system" of environmental regulation that now prevails at EPA. Also in 1988, he sponsored a Conservation Foundation proposal for a "model" omnibus Environmental Protection Act that would reflect the cross-media realities of today's environment. Although such a law is unlikely in the foreseeable future, a push toward a simpler and better coordinated regulatory apparatus will certainly be one of Reilly's major goals (See interview).

President George Bush conducted the swearing-in ceremony for EPA's new Administrator, William K. Reilly, on February 8 at EPA's Waterside Mall headquarters.



Steve Delaney photo.

Reilly's personal style—gentlemanly and soft-spoken—makes him the ideal mediator, effective at bridging differences even when antagonisms are intensely felt and there seems to be no common ground for agreement. He is also known for his firm grasp of facts and his commitment to principle. The importance of ethical "values" is a theme to which Reilly refers frequently in conversation, and he attributes that facet of his thinking—like so much else—to his tutelage under Russell Train.

Reilly, born 49 years ago in Decatur, Illinois, has compiled an impressive professional record. After attending public high school in Fall River, Massachusetts, he completed his undergraduate studies at Yale in 1962. Reilly then moved on to Harvard for his law degree, which he received in 1965. That same year he married Elizabeth Bennett Buxton, the mother of his two daughters. After serving for two years as a Captain in the U.S. Army, Reilly next earned a master's degree in urban planning from Columbia University, awarded in 1971.

While studying at Columbia, Reilly received his first exposure to the burgeoning field of environmentalism. As Associate Director of the Urban Policy Center at Urban America, Inc., he co-authored a report for the Public Land Law Review Commission that predicted what future demands cities would make on public land. Ever since, land use and land conservation have remained among Reilly's keenest interests.

As a senior staff member at the CEQ, from 1970 to 1972, Reilly's responsibilities included land use, public lands, urban growth policy, and historic preservation. During the next year, from 1972 to 1973, he headed a Task Force on Land Use and Urban Growth, chaired by Laurence S. Rockefeller; this task force produced a popular report called *The Use of Land*.

Reilly's career moved into high gear in 1973 when he was named President of The Conservation Foundation, a high-profile Washington-based think tank committed to steering public policy in the direction of decisions that improve the quality of the environment and ensure wise use of natural



While he was President of World Wildlife Fund and The Conservation Foundation, Reilly visited Pasachoa National Park, Ecuador, to meet with representatives of non-governmental organizations that do conservation work. World Wildlife Fund (WWF) helps with training.



Diane Wood photo. WWF.

resources. Reilly's land-use concerns found creative application at the Foundation, which sponsors action-oriented research into a wide variety of matters related to environmental policy.

During the past 15 years, the Foundation has also taken an unusually strong interest in toxics and pollution control. For example, Reilly was instrumental in the 1984 founding of Clean Sites, Inc., the public-private partnership that broke the logjam in hazardous waste site cleanups. He has also maintained an active interest in Third World environmental concerns, and traveled extensively in developing countries.

In recent years, Reilly has scored successes with his efforts to secure dialogue and cooperation among frequently polarized business and environmental leaders. One such widely applauded breakthrough occurred in November, 1988 when 25 previously warring environmentalists, industrialists, and developers made a public commitment to a "no net loss" goal for U.S. wetlands, a resource heretofore subject to dangerously rapid depletion. These same people, so harmonious by late 1988, had scarcely been on speaking terms when Reilly first coaxed them to convene for a meeting in July 1987.

Another facet of Reilly's background deserves mention. In 1985, The Conservation Foundation merged with the Russell Train-led World Wildlife Fund, a major organization with a budget of \$30 million, six times greater than that of the Foundation itself. Reilly became the President of the merged Foundation/Fund, where Train is now

Chairman of the Board. Today, as before 1985, the World Wildlife Fund is committed to the preservation of endangered species and their habitats all over the globe. Under Reilly's brief stewardship, its membership has undergone a spectacular rise, tripling in four short years.

Since Reilly was already a frequent visitor to the Third World for The Conservation Foundation, his recent experiences with the Fund have simply amplified his already pronounced international orientation. During an era in EPA's history when international issues are suddenly a top priority—whether acid rain or the Greenhouse Effect or CFCs—Reilly's hands-on experience is expected to make a valuable contribution.

EPA's new Administrator is also likely to be more ecologically oriented than many of his predecessors. Because of his working background, Reilly is interested in protecting the health not just of people and wildlife but of the biospheres in which they live. Repeatedly in recent years, his predecessor, Lee M. Thomas, has called for a move away from EPA's almost exclusive concern with environmental threats to human health. Reilly, too, is committed to continuing that quest for a sounder balance between never-to-be-neglected human health goals and the long-term challenge of preserving for future generations both the ecosphere and our natural resources.

Everyone at EPA wishes Administrator Reilly the best of success, both personal and organizational, during his years at EPA. All who now work here are eager for a period of more aggressive environmental action at the federal level, and it is inspiring to know that our new leader wholeheartedly shares that goal. Indeed, in every respect, William K. Reilly appears to be the right man in the right place at the right time. □

(Lewis is Assistant Editor of EPA Journal.)

The Fresh Kills landfill on Staten Island, New York.



# Focusing on the Garbage Crisis

Frequent reports about a garbage crisis in America have been appearing in the news media. In the remainder of this issue of *EPA Journal*, various experts explain aspects of the problem. In addition, a diversity of points of view is included, recognizing the controversial nature of garbage and the best way to deal with it. And different local situations are described, to illustrate how garbage problems are being addressed.

*Photo by William C. Franz*





# An Interview with Sylvia Lowrance

*Is a solid waste crisis upon us? What caused it? What is the solution? EPA Journal asked these and other questions about solid waste issues and EPA's solid waste policies in an interview with Sylvia Lowrance, Director of the Agency's Office of Solid Waste. The interview follows:*



Steve Delaney photo

**Q** Some people are talking about a solid waste crisis in the United States, others seem geared toward business as usual. Just how serious do you think the problem is at the present time?

**A** I think the problem is very serious, and it's getting more serious every day. We now produce about 160 million tons of solid waste per annum in this country. By the year 2000, we're going to be producing 190 million tons annually. The fact that we're running out of solid waste capacity in this country in and of itself presents a crisis. But the real issue is that the crisis we face today is different in different sections of the country.

In some sections of the country it's very acute today. They literally do not have any more landfill space. In other sections of the country, it's a crisis that's going to overwhelm them soon, if localities and citizens don't take steps today to plan for tomorrow. So, it's a very real crisis, although its effect on different localities may differ right now.

**Q** Why is the subject suddenly in the newspapers and on television so much? Did the problem sneak up on us in some way?

**A** I don't think the problem sneaked up on us. I think that a couple of incidents recently really brought the solid waste issue to the forefront of public consciousness. First and foremost was the Long Island garbage barge in 1987. I think that most Americans were startled at the prospect of the United States having to export our garbage to other countries. And, I think that offended the average American.

I think that led to additional focus on the part of the public on what was going

on in their local community, and it was clear upon examination over the last few years that most communities were either running out of landfill space in their own locality, or they were exporting their garbage not just to other countries, but to other states. At this point in time, we predict that about a third of our landfills are going to close in the next few years.

**Q** Would you tell us about EPA's national strategy for solid waste? What is it? When will it take effect?

**A** EPA's strategy is called "An Agenda for Action." That was a very conscious call because the basic tenet of the strategy is that everyone has to take action. Not just EPA, but everyone: the individual citizen, industry, local government, state governments, as well as the federal government. I think what people can expect from the federal government is a stronger leadership role.

We intend to be leaders in what we do best, and that's the development of new, cost-effective technologies that localities can use, not just for landfills, but also for treatment of solid waste and for recycling. We're going to be facilitating development of new technologies in the private sector, through increased efforts in our R and D program, where we will be assisting new industries in the development of new technologies for solid waste.

We plan to take a much more activist role and have already started to do so. The first thing is to develop new and more protective standards for landfills. So to the extent that landfills are still used in the future, these new standards are going to set new minimum technical requirements on municipal landfills that assure a greater level of protection.

Also at EPA we're going to provide national leadership on source reduction. One key to solving not just the volume issue for garbage, but also the toxicity issue, is an active source reduction program.

The other thing that people can expect from EPA is education. Everyone needs to be educated about what the management options are for municipal solid waste. How many different ways are there to manage solid waste? We've got landfilling. Many people use incineration. And there are also new and innovative ways of managing garbage, new ways of recycling, and new ways that you can approach source reduction. We intend to educate the public as well as local government officials about what their options are.

**Q** What's EPA's role vis-a-vis that of states and localities, what about public/private arrangements, and so on?

**A** I'd like to emphasize the fact that to solve the solid waste crisis that we're facing in this country, everyone has to play a role. No individual and no institution can do it on its own. Again, in terms of the federal government, I think ours is a role of leadership, it is a role of research and education.

Local governments clearly are on the front line of this problem. Local governments and their citizens have to plan for their future, they have to deal now with siting issues, to site new facilities to manage the waste that will be produced, and foster programs of source reduction and recycling. They have to plan for such programs and they have to fund them.

As for state programs and state governments, their role is overall regulation management and permitting of local modes of waste management, as well as coordinating the federal government's liaison with the locality. It's also the states' responsibility to educate citizens, to provide technical assistance to localities in doing their planning, and in planning for the future.

**Q** Are you daunted by the educational challenge that's ahead; is it a challenge the likes of which we've never seen before?

**A** I think there's a tremendous challenge for anyone in government these days who is dealing with any waste issue. I think there's a great deal of public concern with regard to solid waste and as well as hazardous waste. I think the public perception of waste is



EPA is encouraging Congress to modify the law and create a special category for municipal incinerator ash. This main ash conveyor has been in use for two years in Olmsted County, Minnesota's, waste-to-energy facility.

Triple S Dynamics photo



one of belching smoke stacks, of an abandoned Superfund site that's posing a significant hazard or destroying the environment in their area. Today, we have new technologies, we have new ways of doing business. We've advanced.

And, I think the challenge of government is to convey to our citizens what is possible today—that safe waste management is possible, that we have new and safe technologies, which, if they are properly operated, can be utilized safely by the community. That to me is the enormous challenge facing us all.

**Q There are some landfill regulations that your office is working on right now. Could you tell us how strong they will be, and what are their special features?**

**A** We hope to have those new regulations out in final form this fall. They are going to be very strong regulations. They're going to require most existing and new landfills that are sited in the future, to substantially improve how they're designed and how they're operated.

We're going to establish in those rules minimum standards for where these facilities can be located, how they must be designed to ensure that materials from these landfills don't migrate and pose a problem to health in the environment. They're also going to require monitoring, so that if something does happen it is detected immediately and we know that there's a problem so that it can be cleaned up immediately and never does pose a significant health problem.

Those regulations are going to be very costly for many localities to implement, but the cost has to be weighed against the benefits that are going to be derived from having that type of upgraded standard.

**Q Will these new regulations drive up the cost of disposal considerably and, if they do, do you think they will make other alternatives more desirable?**

**A** In many cases the new landfill rules will increase the cost of disposal. But, one has to understand that we have not, historically, been paying the true cost of disposal. The cost of disposal in the past often hasn't included the standards that are necessary to abate a problem or to prevent a problem from occurring in the first place, that can later cost hundreds of millions of dollars to clean up, and can cause great loss.

As to the second part of your question, yes, the cost of waste disposal has already gone up in some sections of the country to \$100 a ton, \$120, or \$140 per ton. With the added cost of the new regulations, I think other alternatives will become much more attractive. In fact, in some instances, we believe that the cost of a local recycling program will actually become lower than land disposal.

**Q Do you think the small communities will be able to comply with these more complicated and expensive landfill regulations?**

**A** I think small communities will over time be able to comply with these regulations. In the short term, small communities face a severe financial

problem, not just for financing solid waste, but they have increased responsibilities in almost every area of environmental protection and increased cost of sewage treatment, increased cost of providing adequate and safe drinking water supplies to their citizens.

The local decision-maker faced with making choices on how to spend that single dollar is going to have to make choices on how to better manage these programs, and the local decision-maker in small communities is going to have to look at new and innovative ways of delivering these services to their citizens.

Some small communities already are establishing public/private partnerships in the solid waste area. They're assuring that their citizens understand the true cost of disposal, and passing on these costs to their citizens, so that their citizens are more likely to look for better ways of managing their waste, or in fact minimizing the amount of waste they produce.

In addition, many small communities are looking at regionalization. Rather than bearing the cost of operating a small landfill in the locality, they're combining with other small localities, so that they can share the costs.

**Q What role can individual citizens play to ensure that local response is all that it should be?**

**A** Local government is highly dependent on its citizens' involvement in its decisions. In the solid waste area in particular you have increased citizen involvement and oversight of how their solid waste is being managed and where it's being managed. So I think we have a strong grass-roots movement that is



going to assure that local governments, small and large, are looking at sound waste management practices, and to the extent they're using private companies, looking at their environmental track record to make sure that they know how to manage waste safely.

**Q Why it is so difficult to get incinerators sited? Are they really as dangerous as people think they are?**

**A** I think we face the same problem with solid waste incinerators that we faced with many modes of waste management in this country. What we're dealing with is past images and past practices. And many of our citizens are still concerned that history is going to repeat itself.

I think, again, what is important to understand is that we've made advances, that we have regulatory programs on the books, that the federal government and the states have active enforcement programs, and that we have new technologies. We have to inform citizens that incinerators can be safely designed, and that there are state-of-the-art incinerators that can be safely run and not pose a public health risk.

**Q Is there any specific new technology you would like to speak briefly about?**

**A** One example concerns air emissions. EPA recently published a guidance document on a state-of-the-art technological design that will ensure that emissions from a municipal incinerator are not harmful to human health or the environment.

To the best of our knowledge, all of the waste energy facilities that are being planned in this country at this time are planning on using that state-of-the-art technology.

**Q Many cities have incinerators that produce fly ash and ash, but there is a great deal of confusion over how they're supposed to dispose of it. What should cities be doing about the ash program, and how is the federal government trying to help out?**

**A** That confusion stems from a statutory provision in our federal RCRA law which treats some municipal incinerator ash as non-hazardous by law. However, other municipal incinerator ash that may be identical but is produced in a slightly different

fashion may in some circumstances be considered hazardous.

From our perspective that doesn't make technical sense. Ash material from municipal incinerators should be managed safely. We are encouraging Congress to modify the law to create a special category for municipal incinerator ash. For that special waste category we would develop special management standards tailored to the ash material.

In the meantime, on the part of the federal government, we are providing technical assistance to localities that are trying to plan for their ash management, and informing them as to the standards we think are appropriate for the particular ash.

**Q Are other industrial countries reaching the same impasse as the United States with regard to landfills and incineration, and what can we learn from them?**

**A** I think we and other countries share our successes as well as our problems. In some cases, I think other countries have developed new technologies on a local level, and new ways of managing their waste that we in the United States can learn from. Certainly some of the European and Canadian programs for recycling are models on the local grass-roots level.

On the other hand, the United States continues to make significant strides in incineration as well as treatment and reuse technology, and we're sharing these advances with other countries. All of us face a garbage problem—of course, especially in the industrialized world.

**Q What, if anything, can we do with the "not in my backyard" syndrome that impedes both landfill and incineration sites?**

**A** The most important thing goes back to a theme that I have repeated over and over again, and that's one of public education. It's incumbent on those of us in government, those in the waste management industry, as well as local and state governments, to educate our citizens about the true cost of disposal.

Many citizens don't consider the fact that this package that they're throwing in their garbage can today has to be placed somewhere tomorrow, and may pose an environmental problem tomorrow, if it's not managed safely. We've got to make our citizens much more aware of their responsibility to

deal with the waste materials that they produce. And in fact we've got to educate our citizens that it's in their interest not to produce as much waste as they're currently producing.

**Q Now we'd like to ask a few questions about alternatives to landfills and incineration: for example, recycling and source reduction. The waste management industry has been growing very rapidly and with great sophistication in recent years. Is its new-found success and profitability leading to further entrenchment of conventional disposable oriented methods, and are we missing some of the more ecologically advanced alternatives?**

**A** I think that the waste management industry in this country is at the forefront of looking at new ways of managing our garbage. We have to recognize that for the foreseeable future, we're going to need all modes of waste management. We need to source reduce and recycle just as much as we possibly can, but we're still going to need treatment facilities and we're still going to need land disposal facilities, to deal with the entire waste volume that we're producing today, and will be producing over the next decade.

The waste management industry in this country has seen this, I believe, as a lucrative market, and in fact many localities and states are working with the waste management industry to site new recycling facilities, and to work on source reduction.

**Q According to a recent news report, the market for recycled newspapers has collapsed, and reports also indicate that there isn't enough garbage to keep some incinerators going. Are these reports bad news for the solid waste management industry?**

**A** Actually, I'm very optimistic about the prospects for recycling. We understand that markets are expanding and that the capacity to handle newspaper and other materials is growing and will continue to grow. I am aware that in a small number of cases, the supply of paper has been created before the capacity to handle that supply has had a chance to develop. As a result, the value of newspaper has dropped dramatically in those instances. We think that this is a temporary problem and that over the long haul, the supply and the capacity will get into synch.





Steve Delaney photo

Collection day.

With respect to the incinerator point, I think that is becoming less of a problem because localities that choose incinerators as part of their integrated waste management system are now taking recycling into account when they design the size of their incinerators. For those communities that did not take recycling into account in sizing their incinerator, but now wish to recycle newsprint, I would suggest that they look to neighboring communities for garbage to keep their incinerator going and then recycle what they can. In times of capacity shortage, this approach can help both the neighboring communities and the community with the "oversized" incinerator.

**Q** You mentioned source reduction. We'd like to know what it can become. What is its potential?

**A** Source reduction, is solid waste not entering the municipal waste stream in the first place. There's great promise for source reduction. One aspect is to reduce the volume of the material, the other is to reduce its toxicity.

You look at the municipal solid waste stream in this country, and the vast majority of it is made up of paper and yard waste. In terms of yard waste, composting can take care of as much as 18 percent of the waste stream. It never enters the waste stream. So there is great promise.

In terms of toxicity, we deal with a significantly more difficult issue. We have to do more work in this country to identify and eliminate the sources of the toxic components in our municipal

waste stream. We know that lead and cadmium are great contributors to the toxicity of municipal ash. We in the federal government and those in industry have to track back to more of our products to look at what we're using in producing those products and look ultimately at preventing the use of toxics in the first place in the products that we're producing. And that's really the source reduction challenge of the future.

**Q** What can Congress do? Can Congress help to institutionalize source reduction?

**A** Congress certainly can help us in encouraging both source reduction and recycling, and helping to pave the way for their implementation. As to the need for particular legislation at this point in time, I don't believe that we need legislation, because we haven't really reached the limits in terms of what we can do in source reduction and recycling under current law.

**Q** What kind of changes in packaging do you believe are possible to foster source reduction?

**A** The issue of packaging is one of the more difficult issues that we have to deal with in source reduction. It's very simple for many of us to say packaging materials should be reduced by three-quarters. But one has to look behind why the packages are created the way they are, and why packaging material is required. Some current packaging materials are being used to protect health, or to increase the

shelf-life of a product, or for other beneficial purposes. I believe we're going to have to look at the balance that needs to be struck between reducing the municipal waste stream and meeting other societal needs as well, in terms of health protection, convenience, shelf-life, and economics.

There is a great deal more known in this country about source reduction in industrial terms, in terms of reducing the amounts of toxics by changing chemical processes and plants than there is about source reduction in packaging and consumer goods. EPA plans to work very closely with industry to encourage a dialogue among the various industries about where there are opportunities to deal with the packaging issue.

**Q** Some people are suggesting that we should be recycling as much as 80 percent of our garbage. Is that realistic?

**A** We've established in the "Agenda for Action" a goal of 25 percent source reduction and recycling by 1992. We believe that is achievable, and many communities can and will exceed it. In fact, many communities already believe more is achievable and have set higher goals for themselves; 35 percent to 40 percent is not uncommon on the part of many states and localities. I am not aware of any community in this country or elsewhere that has achieved 80 percent recycling.

In terms of the future, I think that based on our experience in trying to reach our 1992 goal, we'll better be able to assess how much further we can push source reduction and recycling for the future.

**Q** Do you sense that we have the nationwide support for recycling, the kind of backing from citizens and companies and so on that we would need to really make it happen?

**A** I believe we have very strong support for both source reduction and recycling in this country. Almost every town, township, city in this country that we hear about today either has put in place a recycling program or is planning to put one in.

**Q** Are there legal requirements for recycling that are in the offing at the federal level?

**A** Given the high level of interest on the part of localities and citizens in



putting recycling programs in place, I don't believe there's a need for federal legislation mandating recycling. We should wait and see the results of all the grass-roots efforts that are going on before we contemplate the need for federal legislation.

**Q Where do plastics fit into the overall solid waste situation?**

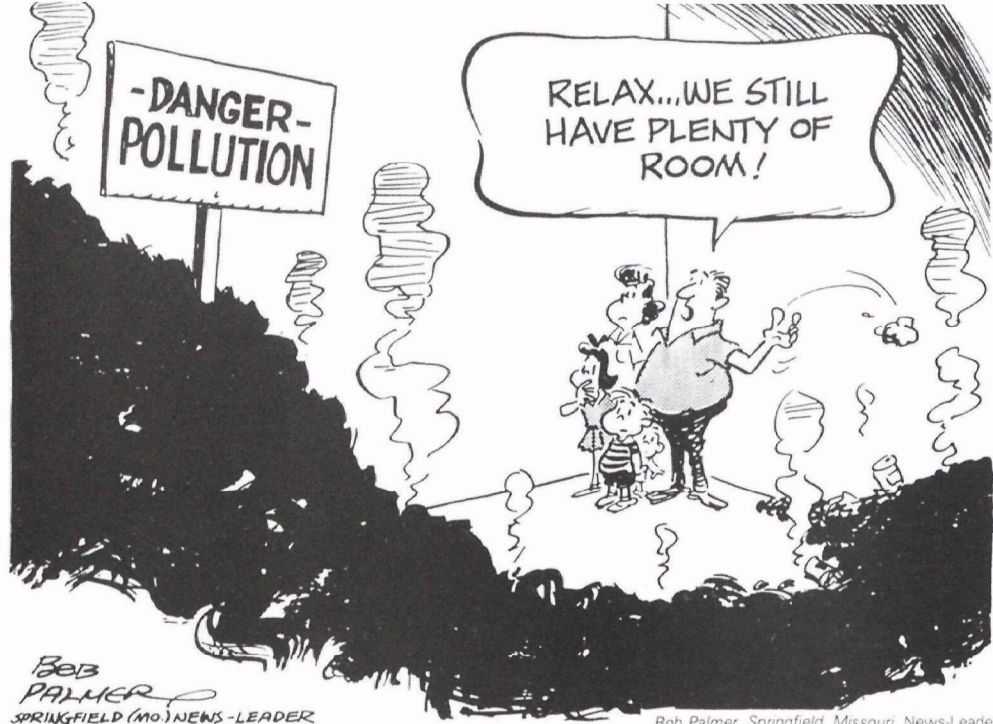
**A** Plastics are an important component of the municipal solid waste stream, because they make up about six or seven percent of the weight of the waste stream. But they also tend to be very light-weight, and some are very bulky. And for that reason we need to deal with them as part of the solid waste crisis. The plastics industry at this point in time is undertaking a great deal of research on how to increase recycling of plastics. Right now there is recycling of plastic milk jugs and of plastic soda containers. The plastics industry is looking at new ways to increase the recycling of plastic goods.

In addition, industry is looking at degradability of plastics, and new formulations of plastics that are degradable are coming on the market. The plastics industry is really taking the initiative to deal with the plastics pollution problem.

**Q What about car batteries and tires?**

**A** Car batteries and tires are two of the problem components of our municipal waste stream. Both pose serious public health and environmental problems, and need to be source-reduced and recycled. Many car batteries already are recycled, and we think many more need to be. Many states have buy-back or deposit requirements, where they make sure these materials are being recycled.

There are new techniques and new technologies being experimented with for recycling tires. But we also ought to remember source reduction for tires in particular. One aspect of source reduction is increasing use for life. An 80,000-mile tire will last a lot longer than a 30,000-mile tire, and thus assure that we don't have as many tires in our municipal waste stream. Also consumer buying habits can influence manufacturers to produce products with longer useful lives.



**Q Talk about resource recovery, where we're suggesting that it's kind of an offshoot of recycling. What kind of resources are most readily recovered, what are your easy targets there?**

**A** Clearly, aluminum is one of the primary targets, and most aluminum cans are already being recycled. Paper, and paper products are easily recycled; we know the technology. The challenge is to make sure that we have stable markets for recycled paper. The federal government certainly can provide a leadership role in looking at procuring recycled paper for its own use. And we're going to encourage not just that we do that within EPA, but that we do that government-wide.

In addition, I think we have to look at the whole issue of yard waste in the municipal waste stream. There should be much more emphasis on back-yard composting. Very simple technologies are available and can be used today.

**Q All of these changes are going to cost a lot of money. Will it all balance out in the end?**

**A** I think that the benefits we gain over time through better and safer management of our solid waste will cancel out any added costs that we incur in the short run. First of all, we are for the first time as a nation considering the true cost of disposal. That's why tipping fees are going up at local landfills. We understand the true cost of safe disposal. The comparative costs of modes of waste management now dictate more advanced modes of waste management, and clearly call for increased source reduction.

In addition to the benefits of safe management in terms of health protection, we also have a strong history in this country of resource management, and preservation of precious natural resources. And I think there's increasing citizen awareness that if we source-reduce in our garbage, we preserve the natural resources that we so badly need for the future of this country.

**Q How do you feel about where we're going to be, how we're going to come out in a year, five years, 10 years, 15 years?**

**A** More than any other issue that I've worked at in my career at EPA, I see more national consensus on the issue of municipal solid waste than I've seen on any issue that we've dealt with in at least the last decade. All parties, industry, local citizens, local and state governments, all the people who have been working with us in pulling together the national "Agenda for Action" for municipal solid waste, agree that we have a problem on our hands, but everyone agrees that there are solutions. And one of the bright points in developing the "Agenda for Action" was realizing that we all, despite many past differences, agree on what we all need to do to solve the crisis.

With that kind of agreement and consensus, along with the grass roots activities that are growing in every section of our country, I'm convinced over the next five or 10 years, we'll make fantastic progress in new source reduction and recycling programs and dramatically upgrade our modes of treatment and landfilling of what is left.



# What's in the Solid Waste Stream?

By Jack Lewis



Glass waste appears to have peaked at about 13 million tons a year in the United States. It can be separated by color and recycled.

When considering possible approaches to any problem, it helps to take stock of its key characteristics. Solid waste is more difficult to characterize than some problems because it is a hugely complex phenomenon that is in constant flux every day, varying from season to season and from place to place.

Social and media attention to the problem are also subject to fluctuation. In the late 1960s and early 1970s, it was fashionable to condemn U.S. consumerism and to predict that the nation would be buried in its own garbage. Then hazardous waste stole the spotlight in the late 1970s and, in the form of Superfund, held it for most of the 1980s.

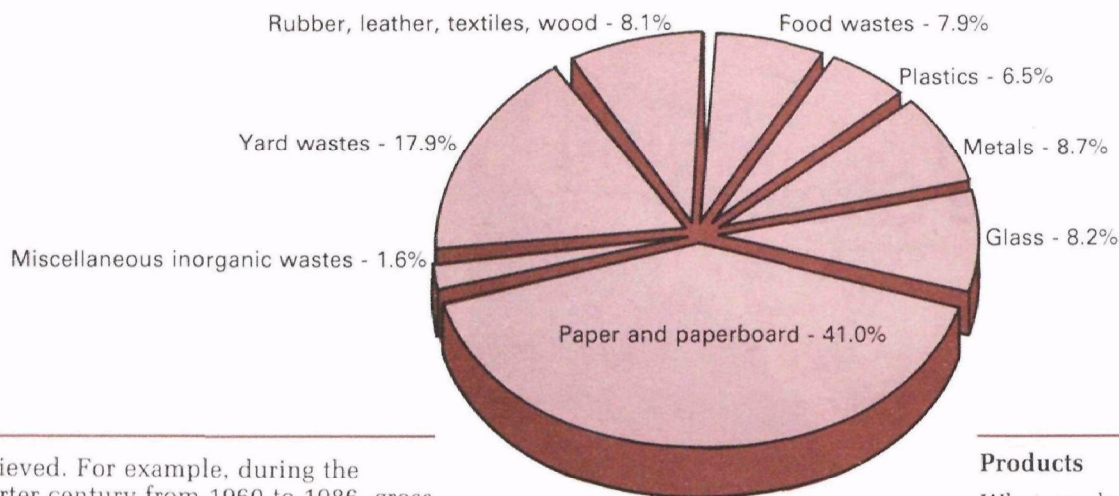
How times have changed! With landfills at or nearing capacity (and new sites in short supply), with incineration siting stymied and costs dramatically rising, Americans are now taking a fresh look at solid waste. Especially in the wake of 1987's Islip barge fiasco, an awareness has taken hold that U.S. society really is going to have to deal with the throw-away problem that just won't go away.

The problem is compounded by the fact that government and industry have not done a very systematic job of gathering data about the municipal waste stream. Data does exist for the decades since World War II, but only recently has it become more thorough and comprehensive as a result of redoubled efforts at the national, state, and local level. However, even on the basis of the limited data now available, it is possible to identify the major components of the nonhazardous waste stream, at least in their broad national parameters. It is also possible to speak with some authority about past and future trends.

Data gathered since 1960 is not only revealing but to a surprising extent encouraging, because it shows that measurable progress has already been

Steve Delaney photo





Gross discards, by weight, of municipal solid waste materials, 1986

achieved. For example, during the quarter century from 1960 to 1986, gross discards of municipal solid waste in the United States grew from 87.5 million tons per year to nearly 158 million tons. Net figures are less misleading, however, for they show the situation after energy recovery and recycling processes are taken into account. From 1960 to 1986, net discards increased from 81.7 million tons in 1960 to 131.2 million tons. The gross increase during that quarter century was 80 percent, while the net increase was only 60 percent, a full 20 percent lower.

***An awareness has taken hold that U.S. society really is going to have to deal with the throw-away problem that just won't go away.***

By the year 2000, that net figure of 131 million tons per annum is projected to rise only 4 percent, to 136.8 million tons, while the gross figure climbs 22 percent to nearly 193 million tons. This is an indication of how energy recovery and recycling techniques, of the sort discussed elsewhere in this *EPA Journal*, can lead to progress, at first gradual but nonetheless real.

What components go to make up these millions of tons of garbage? The breakdown is usually according to material, product, and source. The pie chart on this page provides a visual representation of the material and product percentages of the waste stream. Waste sources will be analyzed later in the article.

Before getting down to specifics, one can speak of broad trends. Changes in what we consume, our life-styles, and even the way we package what we purchase have had a dramatic effect on our waste stream. Over the past 25 years, we have seen greater reliance on prepared, pre-packaged foods, and less consumption of loose, bulk items such as vegetables from food markets or loose nuts and bolts from hardware stores.

Beverage containers have changed from refillable glass bottles to steel cans, to aluminum cans, and most recently to plastic. Advertising has changed as well, with more catalogs and bulk-mail advertising.

In addition to all the changes in what goes into the waste stream, we have seen changes in what we pull out of our waste for recycling. Newspapers and certain other types of paper, aluminum cans, and glass containers, as well as discarded appliances, have been and will continue to be recycled. However, recycling rates will continue to vary as market conditions and other factors affect these different materials. The figures provided here reflect net quantities that remain after current recycling processes are completed.

### Materials

What trends in the waste stream do those net figures reveal? Food wastes have remained relatively constant at 12.5 million tons, and are expected to remain so through the year 2000. This is partly because U.S. population growth is negligible, but it is also a reflection of the improved efficiency of our food packaging. Waste plastics, on the other hand, surged from 3 million tons in 1970 to 10.3 million tons in 1986, and are expected to climb to 15.6 million tons by 2000. Paper and paperboard, which are frequently used in conjunction with plastics in American packaging, continue their spectacular growth: from 24.5 million tons in 1960 to 36.5 million tons in 1970, from 50.1 million tons in 1986 to an expected 66 million tons in 2000.

Glass, on the other hand, is a waste that appears to have reached its peak in the vicinity of 13 million tons per annum. Rubber, leather, textiles, and wood constitute another traditional category that appears to have reached its peak, at the same approximate quantity.

### Products

What product trends are most apparent now? The biggest increase in the past 26 years has been in the category of nondurable goods, such as clothing, newspapers, and other nonpackaging paper products, that are discarded within one year of production. These catapulted from 15.1 million tons to 35.1 million tons, and are expected to grow to 47.5 million tons by the year 2000. Even durable goods, such as furniture and appliances, are beginning to show up in the waste stream more

***Changes in what we consume, our life-styles, and even the way we package what we purchase have had a dramatic effect on the waste stream in the United States.***

rapidly than they did in the past. Having already jumped from 9.1 million tons in 1960 to 19.2 million tons in 1986, they are expected to reach 23 million tons by 2000.

Trends in containers and packaging are more difficult to analyze. Net discards of these materials have climbed steadily from 24 million tons in 1960 to 42.7 million tons in 1986; they are expected to reach 50.7 million tons in the year 2000. But their percentage of municipal solid waste by weight has actually remained constant at about 30 percent. This is partly because the newer packaging materials are lighter weight than their predecessors. Unfortunately, they are often bulkier, and since they are usually composites of paper, foil, and plastics, they are difficult or impossible to recycle.

In addition to the substances already described, there are other wastes that are often co-managed with municipal solid waste: municipal sludges, waste combustion ash, industrial wastes, and construction and demolition wastes. These materials are not included in the composite weight figures already cited, but they can be substantial. For



instance, wastewater sludges amounted to over 40 million tons in 1986, municipal waste combustion ash to 3.8 million tons, and nonhazardous industrial wastes to a whopping 430 million tons. Fortunately, most nonhazardous industrial wastes are managed on-site by the generating industries, but some are landfilled at municipal solid waste landfills, as is the majority of wastewater sludges and combustion ash. Therefore, although technically not part of the municipal solid waste stream, these substances do, in reality, have a very great impact.

Many readers may wonder what is the relationship of the nonhazardous municipal waste stream to hazardous waste. There is some overlap, since small quantities of hazardous waste do enter the municipal solid waste stream from households and small businesses. Nevertheless, the great mass of U.S. hazardous waste is strictly segregated from municipal solid waste and handled in a much more rigorous fashion.

### Sources

Who puts the various types of waste into the municipal solid waste stream? Of course, there is some overlap among the different categories, but the predominant source, whatever it is determined to be, is the key to how municipal solid waste is classified. The principal sources of municipal solid waste may be characterized as follows:

- **Residential:** Waste from single and multiple-family homes.
- **Institutional:** Waste from schools and colleges, hospitals, prisons, and similar public or quasi-public buildings. Infectious and hazardous waste from these types of facilities are managed separately from municipal solid waste.
- **Commercial:** Waste from retail stores, shopping centers, office buildings, restaurants, hotels, airports, wholesalers, auto garages, and other commercial establishments.

- **Municipal:** Waste generated by municipal public works, such as street sweepings and tree and brush trimmings.

- **Industrial:** Waste such as corrugated boxes and other packaging, cafeteria waste, and paper towels from factories or other industrial buildings. The term does not include waste from industrial processes, whether hazardous or nonhazardous.

## What Is Recyclable?

At present, approximately 11 percent of all U.S. solid waste is recycled, but experts estimate that its full potential may be as high as 50 percent.

### Recyclables

#### Materials:

- Paper (Newspapers, corrugated boxes, office papers, mixed papers)
- Plastics (Milk, soft drink, and other containers)
- Glass (Bottles and jars)
- Aluminum (Cans and other aluminum products)
- Steel (Appliances and other steel products)
- Wood (Pallets, lumber, etc.)

#### Compost:

- Leaves, grass, and brush
- Food wastes
- Some other organic materials, such as paper contaminated with food

#### Nonrecyclables

- Wastes heavily contaminated by food residues, household chemicals, or dirt
- Composite materials, e.g., aseptic boxes made of paper, foil, and adhesives, plastic-coated paper, furniture and appliances (other than their metal content)
- Miscellaneous inorganics, such as street sweepings

From its national data base, EPA estimates that about 3.6 pounds of municipal solid waste were generated per person per day in 1986. After materials and energy recovery, that amounts to 3 pounds per person per day. The comparable numbers for the year 2000 are expected to reach 4 pounds per person per day gross, and 2.8 net (or 3.0 if ash is included).

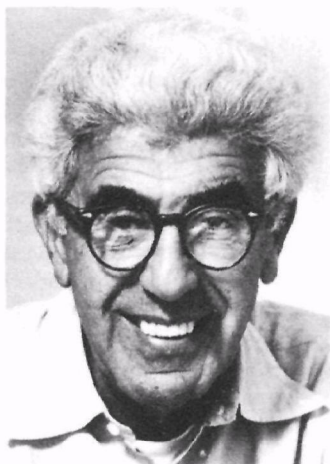
There is an urban versus rural disparity in per capita rates of residential waste generation. The per person per day residential rate nationwide is now estimated to be 2.2 pounds; but it could run as high as 4.5 pounds per person per day in Washington, DC, or 5 pounds per person per day in New York City. There are also seasonal variations, with yard waste being a summer and fall concern in the North but a year-round problem in the South. □



# A Forum: How Can We Become Recyclers?

Dr. Barry Commoner  
Director, Center for the  
Biology of Natural  
Systems

Everyone seems to agree we must become a recycling society. Assuming they're correct, how are we going to become recyclers? For this Forum, EPA Journal asked this question of six persons, all involved in the solid waste control field in some way. Their answers follow:



If—as we must—we are to become a recycling society, we must begin by properly defining the purpose of recycling. Recycling is often regarded as a good thing to do because it conforms with the “no waste” rule of ecology. Guided by this purpose, people are content to do some recycling, perhaps of newspapers, cans, and bottles. A state such as New Jersey is regarded as ecologically well-motivated because it mandates 25 percent recycling.

But this is the wrong approach. Of course, recycling is ecologically sound, but its purpose is to solve the trash disposal crisis—to provide an

alternative to the environmentally hazardous trash-burning incinerators and landfills burdened with their toxic ash. This calls for intensive recycling, a system aimed not at a few targets of opportunity but at the total trash stream. Intensive recycling recognizes that about 90 percent of the trash is recyclable and that much of the remaining 10 percent—plastics, for example—ought to be eliminated from the trash stream. In this way, intensive recycling becomes the method of trash disposal, eliminating the need for incineration and greatly reducing the toxic burden on landfills.

Can this be done? The answer is yes: we at the Center for the Biology of Natural Systems have just shown, in a pilot test for the Town of East Hampton, Long Island, that intensive recycling can recover 84.4 percent of residential trash in the form of marketable products: compost prepared from the household-separated food garbage and yard waste; various grades of paper separated at a materials recovery facility (MRF) from a second household container; aluminum cans, tin cans, and color-sorted glass also separated at the MRF from a third household container. The fourth container holds the non-recyclables, 13.2 percent of the total in our pilot test. This figure, plus misclassified rejects

amounting to 2.4 percent of the total trash, leads to the 84.4 percent actually recovered.

Widely adopted, intensive recycling would generate assured supplies of paper, metals, and glass that could be sold to users at a relatively low price, or even given away, because each ton recycled saves the community the high and rising cost of landfilling or incinerating a ton of unseparated trash. Since manufacturers prefer recycled materials because they are cheaper than virgin products, they will respond by progressively moving toward maximum (in some cases, such as glass, nearly total) use of recycled materials, creating, at last, the recycling society.



Congressman Norman  
Lent (R-N.Y.)  
Ranking Minority Member  
U.S. House Committee on  
Energy and Commerce

Diana Gale, Director,  
Solid Waste Utility  
Seattle,  
Washington



trash, removing metal lids from glass jars, washing out cans, and bundling up newspapers. In any event, merely separating articles does not guarantee their reuse. The effectiveness of recycling will depend on locating new markets for recycled materials, which many towns find difficult even now. The simple economic reality of supply and demand dictates that as more areas recycle, the market becomes inundated, and demand for recycled goods dries up.

Nevertheless, every ton of garbage that is recycled is a ton that taxpayers don't have to pay to get rid of. For this reason, many communities are actively pursuing sound waste management plans that incorporate waste reduction, recycling, and construction of resource recovery (or waste-to-energy) plants that also burn refuse to generate electricity or steam.

Sadly, political paranoia and the NIMBY (Not In My Backyard) syndrome have paralyzed responsible efforts to deal with the nation's waste disposal crisis in a realistic manner. It's time to recognize that there is no magic cure-all and citizens must be willing to make the hard choices necessary to stop the trashing of America now, *before it's too late*.

**W**ith landfill capacity dwindling and waste disposal costs skyrocketing, recycling is often touted as a cheap, convenient cure-all for the garbage crisis ailing America. While it can help alleviate some of the problem by reducing the volume of waste, recycling by itself is only a partial remedy, and its proponents must take care to acknowledge these limitations and avoid overselling this vital tool as a panacea.

Today, only 10 percent of the country's solid waste is recycled, and most specialists agree that even well-run recycling programs might recover only 20 to 25 percent of the total waste stream.

There are many reasons for this. For example, many items such as plastics, disposable diapers, and certain multi-material items cannot be recycled. And frankly, most Americans simply dislike the inconvenience of separating



City decision-makers wanted to start with a voluntary system, which means the program needs to be convenient. People were given free bins and regular pick-ups. We are now initiating a "block leader" program to remind people of their pick-up dates and to take advantage of neighborhood "peer pressure" to encourage all the people on the block to participate.

People like choices and need to be educated. They want a range of methods for reducing or recycling waste so they can "customize" recycling to their life-style. For separated yard waste, three alternative systems of collection are provided. We are designing programs for each element of our waste stream, and we spend much time and money on education and promotion.

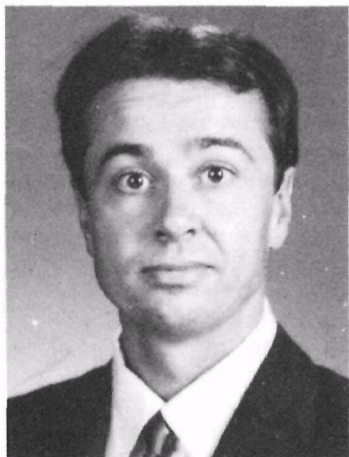
Becoming aware of the environmental problems of waste disposal and steeply rising costs has made people willing to change behavior. Curbside recycling is the most popular civic program initiated in recent years. Using a recycling bin has become a badge of honor and a visible statement that one cares about the planet Earth.

**P**eople in Seattle are demonstrating that they are willing to adjust their life-styles to make recycling work. Seattle is an environmentally conscious city where maintaining quality of life is considered almost as important as acquiring consumer goods. This fact supports a recycling ethic, but the essential elements of our successful program are low cost, convenience, choices, and effective promotion.

People respond when hit in the pocketbook. Seattle's recycling program is free; but, garbage collection is expensive. We have a variable can rate: the more garbage you produce the more you pay. Nearly 80 percent of the people are using one can or less for garbage, and nearly 70 percent of the people are participating in the city's voluntary curbside program.



Dale Gubbels,  
President, National  
Recycling Coalition



To answer that question, I must ask yet another: Who are "we"?

Individual citizens, businesses, institutions, and all levels of government—we all have a role to play. Leave out any of these important players and society is unlikely to adopt a recycling ethic.

Most people understand this on the level that individuals save materials, local governments collect them, and businesses process them. But these activities don't necessarily represent recycling's beginning or its end. To make the system work manufacturers must design products that are both recyclable and made from recycled material. And, manufacturers are correct in saying they need to know that individuals, governments, and other businesses will buy recycled materials and support collection programs, thus assuring them of both

markets and steady supply of raw materials.

A simple credo for all to follow is this: put as much effort into recycling as we once put into harvesting and mining our natural resources.

On the national level, this should equate to the level of energy that went into opening up vast portions of the continent to development. There are numerous examples to show how that was accomplished, but perhaps most instructive is the Homestead Act of 1862. In less than 50 years, the country gave to willing pioneers over a quarter billion acres of land.

Now is the time for similar bold, creative, and far-reaching initiatives such as:

- Tax breaks for businesses using recycled materials.
- Rebates for federal electrical power users to encourage manufacturers to switch to secondary materials.
- An income tax check-off program to support conservation measures.
- Grants and loans to encourage entrepreneurs to establish new uses, and thus markets, for recyclables.

Numerous possibilities exist, if only we—all of us—put our minds to the task. And unlike past initiatives, which viewed natural resources as gifts to be exploited, this time—through recycling—we can restore the bounty for future generations.

William P. Moore,  
Director, Waste  
Reduction  
Waste Management of  
North America, Inc.



Translating our country's philosophical acceptance of recycling into practical reality is the largest challenge facing solid waste managers. But several recent developments have made recycling a more viable solid waste management option. In increasing numbers, commercial businesses and municipalities are requesting recycling services. Secondly, the technology for collecting and processing recyclables has made significant advances. Finally, every ton of material recycled represents a ton of airspace saved at a dwindling number of landfills.

Waste Management's recycling activities are perhaps the fastest growing segment of the company's operations. Our Recycle America program now conducts over 60 curbside recycling operations in cities across the country and another 250 company divisions are directing commercial and other forms of recycling. The corporate headquarters also has mounted a major office paper recycling program that has reduced the company's waste stream by half. In addition, an internal purchasing preference for recycled products has already resulted in the conversion of over 13 million sheets of paper from virgin to recycled stock.

Our experience has afforded us some perspective on the elements common to many successful recycling programs:

- *Proper planning:* Recycling is not merely the collection of recyclable materials—it includes the return of those materials to commerce. In too many poorly planned programs, collected paper is sent to landfills for lack of market planning. Recycling is a demand-driven process rather than a supply-driven process, and well-conceived programs are planned ahead to secure identifiable markets at good prices.

- *Consumer convenience:* There is a good reason why curbside recycling programs consistently secure higher tonnages of recyclable materials than other types of programs. When recycling is made easy for consumers, more citizens participate. And higher participation rates not only reduce cost, but also divert more discards into reuse—which should be the primary goal of every program.

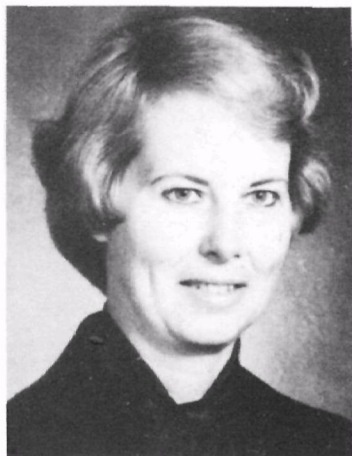
- *Public/Private Partnership:* Many of the nation's most successful programs, such as the one in San Jose, California, are structured so that both the private sector and the public sector have economic incentives to mount an effective program. When both sectors have a stake in the program's success, significant advantages occur.

As for the future, from our perspective, our nation needs more creative public policy approaches to recycling—not simply in straight subsidies, but in visionary programs tied to market stimulation. These range from investment tax credits for recycling equipment to innovative procurement policies and aggressive "buy recycled" initiatives. Waste Management has developed detailed recommendations on these issues.

For solid waste managers, recycling simply represents both good environmental policy and good business.



Mary T. Sheil, Deputy  
Director, Division of  
Solid Waste Management  
New Jersey  
Department of  
Environmental  
Protection



Recycling, at least in New Jersey, is a significant part of the solid waste management program. Its continued success is contingent on the cooperation of all waste generators in the state and on commitment and investment by government and industry to expand the marketplace for recycled products. It will also require policy changes at government and corporate levels to reduce waste at the source, to reduce the use of toxic materials, particularly in consumer products, and to design for recycling.

A significant supply of potentially recyclable materials is generated in every home, business, and institution. These materials will flow as separated scrap if a well-constructed and intensive education program is implemented, and a convenient, reliable collection service is provided. A change in the one trash can habit and the method of handling waste material in the home, office,

or school must occur to achieve separation of recyclables. Only an intensive education program will bring about these changes. People must clearly understand what materials must be separated, how they must be handled, and where they must be placed for collection.

The method for source separation must be relatively straightforward and the collection system convenient. If existing solid waste practices call for collection from a central location or at the curb, then public participation in the recycling program will require a similar collection system for the recyclables. This necessitates a political commitment to the integration of recycling into a waste management program.

By making this commitment, New Jersey has experienced a tremendous increase in the supply of recyclable materials source-separated by its businesses and residents. The documented tonnage in 1982 was 250,000 tons. In 1987, this number reached 1.5 million tons, not including commercial recycling. It is anticipated that by the end of 1989, more than two million tons will be recycled through municipal and commercial sources. The number of curbside collection programs reached 439 in 1988. To achieve these levels, the state has conducted a statewide promotional campaign and organized annual workshops and seven-week courses on

recycling. Grants for local government education programs were provided. Because the education and collection criteria were met, and a local mandate to source-separate was in place, enforcement is only required to refine the process and to bring the few recalcitrants into line.

But source-separated materials will have little value if there is no market demand for the material or for the final product manufactured from the recycled scrap. Thus demand and price are affected by the volume and quality of the scrap. A glass company can manufacture containers using large volumes of cullet (crushed glass), but manufacturing specifications and customers' orders must be met. The material supply must be available as needed. A variety of paper products can also be manufactured from scrap, but newsprint and writing paper require higher quality material than paperboard or insulation. The price paid and willingness to buy will hinge on the volume of that scrap and its quality.

Development of intermediate processing systems to refine the quality of the source-separated scrap and to consolidate large volumes of material to enhance marketing potentials has been the hallmark of New Jersey's program. Multi-material processing centers to handle materials collected through the municipal programs were developed in the 1980s to

accommodate the large-scale commitment to recycling and to provide a more convenient separation and collection system.

The increased supply of material requires expansion of the marketplace through modification of manufacturing processes to displace virgin raw material with scrap, and also to develop new products to utilize more scrap. In addition, demand must be created for the final product. By way of example, the largest volume of material in the residential and in most commercial waste streams is paper. For the homeowner, 12 to 15 percent of the waste stream is newspaper and magazines, yet the publishing industry takes back very little of its product to put out tomorrow's news. Industries generating consumer products must make an investment to modify their processes to make their products more recyclable or recycled. Industry must also support research to address the technical problems in manufacturing recycled products, and government must make the same economic commitment to support recycled materials that it has given by way of tax advantages for extraction of natural resources. □



The siting of landfills and incinerators to handle garbage is one of the most controversial environmental issues today. Is there a place for these facilities in the nation's future? EPA Journal asked the viewpoints of a waste disposal industry leader, an environmentalist, and a state official. Their commentaries follow:

# Are Landfills and Incinerators Part of the Answer? Three Viewpoints

by Eugene J. Wingerter

**T**ry taking this quiz: What's the answer to meeting our needs for increased solid waste disposal capacity? Is it:

- a) More landfills?
- b) Increased recycling?
- c) Development of more waste-to-energy plants?
- d) Source reduction?

Part of the problem really lies in the question itself. Far too many people view this complex dilemma as having a simple, single-answer solution. That is not the case. There is no "magic bullet" that will rid us of our wastes. The best answer is that no matter how much we recycle or burn or reduce our waste volume at the source, American communities must still deposit significant amounts of trash in a sanitary landfill. In other words, the correct choice is all of the above.

Landfills represent the common denominator of what EPA and members of our industry call the "integrated waste management approach." This approach reflects the complexity of our current disposal needs. According to EPA's statistics, Americans produce nearly 250 million tons of trash each year, of that amount, close to 160 million tons are generated by individual households and neighborhood businesses—an amount equal to 3.6 pounds of trash produced daily by each person in the country. After recycling and

waste-to-energy combustion, more than 131 million tons of trash still remain to be deposited in landfills.

Current EPA data show that more than 80 percent of our trash is landfilled in about 6,500 facilities; another 16 percent is incinerated (with or without energy recovery), and the last 10 percent is recycled. The advantage of utilizing waste-to-energy facilities is that they reduce the volume of refuse by 90 percent, achieving a volume reduction that no other waste disposal option can offer.

increased recycling and more waste-to-energy facilities).

The National Solid Wastes Management Association's (NSWMA) own public opinion polling shows that many people are beginning to recognize how serious the solid waste problem has become. Our 1988 public opinion poll of 1,500 adults, for example, showed more than half believe disposal capacity is a public issue of greater importance to their community than affordable housing or expanded police and fire protection. Among those polled, 53 percent said

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*... the fact remains that disposal facilities will be needed for years to come.*

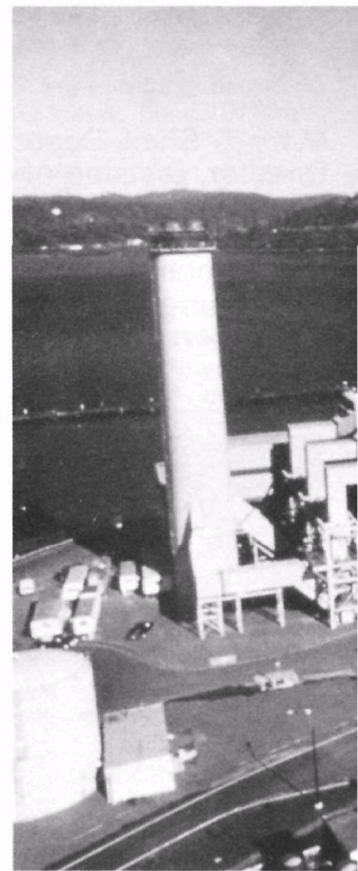
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Of the 6,500 operating landfills, EPA projects more than 2,000 will close within five years—causing an overall yearly capacity loss of 56 million tons. At current construction rates, additional landfill space will be available for only 20 million tons of this amount. So where will the garbage go?

This question brings into focus why the "all of the above" answer is correct. The growing size of our trash dilemma mandates doing everything possible to reduce waste volumes—both at the source (by improved product manufacturing and packaging) and within the waste stream itself (through

government was doing too little to assure environmental protection.

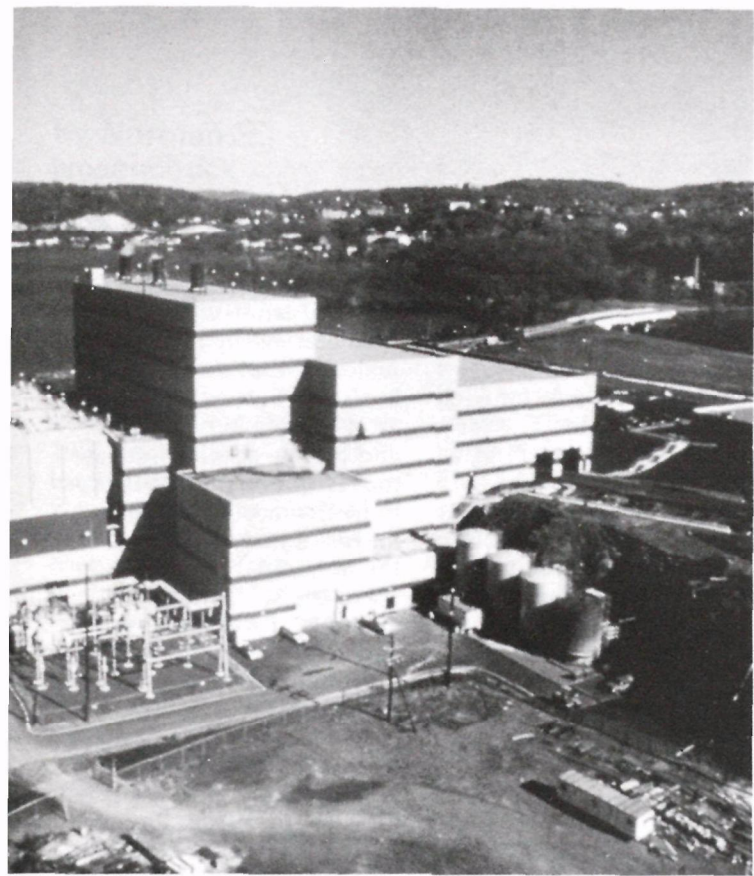
But the poll also showed that such people have not yet accepted the "all of the above" approach that may be needed. For instance, when asked their views about building new landfills, 65 percent registered strong opposition. This "out of sight, out of mind" attitude has resulted in a paradox: many communities, particularly in the Northeast, now must ship their trash more than 300 miles to find a permanent disposal site. That's not a solution—it's an example of sending your problem to someone else's backyard.



Why are most people so reluctant to resolve the "garbage crisis," even when their own communities are involved? In general, two concerns have been raised: how to manage air emissions from waste-to-energy facilities and how to ensure ground-water protection at landfills. Regarding air emissions, federal and state laws already require such facilities to use the best available pollution control technology—which means that properly operated plants meet all existing requirements.

Concerning ground-water protection, the main focus is on resource recovery ash, a concentrated by-product of the combustion process. Such ash contains small amounts of lead and cadmium—not because these are created by the burning process, but because they are already present in the garbage. But





Division of Solid Waste photo, NYS Department of Environmental Conservation

Westchester County mass-burn/resource recovery facility, Peekskill, New York, handles 2,250 tons per day. Unprocessed municipal solid waste is burned, producing steam for heating, cooling, and generating electricity. Ferrous metals are recovered from the residue and the ash is put in a landfill.

ash can be safely deposited in properly designed landfills that include liners, leachate collection systems, and ground-water monitoring devices.

Unfortunately, many people do not yet understand that these safeguards exist and are part of any integrated approach to waste management. As an industry, this is one of the messages that we need to convey—our strong commitment to protecting public health and the environment. We need to underscore how we can safely manage the very small potential risks associated with solid waste disposal.

There are several important steps that can be taken to help resolve our solid waste disposal dilemma. First, we need to support EPA's efforts

to resolve ambiguities in existing environmental rules so that public confidence in our regulatory system will be restored. In some cases, this may mean creating minimum federal standards to serve as a basic guideline for state officials in drafting their own solid waste disposal plans. And it may also mean that Congress will have to act.

Beyond such measures, however, we must broaden the policy dialogue to include a more intensive discussion about solid waste management with members of the public. This discussion must focus on each element of the integrated approach and on the need for a coherent overall plan.

Finally, we must muster the political will to solve our problems, rather than postpone them. State legislatures must decide

where the buck really stops when local officials are unable to act in the broader public interest. After all, what's more important: leading your community toward a permanent solution or heading down the procrastination path to an eventual crisis?

While we can decrease our reliance on landfills and resource recovery plants through increased recycling and waste volume reduction, the fact remains that disposal facilities will be needed for years to come. Society will continue to generate refuse that must be managed. It is only through expanded public information and the exercise of effective leadership that we will be able to address our solid waste problem through a truly meaningful integrated waste management approach. □

*(Wingerter is Executive Director and Chief Executive Officer of the National Solid Waste Management Association, which represents a number of industries in the solid waste control area).*

by Richard A. Denison

Seemingly overnight, our nation's communities have found themselves confronted anew with an old chore: taking out the trash.

Over just the last two years, the "solid waste crisis" has moved from being a cry of alarm to a truism and now is threatening to recede into little more than a platitude.

Any number of reasons for, and solutions to, the crisis are offered by the interested parties: some see landfills filling up, while others see them draining poisons into ground water. Some consider incinerators a clean alternative to unsightly dumps, others see only air pollution and toxic ash. Some regard skyrocketing costs of landfilling and incineration as the problem, others view those same costs as providing incentives to explore and fund better alternatives such as recycling. Some blame citizen opposition and "environmental evangelists" for the crisis, others believe they have no alternative but to block the limited choices offered them.

Quite an impasse!

In my view, these are all manifestations, not causes, of the solid waste crisis. To fashion truly viable solutions, we must go back to where we should have started in the first place. Rational management of our trash requires that we understand what is in it and how best to manage each component (a field of study sometimes referred to as "garbology").



Traditionally, we've skipped over this step entirely. We've simply buried all of our trash, typically in dumps that are little more than large holes in the ground. Now many communities are attempting to replace these mass landfills with "mass-burn" incinerators. Of course, incinerators don't make trash disappear; they only process it and reduce its volume, still leaving large amounts of toxic ash that must itself be landfilled.

Our traditional approaches to landfilling and incineration both suffer the same defect. Each perpetuates two myths that compromise our ability to find workable solutions to the solid waste dilemma: first, that we can manage trash without considering its individual components, and second, that a single method can successfully manage our entire waste stream. If trash is anything, it is diverse. It contains some materials that are readily recyclable, others that aren't; some that burn, others that don't; and some materials that are probably best buried, others that should never be.

Yet today's landfills are operated as mass graves for society's discards; lead-acid batteries and last week's leftovers receive equal treatment. And mass-burn incinerators consume trash as if it were a homogeneous fuel like coal, when in actuality it is comprised of materials such as cans and bottles (which don't burn), yard wastes and paper (which

burn but can be readily composted or recycled), and still other materials that contain toxic metals, such as batteries and many plastics. Landfills contaminate ground water, and incinerators pollute the air and create toxic ash in large part because they don't discriminate in the waste they handle.

No matter how we view the issue—whether we are trying to find the safest and most economical means of

management hierarchy—will all play some role in this nation's solid waste management for the foreseeable future. Given the principles discussed above, what is a proper role for each in a rational waste management system? First, a delicate balance must be struck between the clear logic that certain of these options (reduction and recycling) take priority over the others, and the likely need for most if not all options in many

amount of waste that must ultimately be disposed of, they can also increase the safety of landfilling or incineration, by removing materials that shouldn't be buried or burned. And a growing number of public and private studies indicate that recycling may well prove to be the most cost-effective means of managing most of the municipal waste stream.

For the substantial amounts of waste that can be expected to remain even after maximum recycling, reliance on landfilling and incineration will continue, so their significant health and environmental risks must be directly addressed. Proper design of facilities using best available technology is critical. For landfills, impermeable liners and covers, and collection systems for leachate can greatly reduce risks to water supplies; methane recovery systems can turn landfills into sources of energy. For incinerators, advanced combustion systems and state-of-the-art air pollution controls, coupled with restrictions on the kinds of waste that may be burned, can reduce air pollution significantly. With respect to incinerator ash, provision for chemical or physical treatment and separate disposal of the ash in lined landfills must be integral parts of any incinerator project. We already know that these protective measures will not come cheaply; we know even better the costs of not insisting on them. □

(Dr. Denison is a scientist for the Toxic Chemicals and Solid Waste Programs of the Environmental Defense Fund.)

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***Incinerators don't make trash disappear; they only process it and reduce its volume, still leaving large amounts of toxic ash that must itself be landfilled.***

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disposing of these materials, or evaluating potential to reclaim their resource or energy value, or assessing the prospects for reducing the quantity or toxicity of waste—all of these perspectives demand that we recognize trash for the plethora of materials it is, and as a corollary, that we take steps to keep separate (or to separate trash into) its various components. This ethic is already at the heart of recycling, evidenced by the growth of programs for curbside collection of recyclables and the increasing use of mixed-waste processing technologies. Such source separation must become the ethic for incineration and landfilling as well.

Reality dictates that source reduction, recycling, incineration, and landfilling—the four tiers of the now familiar waste

communities. While it is rarely practicable to proceed in an orderly fashion down the hierarchy by implementing the options in sequence, many communities have entirely precluded any serious development of the options that should be the first resort. The all-too-common scenario of committing most or all a city's waste stream and hundreds of millions of taxpayer dollars over several decades to an incinerator project, while paying little more than lip service to recycling, makes for poor fiscal and public policy.

In addition to their popular appeal, source separation, composting and other recycling programs are now recognized as serious waste management tools: not only can they greatly reduce the



by Norman H.  
Nosenchuck

New York State, like most of the states in the United States, faces a solid waste disposal capacity crisis. Ever-increasing amounts—over 20 million tons of garbage in 1988, up from about 18 million tons in 1987, and about 17 million tons in 1986—indicate that we are also increasing the amount of trash each of us in New York produces: from 0.97 tons per person per year in 1986 to 1.13 tons per person per year in 1988. And, there are fewer and fewer permitted facilities in the state to handle this trash.

To address this garbage

problem, New York State's solid waste management policy calls for (in order of preference): waste reduction; reuse and recycling; waste-to-energy systems; and land burial of the remaining wastes. The New York State Solid Waste Management Plan established a goal of curbing waste by 50 percent by 1997—8 to 20 percent to be achieved by waste reduction and 40 to 42 percent by reuse/recycling.

Under the state's new rules, any plan for a new solid waste facility is reviewed by the New York

State Department of Environmental Conservation and there must be a demonstration that waste reduction and recycling will be maximized.

Wastes may be reduced by changing the way in which goods are manufactured and packaged, or by diverting to reuse or recycling waste materials that formerly were discarded. However, we must not depend totally on such efforts to solve our garbage problems. There are limitations. We'll still have about 50 percent of the garbage left and we've got to get rid of it. We can take that

remaining portion of the trash and extract energy from it through incineration, significantly reducing the volume of waste materials that we bury in the ground.

Waste-to-energy facilities, combined with waste reduction and reuse/recycling programs, and landfills for ash residue, can provide acceptable solid waste management for governments. The sizing of these waste-to-energy facilities is critical. We do not want them so big as to discourage waste reduction or reuse/recycling programs.

Emissions from a properly designed and operated waste-to-energy facility, using state-of-the-art pollution controls, should not significantly or unacceptably increase risks to human health or the environment. Ash residue from incinerators will be placed in lined landfills with leachate collection.

New state regulations for incinerators require that new facilities have more pollution controls, operate at more efficient rates at higher temperatures, and are monitored more closely by better trained operators. For the first time, limits are set for dioxin emissions.

The regulations require a "cradle-to-grave" approach for ash residue management from waste-to-energy facilities. Such a step-by-step management approach allows the Department to monitor and control ash residues from generation to final disposition, thereby protecting human health and the environment from the potential dangers of mismanagement. The approach will be formalized in a required ash residue management plan, prepared



W. Haley photo. NYS Department of Environmental Conservation.

Building a sanitary landfill in 1988. Workers position synthetic liner panels. The liner is tested continuously during construction. Pipes underneath collect any liquid that might escape.



by the applicant. The plan will be an enforceable provision of the permit issued to operate the facility.

In New York, our goal is to use landfills only for disposal of wastes that cannot be reduced, reused, recycled or combusted in waste-to-energy facilities. These include some sewage sludge; waste needing disposal while waste-to-energy facilities are temporarily out of service; construction and demolition debris; waste from some rural areas where other waste management methods are not practical; and ash residues from waste-to-energy facilities.

Landfilling operations must be carefully managed. The new regulations require that new landfills be constructed with double composite liners to provide a minimum of six layers of protection between the trash and the underlying groundwater with dual leachate collection systems and leak detection systems. New state-of-the-art solid waste landfills in New York State will have basic engineering and construction standards similar to those now required for hazardous waste landfills. Landfills will be required to conform to rigid siting restrictions to prevent them from being built where they may have an impact upon sensitive environments such as principal and primary aquifers or regulated wetlands. In addition, the requirements for siting studies will compel selection of the most environmentally appropriate sites for new landfills.

Solid waste management is no longer as simple as it was when localities budgeted minimal amounts of money for garbage disposal at the local landfill. Today, long-term commitments of

emphasized, nor should we forget the lessons learned from past failure to do this.

Very few people welcome incinerators or landfills as a neighbor. Siting solid waste management facilities may be

community planning and analysis, overseen and monitored by the state to assure compatibility with our goals in the context of an integrated state solid waste management program: waste reduction, reuse/recycling, waste-to-energy incineration and volume reduction, and landfilling. Only if all of these methods are integrated into a comprehensive solid waste management program can we hope to overcome the imminent disposal crisis in our respective states. □

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***In New York, our goal is to use landfills only for disposal of wastes that cannot be reduced, reused, recycled or combusted in waste-to-energy facilities.***

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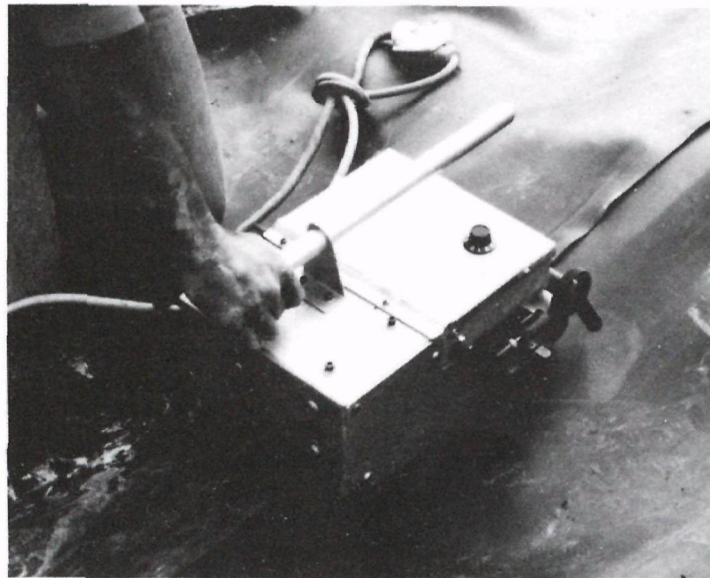
resources and significant sums of money are needed.

Also, history has taught us that early and continuing presentation of issues to the public is essential in gaining public confidence and support. The public must be informed early and continuously for the duration of a solid waste management project. The importance of this can not be over

the biggest problem facing communities planning solid waste management programs. The NIMBY syndrome—Not In My Backyard—accompanied by the lament—NIMTOF—Not In My Term Of Office—is still prevalent; but these facilities have to be located somewhere.

The key to overcoming such reluctance is proper

*(Nosenchuck is Director of the Division of Solid Waste in the New York State Department of Environmental Conservation.)*



Special devices are used to test liner seams during construction of a new landfill. Inspectors from an engineering firm are continuously on site until construction is completed.

W. Haley photo. NYS Department of Environmental Conservation



# Source Reduction: Its Meaning and Its Potential

by Roy Popkin

**R**educing the steadily increasing flow of solid waste deluging our nation's overloaded and diminishing landfills and other disposal resources means solid waste managers must find ways to foster the concept of "source reduction". This is the modern-day environmental equivalent of the old western movie admonition to stop the bad guys by "cutting them off at the pass."

Implementing source reduction measures necessitates getting consumers and industry to recognize that a "throwaway society" in which convenience and easy disposability dominate the market-place does not make environmental or ecological sense.

According to the EPA's Municipal Solid Waste Task Force report, "The Solid Waste Dilemma: An Agenda for Action," source reduction is "the design, manufacture, and use of products so as to reduce the quantity and toxicity of waste produced when the products reach the end of their useful lives. Source reduction is not a technology or process (such as landfill, incineration, recycling, or composting) to be applied to the solid waste stream. In applying the concept of source reduction, one fully considers the ultimate destiny of products when making decisions on how the products are made and which products or materials one uses."

EPA experts involved with implementing the new Agency-wide emphasis on pollution prevention see source reduction as a key component of integrated waste-management and as a first line of defense against the growing mountain of solid waste clogging our national waste stream. In homes, business, and industry, this approach can take many forms: using less or non-toxic solvents in a production process so there is less hazardous waste going into sewer-bound effluent; using cloth diapers instead of disposable diapers (or using highly absorbent

brands); using paper bags instead of plastic; composting garden trash and grass cuttings from backyards or park areas; using a photocopier that prints on both sides; selling products or fast foods in degradable packaging; using longer-lasting products; and taking the mercury out of batteries used in cameras, toys, and flashlights. Or it can

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***One would expect that the goals and concept of source reduction would be so obvious that their adoption and implementation would be in full swing across the nation.***

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take the form of outright bans on the use of certain products or chemicals—like taking lead out of gasoline or prohibiting the use of DDT, or special taxes or penalties related to waste disposal practices.

## **Our Throwaway Society**

Americans discard over 160 billion pounds of solid waste per year. This was the equivalent of 3.58 pounds per person each day in 1986 (and is expected to reach almost 4 pounds by the year 2000). West Germans throw away less than 2.5 pounds per day, Oslo residents 1.7.

Every year we throw away 16 billion disposable diapers, 2 billion razors and blades, and mountains of automobile tires, construction and demolition debris, sludge, automobile bodies, nonhazardous industrial wastes, incinerator residues, household hazardous wastes, and nonfood products such as detergents or cosmetics that may be left inside discarded containers.

A Dow Chemical executive recently told a solid waste forum that 40 percent

of the 50 billion pounds of plastic consumed each year by the U.S. plastic market is used to make disposable, one-use items. And, says Stewart Mosberg, President of the Packaging Coalition for Solid Waste Management, Inc.: "One-third of almost 150 million tons of commercial and industrial trash generated by Americans per year is packaging." Mosberg predicts that within the next 10 years, more than one-half of U.S. cities will run out of dump site capacity. He emphasizes that "recycling, reclamation, and incineration are necessary for survival."

## **Approaching the Problem**

One would expect that the concept and goals of source reduction would be so obvious that their adoption and implementation would be in full swing across the nation. This is still far from the case, even though there is good reason for optimism. Michael Flynn, Acting Chief of the Criteria and Assessment Group in EPA's Municipal Solid Waste Program, indicates that tunnel vision may be part of the problem. He says that when volume reduction is discussed, the focus is usually on packaging. He urges that much more attention be given to paper products and to yard waste. Also, when looking at the overall problem of improving the manageability of the municipal waste stream, manufacturers and consumers, as well as regulators and waste managers, should stress the need for products that are not only degradable but are less toxic, recyclable, and have a longer life span, and a better potential for re-use. Some of these objectives, he notes further, are not always compatible (i.e., degradability as opposed to durability, as in the case of the need for reusable plastic food storage containers versus plastic



Large fronds from Arizona palm trees, a striking example of yard waste as a source of modern garbage.

six-pack holders that are strictly throwaway items).

Howard Levenson of the Congressional Office of Technology Assessment (OTA) points to other, more negative roadblocks: "The problem with the adoption of source reduction is a lack of incentives for the needed changes in social, business, manufacturing, and other related behavior. Those involved at this point don't share the cost of the burdens solid waste creates. While source reduction has theoretical primacy in approaching the problem, you need a lot of incentives and a strong federal role to bring about the needed changes in product design and in people's behavior—what they will or won't buy."

#### **Promoting Source Reduction**

Existing socio-economic and technical problems notwithstanding, promotion and implementation of source reduction approaches are increasing at all government levels and on the part of businesses and consumers. Congress, for example, has passed legislation banning non-degradable six-pack holders and has asked EPA to report later this year on what additional steps are needed to encourage source reduction.

EPA's Pollution Prevention Office and the Office of Solid Waste, are placing special emphasis on source reduction issues, both within the Municipal Solid Waste program and through coordination of Agency-wide source reduction approaches. The Agency is looking at actions to help educate consumers away from the throwaway/convenience approach to life because, as OTA's Levenson says, changes in consumer purchasing patterns are crucial to getting manufacturers to change their products. Workshops, conferences, outreach, and education efforts, as well as an information clearing house, are envisioned.

At the request of Congress, EPA is also preparing a report on plastics in the marine environment and the solid-waste stream. Since most plastic waste is landfilled (with the amount expected to increase 50 percent by the year 2000), the Agency is evaluating means of

reducing plastic pollution. Increased attention is being given to the search for substitutes.

In addition, EPA scientists are working on reducing sources of municipal solid waste toxicity, specifically on heavy metals like lead and cadmium that enter the waste stream from such sources as discarded batteries, consumer electronics, glass, ceramics, plastics, appliances, and pigments. Removing such sources from the waste stream could help resolve concerns about what happens when products containing lead or cadmium are recycled or incinerated.

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#### ***Rhode Island is regarded as the state that is currently doing the most about source reduction.***

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State and local government involvement in source reduction activities is growing, especially in terms of consumer education and legislative action. There have been a number of attempts to ban or tax products or materials considered undesirable and at least one Washington state community is trying rezoning to bar a fast-food chain that uses non-degradable polystyrene food containers. Also, the University of Washington has stopped using plastic utensils in its cafeterias. However, most of the specific product bans that did become law have been legally challenged and either found unconstitutional or become mired in expensive, drawn-out litigation.

Rhode Island is regarded as the state that is currently doing the most about source reduction. A statewide Source Reduction Task Force has recommended bills to make source reduction the top priority in solid waste management planning. The Task Force has introduced a package of bills, including financial incentives or disincentives. Already adopted by the legislature are bills exempting paper bags from the state use tax and requiring stores to have them available, and another taxing businesses that sell a significant amount

of litter-generating items. Task Force staff say there is 90 percent participation in Ocean State source reduction and recycling efforts. Also planned are an in-store consumer education campaign and technical assistance to businesses through waste reduction and recycling audits that will suggest internal production changes to achieve source reduction goals.

There is significant source reduction activity in at least a dozen other states, and in many local municipalities and counties. Suffolk County, New York, for example, has banned plastic food containers and the use of polystyrene foam and polyvinyl chloride for retail and restaurant food packaging. Plano, Texas, successfully reduced a major source of residential garden waste with an intensive public education effort to change the way residents cut their lawns so that the amount of bagged grass clippings coming to the town dump was markedly lowered; and Montgomery County, Maryland, by picking up leaves raked to the curbside and composting them, sharply reduced the volume of bagged leaves picked up by garbage trucks and taken to the county landfill.

Regionally, the Coalition of Northeastern Governors (CONG) has initiated a major source reduction effort, in collaboration with industry and environmental groups, because "the Northeastern states, with a population of over 50 million, generate significant quantities of solid waste," and "represent a significant portion of the consumer market served by the packaging industry." A Coalition Task Force on Source Reduction is seeking "to identify meaningful voluntary and other measures that can effectively be carried out by and within the region to reduce packaging waste volume and problem materials." The Coalition includes the governors of Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Connecticut, Rhode Island, and Vermont.





Waste Age photo.

Task Force goals are to be accomplished by reducing the total volume of disposable packaging material generated for domestic, commercial, industrial, and governmental use; increasing the recyclability of packaging products that cannot be reduced; reducing the disposal impact of package waste by changing to more environmentally benign packaging material; and increasing the recycled material content of packaging products.

The Northeastern governors met recently with the chief executive officers of a number of major packaging and product manufacturers and distributors of such products to initiate the cooperative effort.

Business and industry reaction to source reduction, to date, is limited. A number of relatively new associations and coalitions dealing with specific waste generation problems (especially related to plastics) seem to be as concerned with avoiding new regulations and possible financial disincentives as with changing to more environmentally desirable products. Nonetheless, there are a number of examples of industry-based moves towards source reduction.

Proctor and Gamble is test-marketing in Europe a fabric softener in a reusable plastic container. When the liquid is used up, the consumer buys a small refill package of cleanser concentrate to mix with water in the original container. Sales in Europe have been promising; U.S. market tests are being considered. The company is also lab-testing a new degradable container for other products and has increased the

absorbability of its disposable diapers to the point where, a spokesman said they can "cut in half that particular contribution to solid waste."

Polaroid has eliminated mercury from its battery packs and has reduced the amount of disposable material in its film packs; at the same time, however, the company started marketing a throwaway camera. Nonetheless, the

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***Safeway is using degradable plastic bags, and McDonalds engineers and Amoco are looking at ways to replace polystyrene foam packaging or make it degradable.***

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company has a very active Toxic Use and Waste Reduction Program, and hopes to reduce the "volume of all waste material, not just materials judged hazardous by law."

Safeway is using degradable plastic bags, and McDonalds engineers and Amoco are looking at ways to replace polystyrene foam packaging or make it degradable. Buick has ordered its suppliers to use recycled materials when packaging parts for shipment to Buick assembly plants, while 3M and other companies are changing processes to use less or non-toxic coatings and solvents.

How successful these and other source reduction efforts will be in the long run is hard to project. EPA's Michael Kelly hopes that within the next five years continuing increases in solid waste volume will be reversed and that by the end of the century there will be a substantial reduction. The Final

Report of the Municipal Solid Waste Task Force has set a national goal of a 25 percent volume decline due to source reduction and recycling, as compared to 1988's ten percent drop. However, Allegra Cangelosi, staff person of the Northeastern Governors Task Force, says there is a need for a clear index on which to base such predictions and measure progress, while Karen Hurst and Paul Relis, authors of "The Next Frontier, Solid Waste Source Reduction," offer a variety of forecasts, none topping 10-to-14 percent by the year 2000. But if new developments have a multiplier effect and produce more positive results, source reduction's successes may be even greater.

EPA's *Agenda for Action* does see cause for hope even though the report conceded that "a source reduction ethic is not dominant in today's production or consumption habits." The report says that with recently expanded "interest in the preventive benefits of solid waste source reduction...solid waste issues in the news, depletion of needed landfill capacity, difficulties in siting landfills and incinerators, and soaring disposal costs, source reduction of solid waste has begun to receive serious consideration. Local and state governments are interested in the possibility that source reduction might abate waste management costs and environmental risk, avoid liability costs, preserve landfill capacity, and conserve natural resources."

If the urgent issues can be clarified for American consumers and industry and there can be a change in the nature of consumer demand, a source reduction ethic will replace our throwaway life-style. This would be a major step forward for EPA's pollution prevention approach to environmental protection. □

(Popkin is a writer-editor in the EPA Office of Public Affairs.)



# A Strategy to Control the Garbage Glut

by Bruce Weddle  
and Edward Klein

For many Americans, 1988 was the year the garbage glut hit home. Newspapers reported the feckless odyssey of a U.S. barge that spent over two years roaming the open sea looking for a port at which to dump its cargo of incinerator ash. A flood of medical waste closed beaches along the eastern seaboard. Many people paid much more to dispose of their trash. In some cities waste disposal costs soared to more than \$100 per ton because of shrinking landfill space, long-distance hauling, and high landfill and incinerator "tipping" fees. Barges, spoiled beaches and booming costs, however, are only symptoms of a more basic problem.

Last year, the United States produced enough waste to fill a convoy of garbage trucks reaching halfway to the moon, and the convoy is getting longer every year. Even as we produce more and more garbage, we are running out of places to put it all. New waste management facilities are desperately needed, but many cities face formidable opposition when siting new landfills, incinerators, and even recycling centers. Some communities have already run out of nearby places to put their garbage. Others have adequate capacity now. But, given the long lead-time required to set up a waste management facility, these communities must start planning now to avoid a capacity crisis in the not-too-distant future.

How then can we handle all this waste? Last year, EPA set up a Municipal Solid Waste Task Force to address this question. The Task Force findings and recommendations are outlined in EPA's report, "The Solid Waste Dilemma: An Agenda for Action." The report says that the problems associated with municipal solid waste management, including cost and capacity, are felt most directly at the

local level; therefore localities must be the first line of defense. But everyone has a role in dealing with the garbage problem.

EPA stresses the need for an "integrated waste management system," which is the complementary use of source reduction, recycling, incineration and landfilling to comprehensively manage garbage.

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***Last year, the United States produced enough waste to fill a convoy of garbage trucks reaching halfway to the moon.***

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Communities should mix and match these four tools to develop an integrated waste management system that best suits their local needs. Communities should use source reduction and then recycling to the extent practical, followed by incineration and landfilling. To help foster this preference, EPA has set a national goal of increasing the nation's source reduction and recycling efforts from 10 to 25 percent by 1992. Some communities have set similar or even higher goals and are on their way to achieving them, primarily through ambitious recycling programs.

Source reduction involves minimizing the volume and toxicity of products that ultimately require disposal, and making goods more durable so that longer periods of time elapse before they are discarded. One element of source reduction is for designers and manufacturers to develop packaging and products that use less material and create less waste. In addition, toxic chemicals should be replaced where safe and suitable substitutes are available. Several states have already taken steps to accelerate these changes. Rhode Island legislators have introduced bills to make source

reduction the top priority in the State's solid waste management planning. Several bills have also been introduced in New Jersey to ban or tax certain plastic packaging and disposable plastic products. EPA will be monitoring these activities to determine if they are successful in achieving source reduction. We will also work with industry, public interest groups, states and localities to achieve source reduction at the national level.

Much of the national goal set by EPA can be met by stepped-up recycling efforts. Recycling involves collecting, separating, processing and marketing "wastes" such as glass, metals and paper, as was done during World War II to ease wartime scarcity. Recycling can divert potentially large volumes of trash from landfills and incinerators, and can help conserve natural resources such as trees and oil.

Ten states have established mandatory recycling programs, and many local communities have adopted voluntary programs with curbside pick-up, drop-off centers, or both. In many cases, these towns have found that recycling is less expensive than incineration or landfilling, especially when avoided landfilling and incineration costs are considered.

A rapidly expanding part of recycling in some communities is the composting of yard wastes, which account for nearly one-fifth of the municipal solid waste stream. Composting allows yard wastes to degrade naturally for reuse as fertilizer or mulch, reducing the need for scarce landfill space. Several states have already established composting incentives by banning the disposal of yard wastes in landfills.

Incinerators and landfills, however, will be needed for many years to come because source reduction and recycling in themselves, won't solve all of the





Aluminum Company of America photo.

Some community groups, like these Boy Scouts, raise money by recycling cans.

by-product of waste decomposition. To ensure that toxic gases and liquids do not leak from landfills and that they operate safely, EPA has proposed standards that will force most landfills to take more stringent steps to protect nearby residents and the environment. These rules will bring about a substantial improvement in the way solid waste landfills operate.

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***Much of the national goal set by EPA can be met by stepped-up recycling efforts.***

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All of these elements—source reduction, recycling, incineration, and landfilling—can work together to form a completely-integrated waste management system. Each community should “custom-design” its approach to emphasize specific solid waste management practices that are consistent with the community’s demographics, financial resources, and waste stream characteristics. A community like Manhattan, Nevada, for example, may choose to rely on landfilling as its primary waste management practice since land is readily available and tipping fees are low. On the other hand, Manhattan, New York, where land is at a premium, disposal fees are high, and good recycling waste markets exist, may rely more heavily on recycling to reduce the amount of garbage going to landfills and incinerators.

Integrated waste management is an important framework for addressing the nation’s solid waste woes, but solving the problem is contingent on a strong partnership among government, industry and the public. EPA’s “Agenda for Action” recommends specific roles for everyone.

nation’s trash troubles. Incineration is useful for reducing the bulk of some municipal waste and provides the added benefit of energy production. As such, incineration can be a viable part of an integrated waste management system, especially if other management practices (such as recycling) are used to complement it. In some communities, incineration can be made more efficient by removing from the waste stream those components that don’t burn well or that could create harmful air emissions when burned. At the same time, recycling returns some of these

wastes to productive use. To address concerns over the air pollutants and ash that incineration produces, EPA plans to propose emission standards and is developing guidance for handling and disposing of incinerator ash.

For the foreseeable future, landfills will be essential for disposing of a significant portion of the waste. Landfills will continue to be needed for wastes such as non-combustibles, non-recyclables and incinerator ash. Landfills also can produce moderate amounts of energy through the recovery of methane gas which is produced as a





Source-separated trucks like this one in Santa Rosa, California, can make the recycling process easier.

*Waste Management photo.*

- To begin with, strong national leadership is essential. The federal government will provide this leadership through technical assistance, guidance, education, and regulations (such as EPA's proposed landfill requirements). National leadership also includes bolstering recycling markets by having federal agencies purchase recycled and recyclable products. This also sets a good example for the rest of the nation. The federal government will also foster source reduction and recycling by performing market studies and identifying incentives and other means for reducing volume and toxicity.

- Enforcement and planning are key responsibilities of state governments. States must regulate and issue permits to facilities and enforce those requirements. Each state should also determine the types and quantities of solid waste produced within its borders, and how to manage it. State governments should work with localities on integrated waste management. State governments, too, should purchase recycled goods whenever possible and help develop stable markets for recycled materials. To encourage stable markets, states might also create incentives, such as low-interest investment loans for business and industries that make recycled goods. Finally, states can provide education and technical assistance to municipalities.

- Local and county governments are primarily responsible for safely and effectively managing their citizens' trash. They should plan for the best combination of integrated waste management components and implement the appropriate system; they should also take a lead role in encouraging separation, collection, and marketing of recyclable materials, and educating businesses and consumers about integrated waste management practices.

- Waste management and recycling industries, too, should work with localities to plan and carry out integrated waste management. Localities and private industries can work together in a public/private partnership to safely and efficiently handle the garbage. The need for, and role of private industry will vary from community to community.

Waste companies can help develop markets for recycled materials and educate the public about ways to reduce the local garbage problem.

- Manufacturers should "design for disposal." That is, they should remove toxics, cut back on volume, and use materials which are recyclable, where practical. As large consumers, manufacturers and retailers (supermarket and fast-food outlets, for example) should buy recycled and recyclable products. Businesses can also play a key role in educating consumers

about the best ways to dispose of the products they purchase.

- Citizens must understand and accept their role in both creating and solving the garbage problem. They should learn about the products and packaging they buy and about the wastes their households and offices produce. Armed with this knowledge, consumers should seek out products that last longer, are less toxic, and have less packaging. They can use their purchasing power to demand these types of products. Consumers also should participate in local recycling efforts by separating trash for pick-up, and, where feasible, performing backyard composting. Citizens should be prepared to pay for their trash disposal, and to recognize the need for local waste management facilities. Finally, every individual should make a conscious effort to produce less waste, or at least stop increasing the amount of waste currently produced.

Solving the nation's waste management problems will require cooperation by all of us. No one segment of our society—government, industry, or private citizens—can do the job alone. As a nation, we must deal with our garbage problem now. If we wait, the solid waste disposal problem will only get worse. □

*(Weddle is Acting Director of EPA's Municipal Solid Waste Program, and Klein is Acting Deputy Director.)*



# What You Can Do To Help

by Eric A. Goldstein

**T**hink only government officials can solve the country's mounting solid waste disposal dilemma? Think again.

All of us have direct control over our trash through what we purchase and what we throw away. The amount of garbage generated, the toxicity of trash discarded, and the levels of recycling and waste reduction are all affected by citizen decisions. As members of the public, we can probably have a greater impact in easing the garbage disposal crisis than perhaps on any other environmental issue facing the nation today.

Take yard and food wastes. Together these materials account for a whopping 25 percent of the nation's garbage load, according to EPA data. By setting up backyard composting programs, many

homeowners could take a big chunk of these materials out of the waste disposal stream.

In the composting game, everyone wins. The return of leaves and other organic waste to the earth replaces nutrients in the soil. The need for new landfills and troublesome garbage burning incinerators is reduced. And with less refuse left for garbage pick-up, disposal fees can dip (or at least hold their own in an era of sharply rising collection costs).

You don't need fancy technology to set up a backyard composting system. The concept is literally as old as the woods. All you need to start is a small area in which you put down a 6-to-10-inch layer of grass clippings and

leaves. Then cover them with some soil, adding fresh cat litter or alfalfa meal to cut down on odors. You can even add kitchen scraps (not meat). Rodale's *Organic Gardening* recommends that the moistened compost be piled at least three feet square and up to four feet high. The pile should be turned every few weeks, and can be covered with a tarp during winter months.

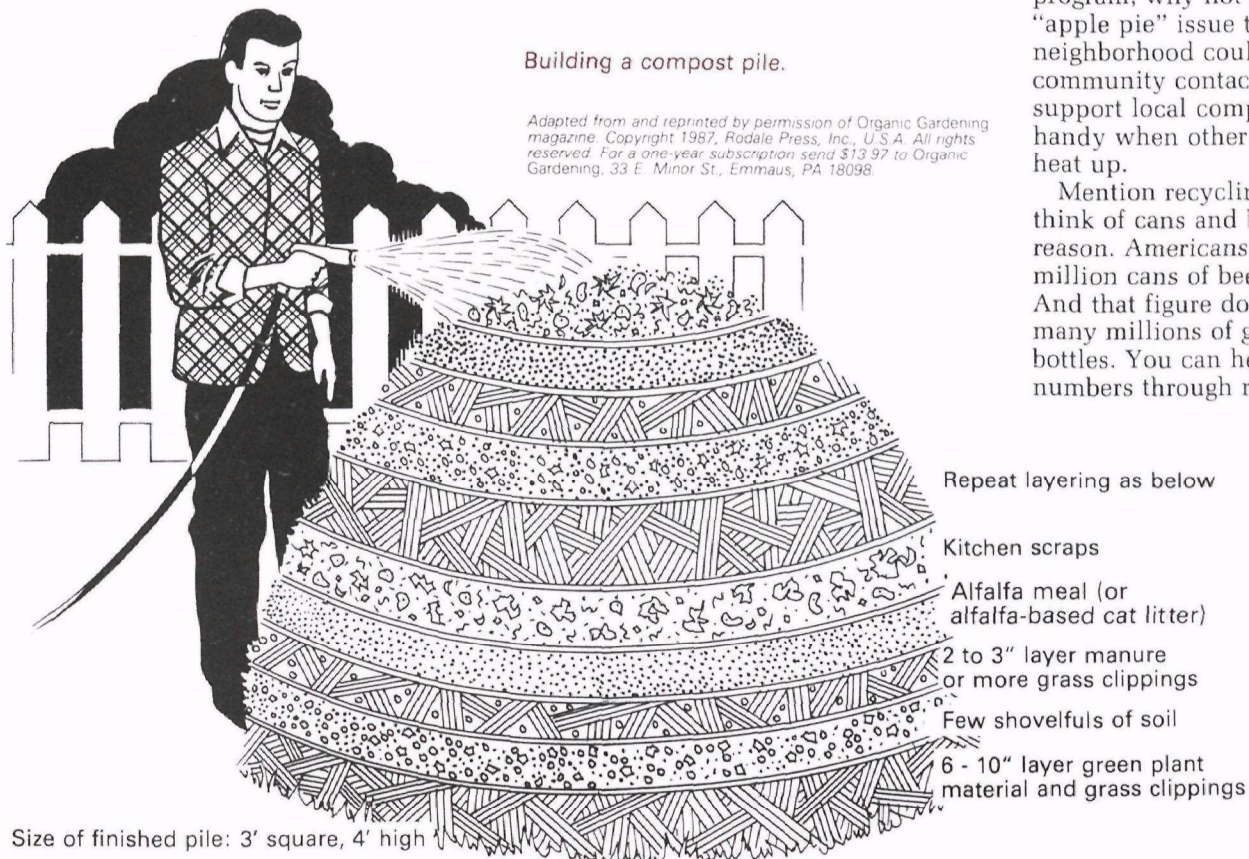
Many localities have already kicked off their own municipal composting programs. In these operations, yard waste is collected as part of the local trash pick up and is taken to municipal parks or other facilities, where large-scale composting activities are underway.

If you cannot set up a backyard composting program, and your community does not have a municipal program, why not lobby for one? It is an "apple pie" issue the whole neighborhood could support. And the community contacts you establish to support local composting could come in handy when other environmental issues heat up.

Mention recycling and most people think of cans and bottles. With good reason. Americans purchase nearly 200 million cans of beer and soda every day. And that figure doesn't even include many millions of glass and plastic bottles. You can help trim these numbers through recycling, saving

Building a compost pile.

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money and conserving natural resources in the process.

Ten states now have returnable beverage container laws. Five-cent or ten-cent deposits for each bottle or can are levied at the point of purchase; the cash is refunded when the empty bottles and cans are returned. A better way for children to learn about conservation and to pick up extra allowance money would be hard to find.

Even in states without bottle deposit bills, beverage container recycling is worth doing. This is particularly true in the case of aluminum. Recycling requires only five percent of the energy needed to produce virgin aluminum cans from bauxite. In part for this reason, you can find recycling opportunities for aluminum cans throughout the 50 states.

Don't forget newspaper recycling. The only trick here is to keep glossy newspaper supplements (Along with junk mail and other trash) out of your separately bundled newspaper. Many localities already have special pick-ups for newspapers. If your community does not, find out why. Although markets for recycled newspapers fluctuate, the landfill space your town can save by recycling newspapers makes this strategy attractive, to say nothing of the benefits from reduced demand for forest products.

What happens to the insecticides, paint, batteries, nail polish remover, and other household toxics you discard? If you are not participating in a local household hazardous waste collection program, these toxins are probably winding up in a landfill where they threaten to contaminate ground or surface water, or an incinerator where they aggravate air pollution problems. Find out from your sanitation department if your community has a household toxics recycling program and help keep these harmful pollutants out of the air and water.

Better than recycling trash is not producing it in the first place. Such activities fall under the banner of "source reduction." Much of the strain on our existing landfills comes from a post-World War II explosion in

packaging. The annual consumption of packaging in New York State, for example, has jumped from about 400 to 800 pounds per person since 1958. Why? Packaging sells. Advertisers have bombarded American consumers with messages luring them to products with elaborate, often multi-material, packaging. While some of this packaging is justified for sanitary purposes, the proliferation of packaging has clearly gone too far.

Here are some tips for those seeking to get out from under the packaging mess. For starters, know what you want when you go shopping; buy the product,

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***All of us have direct control over our trash through what we purchase and what we throw away.***

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not the package. Many supermarkets now offer items for sale in bulk quantities. Patronizing these products can save you money. Excess packaging is expensive; usually it is the consumer who pays.

When purchasing beverages, you might want to stick with glass bottles or aluminum cans; the recycling of plastic bottles is still in its infancy.

You can also cut down on solid waste by bringing your own string bag or satchel to the market to carry a few items home. The Europeans do this, and it is one reason why some European countries produce only half the waste per person than the United States does. And why not skip the bag completely if your trip to the convenience store is only for a quart of milk or a loaf of bread?

Americans now live in a throw-away society. Everything, it seems, is disposable these days. Add fountain pens, razors and even cameras to the growing list of products that were once reusable and now are needlessly piling up on landfills across the country. When purchasing consumer items, inquire about the durability of a product. A cheaper model that will break down or fall apart more quickly is no bargain.

Recycling and waste reduction opportunities don't end in the home. Commercial waste adds significantly to local waste disposal burdens. In New York, for example, commercial wastes surprisingly account for nearly 50 percent of the total garbage disposed by the City.

There is plenty citizens can do to cut back the amount of commercial trash. Paper and paper products regularly top official lists of solid waste volumes. In Washington, D.C., the dean of white collar towns, paper accounts for more than half of all solid waste generated. Separating white ledger and computer paper for recycling could cut down on disposal costs and bring in extra income for your company. This is not a high risk operation; demand for these materials has remained relatively stable over the years.

Another idea is to switch your company's letterhead and paper stock to recycled products. Local environmental groups can help identify suppliers in your area.

All these opportunities for citizen action do not mean that government agencies are off the hook. Recycling and waste reduction activities will never assume their rightful position as the nation's dominant waste disposal strategies without full cooperation from and aggressive involvement by city, state and federal officials.

But you should not minimize your own role. If there is a silver lining in our nation's trash disposal woes, it is that the very citizens who are responsible for producing so much of the municipal garbage load can find plenty that they can do to turn the crisis around. □

(Goldstein is a senior attorney with the Natural Resources Defense Council, Inc., a national environmental group.)



# Five Situation Pieces:

## — Indianapolis, Indiana

by Beulah Coughenour

What is happening around the country, at the grass roots, regarding solid waste management? While the Journal does not have the resources to conduct a broad survey, we did locate what we felt were five especially interesting situations. They include Indianapolis, Indiana, a city that accepted a facility to burn its garbage; Prince George's County, Maryland, a locale that turned down an incinerator; East Lyme, Connecticut, a town with a strong recycling program; Florida, a state that is launching an ambitious solid waste control program with unusually broad political support; and finally, Islip, New York, the town that sent out the garbage barge that became the focus of international attention because a place could not be found that would accept and dispose of the waste. The Journal asked persons involved in each of the five cases to author articles explaining the situations for the lay reader. The five pieces follow.

**B**urn it, bury it or leave it at the curb!

Ten years ago, the City of Indianapolis looked into the future and realized we were heading for trouble unless we figured out what we were going to do with our trash.

The single remaining landfill had a severely limited life, and local government was being held responsible by the U.S. EPA for any environmental problems. In addition, this one landfill was in a position to have an uncontrolled monopoly on the area's trash market, which could have forced the city to pay potentially exorbitant prices for disposal there.

The outlook for additional landfill space was not good. Fifteen formerly available landfills in the area had been closed in recent years, either due to regulations or because they had gone out of business. Meanwhile, no new landfills had been sited in central Indiana for years. One of the factors was strong citizen opposition, which

had increased as the public became more aware of the environmental dangers from inadequately planned sites.

A solid waste task force composed of people from various groups interested in finding a solution to our problems was appointed by the Mayor. This larger group evolved into a smaller steering committee which explored many options including recycling, worm-farming, composting and land application, landfilling in southern Indiana coal mines, and mass burn or refuse-derived fuel technologies. One member of the group had a plane so we were able to see various techniques first-hand. We learned a lot about trash!

In 1978, the steering committee visited resource recovery facilities in Dusseldorf, West Germany. What we saw convinced the committee that the mass burn/resource recovery technology was best for Indianapolis. We made the decision on the basis of addressing several key areas: (1) the technology had to be technically sound and proven; (2) any plan had to

be cost-effective and backed by a reputable bonding company with a deep pocket and a financing plan requiring equity participation on the part of the vendor; (3) the strategy also needed to be backed by the legal authority to control the flow of trash to disposal facilities and to choose the best vendor through the Request for Proposal (RFP) process rather than just accepting the lowest bidder.

In 1979 the task force set up some guidelines:

- The city would guarantee an average of 1500 tons of solid waste each day with an average 4500 to 5000 British Thermal Units (BTU's) per ton.
- The Request for Proposals would include three 600 tons per day (TPD) mass burn boilers with the capacity to dry some wet sludge cake.
- The mass burn plant should be constructed through a full-service vendor who would design, construct, own, operate, and guarantee performance.
- The financing should include Industrial Revenue

Light 'er up! L.-R.: Indianapolis Mayor William H. Hudnut, III; City-County Councilwoman Beulah Coughenour; and Barbara Gole, Director, Department of Public Works. The first fire was lit in the city's new mass burn plant on August 24, 1988.



City of Indianapolis photo



# — Prince George's County,

Bonds the vendor taking 25 percent equity interest. The cost would be backed by the assets of the vendor and repaid from tipping fees and the sale of steam. (Tipping fees are highly dependent on sale of steam.) A landfill will still be needed for bypass and ash disposal.

We thought we were ready to roll. However a new Director of Public Works had other priorities. Our plans were put on hold (Patience!)

Then in 1984, with the appointment of yet another Public Works Director, the task force was expanded to include those groups who have a stake in solid waste decisions—the Chamber of Commerce, environmentalists, and citizens from homes and neighborhoods surrounding prospective landfill sites.

In an effort to site a new landfill for Marion County, which includes Indianapolis, the local government went to the community through a Landfill Evaluation Committee (LEC) with a broad base of representation. This group outlined what the best site would be like without knowing what locations might be proposed. Appropriate sites were sought, based on these criteria.

The proposed sites were announced in December 1984. Citizens' groups opposed the new landfill sites by bringing masses of angry residents and live rats to public meetings. The process led Indianapolis Mayor William Hudnut, III to decide that there would be no new landfill during his administration.

The city administration decided to go back to the original resource recovery plans. An RFP was put out in June of 1985. We had bids from three major systems. The steering committee heard these presentations. The proposal from Ogden Martin System, Inc. was accepted in September 1985. Their use of the proven Martin technology along with a capital cost

projected at \$84 million and Ogden's cash equity of \$21 million made them clearly the best vendor for Indianapolis. We still had the advantage of energy tax credit and accelerated depreciation, which kept our cost down considerably.

The process which took Indianapolis from an impending solid waste crisis to successful plan for solid waste management produced a ground breaking on May 16, 1986. The first fire lit in the new mass burn plant by Mayor Hudnut on August 24, 1988, could only have been possible through the partnership of many people from the business, political, technical, and environmental fields. As other communities set about planning to meet their own needs, they need to consider at least these several suggestions:

- Seek to educate the community about the reality of the solid waste problems your municipality faces.
- Form a broad-based committee to look at possible solutions.
- Include citizens with backgrounds in varying fields—technical, financial, environmental and legislative.
- Make sure the technology is workable and that you see it in action. Ask questions when you tour.
- Make certain you can control the trash flow.
- Select a company with a strong financial position.
- If possible, site your facility in an already industrialized area.

Above all, have the bulldog tenacity to see the proposal through. A mayor's support is indispensable. Expect things to take longer than you thought and don't give up! □

*(Coughenour is City-County Councillor for Indianapolis and Marion County, Indiana.)*



Sharon Kuck photo. Prince Georges Journal

Citizens banded together in Prince George's County, Maryland, to make clear their opposition to a solid waste incinerator. County trees and mailboxes were festooned with blue ribbons symbolizing blue skies and clean air.

Twenty-four hundred tons of trash a day; that's the solid waste disposal problem in Prince George's County, Maryland. Every day garbage trucks lumber across the nearly 500 square miles of this suburban county, bordered on the west by the District of Columbia. They carry garbage churned out by the county's approximately 700,000 residents; garbage that is rapidly filling the county's two landfills, slated to close by the year 2002, even if a controversial landfill expansion is approved by the local County Council. Without the landfill expansion, the landfills will be chock-full by the late 1990's. And, because it takes years to approve a site, and obtain permits for a new garbage disposal facility such as a landfill or incinerator, there is little time for debating even the proposed short-term solution.

Nevertheless, debate is the one thing Prince George's county has had plenty of, so long-term solutions to the trash disposal problem have been harder to come by. In fact, a bitter and nearly three-year debate over what to do with the county's

trash—including proposals to burn it, bury it, recycle it, or do a little of each—has left the county government still dealing with garbage the old-fashioned way. Nearly all of its garbage is buried in two landfills. A proposal by County Executive Parris Glendening to build an incinerator that would burn half the county's garbage was rejected unanimously by the County Council last November, after prolonged and acrimonious debate. Glendening, a popular county executive who generally gets what he wants from the County Council, lost big on this one, at least in the short term. More than 300 angry county residents packed a public Council hearing last October, weeks before the final vote on the incinerator. The handwriting was already on the wall. Citizens were convinced incinerator emissions would poison the air, and that bottom ash disposed of in "monofills" (landfills only for ash) would leach toxic plumes into the ground water.

One resident strode to the dais and slapped a small cylinder full of incinerator ash in front of each Council



member and invited them to unscrew the lid and breathe deeply. Make no mistake, the citizen activist said, council members' political careers would "burn in flames of the election of 1990" if they voted in favor of an incinerator. The speaker was part of a highly vocal, organized, aggressive citizens group known as the Prince George's Recycling Coalition, which was formed within two weeks of a press conference Glendening called last June to name his chosen location for construction of the so-called waste-to-energy facility.

The coalition sounded a heavy drumbeat of concern. Town meetings were held and environmental activists visited the county and spoke against incineration. The local Sierra Club became involved. Blue ribbons symbolizing blue skies and clean air turned up on trees, mail boxes, and signs as the movement spread. The group distributed posters declaring "Prince George's County: Incinerator Free Zone." A full-scale, countywide mandatory recycling program and state-of-the-art landfills were the only trash disposal methods the group decreed acceptable.

As the anti-incinerator movement grew, early Council supporters of incineration began to say federal and state air quality standards for incinerator emissions and regulations regarding disposal of incinerator ash were nonexistent or inadequate, so how could they be expected to vote for an incinerator?

The embattled County Executive brought panels of experts before the council to answer technical questions about incineration and ash disposal. The experts assured council members that breathing incinerator emissions was safer than drinking water, or driving a car.

He also warned that the county would have to truck

its trash out of state when its landfills finally bulged, because recycling could not handle enough trash. He said that angry constituents would wonder why their government did not act sooner and more decisively to solve the Prince George's County trash disposal problem.

Seagulls, Glendening predicted, would be in every kitchen, picking over piled up scraps; garbage would wash up on the beaches from ocean dumping. But in the end, even the most dramatic arguments failed to convince. The Council had to bury most of the county's garbage in landfills and recycle the rest for the foreseeable future.

Council members all hotly deny it was fear of losing their jobs that spurred the nine of them to vote against incineration. Rather, they say that it was concern for the environment and a desire to give full-scale recycling a trial that moved them to vote no.

As often happens in politics, few seemed fully satisfied with the decision.

In the newspapers, the county executive scolded the Council, saying it had shirked its responsibility to provide a long-term solution to the trash problem. He emphasized the Council's reversal of its own earlier unanimous commitment to reduce reliance on landfills for trash disposal.

On the other side, citizen activists who pushed for defeat of the incinerator were uneasy with what they saw as a compromised victory. They had asked for a mandatory, countywide recycling program to dispose of as much waste as possible. Instead, they got a commitment from the Council to launch a voluntary recycling program. And they were disappointed by a lack of specifics on how the program would work and when it would begin.

Even Council members who voted against the incinerator publicly expressed misgivings about their decision; some said the incinerator proposal is sure to be back in a few years, when recycling and landfilling fail adequately to take care of the trash disposal problem.

Today, a pilot recycling effort is underway in six county communities, including more than 5,000 households. Newspapers, bottles, and aluminum cans are collected at curbside. But the effort is not even a year old.

Meanwhile, trash trucks continue their trek to the county landfills, packing them fuller with 2,400 tons of trash each day. As county officials often said during the incinerator debate, "it's got to go somewhere." □

*(Mapes is a Staff Writer for the Prince George's Journal in Prince George's County, Maryland.)*

## — East Lyme, Connecticut

by Dennis J. Murphy, Jr. and Peter L. Battles

As the first town in the state to achieve Connecticut's goal of 25 percent reclamation of the waste stream through recycling, East Lyme, with its population of 15,000, is known as a recycling leader. East Lyme's commitment to recycling goes back to 1974, when the town adopted an ordinance requiring the source separation of recyclable materials. We began with residential curbside pick-up of newspaper and magazines, and in 1976 added mandatory separation of glass and cans. Under the current

system, residents set out their recyclables on the same day as their regular refuse pick-up, with glass and cans in a container carrying a town-supplied recycling sticker and newsprint bundled or placed in paper bags. A two-person crew operates the town's recycling truck, which can cover all routes in a 5-day week.

Since 1985, the town has brought the private haulers serving multi-family and non-residential development into the recycling program, encouraged by institution of a \$35 per ton tipping fee for unseparated waste brought to the landfill. At the same time, corrugated cardboard was added to the list of mandatory recyclables. As a

result, all industrial, commercial and multi-family units are supplied by the haulers with a dumpster for refuse and two additional dumpsters for recyclables.

At the landfill, the town maintains separate ramps with leased 30-yard roll-offs for glass, cans, and newsprint, and a compactor for corrugated material. Glass and cans are hauled to and sorted at a regional processing facility. The facility is currently being upgraded with funding assistance from the state. Newsprint and corrugated material are transported to recyclers under contracts with private recyclers. Also at the landfill, a full-time gate attendant ensures that





East Lyme photo.

East Lyme, with its 15,000 population, was the first town in Connecticut to achieve the state's goal of reclaiming 25 percent of the waste stream through recycling.

other recyclables and non-refuse materials are deposited separately for disposal without landfilling. These materials include scrap metal, batteries, tires, and motor oil. In 1987, total tonnage recycled exceeded 2,400 tons, an almost 30 percent diversion from the solid waste stream. In the past year the town has begun curbside separated collection of leaves for composting, and recycling of office paper in the Town Hall and the public schools.

With the notoriety our recycling program has achieved, it is not surprising that numerous inquiries come from municipalities around the country on how to set up and run an effective program. We are happy to show people what we're doing, but we sometimes sense that these delegations go away slightly disappointed to find we have no "secret ingredient"—no simple trick of the trade that will guarantee success.

Although we have no magic to impart, East Lyme's 15 years of recycling experience indicates that the most vital aspect of a recycling program is communication—developing a clear and simple message and then continuously reinforcing it.

First, the townspeople must be convinced of the necessity of recycling. Some

people may be swayed by resource conservation or anti-litter arguments, but everyone appreciates simple economics. This is why our appeal is not to our residents' environmental conscience but to their pocketbooks: every ton of material recycled is a ton the taxpayers won't have to pay \$100 or more to dispose of at an out-of-town landfill after our own facility closes this year. The theme is: better to spend money on educating our kids than to spend it on burying our waste.

This message and the simple rules concerning when and how to put out recyclables are repeated in regular paid newspaper advertising, in flyers and brochures mailed out with tax bills and distributed through supermarkets, and in instructional material left at the curb by the recycling crew when materials are not separated. The town has even prepared a packet for Welcome Wagon to give to new residents. Also, we seek out any publicity that we can generate because articles about the success of our program instill community pride that increases participation.

An indispensable component of the education effort is an effective recycling coordinator, and the place for the coordinator is in the field: educating, cajoling, or

otherwise effecting the compliance of commercial waste generators, private haulers, and individual residents.

The kind of persistent public relations and education program that we speak of requires a strong commitment at Town Hall, from the chief elected official on down, but it can yield dramatic results. In the early 1980's, East Lyme was recycling approximately 1,000 tons per year, a successful program for a town of 15,000 people. By 1985, the realization hit home that our landfill would close within a few years, and with a renewed emphasis, that level grew to over 2,400 tons in 1987, a 140 percent increase; in 1989 the town expects to recycle 3,000 tons of material. □

(Murphy is First Selectman for the Town of East Lyme, Connecticut, and Battles is Director of Planning for the Town.)

During the summer following the 1987 session of the Florida Legislature, there was a growing awareness of emerging solid waste problems. The Secretary of the Department of Environmental Regulation was calling solid waste management the most neglected environmental problem in the state.

Nearly half of Florida's 67 counties were operating landfills under a consent order from the DER to correct violations in landfill operation. The agency listed 48 solid waste landfills as suspected of being, or actually known as, sources of environmental contamination and public health threats. Nine of the 48 sites were on the federal Superfund list. The public really began to realize the magnitude of the problem when it was reported that Jacksonville/Duval County processes enough solid waste to fill the Gator Bowl every 22 days and Miami/Dade County processes enough solid waste to fill the Orange Bowl 13 times a year.

Even though the Senate formalized its approach for reviewing the solid waste management issue by creating the Select Committee on Solid Waste Management, there was a growing consensus emerging in the legislative and executive branches of the state government that solid waste management problems had grown to near critical proportions and needed to have a high priority for the 1988 legislative session. The House Natural Resources Committee, chaired by Representative Sid Martin assigned full time staff to review the issue and propose legislation for the House of Representatives.

Governor Bob Martinez, previously the Mayor of Tampa, Florida, was already well aware of the growing solid waste problems facing local officials. The Governor





Under Florida's comprehensive new solid waste legislation, old tires must be destroyed. Portable tire shredders like this one can help.

and his appointed Secretary of the Department of Environmental Regulation, Dale Twachtmann, announced that they would develop legislative proposals for the 1988 session.

The Senate Select Committee on Solid Waste Management held eight meetings at various locations around the state to gather information on solid waste problems and to meet with local government officials and private sector businesses to solicit their comments on ways to solve them. Extraordinary efforts were made to inform statewide business organizations about the emerging solid waste issue and to solicit their suggestions on how the business community could help solve the problem. A great many man-hours were devoted to these tasks, as committee members traveled around the state to meet with as many business groups as possible in morning and evening sessions. The business associations were receptive to these discussions and indicated a willingness to participate in finding solutions, even if it meant providing new taxes or fees to solve the problem. Participants in these meetings included such organizations as the Florida

Retail Federation, Associated Industries, Soft Drink Association, Southland Corporation, Beer and Wine Industries, Waste Haulers, Publix, and many others. The toughest folks to get involved were the plastics companies. Finally after much pounding and threatening, they came to the table. An informal advisory group was formed of businesses involved directly in recycling activities to solicit their suggestions for reducing the volume of solid waste. This advisory group involved representatives from the paper, glass-forming, plastics, scrap iron and metal industries and others. These forums helped to develop a broad base of interest groups who generally supported the need for solid waste legislation, and the recognition that such legislation needed to be comprehensive in its scope to solve Florida's problems. This later proved to be extremely important in overcoming early proposals to have less comprehensive legislation limited to mandatory beverage container deposits (bottle bill legislation) and attempts to "take my client out of the bill."

As the legislative proposals on solid waste matured during the 1988 session, they became the most

extraordinary environmental legislative package of this decade. Never have so many different lobbying groups been interested and involved in a single bill. There were easily 70 to 80 lobbyists who regularly attended the weekly meetings held in both Houses to amend and improve the solid waste legislation. I would estimate that we ultimately dealt with over 230 lobbyists and interest groups.

There were several issues that proved to be major roadblocks to the passage of this important legislation, but both Senate and House leaders were committed to solving the problems and removing the roadblocks. Among the major issues were:

1. The role of private waste management businesses, including private recyclers versus local governments, in designing and implementing volume reduction programs.
2. Whether grants would go to all local governments (67 counties and 392 cities) or whether resources would be focused on larger cities and counties.
3. Ways to cause polystyrene foam products and plastic products to be recycled or degraded. The concern here was more for the litter aspects of these products than for the total volume they represented in the waste stream.
4. Whether local governments should be required to develop extensive implementation plans as a prerequisite for receipt of grants.
5. Whether the funding source for the legislation should be based on the allowance merchants retain for sale tax collections or based on a workers' compensation type mechanism that charges businesses a fee based on the number of workers. We ultimately

agreed on about \$30 million dollars of recurring revenue each year.

6. Creation of a broad-based advance disposal fee on containers to be effective in 1992, rather than a container deposit (bottle bill) feature limited to beverage containers. This has the potential to add another \$75-100 million dollars to pay for recycling infrastructure.

These issues were finally resolved by a conference committee during the last week of the legislative session. The compromise measure was enacted and became law on October 1, 1988. Florida's legislation was designed to change people's disposal habits, to provide incentives for recycling, to assist in informing the public of the true costs of solid waste management, to make sure all users pay their fair share, and to emphasize the importance of protecting the environment.

We probably made some mistakes, but it has been my experience that timing is critical to the passage of difficult legislation. Senate Bill 1192 is probably the most comprehensive legislation dealing with solid waste and all its aspects yet passed by any state legislature in the United States. Our window of opportunity was there, the time was right, and with a lot of great work from our staff and the other participants we were able to get it all done at one time. I am sure we will be fine-tuning this legislation for years, but the die is cast. It is hoped that by starting this aggressive program now, Florida will not be faced with the overwhelming solid waste crisis now confronting many other states. □

(State Senator Kirkpatrick was Chairman of the Florida Senate Select Committee on Solid Waste Management in 1987-1988.)



# — Islip, New York

by Frank R. Jones

March 22, 1987. To many the day has no significance. But to the residents of the Town of Islip it marked the beginning of a saga that would thrust our community into national prominence. It was that day when a group of garbage disposal entrepreneurs launched from Long Island City, New York, a barge laden with refuse—destination Morehead City, North Carolina. That vessel would come to be known as the "Islip Garbage Barge" and, while all of its cargo was not from our Long Island town, to the rest of the nation we became a symbol of the national, indeed international, problem of solid waste disposal.

We have often said that the Islip barge was the Paul Revere of garbage, with its not too subtle message, "the garbage is coming . . . the garbage is coming!" In retrospect, however, the barge's voyage was a blessing in disguise because it enabled our town government to rally our residents and get them to participate in recycling to reduce our solid waste disposal problem in a way not achieved before by any municipality in the United States.

Now, two years later, the Town of Islip is known to many as the recycling capital of the United States. CNN, ABC World News Tonight, and NBC News have all focused on Islip and the impressive fact that, on an annual basis, we now recycle almost 40 percent of our refuse. Our success as recyclers is due in large part to the attention focused on the problem by the infamous barge, and residents of Islip wanted to do something to help restore our proud community's good name. They were eager to participate in our expanded WRAP (We Recycle...America...and Proudly) recycling program.

In May of 1987, in response to dwindling

landfill space, and the fact that all Long Island landfills were under orders from New York State to close by the end of 1990, Islip developed an expanded mandatory recycling program, and enforced it.

A major factor in the Town of Islip's ability to recycle its garbage is the special WRAP containers provided to every town residence. These beige and green twenty gallon lid containers were distributed free of charge to each residence. Citizens are required to put them curbside every Wednesday. They are used to collect glass, metal cans, and paper recyclables, which are picked up by garbage trucks and taken to our recycling center where they are sorted out and readied for transport to the various brokers and paper brokers. WRAP inspectors tour our town each Wednesday and issue fines of up to \$250 to those who ignore warnings to "recycle or else."

Fully 95 percent of all of Islip's residents now place their recyclables out for collection each week and are

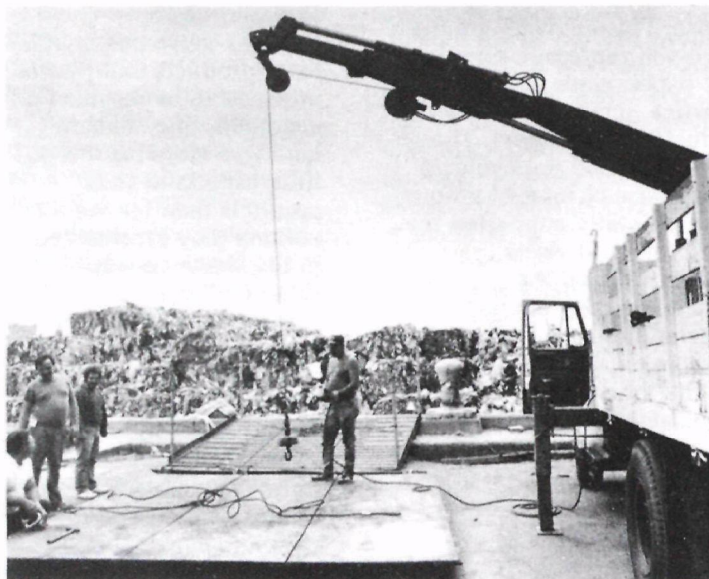
quite dedicated to the project. If those recyclables are not collected in what the taxpayers feel is a timely manner, they are on the phone to my Town Hall office expressing their concern that the recyclables, if not picked up on Wednesday, will become mixed in with their regular household trash collection the next day. We currently collect 50,000 tons of residential and commercial paper, glass, and metal recyclables yearly.

To complement the Wednesday WRAP program success, in September, 1988 Islip embarked upon a program to recycle yard waste. On Mondays and Tuesdays, every resident in Islip is provided a special yard waste collection. We collect all grass clippings, leaves, brush and branches and bring the material to a 30 acre composting site. Islip is the first municipality in the nation to operate a compost facility where more than 60,000 tons of yard waste is turned each year into fresh, fertile compost by using nature's own system.

As with our WRAP collection, we knew that making participation easy for our residents was essential to the composting program's success, so we developed a process that enables everyone to continue to use plastic bags for yard waste disposal—the very same kind of bags residents have been using for years. This system makes it convenient for residents to place their yard waste material curbside for pick up. We separate the plastic from the yard waste at the site, before processing. Currently we are using the compost material to provide cover for our dwindling landfill while also making it available free of charge for residents to reuse in their home gardens.

The final element in our program will be our waste-to-energy resource recovery plant. When the plant goes on line in June of this year, with some additional burning capacity to be added later, it will burn that portion of the town's solid waste that can not be recycled or returned to nature as compost. The plant will be revenue-producing, and will generate enough electricity for 9,000 homes in our community of 73,000 homes. Of course, it will also produce ash. Right now, working with experts from the State University of New York at Stony Brook, we are hopeful that we will be able to also re-use the ash for road or building construction material. When that technology is perfected, we will then be able to recycle and re-use our entire waste stream.

Thus, in just two short years, the town of Islip has progressed from being an exporter of garbage to being its foremost recycler. With a tip of the Islip hat to the garbage barge, we intend to remain just that way! □



(c) 1987 Audrey C. Tiernan, Newsday.

Workers preparing a ramp to unload the widely traveled barge that carried garbage from Islip, New York.

(Jones is the Supervisor of the Town of Islip.)



# How Japan Is Handling Its Solid Waste

by Joanna D. Underwood

Fewer than 6,500 municipal solid waste landfills operate in this country, and half of these, it is estimated, will be closed or filled within the next two years. As landfills are shut down at this alarming rate, community leaders face urgent decisions about what to do with their garbage.

Many municipalities have decided that incinerators, particularly those that burn garbage for energy, are the solution, and are going full steam ahead. As of 1987, 107 energy recovery plants

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*Japan has been a pioneer in integrating use of waste burning with maximum materials recycling.*

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had been built in the United States, and another 50 were under construction or in advanced states of planning. But these plants are encountering a great deal of opposition around the country. Community concern about these facilities centers on their safety and whether, and to what extent, they are needed. (Are there better ways to handle garbage?) If incinerators are built, what steps can be taken to ensure the cleanest possible operation?

In recent years, Japan, Sweden, and West Germany have been among the countries leading the way in developing incinerators, and Japan has been a pioneer in integrating use of waste burning with maximum materials recycling. Japan may have the most sophisticated overall system for managing solid wastes of any country.

The impetus for developing Japan's system was clear: They virtually ran out of landfill space 35 years ago. Their population of 120 million (half that of the United States) is jammed into an



INFORM photo: Dr. Allen Hershkowitz.

island nation the size of California, of which only 21 percent of the land is habitable. Today the Japanese have over 1,400 people per habitable acre. We in the United States have 50.

My firm—INFORM, Inc.—made a two-year study of the Japanese approaches and described them in *Garbage Management in Japan*. What the Japanese do with their solid waste, and what they achieve, offers helpful, indeed exciting, models for this country.

## Approaching the Problem

The Japanese, first of all, do not treat municipal solid waste as one mass that should simply be carted off and somehow disposed of as we have typically done for decades in the United States. They follow the theory that every

piece of waste has its proper place. They distinguish four categories of waste (only one of which, in their view, needs to be incinerated). The first category includes glass, metals, paper, and other materials (increasingly including plastics) that can be recycled into new products. Japan has pursued recycling of such materials extensively—which they refer to as “resources,” not “waste”—for nearly a hundred years. Japanese communities

Because it has little land available for landfills, Japan has extensive waste separation and reclamation programs. Children are taught the importance of separation early and entire families segregate their trash before it is collected.





Cartoon drawings help keep Japanese aware of the importance of recycling.

INFORM photo. Dr. Allen Hershkowitz

are achieving impressive recycling levels of 50 percent or more.

Second, Japan—as well as some of the European countries studied by INFORM—identifies hazardous elements in its trash, such as flashlight and watch batteries and certain plastics, as materials that require special treatment or disposal. These are difficult to recycle and are considered undesirable to burn because they may produce dangerous gas and heavy metal emissions. (Because of such concern over toxicity, the Swedes have banned use of cadmium in all consumer products.)

The third category is garbage that is appropriate for direct landfilling—non-combustible, non-toxic materials such as ceramics and nonrecoverable glass that can't be recycled.

What remains are "soiled combustibles," including organic kitchen waste, yard waste, light plastics, and soiled paper. Most of this—about a third of all the country's solid waste—is burned. (Recognition of problems of nitrogen oxide emissions related to burning yard wastes have recently led a growing number of U.S. cities to promote composting of yard refuse.)

The Japanese prefer incineration to direct landfilling of "soiled combustible" wastes because incineration reduces the volume of material going to limited landfill space. It also reduces the risk of toxic elements in raw waste contaminating ground water by percolating down through

### ***They follow the theory that every piece of waste has its proper place.***

landfill sites, or causing air pollution via gaseous emissions.

In order to plan for future waste management needs, the Japanese inventory their wastes very carefully. Detailed national statistics on materials collected and recycled are kept continuously. They track the amount of incinerated wastes coming from the country's 3,255 municipalities by such measures as weighing trucks as they deposit loads at local incinerators.

This careful materials inventorying allows the Japanese to assess how much landfill space or incinerator capacity they may need. Such detailed composition studies are only beginning to be conducted in the United States.

### **Waste Separation and Recycling**

The remarkably high—50 percent or better—recycling rates accomplished by most Japanese municipalities are achieved mainly by use of extensive waste separation programs at the household level. To gain a concrete picture of how waste separation and collection are accomplished on this level, INFORM studied practices in Machida, a typical medium-sized city with a population of 320,000 (smaller than Boston, but larger than New Haven.) Machida's citizens routinely separate waste in their homes. They separate:

- Bottles, papers, and cans to be reused or recycled.
- Poisonous or hazardous materials (including batteries, solvents, paints, etc.).
- Bulky, broken objects, such as old furniture, bicycles that can be repaired, and other non-combustibles, such as broken glass, scrap metal and hard plastics that go directly to landfill.
- "Soiled combustibles" to be incinerated.



The city has a well organized system for moving these materials to their proper destinations. Over 103 civic groups and resource recovery dealers pick up recyclables and sell them back to companies that reuse them. Municipal officials collect bulky objects and take them to local "cultural centers" where they are repaired to be sold. The repair work is done by senior citizens or people in need of therapy, a process that gives people productive work as well as creating saleable products. (During 1985, in Machida, more than 1,500 items, such as bicycles, furniture, and books were sold.) Municipal officials collect soiled combustibles that go to incineration several times a week, and they pick up dangerous materials from homes upon request.

Key to the success of community waste separation in Machida and hundreds of other Japanese cities is diligent public cooperation. A Japanese woman, when asked by INFORM what would happen if she and other families didn't separate materials, responded plainly: "But we do." This is a way of life. Children in their earliest school years are taught about waste and its management. They often tour their local garbage burning plant where workers give them lectures on proper waste management.

### **The Role of Garbage Burning**

The approximately 33 percent of Japan's wastes comprising the "soiled combustibles" portion that were burned in 1986 went to a total of 1,915 incinerators, 362 of which recover energy. The Japanese realize that burning garbage produces a range of problem-causing emissions, including acid gases, heavy metals, and toxic organic chemicals, and that studies correlating these emissions with human health effects leave much room for disagreement on the safety of incineration.

Their response to this dilemma has been to require use of all possible operating practices and technologies that reduce risk most effectively.

Under optimal circumstances seen at plants in Japan, West Germany, and Sweden, 99 percent of all measurable pollutants are removed, with the exception of mercury, which can be controlled at a range from 91 to 97 percent.

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### ***Key to the success of community waste separation in Machida and hundreds of other Japanese cities is diligent public cooperation.***

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The Japanese achieve high environmental standards with six key pollution-control and worker-training measures. They:

- Equip their plants with acid gas scrubbers which help condense metals and control acid gases, as well as with high-efficiency electrostatic precipitators or baghouses, which collect contaminated airborne particles.
- Remove non-combustible materials that would both upset furnace operations and increase air pollution levels.
- Monitor combustion conditions constantly to maintain temperatures best suited to minimize organic pollutants.
- Give plant workers extensive formal training.
- Monitor plant operations in keeping with strictly enforced environmental standards. In Japan and much of Europe, violations of air standards are punishable by fines, plant closings, and in some cases jail sentences for company officials.

- Manage the ash residue from incinerators carefully. The amount of ash is less than that generated by U.S. plants because so much noncombustible material is removed beforehand. Large incinerators (those burning 200 or more tons of waste a day) are required to produce no more than five percent ash by volume of the garbage burned. (U.S. facilities, which generally burn unsegregated garbage, generate from 10 to 15 percent ash, by volume.)

To avoid exposing workers and the public to the ash which they consider toxic, the Japanese use enclosed conveyor systems and transport the ash to landfills in covered trucks. The ash—often solidified into cement blocks—is disposed of in lined landfills that have leachate collection systems and wastewater treatment plants.

It is worthwhile noting that few Japanese programs have been developed to reduce at the source the amount of waste generated by households or businesses.

However, by the combination of public involvement in sorting and recycling garbage, conducting extensive recycling, and using state-of-the-art technology and careful worker training in incineration, Japan has been in the vanguard of nations that are coping with municipal wastes, economically conserving resources, and protecting the environment.

For U.S. policy-makers and the hundreds of American communities now struggling with their own waste management, a look at what the Japanese have accomplished should both encourage and inspire our own efforts toward developing integrated solid waste management. □

(Underwood is President of INFORM, Inc., a nonprofit environmental research and education group in New York City.)



# Making It Pay To Cut Waste

by Alyce M. Ujihara  
and Paul R. Portney

Americans are producing more solid waste—garbage, to put it colloquially—than ever before. Graphs, bar charts, and tables from a variety of reports all confirm what our eyes and, all too frequently, our noses tell us about the accumulated by-products of modern life. In the space of a few short years, most citizens have become aware of a problem that had heretofore only registered in those places where an occasional strike by municipal workers had left garbage piling up on streets and sidewalks. This awareness has been heightened by the saga of a hapless, wandering garbage barge, the sight of

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***Americans have been and continue to be prodigious users of resources. This is as true of the energy we consume as it is of the garbage we generate.***

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medical wastes washing up on public beaches, the closure of long-time landfills, and the acrimony surrounding efforts to site new waste incinerators.

Just why we are now confronting this problem is less clear. Two apparently competing theories seem to hold sway. The first—which we refer to as the “cowboy” hypothesis—holds that Americans have an almost ingrained use-it-up-and-toss-it-out mentality that will make it difficult, if not impossible, to reverse the growth of municipal solid waste. A competing view—the so-called “rationalist” perspective—is predicated on the belief that individuals respond in a more or less calculating way to the set of incentives they face. According to this view, the costs associated with a “toss it out” approach have historically been quite low: householders have paid

very little for garbage collection, so there was little reason for them to cut down on their effluvia.

Something may be learned from both points of view. Americans have been and continue to be prodigious users of resources. This is as true of the energy we consume as it is of the garbage we generate. And part of this may well be traceable to our national origins: we were, after all, a frontier society in which it was literally possible to pick up and move on when things ran out or we had made a mess. This was both the blessing and the curse that a vast and bountiful land conferred. Thus, a sort of horn-of-plenty mentality may have become ingrained in us all.

On the other hand, one can view this historical pattern as a natural response to the availability of land for waste disposal. Unlike Europeans, we could almost always find new landfilling areas even as our large cities grew. It made little sense to spend \$100 on recycling and waste reduction when waste could be discarded for a \$5 disposal fee (when we were unaware of the external costs that have now come home to roost in the form of ground-water contamination and other problems.) According to the rationalist argument, then, we may well have had a cowboy mentality when solid waste disposal was virtually free, but this should change as the cost goes up.

Regardless of one's preference between these competing theories, developments on both fronts point in the direction of less waste disposal. Recycling, source reduction, and other measures are becoming more and more popular. At the same time, and, not coincidentally, economic factors are pointing in the direction of less waste generation and reduction.

Recycling is viewed by many as a first line of defense in the battle to reduce solid waste. Nationwide, we currently recycle only about 10 percent of the

municipal solid waste we produce, primarily newspapers, bottles, and cans; but this is sure to increase because more and more voluntary recycling programs are popping up. The organizers of these programs seek “converts” through education campaigns and by making collection points as convenient as possible. For example, recycling rates are higher when the programs provide “curbside” pick up rather than offering only “drop-off” centers. Typically, these programs have householders separate recyclable waste from other garbage and this waste is kept separate when collected. As more people learn about opportunities for recycling, it should continue to grow in popularity.

Although these voluntary programs seem to be working well in some places, in others, programs may not grow fast enough to make a dent in the solid waste problem. As a result, communities are turning to more coercive measures to advance recycling goals. In a few places, participation in the local recycling program has become mandatory. Residents in these communities must, at a minimum, separate recyclable items from their garbage for curbside pick up. If they fail to do so, they may face a stiff fine (the heavy hand of the rationalist!) or, worse yet, the hauler may not pick up their garbage. Needless to say, these mandatory programs have much higher participation rates than voluntary ones.

Moving more in the direction of incentives rather than volunteerism, deposit laws or “bottle bills” provide a direct monetary incentive for households and others to recycle beverage containers. Nine states currently require consumers to pay a small deposit at purchase—up to 10 cents for each bottle or can—that is refunded when the empty container is returned. On the whole, such deposit





Scott Willis cartoon, Copley News Service.

systems have greatly encouraged recycling. EPA estimates that beverage container return rates are typically 85 to 90 percent. For this reason, some have proposed expanding the deposit-refund system to include other types of waste. In particular, this approach would be attractive for ensuring that potentially toxic items, such as car batteries and household hazardous wastes, are recycled or disposed of properly.

Even with successful recycling programs, some wastes will need to be discarded and the costs of doing so are increasing. A survey conducted by the

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***According to the rationalist argument, then, we may well have had a cowboy mentality when solid waste disposal was virtually free, but this should change as the price goes up.***

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National Solid Waste Management Association showed that average "tipping" fees for landfills—the charges paid by municipal or private trash haulers to dispose of solid wastes—rose more than 50 percent from 1986 to 1987. Fees will continue to climb in anticipation of stricter federal standards for solid waste landfills. But these higher tipping fees won't have their desired incentive effects unless they are passed on to those actually producing the garbage. Unfortunately, householders typically pay flat disposal fees that are based on factors other than the quantity of waste they generate. Because these fees do not decline if households produce less garbage, there is little economic incentive for them to do so.

The obvious solution is to link the disposal fee to the amount of garbage a household produces. Charging by the bag for trash or garbage can provide a direct incentive to reduce, and a number of communities are considering such an approach. Under one variant, residents buy stickers that must be affixed to garbage bags before they will be picked up by haulers. The concept of variable disposal fees can also be combined with recycling efforts. For example, in Palo Alto, California, residents who recycle receive free passes good for disposing of their other garbage. However, one concern is that higher disposal fees will have an undesirable effect: increased costs to consumers may encourage "midnight" dumping of solid wastes as some fear it has already done for hazardous chemical wastes.

Costs to consumers also may rise as a result of proposals for taxes aimed at solid waste reduction. Taxes targeted at non-recyclable items combined with a lower tax or exemption for reuseable or recyclable items, would provide an economic incentive to generate less waste. While many states are considering solid waste reduction taxes, only a few have actually instituted them. Rhode Island, for example, promotes the use of paper bags by exempting them (but not plastic bags) from a state tax. Florida will begin collecting a one cent tax on containers that do not sustain a 50 percent recycling rate as of 1992.

Believing, perhaps, that the habits of some cowboys will never change, many states are considering outright bans on

certain types of waste. As with solid waste reduction taxes, only a few have been enacted. Most likely to be singled out for such bans is packaging that is considered excessive or unnecessary, and for which environmentally more benign substitutes are readily available. New Jersey, for example, is considering a ban on styrofoam egg cartons. Anything thought to preclude recycling efforts may also be the target of a ban. The plastic can is one such example. Because it would have been very difficult to recycle and would have displaced the recyclable aluminum can, two states banned the plastic can and several others proposed similar legislation. These actions called a halt to the can's introduction into U.S. markets.

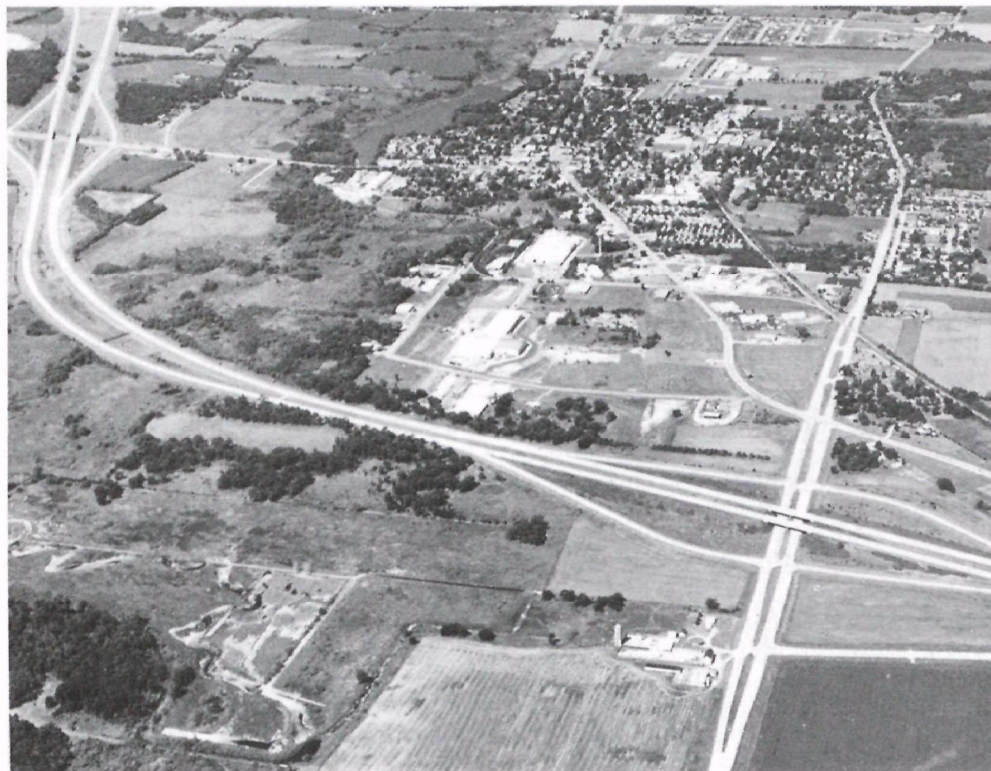
In its recent "Agenda for Action", EPA has established a national goal of diverting 25 percent of the waste stream through recycling and source reduction measures by 1992. Even though a number of successful recycling programs have already surpassed this level, meeting the goal nationwide will not be easy. But understanding the cowboy and rationalist in us all provides insight into how we might go about finding workable solutions to the mess. And some of the options discussed here hold promise for that change. □

(Ujihara is a researcher with the Center for Risk Management at Resources for the Future, a non-profit environmental research organization. Dr. Portney is the Director of the Center.)



# Mediation: How It Worked in East Troy, Wisconsin

by Patti Cronin



Robert T. McCoy photo

Few communities want a landfill. But as long as they are necessary, Wisconsin believes residents should have a say in site selection. Mediation settled a landfill siting dispute in East Troy, Wisconsin.

One of the positive results of a proposed solid waste landfill is that it brings people together. Neighbors who haven't spoken to one another in years suddenly talk for hours about their opposition to THE DUMP. Their frequent battle cry of "Not in my backyard", also means not in my front yard, side yard, on my street or in the vicinity of my eye, ear, nose or throat. And going for the throat was the reaction on the day when, in 1982, a second large landfill was proposed in Walworth County, in the town of East Troy, Wisconsin.

East Troy, a town of about 3,000 in southwestern Wisconsin, "is a very quiet rural middle-class community surrounded by three clear lakes and is an ideal summer escape for folks from Chicago. It's the last place in the world you need a second large dump," according to one of its residents.

To protect its idyllic surroundings, Walworth County had in place, at that time, a solid waste management plan approved by the state. The plan allowed only one large landfill to operate in the county. The remainder of the waste was to be handled by recycling and incineration. Greidanus Enterprise operated the one large existing landfill. All was well until Residuals Management Technology (RMT) proposed building a second large landfill in the county. To no one's surprise, the county and its residents, not to mention Greidanus, strongly opposed a second large landfill and argued that it was "totally inappropriate, unnecessary and unwanted," to use the printable adjectives.

While strongly opposing the proposed landfill, both Walworth County and East Troy, the only political jurisdictions affected by it, complied with Wisconsin's newly enacted law. Each passed a resolution stating its intent to negotiate and, if necessary, arbitrate with RMT all of the social and economic concerns created by the proposed landfill. All concerns could be negotiated except the need for the landfill, which would be determined by the state's Department of Natural Resources (DNR). In short, DNR would determine need and engineering soundness, while the local citizens,



through negotiation, would determine the social and economic issues. Wisconsin's landfill law, requiring both state and local approval, was, and continues to be, unique.

To negotiate with RMT, the county and city formed a local committee of six outspoken members. By law, the county was allowed two members and appointed Neal Frauenfelder, a planner for Walworth County and Derald West, an architect with an environmental background and a member of the county's solid waste board. The town

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***This is not to say that residents like the landfill, only that negotiations can work to address and resolve many issues and concerns created by the landfill.***

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could appoint four members. The town appointed Maxine Hough, an elementary school teacher and principal; Roman Henningfeld, a long time farmer and town board supervisor; Ellery Clayton, the vice-president of Waukesha State Bank; and Kurt Davidsen, a nearby property owner who according to Maxine "was the only member more crazed than I." The local committee then hired a local attorney from a small firm. RMT hired its own attorney, but from a large law firm in Madison. Then nothing happened, which was just fine with the local committee, but not with RMT.

Because nothing happened, RMT charged that the local committee was purposely delaying the negotiations to delay operation of the landfill. The local committee argued its members were just plain ordinary folks trying to educate themselves on landfill issues. At the request of RMT, the Waste Facility Siting Board, the state agency which oversees the negotiation-arbitration landfill law, intervened, met with the parties and arranged a first negotiation meeting to be held in January, 1983. And just as negotiations got underway, DNR, after a public hearing, ruled that RMT's proposed landfill met the state's test for engineering soundness.

But after 12 months, negotiations were not going well, and both sides were frustrated. To move things along, RMT decided to hire a new lawyer, this time from a very large firm in Milwaukee. The dress code for the

negotiations changed from flannel shirts to three-piece suits. RMT's new lawyer immediately withdrew all previously negotiated items and the parties were back to square one, further apart than ever, if that was possible.

Meanwhile, DNR decided that despite the county plan, a need for the second landfill existed. RMT now had the necessary state approval, but local approval seemed impossible.

RMT had an idea. If they could prove that the local committee's failure to reach a negotiated settlement was deliberate, repeated and flagrant, the local committee would lose all right to negotiate and RMT could build its landfill without local approval. This course of action had obvious appeal. So RMT filed a petition, and the Waste Facility Siting Board conducted a hearing. The Board, however, failed to find the local committee in default.

Not about to let such a good idea pass them by, the local committee immediately filed its own petition and charged that because RMT had withdrawn all previously negotiated offers, RMT was not negotiating in good faith. If found in default, RMT could not construct the landfill. This course of action had even greater appeal. The Waste Facility Siting Board recommended that a second hearing be postponed to allow tempers to cool, the Christmas holidays to pass, and the executive director of the Board, who arranged all hearings and wrote all proposed decisions, to give birth.

Despite the festive parties in many Wisconsin homes, holiday cheer escaped the two contending parties and they remained frustrated and uncharitable. RMT asked for a mediator. The local committee argued such a request was premature until after the second default hearing. The executive director tried, without success, to resolve the differences from the maternity ward. The Waste Facility Siting Board subsequently failed to find RMT in default and negotiations continued, but progress was slow.

Late in May, 1985, three years after the initial proposal for the landfill, both parties agreed to mediate the remaining issues of monetary compensation by RMT to the town and reopening negotiations for any proposed expansion

of the landfill. The Board appointed a mediator, Ed Krinsky, who was satisfactory to all parties. This was no easy selection, and it helped enormously that Mr. Krinsky had no past experience in landfill mediation.

Finally, in January, 1986, RMT and the local committee signed a forty-one page negotiated agreement that was binding on both parties and enforceable in court for the life of the proposed landfill. After three-and-one-half years, RMT had both state and local approval, and the landfill was licensed and began operation.

It was not an easy negotiation. Most residents of East Troy still believe a second large landfill in their community is inappropriate. Ironically, RMT's first lawyer now agrees, though perhaps it's because he recently became legal counsel for the owners of Walworth's County's original large landfill.

To end on a bright note, it is fair to say that if residents of East Troy must have a second landfill, most would choose the RMT landfill because it provides monetary compensations and numerous stringent safeguards over and above those required by the state. This is not to say, however, that residents like the landfill, only that negotiations can work to address and resolve many issues and concerns created by the landfill.

It may be light years before any community or more specifically, the residents of any community, welcome a landfill. But as long as landfills exist, Wisconsin believes residents must have meaningful and constructive input into their existence. Wisconsin's unique law, however, requires that such participation be at a negotiating table in an open meeting. Only then will residents begin to accept landfills as a necessary community service. Only then will landfills not become the other memorable "L" word. □

*(Cronin is Executive Director of the Wisconsin Waste Facility Siting Board.)*



# About Medical Waste

by John A. Moore

During the summer of 1988, medical wastes moved to center stage in the nation's environmental consciousness. Local and national news media reported numerous incidents of syringes, blood vials, and other medical-related waste being found on beaches along the Atlantic and Gulf coasts and the shores of the Great Lakes.

In response to concerns about possible health threats, many beaches in New York and New Jersey were closed on several occasions, causing substantial losses to the tourist industry.

The U.S. congress held public hearings on the issue and passed the Medical Waste Tracking Act of 1988 to help ensure the proper disposal of certain kinds of medical wastes.

Now, in the midwinter of 1988-1989, the public furor has died down. The beaches are closed, and news reports of medical wastes found onshore are rare. EPA is in the process of developing regulations to implement the new medical waste tracking law; those regulations should be in place by the time the beaches reopen for 1989. It is a good time to reevaluate what happened last summer and look at what EPA expects to accomplish with the new law.

As we look at last summer's events it is important to put the medical waste problem into proper perspective. Medical waste makes up only a small fraction—by most accounts, about one percent—of the floatable garbage that pollutes our nation's beaches. And the improper disposal of medical waste is not limited to beaches; such waste is also being found on city streets, in vacant lots, in ditches and alongside dumpsters in the alleys behind doctors' offices. In other words, medical waste is a subset of the nation's solid waste problem; wherever solid waste is thrown or dumped or washed up, some medical waste probably will be found.

Although it is only a small percentage of overall solid waste, medical waste causes a disproportionate amount of public concern. First, is concern about possible threats to public health. There is very little scientific evidence to suggest that medical waste—with few exceptions—is any more infectious than typical household waste. Nevertheless, some of the syringes and blood vials that turned up on beaches were contaminated with AIDS or hepatitis

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***...we have to take special care with certain kinds of medical wastes to ensure that they do not show up on our nation's beaches and streets.***

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viruses, and Americans seem unwilling to tolerate even a remote possibility of contracting such diseases through contact with medical wastes.

Second, medical waste causes concern about public safety. Syringes and scalpels found on beaches or in dumpsters are dangerous even if they are not contaminated. This past summer, the American public was surprised to discover that the disposal of medical "sharps" is not regulated in any comprehensive way by federal, state, or local governments. It seems clear now that the public will not tolerate disposal of sharps intermixed with other solid wastes.

Third, medical waste causes concern about environmental and aesthetic quality. Any improper garbage disposal degrades the environment, but discarded blood and other body fluids and tissues are especially repugnant. People do not want such medical wastes intermixed with the typical solid-waste stream, and they are especially sensitive to the degradation of recreational areas

like beaches, that can result when such wastes are not properly disposed of.

In short, medical waste may actually be a very small part of our national solid waste problem, but it has a very big potential to cause public concern and outrage. It seems clear that we have to take special care with certain kinds of medical wastes to ensure that they do not show up on our nation's beaches and streets.

To that end, Congress passed the Medical Waste Tracking Act of 1988. The new law requires EPA to establish a two-year demonstration program to track medical waste in ten states: New York, New Jersey, Connecticut, Pennsylvania, Indiana, Ohio, Illinois, Michigan, Wisconsin, and Minnesota. (However, under the terms of the law, those ten states can choose to opt out of the demonstration program, and other states can choose to opt in.)

The demonstration program is intended to track several categories of medical waste, defined in the law, from generator to actual disposal. Any hospital, doctor's or dentist's office, veterinarian, research facility, etc., that generates more than 50 pounds per month of waste in those categories must participate in the tracking system.

In operation, the mandated demonstration tracking system will be modeled after the systems already being implemented in New York and New Jersey. Medical waste generators in participating states will have to fill out a four-part manifest whenever they ship any of the wastes defined in the law. The generator will keep one copy; the waste transporter will keep one copy, and the waste disposal facility will keep one copy and send the fourth copy back to the generator. If that fourth copy does not come back, the generator must notify enforcement officials.





William C. Frenz photo.

Medical wastes at the Fresh Kills landfill on Staten Island. Part of the national solid waste problem, medical waste has been causing public concern and outrage.

According to the law, EPA must have the regulations in place by May 2, 1989; participating states have 90 days after that to implement them. Because even that very tight schedule would mean that a demonstration tracking system might not be in place in some states until August 1989—well into the summer beach season—the Agency is moving more quickly than the law requires. Federal regulations published in February 1989, will enable participating states to have their tracking systems in place before beaches open up for the summer.

EPA is committed to making a success of the medical waste tracking system. We are strongly encouraging the ten states named in the law to stay in the system, and we will welcome any other states that may want to opt in. We intend to keep the tracking system as simple as possible, and we will minimize the reporting required of

medical waste generators, transporters, and disposal facilities. The Agency's goal is simply to ensure that, at least in those states participating in the program, medical waste the public finds most offensive, is disposed of properly.

As the tracking system begins to take effect this spring and summer it is important to remember that it is only a two-year demonstration program at the end of which EPA will report to Congress on the extent of the medical-waste problem, the potential threat it poses to public health and the environment, and the effectiveness of the demonstration tracking system. The experience with the tracking system should also help in development of an effective national medical-waste disposal policy for the long term.

It is also important to remember that this tracking system may not be entirely successful in keeping all medical waste off streets and beaches because

individuals who are users of medical supplies, whether legally or illegally, will not be involved in the tracking system. A substantial share of the medical waste that washed up on U.S. beaches last summer was originally generated by individual diabetics or illegal drug users; it is likely that the same type of waste may show up again on beaches this coming summer.

If that happens, it will reemphasize that the medical waste problem, like the larger problem of municipal solid waste disposal, will never be completely solved until millions of people change their behavior patterns. Everyone involved in this issue—government regulators, health care professionals, community leaders, waste haulers, and the managers of waste disposal facilities—must work together to educate the public that individual behavior is a large part of the problem and a large part of the solution.

In other words, effectively tracking medical waste is going to pose a major challenge to medical facilities and the waste management professionals who serve them. And managing the overall medical waste disposal problem is going to pose a major challenge to everyone in the country who uses medical supplies. Both challenges can be met. Successful implementation of the demonstration tracking program will be an important first step. □

(Moore is Acting Deputy Administrator of EPA.)



# The Case for Pollution Prevention

by Joel S. Hirschhorn

The author believes pollution prevention is preferable to dealing with waste after the fact. Ion exchange recovery units of the sort pictured here remove heavy metals from aqueous wastes generated in electroplating, metal-finishing, and electronics manufacturing.

All the recent talk about escalating and even global environmental problems—such as acid rain, global warming, garbage crises, and infectious waste—has failed to crystallize national interest in preventing pollution rather than controlling it. The nation's focus on using more and better technology to control pollutants *after* they have been produced has weakened taboos against producing pollutants.

Negotiating safe or acceptable levels of pollution institutionalizes approval to produce it. Yet the failures of this pollution control strategy, and the resultant environmental policy gridlock, have not sparked a major policy debate focussing on the choice between *prevention and control*. The upcoming 20th anniversary of Earth Day in 1990 offers an opportunity to put the policy spotlight on pollution prevention.

Calls for more recycling of garbage and toxic waste miss the point that any handling and management of waste is never as safe or certain in its benefits as avoiding the generation of the waste in the first place. Discussions of finding substitutes for chlorofluorocarbons (CFCs) to combat stratospheric ozone depletion fail to articulate the solution to the problem in terms of prevention and do not acknowledge that control measures used after CFCs are produced are far less effective. In the debate on how to reduce coal power plant emissions to fight acid rain, the choice between burning dirty coal and controlling air emissions versus using a cleaner raw material or energy source to eliminate them—another pollution prevention tactic—is not fully described by comparative analyses which ignore the fact that the options are different *qualitatively*.

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## ***Negotiating safe or acceptable levels of pollution institutionalizes approval to produce it.***

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Waves of bad environmental news and conflict between environmental fears and economic concerns create an opportunity for all concerned to rally behind prevention as a way to revitalize environmental protection programs. Here are some factors that limit interest in pollution prevention and some that describe its complexity.

- An inescapable disadvantage for pollution prevention is the historic domination of the pollution control paradigm. This means that people think and speak in terms of pollution control and also explain and understand environmental protection in terms of pollution control.
- Our society has learned to value preventive health care benefits in comparison to traditional curative remedies, but we have not applied those lessons to the environment. Disease prevention does not sacrifice our standard of living. The same is true of increased material and energy efficiency: the ends remain the same, but the means change.
- The practice of pollution prevention by individuals can be attractive from a moral perspective—out of concern for others, acceptance of limits to individual rights, or religious beliefs. Individually and collectively, prevention may offer a moral benefit independent of any comparative environmental and economic advantage over pollution control. The pollution control strategy ignores the moral dimensions of environmental protection.
- There has been little discussion of the difference between the *technical* means of implementing pollution prevention

versus pollution control. For example, technology such as incineration or wastewater treatment plants, which control and limit releases of hazardous substances into the environment, is fundamentally different from *changing processes* to reduce the amount and toxicity of materials requiring such treatment.

There are now hundreds of examples of successful industrial pollution prevention actions. For example, 3M has replaced a chemical process to clean flexible metal electronic circuits with a strictly mechanical process. Similarly, many companies are finding it possible to use non-hazardous biological solvents instead of traditional solvents which inevitably generate hazardous waste or toxic air emissions. And the Air Force has developed a mechanical paint stripping process to replace the traditional chemical process.

- Many people who do understand this technical difference fear a shift from end-of-pipe controls to prevention. This kind of shift inevitably means changes in what we produce and how we produce it—possibly through what people in industry perceive as intrusive and inflexible government regulation.
- Prescriptive government regulations, however, are not feasible or practical for promoting pollution prevention. A number of studies have indicated that technical assistance and education are more effective public policy tools for prevention. The problem is existing environmental policies and organizations are not designed to promote prevention through non-regulatory measures.
- It is difficult to acknowledge the negative aspects of all pollution control technologies and strategies, which





MnTAP photo.

cannot be avoided or accurately assessed and anticipated. These negative aspects include:

- Intrinsic flaws (e.g., human error and transferring pollution from one environmental medium to another)
- Uncertain effectiveness (e.g., incomplete health effects data)
- High long-term costs (e.g., cleanup).

For example, the control of many volatile organic chemicals means nothing more than letting those wastes enter the municipal wastewater treatment plant, where they vaporize into the air rather than get destroyed. It is even more difficult to accept the ineffectiveness (e.g., loopholes) and inefficiency (e.g., uneven enforcement and tolerable penalties) of the regulatory system used to implement the pollution control strategy. In California, about half the regulated hazardous wastes are subject to regulation based on the state rather than the federal definition of what constitutes a hazardous waste. But how many other states provide that kind of safety net?

- Prevention is threatening. The adoption of a prevention strategy to guide both government and private sector programs and policies would represent a major cultural change. It is therefore resisted by many existing public and private institutions already committed (explicitly or implicitly) to the original control strategy. Some of America's largest companies have recently decided to go into the waste management business. Pollution

prevention also means personal behavioral change either as workers or (as we focus more on garbage) consumers. The prospect of changing products to reduce post-consumer waste makes American manufacturers and the packaging industry nervous.

- The marketplace does not efficiently promote pollution prevention. Waste generators can respond to rising regulatory compliance and waste management costs with actions other than pollution prevention (e.g., replacing landfilling with incineration). Pollution control shifts long-term costs to the general public and increases the environmental deficit for the nation (e.g., Superfund). Continued spending on pollution control (i.e., sunk investments) increases the opportunity costs of ignoring or under-utilizing pollution prevention solutions. Poor information and analysis as well as competing priorities and investment opportunities mean that everyday decisions are often inconsistent with the research finding—and the experience of several major companies—that pollution prevention increases profits.

- The natural alliance and synergism of pollution prevention and increased industrial process and product innovation, energy conservation, and international competitiveness are usually overlooked. Few companies are using pollution prevention measures as a way to gain competitive advantage by appealing to environmentally conscious consumers, producing innovative products, developing clean technologies for export, or cutting production costs.

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***The most effective, expeditious reductions in pollution have always come from practicing prevention.***

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The most effective, expeditious reductions in pollution have always come from practicing prevention—notably through banning chemicals and products, such as DDT, PCBs, and leaded gasoline. Despite concerns about severe economic dislocations, there is little evidence that such consequence have occurred. Even now, the replacement of CFCs seems to be moving rapidly. The practice of pollution prevention does not mean that a threat to health or environment must be predicted. Pollution prevention can be used successfully after an environmental threat is identified, if preventive measures can be conceived and differentiated from control measures. Moreover, an emphasis on prevention would also favor monitoring and analytical efforts to detect problems early, before they become acute.

If pollution prevention became the environmental protection paradigm, then it would be routinely used to respond to environmental threats. Pollution control measures would be seen as inferior and used only in those cases where preventive measures had not yet been identified. Commitment to pollution prevention does not imply a belief that all pollution can be eliminated.

If pollution prevention were easy, we would already be practicing it. Because prevention is not easy to implement, we need to make it an issue of public policy debate, to make room for it on crowded agendas, and to acknowledge that we need a better, more cost-effective strategy and paradigm to



achieve comprehensive environmental protection. Pollution prevention needs to cease being a theoretical, philosophical concept sometimes invoked in an atmosphere of crisis and evolve into an explicit, commonly valued and applied tool used for all environmental problems.

Two recent actions at EPA, following several reports on waste reduction and pollution prevention by it and several other organizations, are positive signals that this evolution is beginning. A recent report entitled *Future Risk: Research Strategies For The 1990s*, issued in September 1988 by EPA's Science Advisory Board concluded:

In addition to the current emphasis on federally mandated controls that are put in place to clean up pollutants after they have been generated, the Agency must develop a strategy that emphasizes the reduction of pollution before it is generated. A strategic shift in emphasis from control and cleanup to anticipation and prevention is absolutely essential to our future physical, environmental, and economic health.

Even before the report was issued, EPA had formed an Office of Pollution Prevention—an idea embodied in several bills introduced in Congress. Funding for the office is low, however.

Now, the challenge is to build nationwide support for these initial steps. If public and private resources shift from control to prevention, then we will have more tangible evidence that the prevention paradigm is taking

hold. In the coming months there is a historic opportunity for leaders in government, industry, and public interest groups to select pollution prevention as the theme for the 20th anniversary of Earth Day in 1990. This could rekindle the spiritual and moral uplift Earth Day gave the nation, firmly plant pollution prevention in the national consciousness, and overcome lip service to it in key institutions. Fearing that technology may not be harnessed fast enough to avert catastrophe and lacking confidence in current environmental programs, Americans are ready for pollution prevention. □

*(Hirschhorn is Senior Associate at the Congressional Office of Technology Assessment. The views expressed here are the author's and not necessarily OTA's.)*

## Letter to the Editor

### *EPA Journal*

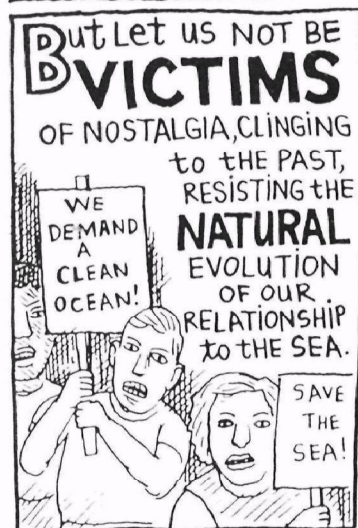
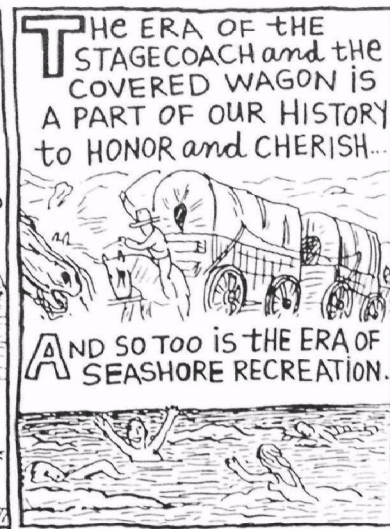
I want to talk to you about an idea I had when I was with my Mom driving to the Post Office one day. I said I *disliked all the trash I saw all over the street and sidewalks*. I thought it was terrible that people would not care about their neighborhoods. My Mom and I talked about it, and I thought up the idea of having a Holiday called National Clean Up Day, just like we had when I was little and lived in Sandpoint, Alaska. We all got garbage bags and spent most of the day cleaning up the city. It was like a holiday because a lot of people were outdoors picking up trash, and afterward we had a big BBQ, played games, and were awarded prizes for the garbage we had picked up.

Some people would not participate, but some would feel the same way I do. I know that my family and I would participate in this activity.

It is up to all of us to keep our country clean and I think a Holiday called National Clean Up Day, where everyone cleans up is a good idea. How can we make this happen?

Sean D. Rosen  
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Back Cover: Looking for something?

Photo by Pat Field for Folio, Inc.



