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Building State and Local Pollution Prevention Programs

1. Status and Trends
2. Findings and Recommendations

State and Local Environment Committee
National Advisory Council
for Environmental Policy and Technology

ABSTRACT

There is increasing evidence of the value and attractiveness of pollution prevention as a basic strategic approach to achieving both environmental and economic health. There has been a steady emergence of new laws and government-sponsored education and technical assistance programs to promote pollution prevention. The private sector has a critical role in taking voluntary actions to reduce the sources of pollution. However, government actions and policies can stimulate or thwart even voluntary efforts, and the existing structure of environmental protection programs presents both opportunities and obstacles for promoting pollution prevention. The State and Local Environment Committee of the National Advisory Council for Environmental Policy and Technology (NACEPT) examined status and trends in State and local pollution prevention programs and analyzed issues affecting progress in making pollution prevention the dominant strategy for environmental protection. A major challenge is finding the delicate balance between fostering voluntary and cooperative efforts and keeping up the consistent regulatory pressure that often motivates firms to seek pollution prevention solutions.

The Committee's recommendations suggest what the U.S. Environmental Protection Agency (EPA) can do to take advantage of the early successes in government efforts to promote pollution prevention and build even greater momentum for action. The recommendations address:

- Providing leadership and building broader support for pollution prevention;
- Integrating pollution prevention into mainstream environmental programs;
- Modifying management accountability and funding systems to support prevention efforts;
- Improving technical capacity and the infrastructure for information exchange about pollution prevention;
- Clarifying the appropriate roles for Federal, State, and local governments in fostering pollution prevention; and
- Expanding the role of pollution prevention in meeting the environmental goals of the wastewater pretreatment program.

NOTICE

This report was written as a part of the activities of the National Advisory Council for Environmental Policy and technology (NACEPT), a public advisory committee providing extramural policy information and advice to the Administrator and other officials of the U.S. Environmental Protection Agency (EPA). The Council is structured to provide balanced, expert assessment of policy matters related to the effectiveness of the environmental programs of the United States. This report has not been reviewed for approval by EPA and hence, the report's contents and recommendations do not necessarily represent the views and policies of the EPA, nor of other agencies in the Executive Branch of the Federal government, nor does mention of trade names or commercial products constitute a recommendation for use.

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BUILDING STATE AND LOCAL POLLUTION PREVENTION PROGRAMS

INTRODUCTION

"Why not avoid creating pollution in the first place?" This simple question is revolutionizing the way we think about environmental protection.

Since the modern environmental movement began two decades ago, our basic protection strategy has been to treat and manage wastes before they enter the environment. We have made significant progress in cleaning air, water, and land resources by limiting the amount of releases allowed and by prescribing control technologies to be used in achieving these limits.

At its heart, the "treat and manage" strategy is based on an assumption that pollution is an inevitable byproduct of human activity. Today, we are coming to understand that much pollution can be avoided altogether, and that many wastes that cannot be avoided entirely can be substantially minimized. Further, the steps involved in minimizing waste can lead to more efficient and profitable production. With the concept of *preventing* pollution as a starting point, we are entering a new era in environmental protection.

The need for change stems in part from acknowledged shortcomings of the traditional approach to environmental protection. The existing system is founded on an array of Federal, State, and local requirements, each addressing a particular activity and its releases to a single medium. As we develop controls for the more subtle environmental threats that remain, the regulatory umbrella encompasses literally hundreds of thousands of facilities, many of them very small. This increasingly complex system often includes overlapping and even conflicting requirements, resulting in high transaction costs to both the administering agencies and regulated entities. Even if they are in full compliance now, companies cannot assume they are protected from liability for future environmental damages. Yet companies that want to innovate and go beyond what the law requires may find their efforts stymied by rigidity in the existing system. From an environmental protection standpoint, a serious concern is that we have learned that controls on discharges to one medium can sometimes result in transferring the pollution to another. Pollution prevention cuts through many of these problems by seeking permanent reductions in the generation of wastes throughout a facility.

Despite its common sense appeal, the shift to a prevention-oriented strategy will not come about quickly or easily. Bureaucracies have built up at the Federal, State, and local levels to implement single-media, command-and-control programs. The generation of environmental professionals who are now working in government and the private sector was trained to design and execute end-of-pipe solutions. Enormous public and private investments have been made to construct the treatment facilities and install the control equipment that is now in place. And there are strong constituencies vested in the existing system, including influential environmental activists and legislative committees in Washington and in the States.

Nonetheless, as weaknesses in the current system are becoming more widely understood, a consensus is emerging that pollution prevention offers the promise of a more rational, efficient, and ultimately cost-effective approach to environmental protection. A growing body of evidence indicates that employing source reduction and waste minimization techniques can not only produce the obvious environmental benefits of reducing pollution overall but can also result in cost savings and avoided future liability for the firms which

adopt them. This potential for serving both environmental and economic goals makes the prevention-oriented strategy especially attractive.

Government efforts to promote prevention are growing. For the past several years, and often with EPA support, State and local governments all around the country have been establishing programs to promote pollution prevention. Typically, these programs provide technical assistance, education and training, and other incentives to businesses to encourage adoption of pollution prevention measures. EPA and many States have also established special programs to get businesses to commit to substantial voluntary reductions in emissions. On the legislative front, Congress adopted a national Pollution Prevention Act in 1990 that is designed to encourage pollution prevention; some waste minimization provisions were already in place under the Resource Conservation and Recovery Act. Many State laws establish environmental technical assistance programs for businesses, and more than a third of the States have now enacted prevention laws that require facilities to develop plans for how they will reduce the source and production of wastes. Additional legislative action at both national and State levels is likely.

While the bulk of government-sponsored prevention efforts have been voluntary thus far, there are also many experimental and pilot efforts using regulatory or quasi-regulatory mechanisms to promote prevention. Many States -- and EPA -- are beginning to include pollution prevention provisions in some permits and enforcement settlement agreements. Multi-media inspection and permitting initiatives are often intended to identify prevention opportunities as a means for addressing environmental impacts on a "whole facility" basis. EPA and many States are also seeking ways to incorporate prevention directly into the design of regulations by, for example, including source reduction as a "best available technology." Some local wastewater treatment agencies are promoting prevention as a way for industrial dischargers to meet their pretreatment requirements. In addition to these more traditional regulatory mechanisms, a variety of market-based policies, such as assessing fees based on emissions and providing tax credits for environmental investments, are being tried.

We are in the midst of a transition now, and we have not yet figured out how to adapt our government institutions, policies, and programs so that pollution prevention becomes the *dominant* strategy for environmental protection. We have made substantial progress in cleaning and protecting air, water, and land resources under the existing command-and-control system, and basic components of this system are here to stay. We are not likely to abandon the role of government in establishing and assuring compliance with requirements for environmental protection, although we may modify the way government carries out these responsibilities. Our challenge is to find ways to make the shift that neither jeopardize the environmental progress we have made under the existing system nor stifle the actions that could lead to significant permanent reductions in the amount of pollution that is generated.

NACEPT State and Local Environment Committee: Focus on Building State and Local Pollution Prevention Programs

In the Spring of 1991, William K. Reilly, Administrator of the U.S. Environmental Protection Agency (EPA), asked the National Advisory Council for Environmental Policy and Technology (NACEPT) to help the Agency in promoting pollution prevention. He asked the Council to recommend steps EPA could take to overcome the policy, institutional, technical, and educational barriers that are impeding more widespread adoption of pollution prevention. Recognizing that a variety of factors will influence

whether and how pollution prevention becomes the dominant approach to environmental protection, each of the NACEPT Committees began exploring factors relevant to its particular areas of interest.

From its inception, the principal objective of the NACEPT State and Local Environment Committee has been to foster improved State and local government capacity for carrying out their environmental management responsibilities. The Committee recognizes the critical role of the *private sector* in taking voluntary actions to reduce the sources of pollution. However, government actions and policies can stimulate or thwart even voluntary efforts by the private sector. Further, the existing structure of environmental protection programs presents both opportunities and obstacles for promoting pollution prevention. Since government has a key role to play, the Committee focused its attention on the *governmental activities* that have been undertaken thus far to promote pollution prevention and the adjustments to *governmental institutions* needed to foster greater progress.

Since pollution prevention efforts are still relatively new and the shape that national efforts will take is still being formed, the Committee saw an excellent opportunity to consider how to make optimum use of the resources and unique capabilities of Federal, State, and local governments in this area. In keeping with Federalism principles and the basic alignment of responsibilities for national environmental programs, it is clear that State and local governments will have major responsibilities in implementing whatever pollution prevention initiatives emerge at the national level. They are already leading the way by experimenting with a variety of mandatory and voluntary approaches. The Committee decided to focus its efforts on finding ways to foster growth in State and local pollution prevention efforts.

Despite the demonstrated political appeal presented by the twin benefits of environmental and economic improvement, pollution prevention programs are still quite small. Even in those States with the most developed programs, they reach only a tiny fraction of the businesses that might benefit from source reduction measures. The integration of pollution prevention into routine environmental program operations has barely begun, and there are enormous untapped opportunities for building pollution prevention into the range of government programs and services that are designed to foster economic development.

To carry out its charge, the Committee and its staff examined the current status of State and local efforts to promote pollution prevention and the issues such programs face, giving particular attention to the relationship of these efforts to EPA programs and policies. The Committee reviewed existing documents; interviewed key government and private sector experts; and commissioned papers on the topics of implementing State and local prevention programs, incorporating pollution prevention into permits and enforcement actions, and leveraging business assistance programs to promote prevention. The Committee's information-gathering process culminated with a national workshop, during which 60 participants from all levels of government, business and industry, academia, and the advocacy community provided their insights on issues and opportunities for building State and local pollution prevention programs.

Part I of this report presents the Committee's findings and recommendations for achieving greater progress in building State and local pollution prevention programs.

Part I: Findings and Recommendations summarizes key issues affecting State and local pollution prevention programs and highlights opportunities for strengthening these efforts. The Committee's recommendations suggest what EPA can do to take advantage of the early

State and local successes in promoting pollution prevention and build even greater momentum for action.

The Committee's recommendations address:

- Providing leadership and building broader support for pollution prevention;
- Integrating pollution prevention into mainstream environmental programs;
- Modifying management accountability and funding systems to support prevention efforts; and
- Improving technical capacity and the infrastructure for information exchange about pollution prevention.

In addition, the Committee's recommendations outline the appropriate roles of Federal, State, and local governments in fostering pollution prevention; specific actions EPA should take are also discussed in the context of individual recommendations. Finally, the Committee highlights the opportunity for adopting pollution prevention as a strategy for meeting the environmental goals of the wastewater pretreatment program.

Part II analyzes trends in government pollution prevention efforts and the issues and challenges to be addressed if the prevention approach to environmental protection is to become more widely implemented.

The analysis in *Part II: Status and Trends in State and Local Pollution Prevention Programs* provides more detailed background for the Committee's recommendations. It begins with an overview of progress in building prevention programs and the principal challenges which remain. The next section assesses State and local programs to promote prevention through voluntary action, including business assistance programs, voluntary toxics reduction programs, and incentives programs. The third section analyzes issues and opportunities for integrating pollution prevention into regulatory mechanisms such as environmental permits, enforcement activities, and facility planning laws.

IMPORTANT N0TE

The concept of pollution prevention can be applied to every sector of the economy, and there are significant prevention opportunities in such arenas as energy, agriculture, and mining. Because of its limited time and resources, the Committee chose to focus its attention on pollution prevention efforts designed to reduce pollution from industrial sources, where EPA has thus far made the greatest investment. The Committee recognizes the importance of continued efforts to foster greater implementation in the other sectors as well.

Building State and Local Pollution Prevention Programs

PART I:

FINDINGS AND RECOMMENDATIONS

The steady emergence of new laws and government-sponsored education and technical assistance programs, as well as actions to reduce toxics that industry has taken voluntarily, suggest that the concept of pollution prevention is taking hold. The State and Local Environment Committee of the National Advisory Council for Environmental Policy and Technology (NACEPT) examined trends in pollution prevention efforts around the country and found innovative policies and programs at all levels of government, creative uses of authorities and resources, and cooperative partnerships between public and private sector entities. Many of these promising developments were aided by financial support, technical assistance, and encouragement from the U.S. Environmental Protection Agency.

The Committee endorses pollution prevention as an effective and efficient approach to environmental management, and believes there is great potential for expanding support for and adoption of pollution prevention in both the public and private sectors. The successes of the early pollution prevention efforts demonstrate the attractiveness and value of pollution prevention as a basic strategic approach to achieving both environmental and economic health. Perhaps even more importantly, the cooperative spirit that characterizes so many State and local prevention efforts may help to break down the lack of trust between and among government officials, business leaders, and environmental advocates that has served to impede our ability to find solutions to environmental problems.

For the most part, the early government pollution prevention initiatives have occurred outside the mainstream of traditional environmental programs -- either as functions of organizationally separate entities (e.g., technical assistance programs housed at universities) or as special projects within a regulatory agency (e.g., multi-media inspections or permitting and voluntary toxics reduction programs). However, the realities of the existing environmental regulatory system place significant constraints on innovators inside and outside the government. As more voluntary actions are being undertaken, the line between regulatory programs and voluntary efforts is becoming increasingly blurry -- creating both tensions and opportunities. Some progress can be made by continuing with additional special projects and initiatives. However, for the full potential of pollution prevention to be realized, it must become an integral part of the way the responsible government agencies perceive and carry out their daily functions -- the norm, rather than the unique -- so that the government is consistent in its message to the industrial community.

The findings and recommendations in this Part I of the Committee's final report summarize key issues affecting State and local pollution prevention programs and highlight opportunities for strengthening these efforts; they are based on the more detailed background and analysis of status and trends in pollution prevention programs that is contained in Part II. Because NACEPT's charge is to advise the Administrator of EPA, the Committee's recommendations focus on steps EPA can take to resolve policy matters and provide support services that would bolster State and local capacity to implement pollution prevention programs.

1. Leadership and Support for Pollution Prevention

EPA has a critical leadership role to play in promoting pollution prevention. Its actions and decisions must send a consistent message that prevention is the strategy of choice for environmental protection.

EPA top managers have been voicing their support for pollution prevention for several years now, but skeptics point out that EPA's actions have not always been consistent with its prevention message. Some suggest that by still advocating recycling, EPA may be undermining the development of a source reduction ethic. Many industry officials say they see little evidence yet of the regulatory flexibility they need to be able to innovate. Staff in EPA and the State and local environmental agencies say they do not see the rhetoric of pollution prevention being backed up by changes in the way they and their programs are evaluated.

The confusion about what activities the term "pollution prevention" should encompass has been a significant barrier to designing and evaluating programs; goals were unclear. EPA's recent issuance of its definition of pollution prevention (5/28/92) represents an important step forward in articulating a national policy that can guide future efforts. However, the range of definitions embodied in State laws and regulations will continue to present policy challenges.

While it is hard to find anyone who disagrees conceptually with the idea of pollution prevention, there are important constituencies inside and outside EPA who are concerned about the practical implications of implementing pollution prevention and other integrated approaches. Many environmental agency staff members are reluctant to assume new, broader responsibilities that involve understanding disciplines outside their particular expertise. Media program managers are resistant to efforts to re-invent or re-shape the regulatory wheel, particularly in times of heightened competition for resources among programs. Regulatory agency staff accustomed to viewing members of the regulated community as adversaries are wary of adopting a more cooperative relationship or of recognizing voluntary efforts. They are joined by legislators and activists who fear that hard-won environmental laws and standards could be weakened by providing greater flexibility in implementation. Business leaders, even those who embrace the pollution prevention approach, fear that it could lead to more burdensome requirements.

If EPA is to be successful in promoting pollution prevention, the Agency must address the concerns of these doubters -- and bring them into the fold -- because each has the potential to thwart progress. Many of the Committee's recommendations are intended to build greater support for prevention efforts by addressing these concerns.

Industry is often motivated to seek pollution prevention solutions as a way to reduce regulatory pressures, so a continued strong environmental regulatory program is central to success.

Firms who adopt pollution prevention often cite a desire to reduce current and potential regulatory pressures as a principal reason they sought to reduce their sources of pollution. While some may also be motivated by the potential cost savings to be realized, the existence

of a strong regulatory climate is an essential ingredient in a firm's decision to adopt a prevention strategy.

A broader "bandwagon" of support among policy makers and opinion leaders at the Federal, State, and local levels would help to assure continuity and growth in prevention programs.

The support of political leaders, the business community, and other opinion leaders is essential to securing visibility, funding, and needed authorities -- but relatively few are aware of the potential economic and environmental benefits pollution prevention offers.

Elected political leaders will respond when they learn that supporting pollution prevention programs can provide a rare political "win-win" because such programs are both pro-business and pro-environment. Programs that provide technical assistance and other benefits, such as tax incentives or low-cost loans for prevention investments, can demonstrate a State's or community's interest in creating a friendly climate for business while fostering environmental improvement. Further, toxic use reduction and waste minimization can simplify regulatory life for the business community. Other benefits include reducing friction between government and businesses, reducing the need for new waste disposal capacity, and enhancing permit streamlining opportunities.

Economic development entities and financial institutions are natural allies of pollution prevention, but most are not yet involved.

Most State and local governments support a variety of programs to foster economic development and assist businesses. Although the primary purpose of such programs is economic improvement, they could be enlisted to promote pollution prevention as a way to realize the potential cost savings from energy efficiency and waste reduction. Managers of business assistance programs indicate that many of the questions they receive from their clients are related to environmental compliance matters. At this time, however, there are few links between pollution prevention and general business assistance programs.

Unfortunately, in many States and communities, economic and environmental agencies have traditionally seen each other as adversaries; it will take strong leadership to overcome long-standing barriers to cooperation. However, pollution prevention does offer a unique opportunity to address mutual interests: promoting environmentally and economically sound development by encouraging source reduction and waste minimization.

Credit is essential to businesses being able to make investments in expansion or in needed environmental equipment. The best technical assistance program will fail if firms are unable to raise the capital they need to make changes. Therefore, the understanding and support of financial institutions is essential to a successful prevention effort. Since financial institutions have a direct interest in environmental matters, however, they are also potential allies. They are very concerned about potential environmental liability because a business faced with huge cleanup costs may ultimately default on a loan -- which means that the lender may end up owning contaminated property. Similarly, insurance companies have an interest in helping their clients avoid future liability. Businesses which adopt pollution prevention can be a better credit risk, and financial institutions and insurers may be willing to provide support to programs that conduct audits and provide technical advice to businesses.

RECOMMENDATIONS

1-1 Provide national leadership in promoting pollution prevention as the strategy of choice for environmental management.

1-1a EPA should continue fostering a strong environmental regulatory climate that pushes companies to seek prevention alternatives.

- Continue development and enforcement of stringent regulations governing waste disposal and releases to the environment.

1-1b EPA should assure that its actions and decisions are consistent with its pollution prevention message.

- Adopt procedures to assure that pollution prevention opportunities are fully identified and taken advantage of in all EPA regulatory, enforcement, and program management decisions.

- Assign highest funding priority to efforts that prevent pollution.

1-1c EPA should develop and implement a careful strategy for building greater consensus and support for pollution prevention.

- Develop information demonstrating the economic, environmental, and other benefits of pollution prevention as a strategy for environmental protection, and use it in outreach activities.

- Develop a consensus-building process to address the major concerns of the key constituencies at the national level, including Congress, business groups, environmental organizations, and environmental agency officials.

- Identify and address the specific issues of concern to mid-level managers in environmental agencies.

1-1d EPA should develop and implement a pollution prevention education strategy to foster prevention as both an ethical standard and a practical goal for all endeavors.

- Elements of the strategy should address traditional educational settings (e.g., elementary/secondary schools, community colleges, universities) as well as other means for reaching citizens (e.g., in the workplace, through news media and entertainment programs).

1-2 Build support for pollution prevention by State and local policy makers.

1-2a EPA should develop an outreach strategy, working with national organizations representing elected officials, to educate them about pollution prevention and how to build effective prevention programs.

- Educate Governors, State legislators, and local elected officials about policy and program initiatives around the country.

- Foster adoption of State/local policies and programs to implement prevention measures in the operation of government agencies.

- Promote use of regulatory consultation service with State environmental agency and EPA that is separate from enforcement activities, similar to the OSHA consultation process.

1-2b EPA should develop and disseminate information about potential economic and environmental benefits to *States* and *communities* of prevention efforts

- Conduct analyses and disseminate information on such topics as how a pollution prevention program can:

  -- Improve the attractiveness of a State or community to existing businesses, bond purchasers, and potential investors;
  -- Save jobs by helping companies reduce compliance costs;
  -- Reduce the need for waste disposal capacity;
  -- Avoid costs in capital improvements to wastewater treatment plants and drinking water works; and
  -- Other benefits to States and communities as a whole (not just benefits to individual businesses).

1-3 Forge new alliances with economic development entities and financial institutions.

1-3a EPA should expand its work with national economic development organizations as well as with the other Federal agencies which have relevant programs.

- Establish links and develop joint efforts with economic development programs at the Federal, State, and local levels.

- Identify opportunities for use of mechanisms and programs not traditionally linked to environmental protection to promote prevention (e.g., loan and grant programs in commerce, economic development, housing agencies; assuring compliance with community reinvestment requirements).

1-3b EPA should expand efforts to educate financial institutions and the insurance industry about the benefits of pollution prevention and examine the role pollution prevention might have in helping to resolve lender liability concerns.

- Encourage financial institutions, other lenders, and insurers to incorporate prevention considerations into their decision-making processes.

- Address the financial and credit needs and problems of small businesses wishing to make environmental improvements.

2. Roles and Responsibilities

Roles and responsibilities of Federal, State, and local governments in promoting pollution prevention are unclear.

Several of the challenges to be faced in building State and local pollution prevention programs relate to the need for better leadership, regulatory policy, technical capacity, and coordination. Setting out the appropriate roles and responsibilities of Federal, State, and local governments for pollution prevention would improve coordination, foster efficient use of resources at each level, avoid confusion in policy matters, and facilitate exchange of information. Ideally, each level of government will carry out the functions and activities for which it is best suited within a system that is mutually supporting. However, a national framework is needed to help guide investments at each level of government and help to avoid duplication of effort and conflicts.

The relationships between Federal, State, and local governments are made more complex by the introduction of pollution prevention as a means for addressing environmental issues. In the traditional environmental programs, at least the framework for intergovernmental relationships is established by law; but no over-arching national law sets out this framework for pollution prevention. In addition, the relationship between pollution prevention and the existing statutory and regulatory structure is still unclear, especially since voluntary actions by industry often cross single-media program boundaries and go beyond what the laws require. In addition, new State laws requiring facility planning or toxic use reduction have been adopted in about a third of the States -- and each is different.

RECOMMENDATION

2-1 Clarify roles and responsibilities between Federal, State, and local governments for pollution prevention.

Because of the early stage in development of pollution prevention programs and the wide variability of coverage, content, and depth, appropriate roles and responsibilities can only be defined in general terms at this time. The chart on the page which follows provides a general framework for EPA, State, and local roles in promoting pollution prevention.

It is important to note that many of the actions shown on the chart can be carried out only if Congress (or State legislatures) are willing to provide new authorities or more flexibility in administering existing authorities. It is also important not to over-estimate the government's role in being able to foster pollution prevention: the private sector plays the most critical role in implementation.

PROMOTING POLLUTION PREVENTION: ACTIONS FOR LOCAL, STATE, AND FEDERAL GOVERNMENT

LOCAL	STATE	FEDERAL/EPA
	LEADERSHIP	
Work as high profile initative (mayor, city council, agency executives) Tie economic development, job retention benefits to environmental benefits Build partnerships with businesses, universities, financial institutions	Work as high profile initiative (governor, legislators, agency executives) Tie economic development, job retention benefits to environmental benefits Build partnerships with business leaders, universities, financial institutions Implement prevention in State operations Support local pollution prevention initiatives	Give highly visible leadership emphasizing commitment and follow through; stress economic and environmental benefits environmental benefits Set, publicize national goals, objectives Give visibility to prevention leaders in business, State and local governments Research, publicize economic benefits of pollution prevention for businesses, communities Fund demonstration projects integrating Federal, State, local resources
	LEVERAGE	
Leverage investments in community to finance pollution prevention (e.g., Community Development Block Grants, Community Reinvestment Act)	Generate technical assistance through universities, private sector Leverage State departments of commerce, economic development to provide support for assistance efforts, provide loan/grant and other support to businesses doing prevention	Catalyze other Federal agencies for joint efforts, implementation within own operations Include Commerce, Small Business Administration, Economic Development Administration, Transportation, Energy, Defense, Comptroller of Currency
	TOOLS	
Use local mechanisms such as zoning and ordinances, building codes, POTW pretreatment program Target bank deposits with lenders willing to aid businesses implementing prevention initiatives Use TRI, other data to set priorities Set goals and measurable work activities Regionalize services and activities	Use executive orders, seek new authorities if needed Provide regulatory flexibility to businesses, communities trying pollution prevention Participate in development and implementation of national strategies and programs Strive to develop one-stop industry-based regulatory and pollution prevention resources	Use executive authorities, seek new authorities if needed Provide regulatory flexibility to those trying polluton prevention Provide flexible funding, oversight of States and locals where pollution prevention/ multi-media initiatives are being tried Develop and implement national strategies for: • Research • Training • Technology Transfer

3. Prevention in Mainstream Environmental Programs

Top-level managers voice support for pollution prevention, but the rhetoric has not yet been translated into clear goals and expectations for the mainstream environmental programs.

Political leaders and senior managers of environmental agencies are attracted to pollution prevention as a good, multi-media planning device. Because targeting can be based on such factors as amount of emissions and risks involved, these leaders can get a sense of where the environmental problems really are. Further, pollution prevention can result in more effective use of environmental agency staff through better targeting of resources to facilities presenting the highest risk, giving multi-media attention to problems, and focusing on fundamental solutions to environmental problems that will have long-lasting effect.

However, the goals, objectives, and expectations for pollution prevention are unclear to mid-level managers of the mainstream, media-specific environmental programs of EPA and State and local governments. These agency officials believe they are receiving mixed messages: EPA (or State) top management touts pollution prevention as the strategy of choice, but staff involved in the day-to-day operations of mainstream programs see no tangible changes in the kinds or amounts of work they are expected to perform. Many program managers are resistant to the new approaches, particularly when they involve resource-intensive coordination or a more cooperative relationship with the regulated community.

Integration of prevention into mainstream environmental programs has been spotty and slow.

For the most part, the rhetoric in support of pollution prevention has not been translated into changes in the day-to-day operations of environmental programs at the Federal, State, and local levels. The potential for using regulations, permits, and enforcement actions to promote prevention has barely been tapped. In short, with a few exceptions, the prevention message has simply not yet resulted in many changes in the way the established environmental programs conduct their activities.

Throughout the environmental bureaucracies, prevention projects and initiatives are commonly viewed as distinct, add-on efforts having little relevance to the mainstream programs. Many times, such projects are conceived of and conducted by staff who are organizationally located outside the mainstream program involved. Consequently, while the individual projects may be very successful, the results are not being used by program officials to affect real, lasting changes in the way the program operates.

In their defense, the mainstream environmental programs are already overburdened and underfunded. Media program managers have little impetus to take on new voluntary responsibilities such as pollution prevention, especially when they must take any resources required out of their existing, inadequate pool -- and then get no offsetting relief in the tasks they are expected to accomplish.

Unease about the interface between regulatory and non-regulatory pollution prevention efforts continues.

Until recently, most pollution prevention efforts were non-regulatory -- using education and technical assistance to persuade businesses to adopt prevention measures. Now, however, an

increasing number of environmental agencies are seeking ways to incorporate pollution prevention into the regulatory arena, such as in permit writing and enforcement. Even voluntary reduction efforts eventually bump up against the regulatory system.

No longer academic are questions such as how should pollution prevention be defined or should companies be given compliance flexibility in exchange for going beyond what the law requires. Such matters affect implementation of existing national laws and regulations. Where delegated national laws and programs are involved, there will be calls for national guidance and criteria to assure consistency. Since these are complex issues that go to the heart of the traditional command-and-control system, resolution will not come without considerable controversy.

Another concern is the relationship between technical assistance efforts and regulatory programs. Regulatory agencies that take on technical assistance functions find themselves in a "white hat/black hat" role conflict. Many see the philosophic underpinnings of technical assistance as fundamentally incompatible with the functions of a regulatory agency.

Many advocate providing incentives as a way to encourage companies to implement prevention measures. At this time, there is little understanding of how the non-regulatory or quasi-regulatory mechanisms being proposed to promote prevention, such as market incentives and tax policies, really affect business behavior.

A cohesive system for promoting prevention does not yet exist, and there is potential for even greater fragmentation.

Many successful EPA pieces of a pollution prevention program are in place, such as the 33/50 voluntary reduction program, special prevention grants and projects, technology research efforts, media-specific prevention projects, and energy conservation programs. However, the parts are not very well connected within EPA, and only on an *ad hoc* basis with programs at the State and local level.

Meanwhile, there has been a proliferation of fragmented EPA-supported technical assistance efforts; many "specialize" in a particular environmental program area based on source of funding (hazardous waste, solid waste, air). Still more fragmentation is likely in light of new Clean Air Act-required technical assistance programs, the proposed RCRA "extension" effort, and additional prevention grants. Further, pollution prevention programs are not well linked to State and local programs for energy and water conservation or economic development that often have comparable objectives. Many of these programs receive Federal funds from other agencies such as Commerce, Energy, and Interior.

Prevention projects are being developed, managed, and/or funded throughout EPA Headquarters and Regional offices as well as in the Office of Research and Development. This decentralization makes it quite difficult to find out what pollution prevention projects have been undertaken or funded by EPA. In addition, the results or products from the projects cannot be readily found. (It is even more difficult to find out about prevention projects not tied to EPA funding.) This situation has already led to some duplication of effort. In addition, there is little emphasis given to evaluating project results and transferring successful practices and products to others. Finally, there are weak links between pilot and special prevention projects and routine program operations; project results are not often translated into permanent changes in affected programs.

RECOMMENDATIONS

3-1 Clarify goals and expectations for prevention efforts and develop a cohesive strategy to build prevention into mainstream environmental programs.

3-1a EPA should establish clear goals and expectations for what its programs offices should do to incorporate pollution prevention into their routine activities and to accommodate multi-media and prevention innovations.

- Set out goals and expectations regarding incorporation of prevention in mainstream programs at the Federal, State, and local levels.
- Assure follow-through by making needed modifications in oversight, accountability, and performance evaluation systems.
- Modify accountability measures for permits and enforcement to provide greater "credit" for multi-media and prevention solutions.

3-1b EPA should develop an overall strategy for incorporating pollution prevention into its programs, including both multi-media and single media components.

- Prepare an overall strategy covering priority setting (based on risk and other relevant factors), plans for addressing policy issues, developing needed technical expertise, and Federal-State-local relations; establish timeframes for implementation.
- Develop written strategies for incorporating pollution prevention into each of the media programs as well as a strategy addressing priority multi-media problems.

3-1c EPA should continue and expand industry cluster approaches to regulation development to enhance identification of prevention opportunities and address multi-media issues.

- Provide for adequate participation of States in regulatory cluster activities.
- Assure that pollution prevention information developed through this process is disseminated to State and local governments, and incorporated into the clearinghouse and other information networks.

3-1d EPA should take steps to assure that the results of pilot projects are translated into needed changes in routine program operations.

- Strengthen links between special projects and mainstream programs, and plan for use of results in making lasting policy and procedural changes

3-1e EPA should begin a deliberative process to resolve policy issues associated with integration of pollution prevention into regulatory programs.

- Address such priority issues as: (l) providing regulatory flexibility or extended compliance deadlines in exchange for additional reductions; and (2) developing and enforcing prevention permit conditions.

- Assure dissemination of results of policy determinations to EPA, State, and local officials; monitor implementation to assure that policies are followed and to identify additional issues.

4. Management Accountability and Funding

Traditional approaches to funding and EPA oversight of States present significant barriers to pollution prevention and other multi-media efforts.

Addressing the need for flexibility in the administration, funding, and oversight of environmental programs is perhaps the most important factor that will foster adoption of pollution prevention and multi-media approaches to environmental management. From its inception, the State and Local Environment Committee has consistently advocated for changing oversight and funding policies and practices to give State and local governments more flexibility in designing and managing their environmental programs. There have been many incremental reforms over the years, and the Committee endorses the current efforts of EPA's State Capacity Task Force to find additional ways to improve the way EPA supports State and local environmental protection programs.

The adoption of pollution prevention as a basic strategy for environmental protection has potentially profound effects on current environmental programs and the relationships that have built up over the years between EPA, States, and local governments. Until the oversight and accountability system is modified to better mesh with pollution prevention developments, it will be a significant barrier to progress. The existing oversight and budget systems have little ability to encourage or give credit to State and local innovative approaches to environmental management such as implementation of facility planning laws, cooperative projects with other agencies, programs to provide technical assistance, or public private partnerships.

The "mismatch" is already being experienced by States with new multi-media organizational structures or new toxics use reduction laws. Some of the innovative and far-reaching State laws and policies simply do not fit into existing media-specific laws, structures, and policies. If States are not granted some flexibility in interpreting national program requirements, they will be stymied in implementing their new laws -- even if implementation would bring about greater environmental results than would strict adherence to national requirements. Finding a solution to this problem is complicated by the fact that State and local pollution prevention laws and programs originated at the grass roots level rather than under some "national" design, so there are considerable variations among them.

Despite the support of many senior State and EPA managers, most bureaucratic structures have no natural home or voice for multi-media efforts. Because most agencies are organized along single-media lines, any multi-media project automatically requires special arrangements for management, oversight, and funding. Funding can be especially

troublesome, because current laws severely limit the ability to use grant funds across single-media program lines.

State and local governments need relief from counterproductive requirements as well as maneuvering room to interpret requirements.

Current accountability methods and oversight practices tend to promote *status quo* approaches to implementing environmental programs. The accountability measures used to judge program performance are particularly important, because they drive the bulk of program activities. In other words, what gets counted is what gets done. State and local governments may be forced to perform inspections or write media-specific permits based on an EPA scheme that does not take into account their unique needs or their own preferred strategy for meeting environmental goals. In the current system, credit is given for routine program activities such as writing permits and taking enforcement actions, but there is no mechanism through which to get credit for a successful voluntary reduction effort or technical assistance program. It is also difficult to get credit or funding for participation in a multi-media effort or for actions that require the cooperation of multiple agencies or organizations.

States are often inhibited from trying new ideas about incorporating pollution prevention into their routine activities because they fear that EPA will intervene or override their actions. At a minimum, trying something new is likely to add to the transaction costs between EPA and the State. Ultimately, if EPA does not like what a State does or its interpretation of a requirement, EPA retains authority to pull back the permit or override the enforcement action.

Sustainability of prevention programs is uncertain, especially in light of tight Federal and State budgets. More stable alternative funding approaches are needed.

Pollution prevention cannot become a widely adopted practice unless government resources are available to promote the concept and to take the steps necessary to integrate it with environmental regulatory efforts. State and local governments -- already strapped for resources and overburdened with responsibilities -- may simply not be able to spare the funds and personnel needed. It is hard for "nonessential" programs such as technical assistance to compete for resources with mandated regulatory functions at any level of government. EPA funding for pollution prevention through special grants and projects cannot be relied upon completely either, both because these types of programs are the most vulnerable to cutbacks and because most prevention funds have been intended to help start programs that would become self-sustaining later. For this reason, pollution prevention will most likely receive sustained EPA funding if it is built into routine, mainstream program funding mechanisms.

In a few States, new laws now levy fees on waste generators as a means for assuring sustained resources for their technical assistance programs; other programs charge a small fee for certain direct services. Many pollution prevention programs have successfully entered into partnerships with private sector organizations and universities to provide services.

As a new area of government endeavor in a time of shrinking resources, special care must be taken to assure that pollution prevention programs find the most economical, cost-effective way to deliver services and to leverage scarce resources to the fullest extent possible. This includes taking advantage of existing materials and expertise as well as leveraging existing government programs such as small business assistance and economic development programs.

EPA has begun to address the need for more flexible funding and accountability measures.

To begin addressing funding flexibility issues, EPA is now encouraging the use of media State grant funds to support pollution prevention activities to the extent possible given statutory and program purposes and limitations. A memorandum from the Deputy Administrator (5/28/92) sets out principles for incorporating prevention-oriented activities that were used by EPA in negotiating the FY 1993 State workplans that are now beginning to be implemented. Guidance for negotiating FY 1994 media grant activities (to be issued in November, 1992), will refine these national principles for incorporating pollution prevention into grant activities; ensure that interpretations of grant requirements in EPA/State workplans are flexible enough to support innovative State activities; and establish an accounting process to ensure that EPA shares information on successful State projects and identifies statutory or other barriers to funding State proposals. The FY 1994 guidance will also address allowing trade-offs and disinvestments from traditional (non-statutory) program requirements and providing multiple credit for "multi-media" inspections that emphasize pollution prevention technical assistance.

RECOMMENDATIONS

4-1 Develop and implement new approaches to funding and assessing State and local environmental programs

4-1a EPA should continue exploring ways to provide for greater flexibility in funding, administration, and oversight of State and local environmental programs -- using strategic planning and pollution prevention as key components of new approaches.

- Develop more flexible management accountability and funding systems that can more readily accommodate strategic choices and innovative approaches by State and local governments -- for pollution prevention and other integrated efforts. Flexibility should be linked to risk-based strategic planning efforts.

- Seek new statutory authority as needed to get flexibility and ability to do and fund cross-media efforts, including incorporation of pollution prevention, which is inherently cross-media; seek multi-year funding authority.

- Conduct pilots, analyze results, and incorporate findings into routine operations.

- Provide for different structural relationships between EPA and States with innovative laws (e.g., facility planning laws) and organizational structures (e.g., one-stop permit units).

- Continue and expand set-asides, grants, and other flexible funding mechanisms, preferably using an "up to X%" approach for pollution prevention and multi-media projects; negotiate efforts during annual work plan development process; monitor how flexible funds are actually used.

- Determine the feasibility of designing and implementing a more comprehensive approach to assessing the overall strengths and weaknesses of State environmental management programs -- considering such matters as

tax and incentives policies and availability of technical assistance and financing to help businesses comply -- in concert with traditional environmental measures.

4-2 Foster development of more stable sources of funding for pollution prevention efforts.

4-2a EPA should maximize its use of existing funding mechanisms to support pollution prevention efforts.

- Continue special set-asides for pollution prevention priority projects.
- Implement policy and guidelines (5/28/92 and 11/92) on using media program grants for pollution prevention purposes. Monitor how the flexibility is actually used, and assess its impact on routine media program activities.
- Assign highest priority to funding of routine program activities that result in pollution prevention (e.g., issuing permits and conducting inspections/enforcement that lead to permanent reductions in releases).

4-2b EPA should ask Congress for adequate funds to support pollution prevention initiatives, and seek the flexibility needed to support them with routine program funds.

- Develop information needed to persuade Congress and the White House of the value of pollution prevention initiatives.
- Work with Congress (and others) to develop more appropriate measures for overseeing EPA and State progress in meeting environmental goals.

4-2b EPA should identify and disseminate information about alternative mechanisms being used to finance State and local prevention programs.

- Sponsor analysis of various approaches to funding State and local pollution prevention programs, including such mechanisms as fees, waste taxes, and public-private partnerships.
- Disseminate information to State and local governments about successful mechanisms.

5. Technical and Management Capacity

Government at all levels has limited technical capacity for pollution prevention, and expertise is not being shared effectively.

Pollution prevention is a new area of endeavor, for both the public and the private sectors. A wealth of technical information and knowledge is being developed, but not all of it is being shared effectively with everyone who needs it. There is a need for additional training

and technical support for both the prevention practitioners who provide assistance in the field and for program staff such as permit writers and enforcement personnel.

Pollution prevention technical information and program management experience is shared largely on an *ad hoc* basis through a loose network that includes government and private sector prevention practitioners, researchers, and program managers. There are clearinghouses, hotlines, and data bases operated by various Federal and State agencies as well as by the private sector. While EPA has a national (and now international) pollution prevention information clearinghouse, the clearinghouse has been criticized for having a seriously incomplete and difficult-to-use data base. In response, the Agency recently embarked on a major overhaul of the clearinghouse.

While pollution prevention information has been developed for various industries, industrial processes, and businesses, the level of detail and quality varies. Unfortunately, duplication of effort is common, and there are many examples of comparable technical materials and training programs having been developed by several different entities.

Not enough is being done to provide the training needed to develop qualified staff or to assure they have access to technical expertise.

In all but the most elementary situations, the ability to recognize pollution prevention opportunities requires a sophisticated level of knowledge about industry processes and practices -- as well as of the environmental requirements that apply. Because they are connected, ideally pollution prevention practitioners would also be familiar with worker safety and health matters as well as energy conservation. To be able to work credibly with their industry counterparts, staff at all levels of government involved in either technical assistance or regulatory efforts will need additional training and access to technical expertise. Some States have been successful in hiring retired engineers and engineering graduate students to help bridge some of the gaps in staff capacity.

At this point, the vast majority of environmental agency staff have not yet received even an "orientation" level of pollution prevention training. Very few have received more extensive training in such areas as permits and inspections incorporating pollution prevention. Information clearinghouses do exist in EPA and in many States, but the extent to which they are able to provide direct help varies, as does their coverage of various industries. The training needs of senior and mid-level program managers now responsible for new prevention laws have not yet been addressed.

Government managers need better information about policy, program management, and organizational issues associated with pollution prevention and other innovative approaches to environmental management.

Many State and local governments are developing new policies, laws, and programs to encourage pollution prevention. These new developments are often broad in scope, transcending traditional program boundaries and potentially having profound effects on the way a State or local government carries out its environmental management responsibilities. However, such State and local policy and management changes are not generally monitored or analyzed by EPA, even though the experiences of innovating governments would be valuable to others as well as in the development of national policy. In addition, existing EPA policies and practices could inhibit a State or local government's ability to implement an innovative approach. At this time, there are few mechanisms through which policy and management information can be exchanged.

RECOMMENDATIONS

5-1 Build effective mechanism(s) for sharing technical information on pollution prevention and related policy, management, and organizational issues.

5-1a EPA should design a national strategy for meeting technical information and training needs, and provide adequate financial support for implementation.

- Develop protocols that can be used to assess technical information needs, and design a framework for developing and disseminating information that makes optimum use of public and private resources.
  - -- Identify needs of the various audiences, what mechanisms already exist to serve these needs, duplication and overlaps, and gaps in coverage.
  - -- Acknowledge that pollution prevention programs will be diverse and built from the bottom up (State and local); highlight the need to build capacity at those levels.
  - -- Analyze how technical assistance programs for businesses (particularly those that receive government funds from EPA, other Federal agencies, and State and local government) can be more effectively linked.
- Establish training programs and address ongoing technical needs of government practitioners such as permit writers,inspectors, and enforcement personnel at all levels of government -- Federal, State, and local.
- Foster a pilot program of "centers of technical excellence" on specific key industries to be responsible for: preparing waste audit protocols and other technical materials that would be made available nationally (e.g., through a clearinghouse), consulting with other technical assistance providers, and keeping up with industry developments.

5-1b EPA should establish an ongoing program to develop and disseminate information to government managers on the design and implementation of pollution prevention programs.

- Develop guidance on designing non-regulatory components of a pollution prevention program, recognizing that not all will or should receive financial support from EPA.
- Establish a mechanism through which State and local senior policy managers can raise and address management and policy issues associated with pollution prevention.

5-1c EPA should support mechanisms through which State and local regulatory program staff can share information and experiences on

integrating pollution prevention and other multi-media approaches into their routine operations.

- Establish mechanisms for sharing information and experience in designing and implementing pollution prevention and multi-media permit and enforcement programs.

  -- Address managers' needs for information about: policy initiatives, organizational structures, intra-agency and inter-agency coordination, and management approaches.

  -- Address practitioners' needs for: model provisions, access to industry-specific technical expertise, manuals and protocols, and training.

5-2 Reap greater benefits from government investments in pollution prevention projects.

5-2a EPA should develop and implement a system that will allow the Agency to keep track of the myriad pollution prevention projects (internal and external) -- and their results -- funded by the various Agency offices.

- Establish systems needed to avoid duplication of effort in development of technical materials and training programs; ideally this should include information from all sources, not just those developed with EPA support.

- Modify grant application and oversight procedures, and staff adequately to assure that EPA is not paying for duplicative work and that grant products are readily accessible to others.

- Maintain an indexed repository of project products and results that can be used for evaluation purposes as well as to identify and publicize "best practices."

- Analyze project results and disseminate "best practices" and "how to" materials on program design, policies, and management.

5-3 Develop and share expertise on State and local innovations in environmental management, including pollution prevention.

5-3a EPA should monitor and analyze innovations in State and local environmental programs and policies, facilitate transfer of information about new approaches, and broker policy conflicts.

- Establish an EPA unit with responsibility for conducting analyses of innovative State and local policies, organizational structures, and programs; disseminating information to other State and local governments; and identifying and addressing policy implications for EPA programs and national legislation.

- Designate a senior official in each EPA Region and in Headquarters as liaison between EPA and innovating States to negotiate annual agreements and broker disputes as needed.

6. Prevention Opportunities in the Wastewater Pretreatment Program

The wastewater pretreatment program offers a unique opportunity for Federal, State, and local cooperation in developing a new prevention-oriented strategy for meeting environmental goals.

There are opportunities for incorporating pollution prevention into each of the environmental regulatory programs. However, several unique aspects of the wastewater pretreatment program make it a particularly attractive program through which pollution prevention can be promoted. The pretreatment program touches on Federal, State, and local responsibilities and so seemed appropriate for special attention in considering ways to build State and local capacity for pollution prevention.

The national pretreatment program was established to prevent pollutants discharged from industrial facilities to publicly owned treatment works (POTWs) from: interfering with the operation of the wastewater treatment plant, passing through the treatment plant into the environment, contaminating municipal sludges, and exposing treatment plans workers to hazardous chemicals. The program is also intended to improve opportunities for recycling and reclaiming municipal and industrial effluents and sludges. The objectives of the pretreatment program are met mainly by regulating commercial and industrial facilities that discharge toxic or unusually strong conventional wastes. Approximately 1,500 local wastewater treatment programs (about 10% of the total number of local programs) are required to have pretreatment programs because their facilities handle industrial wastes.

For the most part, the pretreatment program has focused on achieving compliance by POTWs with the procedural and administrative aspects of the program -- and less on setting and enforcing local limits on the industrial sources who discharge to the POTWs. A shift to to an environmental results-oriented approach would necessarily reach behind the discharges of the POTW itself to see what the facilities that send polluted wastewater to the POTW can and must do to limit their discharges. For many sources, pollution prevention will be a cost-effective remedy. However, most pretreatment POTWs at this point lack the technical capacity that would allow them to trace sources of toxics, understand the processes and operations of the various industrial facilities, and provide technical information on pollution prevention. Thus far, there has been very limited investment nationally in helping them to develop the needed expertise.

The pretreatment program is under increasing pressure to address toxics more effectively, and POTWs need help in meeting increasing environmental requirements. Pollution prevention offers some solutions.

Although POTWs have made significant progress in meeting program goals, the pretreatment program is facing external pressure for reform because several studies have revealed that it has given insufficient attention to the control of toxics. Some of the pressure for reform is also coming from the costs that the POTWs themselves must bear to

be in compliance with requirements now coming into place governing such matters as releases to the air, sludge management, and re-use of water. Compliance costs are significantly higher and options more greatly limited if the POTW is handling toxics.

Some of the problems in the pretreatment program that are now surfacing are rooted in the lack of effluent guidelines, criteria documents, and categorical standards for many industries. Sludge standards are also lacking. Without these as a foundation, it is difficult for POTWs to set specific, numeric toxic limits in the permits of their industrial dischargers. Some two-thirds of POTWs do not have numerical toxic limits in their own State-issued discharge permits. However, as new categorical standards (now under court-ordered development) are issued, POTWs will be faced with even more challenging standards to meet.

POTWs have been successful in supplementing the categorical standards with local limits for at least some pollutants, but comparatively few of these limits are actually based on site-specific criteria for surface water and sludge quality, potential for interference with the POTW, or worker health and safety. In addition, many POTWs do not have numerical limits for toxics in their surface water discharge permits. Consequently, there is no link between the POTW's discharge limits and the numerical limits for toxic substances regulated under permits issued to industrial users that discharge to the POTW.

The experiences of several POTWs now carrying out pilot efforts suggest they can be effective agents for fostering adoption of pollution prevention by a large number of industrial sources. In the pilot efforts, local POTWs identify individual sources of toxics entering the system and provide technical advice and other assistance to help the dischargers implement toxic use reduction and other pollution prevention measures as a way to meet pretreatment requirements.

The timing is especially ripe for a larger scale pollution prevention initiative within the national pretreatment program. In addition to the need to respond to criticisms of the program, the POTWs themselves, faced with the need to meet costly new air, sludge, and reclaimed water requirements, will have internal motivation to work effectively with their industrial dischargers to reduce loadings to the treatment plant. Another reason for focusing attention on POTWs is that treatment plants represent enormous investments of public capital; pollution prevention and water conservation efforts can reduce the need for expanded or more sophisticated capacity and can protect the investments already made.

The shift to a prevention strategy can happen only gradually and with considerable investment in developing the needed technical and managerial capacity at the local level. Efforts will need to be phased in, ideally targeted to address the highest risk situations first.

Increased attention to meeting the environmental goals of the pretreatment program should lead program managers to embrace pollution prevention as a basic approach to addressing toxics generally as well as in meeting the costs POTWs now face to comply with new air, sludge, and reclaimed water requirements. The implications of such a shift should not be understated, however. It will take commitment, it will be costly, and it will take time. However, with the right management perspective and motivation, pollution prevention will enable POTWs to succeed more easily than at present. Since there are only a few pilot projects in place thus far, pollution prevention in pretreatment must be considered to be in the early development phase. A long term strategy for gradual change is needed that is sensitive to the technical and financial capacity of POTWs which must manage a diverse universe of indirect dischargers -- who are themselves on a learning curve. Ideally, efforts

would be phased in, targeted to address the highest risk situations on a geographic, industry, or contaminant basis.

RECOMMENDATIONS

6-1 Develop a long term strategy for improving the capacity of local pretreatment programs, including adoption of pollution prevention approaches.

6-1a EPA should establish environmental goals and objectives for the pretreatment program.

- Change current programmatic accountability measures into measures focused on environmental goals and objectives.
- Accelerate development of criteria and standards for effluent quality and sludge, and site-specific limits in POTW permits to reflect such development.
- Use risk-based criteria to identify priority industries, geographic areas, and/or pollutants for priority attention.

6-1b EPA should improve its relationship with local POTWs and work to address their concerns and needs.

- Provide opportunities for greater interaction between EPA, State, and local pretreatment officials to promote better understanding of the real world problems faced by local pretreatment programs.
- Identify and address policy issues that are barriers to innovative approaches by POTWs, such as the definition of an appropriate response to significant compliance, and the optional use of mass limits instead of concentration limits when it will result in greater loading reductions.
- Modify oversight criteria and practices to provide greater flexibility to POTWs in how they meet program goals and objectives and give credit for innovative approaches such as promotion of pollution prevention.

6-1c EPA should invest in building the technical and managerial capacity of POTWs.

- Develop information and provide technical assistance needed to help local POTWs understand the impact of discharges on the receiving environment and, where there is a potential threat, develop appropriate site-specific controls on their industrial dischargers.
- Develop needed technical information and training programs for pretreatment permit writers, covering such topics as: waste assessments for permit applicants, tracing industrial sources of toxics, industrial processes, and pollution prevention alternatives.

6-1d EPA should support additional pilot initiatives by POTWs to incorporate pollution prevention, and disseminate the results.

- Identify additional communities seeking to initiate or expand efforts to incorporate pollution prevention into their pretreatment programs, and support these efforts with EPA funding and technical assistance.

- Establish a mechanism through which the technical, resource, policy, and oversight issues encountered by these (and previous) pilot efforts are raised and addressed.

- Develop and implement an outreach strategy to educate EPA, States, and other communities about successful approaches.

6-1e Explore policy options that would encourage greater adoption of pollution prevention as a strategy in local pretreatment programs.

- Identify incentives for local governments to incorporate prevention into POTW programs.

- Explore development of a "demand side/least cost" economic model for POTWs (comparable to those used by energy utilities) to show potential for reducing the costs of new, expanded, or more sophisticated facilities by getting industrial users to adopt water conservation and/or pollution prevention measures.

- Adopt a policy that will encourage recipients of revolving loans or construction grant funds to assure that dischargers have adopted all reasonable water conservation and prevention measures that would affect the cost of the planned facility.

Building State and Local Pollution Prevention Programs

PART II:

STATUS AND TRENDS

I. OVERVIEW:

PROGRESS AND CHALLENGES

The proliferation of diverse and innovative State and local initiatives suggests that pollution prevention is becoming a strategy of choice for environmental protection.

During the past few years, there has been a steady proliferation of State and local government initiatives designed to encourage firms to adopt pollution prevention measures. The prevention efforts underway now in nearly all States and in many communities are shaping the future of environmental protection efforts; pollution prevention is becoming the strategy of choice for addressing environmental matters. Pollution prevention offers new, cost-effective ways to to address emerging environmental issues such as nonattainment of air quality standards and removal of toxics from municipal wastewater treatment plant discharges.

Unlike most other environmental programs, the pollution prevention initiatives targeted to industrial audiences do not follow a national model established by law or policy. As a consequence, State and local programs differ in purpose and philosophy, organizational location, authority, size and scope of activities, mechanisms used for implementation, and the services they provide. See Exhibit I-1 (page 37) for a summary of common components of pollution prevention programs.

The diversity in pollution prevention programs and policies is viewed positively by most observers as an indicator of State and local creativity and innovation. State and local governments want to maintain their options in designing and implementing programs in the way they see fit and in accord with what they can afford. With more national attention to pollution prevention now, they fear that a new Federal law and/or EPA policy might be adopted that could force them to change their approach or spend resources they do not have. From a national standpoint, however, the diversity in State definitions of what qualifies as pollution prevention and the different stages in development of State and local efforts do make it difficult to evaluate progress and needs. There is considerable potential for legislation to be adopted that would be inappropriate for both the least and most progressive States.

Pollution prevention provides both economic and environmental benefits, and thus has broad natural appeal.

The support of political leaders has been critical to the success of many State and local prevention programs. These elected officials have recognized that supporting pollution prevention programs can provide a rare political "win-win" because they are both pro-business and pro-environment. Programs that provide technical assistance and other benefits can demonstrate a State's or community's interest in creating a friendly climate for business, while fostering environmental improvement at the same time. Mayors or governors can use prevention initiatives to demonstrate their leadership -- such as by establishing special task forces with representatives from the various constituencies and government agencies, or by issuing executive orders requiring government agencies to take action to reduce wastes. Award and recognition programs for prevention accomplishments generate positive publicity for both political leaders and businesses.

From the business perspective, an advantage to pollution prevention is that it can simplify regulatory life. Toxic use reduction and waste minimization can help businesses avoid being subject to certain regulatory requirements and can lead to streamlining the permit process. In addition, case studies show relatively quick payback times for many investments in pollution prevention techniques, and the cost savings realized help businesses increase their competitiveness.

A benefit to both government and industry is that pollution prevention can minimize transaction costs and friction between regulatory agencies and businesses. Where laws allow, States can give preferential treatment in the permit process or other benefits such as tax benefits and low-cost financing or grants to businesses that adopt progressive pollution prevention measures. Multi-media inspections can stop complaints about frequency of inspections, and the multi-media/whole-facility approach to environmental management can reduce the complexity of agency rules. Many actions to promote prevention can be taken within the current single-media laws and organizational structures, however, such as by re-orienting staff, changing existing regulations, or using executive orders and cabinet instructions to effect changes.

Another potential benefit is that promoting pollution prevention can help State and local governments address the controversial problem of siting waste disposal facilities. If firms aggressively adopt waste minimization, the need for additional capacity for waste disposal will also be minimized. This can help a State meet its capacity assurance requirements under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Further, a State or community is likely to find it easier to build support for siting or expanding a disposal facility if it has implemented a program for waste reduction first.

Political leaders and managers of environmental agencies have found pollution prevention to be a good multi-media planning device. Because targeting can be based on such factors as amount of emissions and risks involved, political leaders can get a sense of where the environmental problems really are. Environmental agency staff can be used more by focusing on facilities presenting the highest risk, giving multi-media attention to problems, and focusing on fundamental solutions to environmental problems that will have long-lasting effect.

A variety of definitions of pollution prevention are in use among the States and EPA, leading to some controversy and confusion about what kinds of actions are covered by the term.

The seemingly innocuous issue of deciding what is meant by the term pollution prevention -- that is, what activities are actually pollution *prevention*, as contrasted with pollution *control* or *management* -- has led to endless debate in virtually every State or local government trying to develop a program. The debate becomes particularly contentious if new legislative authorities are being drafted. Since there is no national legislation governing State or local government pollution prevention programs, they are free to develop their own definitions of pollution prevention. Many different definitions are in current use.

While details vary, the definitions fall into three general categories: *waste reduction*, *waste minimization*, and *source reduction* (or *toxic use reduction*). Each definition presents positive opportunities for improvement over doing nothing about waste, but there are important distinctions because the inclusion or exclusion of certain activities within the definition of pollution prevention can skew the emphasis of the program. Narrowly applying a *waste reduction* definition, for example, could result in solving one problem at

the expense of creating another. A company might figure out a way to eliminate a waste stream by leaving the hazardous material in the consumer end product -- creating a risk of exposure to consumers and ultimately putting the hazardous material into the solid waste stream. If off-site recycling and treatment methods such as incineration are included in *waste minimization,* there is no incentive to prevent the creation of waste; the wastes can still present hazards while they are being transported and handled. *Source reduction/toxic use reduction* represents a fundamental change -- questioning whether toxic chemicals should be used in the first place, going back into the production process itself looking for ways to eliminate or reduce the use of toxic materials.

EPA's definition equates pollution prevention with *source reduction* as defined in the 1990 Pollution Prevention Act, and the Agency recently specified in detail what kinds of actions qualify.

The national 1990 Pollution Prevention Act defined pollution prevention as meaning the same thing as source reduction. Recognizing that not all hazardous materials or waste matters could be addressed through source reduction, the Act established a hierarchy of desirable approaches to dealing with waste. Source reduction is the most desirable approach, followed by recycling and reuse, then by treatment, and last, by disposal. EPA set out a blueprint for implementing the national legislation and incorporating pollution prevention into Agency programs and activities in its *Report to Congress: Pollution Prevention Strategy* (1990).

The source reduction/hierarchy definition has guided EPA efforts since the law was enacted, but because it addressed only industrial waste, it was generally thought to be too narrow. In May 1992, EPA issued a broad definition of pollution prevention that it will use in determining whether a given activity should be classified as pollution prevention. In addition to industrial pollution, the definition addresses energy, agriculture, resource conservation, and other activities. The definition focuses heavily on actions that result in actual source reduction; only in-process recycling is included. (Note, however, that the definition of in-process recycling has still not been fully resolved.) The full text of EPA's definition of pollution prevention is included as Exhibit 1-2 (page 38).

In the future, only projects and activities meeting EPA's definition will be eligible to receive pollution prevention-related grants or flexibility in the administration of EPA programs. EPA's definition will be used for such purposes as to screen applications for Federal pollution prevention grants and to determine if a State should be given flexibility in use of grant funds or relief from program accountability measures on the grounds that a planned activity furthers pollution prevention goals. Significantly, EPA's definition of pollution prevention does not include off-site recycling. (Recycling activities are funded by EPA, but through solid waste programs.) National pollution prevention legislation now under consideration on Capitol Hill would, if enacted, codify a stringent interpretation of pollution prevention that would affect the eligibility of State and local efforts for program benefits.

Ultimately, every State or local government developing or implementing a prevention program must grapple with the definition issue -- especially if pollution prevention becomes a means for receiving special treatment by the government and/or if legislation is being considered. However, there are many easy opportunities for reducing wastes and use of toxic materials in all kinds of businesses that can be initiated without resolving the debate about definition.

Most programs promote voluntary adoption of prevention measures, but the use of regulatory tools is increasing.

For the most part, pollution prevention efforts have thus far been voluntary in nature, using education, technical assistance, and incentives in a variety of forms to persuade businesses to adopt prevention practices. After the national Toxics Release Inventory (TRI) was published, special efforts began at the Federal, State, and to a lesser extent, local levels to secure voluntary commitments from major polluters for significant reductions in emissions. New pollution prevention laws have passed in many States. Now, nearly a third of the States now require facilities to develop pollution prevention plans, although the new programs typically rely on voluntary mechanisms to get the plans implemented.

While voluntary efforts still predominate, there is a growing trend toward incorporating pollution prevention into the regulatory aspects of environmental agency activities. The practice cannot yet be considered widespread, but many State and local governments are including provisions requiring companies to adopt prevention practices into environmental permits and enforcement settlements. Several State experiments are underway to develop multi-media environmental permits that would require analysis of prevention opportunities and then implementation on a whole-facility basis. Further, EPA and some State agencies now include explicit consideration of pollution prevention opportunities in the development of all new environmental requirements.

The interest in exploring regulatory approaches to achieving pollution prevention is not expected to wane, and the relationship between regulatory and nonregulatory efforts promises to be a continuing challenge. There are deep-seated philosophic differences between those who advocate a strictly voluntary approach and those who believe that an underpinning of enforceable requirements is needed. EPA and many State and local governments acknowledge the value of both approaches and are pursuing a combination of voluntary and regulatory measures.

Many States are experimenting with new organizational structures to enhance their ability to carry out multi-media efforts.

Because one of the biggest advantages of pollution prevention is that it promotes consideration of all potential environmental impacts and fundamental solutions, most observers believe that a multi-media approach would be the ideal. Generally, the States experimenting with multi-media permitting and/or enforcement are doing so by setting up special task forces or teams. Representatives from the various media groups participate in a team addressing targeted facilities or geographic regions. The task force or team approach allows the environmental problems of a facility to be identified and addressed comprehensively. A key benefit is that media program staff become exposed to the requirements and issues of the other media programs -- experience they then bring back to their home programs. This approach also fosters networking and cooperation among programs. Participation in multi-media projects can be linked to job promotion opportunities as well. Some of the difficulties in carrying out multi-media efforts are common to other "matrix" management situations: unclear supervisory controls, program managers' concern about loss of staff to accomplish already heavy workloads, and the need for extensive planning and coordination. For these reasons, only a few multi-media efforts have actually been attempted thus far, focused on the very largest and most environmentally significant facilities.

A very few States have begun implementing major reorganizations that emphasize functions that cut across all media (e.g., permit writing) rather than single-media laws and programs. Some of these reorganizations were undertaken in part to improve the State's ability to

promote pollution prevention in regulatory activities and/or to foster implementation of new toxic use reduction laws. There is evidence to suggest, however, that some State reorganization efforts are mostly concerned with improving regulatory efficiency. Since these reorganizations are quite new, it is too soon to tell how well they will work and what specific problems they face.

Evaluating the effectiveness of pollution prevention programs will be difficult, requiring new approaches to measuring progress.

Like any government activity, pollution prevention programs will be called upon from time to time to demonstrate what they have accomplished and to justify their existence. The much-maligned traditional approach to measuring accomplishments in environmental programs -- e.g., counting numbers of permits issued and enforcement actions taken -- is even more inappropriate for measuring progress in preventing pollution than it is for measuring progress in meeting environmental goals.

It will be difficult to establish a cause and effect relationship between the activities of a prevention program and growth in the adoption of prevention strategies by businesses. A company's decision to implement prevention measures will hinge on many factors, including such things as regulatory/enforcement climate, general economic conditions, company financial condition, availability of capital, and a host of other factors which may have little to do with whether or not an assistance program was in place or even directly reached the particular firm involved. Specific prevention program efforts constitute only a very tiny part of the overall mosaic and should not take full blame or credit for the extent to which prevention is adopted by businesses in a State or community.

Specific quantitative improvements such as pounds of pollutant reduced and costs saved at the facilities reached by the program are powerful indicators of success. Measuring trends in toxic releases, at individual facilities and across a sector or geographic area, can be useful indicators of whether pollution prevention is catching on. However, the potential administrative and financial burden of monitoring to gather proof of reductions must be balanced against the potential that onerous data requirements could discourage firms from adopting prevention.

Also important are qualitative changes -- such as in changes in corporate culture, trade association interest, employee behavior, engineering curricula, and government-industry relations -- that may also result from promoting the prevention approach. Such changes may well have the longest lasting effect on the future of the environment and economy. Further, implementation of pollution prevention measures can serve as a means for helping business stay in business and increase their competitiveness. The potential dual benefits of environmental and economic improvement suggests the need for new ways to assess and report on progress -- one that transcends traditional environmental indicators and looks at such factors as jobs retained and costs saved as well.

This paper will explore current developments and the opportunities and challenges ahead in building State and local programs to promote pollution prevention for industrial facilities.

As a foundation for understanding the challenges ahead in building State and local capacity for promoting pollution prevention, this paper will examine the origins of existing programs, discuss common components, and explore trends likely to affect the future of these efforts now that prevention is becoming a more widely accepted approach to environmental protection.

Most of the pollution prevention programs to be discussed in this paper focus on an industrial audience, but many more programs exist to address municipal solid waste recycling, agricultural practices, and energy conservation -- all of which also fall under a broad definition of pollution prevention. In addition to the programs designed primarily for "environmental" purposes, there are also literally hundreds of government-sponsored business assistance efforts which may address environmental matters in the course of their work. As will become evident, one of the principal challenges to be faced in building capacity for promoting pollution prevention is finding ways to link these myriad efforts into an effective and efficient delivery system.

This paper will examine the issues from the perspective of environmental protection agencies at all levels of government, since they have primary responsibility for environmental matters and have been key players in the development of programs to promote waste reduction and pollution prevention. While many business assistance programs do provide environmental information, more is known about the specific pollution prevention activities of the programs developed *primarily* for pollution prevention purposes because they typically share information and experience with others through their membership in the National Pollution Prevention Roundtable. They are also more likely to be connected in some way to the U.S. Environmental Protection Agency and to be influenced directly by national environmental policy.

The remainder of this paper addresses common components and issues associated with various types of State and local programs. For clarity purposes, the discussion is broken into two general categories of activity:

- Efforts to promote *voluntary* adoption of pollution prevention primarily through education, technical assistance, and incentives; and

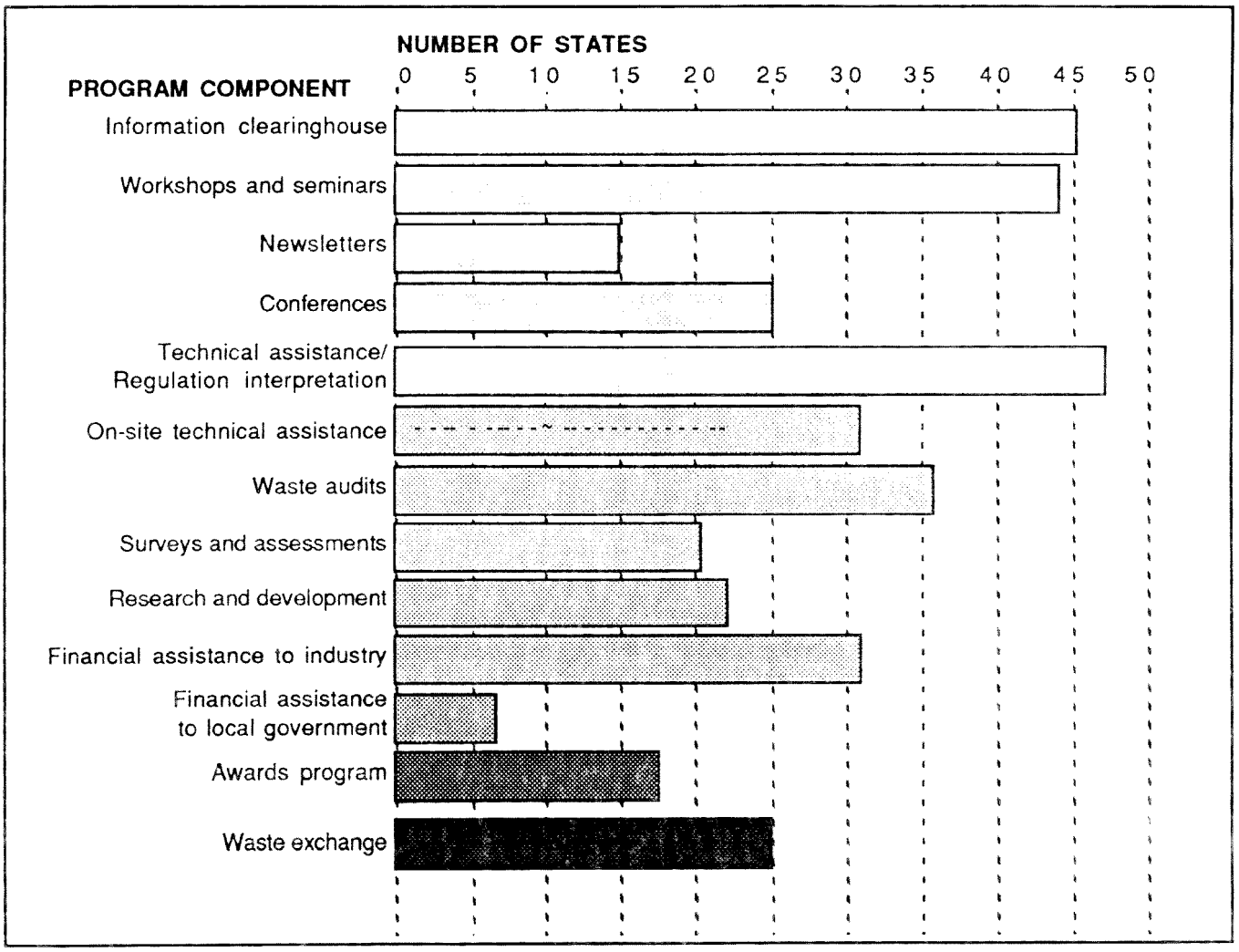
- Efforts to integrate prevention into *regulatory* activities such as permitting and enforcement (including new State laws for facility planning and toxic use reduction).

However, it should be understood that a State or local program will often use an array of tools and activities to promote prevention, including components falling under *both* categories. One of the major challenges ahead is working out a relationship between voluntary and regulatory activities that will be most effective in promoting the adoption of prevention measures.

Exhibit 1-3 (pages 39-40) shows a model comprehensive pollution prevention initiative developed by participants at the national workshop "Building State and Local Pollution Prevention Programs."

EXHIBIT 1-1

COMMON COMPONENTS OF STATE POLLUTION PREVENTION PROGRAMS



Source: Pollution Prevention 1991: Progress on Reducing Industrial Pollutants, U.S. Environmental Protection Agency, October 1991.

EXHIBIT 1-2

EPA DEFINITION OF POLLUTION PREVENTION

(Pursuant to the Pollution Prevention Act of 1990 and EPA Pollution Prevention Strategy)

Under Section 6602(b) of the Pollution Prevention Act of 1990, Congress established a national policy that:

•• pollution should be prevented or reduced at the source whenever feasible;
•• pollution that cannot be prevented should be recycled in an environmentally safe manner whenever feasible;
•• pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and
•• disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally sound manner.

Pollution prevention means "source reduction," as defined under the Pollution Prevention Act, and other practices that reduce or eliminate the creation of pollutants through: increased efficiency in the use of raw materials, energy, water, or other resources; or protection of natural resources by conservation.

The Pollution Prevention Act defines "source reduction" to mean any practice which:
reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

The term includes: equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

Under the Pollution Prevention Act, recycling, energy recovery, treatment, and disposal are not included within the definition of pollution prevention. Some practices commonly described as "in-process recycling" may qualify as pollution prevention. Recycling that is conducted in an environmentally sound manner shares many of the advantages of prevention —it can reduce the need for treatment or disposal, and conserve energy and resources.

Pollution prevention approaches can be applied to all pollution-generating activity, including those found in the energy, agriculture, Federal, consumer, as well as industrial sectors. The impairment of wetlands, ground water sources, and other critical resources constitutes pollution, and prevention practices may be essential for preserving these resources. These practices may include conservation techniques and changes in management practices to prevent harm to sensitive ecosystems. Pollution prevention does not include practices that create new risks of concern.

In the agricultural sector, pollution prevention approaches include: reducing the use of water and chemical inputs; adoption of less environmentally harmful pesticides or cultivation of crop strains with natural resistance to pests; and protection of sensitive areas.

In the energy sector, pollution prevention can reduce environmental damages from extraction, processing, transport, and combination of fuels. Pollution prevention approaches include: increasing efficiency in energy use; substituting environmentally benign fuel sources; and design changes that reduce the demand for energy.

5/28/92 memorandum to EPA staff from F. Henry Habicht II, Deputy Administrator

Exhibit 1-3

MODEL POLLUTION PREVENTION INITIATIVE*

THE VISION

Establish public-private partnerships to:

- Improve environmental (management) efficiency
- Assure environmental and public health protection
- Assure economic growth, stability, and community development

KEY IMPROVEMENTS

- Establish a total multi-media program
- Integrate polllution prevention into the State's strategic planning process, permitting, and enforcement
- Use Total Quality Management (TQM) principles and methods to assure continuous process improvements
- Upgrade the level and quality of technical assistance
- Provide an "incentives" program to motivate industry to invest in prevention strategies; if permittees accept the entry requirements, they will receive special consideration in regulatory matters
- Provide low interest loans, research grants to small firms implementing prevention strategies; assure access to credit
- Establish a program of rewards and recognition for leadership activities
- Make full use of State and Federal data for analysis, targeting of efforts
- Upgrade the level and quality of public education, stressing prevention
- Upgrade pollution prevention staff positions to attract quality people into the program

*Developed by participants in National Workshop on Building State and Local Pollution Prevention Programs, Washington, D.C., January 1992

ACTION PLAN

KICKOFF

Governor issues an executive order at a press conference along with key partners in the program

Environmentalists	State legislature
Labor	Chamber of Commerce
Attorney General	Public Interest Research Group (PIRG)

FOLLOW-UP

- Set up special interagency task force charged with establishing the program in 180 days
- Require each agency chair to attend bi-weekly progress meetings to help avoid inter-agency bickering
- Set up high-level committee to settle issues between media programs and permit-issuance authorities
- Report to State legislature and the public on program successes

KEY PROGRAM ELEMENTS

- Inter-agency, multi-media coordination of regulatory programs
- A staff contact in governor's office to give industry and the public a point of direct contact
- A directive to independent permit-review authorities to make every legal effort possible to promote prevention concepts in their decision-making
- An assessment of resource needs and funding options, including enlisting the assistance of leading financial and business institutions
- An incentives program for permittees to invest in prevention approaches in order to obtain expedited regulatory processing
- A program to reach out to all constituents in th e process

II. PROMOTING PREVENTION THROUGH VOLUNTARY ACTION

Most State and local pollution prevention programs are designed primarily to encourage companies to adopt pollution prevention measures voluntarily.

Overwhelmingly, the businesses that have adopted pollution prevention measures have done so voluntarily. Although the reasons companies choose to implement prevention measures vary and are not fully understood, most experts point to such factors as: cost savings to be realized from reductions in the use of input materials and avoidance of waste disposal costs, the potential for relief from the burden of certain regulations, avoidance of long term environmental liability, company adoption of total quality management principles and techniques, and the desire for a good corporate image. Although not strictly a "voluntary" action, many firms facing compliance problems have chosen to implement source reduction or other prevention methods rather than traditional, end-of-pipe techniques for achieving compliance.

Whatever the ultimate motivation for a company's decision to adopt pollution prevention techniques, knowledge is a prerequisite. For this reason, virtually all of the State and local pollution prevention programs include education and technical assistance components designed to let businesses know about the benefits of pollution prevention and the technical options available. Many of these programs are targeted especially to small businesses, which may have environmental problems but are not expected to have the technical or managerial expertise necessary to know about or implement prevention measures. Newsletters, workshops, and information clearinghouses and hotlines are common features. Some programs offer on-site direct technical assistance; some help firms by funding research and demonstration of new techniques.

Under special initiatives at the Federal and State levels, senior officials of firms releasing high amounts of toxics to the environment are being called upon to commit their firms to significant voluntary reductions in releases. Larger firms have managerial, technical, and financial resources to bring to bear, and the "jawboning" approach has been successful in obtaining reduction commitments from literally hundreds of companies.

The design of a program to promote voluntary action and how its activities are targeted will reflect the program's basic goals and objectives.

Although programs will typically address both environmental and economic objectives, the relative priority given to each will shape how the program is designed and how its target audience is defined. If the primary objective is environmental improvement, program resources might be targeted to those geographic areas and/or industries with the greatest environmental problems. If economic enhancement is the primary objective, program efforts might be targeted to geographic areas or types of businesses facing the greatest economic stress and for which environmental compliance problems loom large.

Some programs are using data such as the Toxics Release Inventory to identify facilities that release the largest amounts of toxics to the environment. The major advantage of this targeting approach is that it can result in large amounts of reductions. Efforts focus on the

largest facilities, and concentrate on industries using the listed substances. Because these facilities tend to be medium-to-large in size, they normally will have adequate access to technical expertise that will enable them to identify and implement pollution prevention alternatives (e.g., through their own engineers, hired consultants, and/or trade associations). EPA and many States have been successful in getting many of the largest companies to make commitments to voluntary emission reductions (e.g., EPA's 33/50 Program and similar programs at the State level). Incentives such as positive publicity, tax benefits, and expedited permitting may provide impetus for companies to achieve voluntary reductions. Typically, States have targeted the larger firms with multi-media releases first for compliance with toxic use reduction laws and facility-wide permitting efforts.

If the primary objective of the program is to help small businesses retain their economic viability, reductions in releases to the environment as a result of program activities will be smaller and harder to prove. Most small businesses have problems just dealing with environmental compliance; they typically lack the managerial, technical, and financial ability to comply. In these cases, pollution prevention may be an attractive and cost-effective way to help businesses come into compliance, or even to remove themselves from under the regulatory umbrella if they can stop using toxic materials. However, experience of existing programs indicates that resolving compliance matters may consume a considerable amount of program staff time, and pollution prevention is not always involved. Programs to address problems of small businesses might include provision of technical assistance and training as well as financial help such as tax credits for investments, access to grants or low interest loans to buy needed equipment, and support for technology research.

Exhibit 2-1 (page 43) summarizes the three phases a company typically goes through in implementing pollution prevention measures, the major barriers encountered in each phase, and the kinds of assistance a company is most likely to need in each phase. The vast majority of firms -- and especially the small firms -- have not even entered the initial phase. To get started, they need access to technical information about inexpensive, proven techniques for pollution prevention such as good housekeeping, waste segregation, input substitution, and minor process changes. As firms move beyond this phase, they may need to make significant capital investments in new equipment; then, they need access to capital and tax incentives. In the last phase, where new technologies need to be developed or tested, firms need research and development funds and information about the results of demonstration projects.

Exhibit 2-1

PHASES IN IMPLEMENTATION OF POLLUTION PREVENTION MEASURES

Waste reduction efforts can be categorized into three phases. Each phase has different barriers and potential incentive mechanisms to overcome them.

WASTE REDUCTION EFFORTS	MAJOR BARRIERS	POTENTIAL INCENTIVE MECHANISM
INITIAL PHASE		
Inexpensive, proven techniques, such as: • Good housekeeping • Input substitution • Waste segregation • Minor process changes	• Lack of information on waste reduction methods • Lack of technical expertise	• Information dissemination, such as newsletters and technical workshops
CAPITAL-INTENSIVE PHASE		
Capital-intensive investments, such as: • Recycling or waste water equipment • On-site treatment facilities • Product changes	• Financing not available • Lack of information on waste reduction methods	• Loan guarantees • State loans • Grants for project implementation • Investment tax credits • Interest subsidies • Tax deductions
RESEARCH, DEVEOPMENT & DEMONSTRATION PHASE		
Research, development and demonstration of: • New, unproven technologies	• Technology not available or not demonstrated	• Grants for RD&D • Dissemination of results of RD&D projects

Source: Economic Incentives for the Reduction of Hazardous Waste. 1985. Prepared by ICF Consulting Associates for the Toxic Substances Control Division of the California Department of Health Services.

A. Assistance Programs

1. Pollution Prevention Assistance Programs

Assistance-oriented programs assume that businesses will voluntarily adopt prevention measures when they have reliable technical and economic information.

The programs designed to assist industry in identifying opportunities for preventing pollution and in implementing waste minimization measures have much in common with economic development programs and agricultural and industrial extension services. They assume that the industrial audience needs objective advice and information about pollution prevention and that businesses will respond to encouragement, particularly if given information which contrasts the costs of use and disposal of a toxic material with the potential benefits of pollution prevention.

Many of the technical assistance-oriented prevention programs can trace their origins to State training programs designed to foster hazardous waste minimization, funded by the U.S. Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA) during the late 1980s. Other prevention efforts began when EPA made grants available to States under the Pollution Prevention Act of 1990. The importance of both EPA funding and the statutory language supporting waste minimization and pollution prevention to the development and continuance of these programs should not be underestimated.

However, it is important to understand that some programs emerged as a State or local government's own response to the perceived needs of its constituents. A major impetus for waste minimization programs came from public demand opposing the siting of new hazardous waste treatment and disposal facilities; thus, establishing a pollution prevention program in some cases was a political accommodation in order to facilitate hazardous waste facility siting. Some States, concerned about the economic impact on their small businesses of the high costs of waste management, developed programs designed primarily to help them reduce their compliance costs through waste reduction. The Federal requirement that States must assure they have adequate capacity to dispose of their hazardous waste gave additional impetus to the development of waste minimization programs.

The original focus on hazardous waste minimization still influences the design, staffing, and operation of many of these programs. Most practitioners try to identify waste reduction opportunities throughout a facility, recognizing that an integrated "whole facility" approach to waste reduction is a key to avoiding the cross media transfer of pollutants. However, program staff hired originally for their expertise in hazardous waste matters may be less prepared to address air and water issues.

The organizational location of assistance-oriented programs for industry varies, but they are usually separated functionally, if not physically, from any regulatory activities that may deal with the same audience. In many States, they are located in academic institutions, small business centers, or nonprofit organizations, which are generally viewed by the business community as unbiased sources of advice. In other States, the assistance program is housed within the environmental regulatory agency. Even though the assistance function is typically separated by a "Chinese wall" from regulatory compliance functions in these

cases, such programs do face the hurdle of overcoming their potential clients' fears that a request for help could lead to an enforcement action.

Assistance programs provide a range of services based on their size and other factors, but even the largest programs reach only a small fraction of facilities that might benefit.

The services provided by pollution prevention assistance programs range from simply responding to inquiries by disseminating written materials up to conducting full-scale, on-site pollution prevention audits. Typical components of assistance-oriented programs, as well as their advantages and drawbacks, are described below. As would be expected, the smaller, lower budget programs are generally more likely to provide information than to provide on-site audit services. Even the largest programs, however, are able to conduct only a tiny number of audits compared to the number of facilities that might benefit.

A common concern of program officials is the difficulty of hiring and retaining qualified pollution prevention staff.

Ideally, staff would be be familiar with the processes of and pollution prevention opportunities for the particular industries they deal with as well as with the range of environmental requirements that apply to it. The need for highly qualified staff is particularly true for those who will carry out the more sophisticated prevention efforts such as on-site assessments and direct technical assistance. An assistance-oriented program that is mostly an outreach effort providing introductory-level information and written materials can get by with staff who have a more basic level of training. These staff can call in industry experts as needed for industry-specific workshops and seminars. However, if the program wishes to go beyond general information dissemination and referrals, industry-specific training is needed. Regulatory staff who are incorporating prevention requirements into permits and enforcement settlements need, at a minimum, access to someone with industry expertise to be able to help draft and review technical provisions.

Some States have been successful in hiring retired engineers and engineering graduate students to help bridge gaps in staff capacity. As the various information clearinghouses grow, they will improve as sources of technical information that can help build staff capacity as well. Another option for gaining industry-specific training is establishing internships and exchanges between industry and government agencies.

Common Program Components

• Information Dissemination

Nearly all programs provide information about pollution prevention, using a variety of information delivery systems.

Many programs have telephone hotlines, often with 800 numbers, to answer questions on a range of waste issues. A request for information about regulations or waste management can provide the entry for a discussion of pollution prevention opportunities. Although a good way to establish an early presence in the regulated community, the responsive nature of a hotline makes it difficult to target to a particular audience. The time required to respond to an individual request may be disproportional to the size of the company or volume of materials used or wastes generated.

When there is a relatively large audience needing similar information, fact sheets are often developed and disseminated. The short written documents (up to four pages), might include such information as the best available information and advice about a particular industry's pollution prevention options and considerations for choosing among them.

Manuals and guides contain more detailed information about pollution prevention for a particular industry, waste, or use of a substance. They typically describe processes and operations in sufficient detail to allow for site-specific analysis and option identification, and include a discussion of the pros and cons of various approaches as well as technical details that would affect the applicability of a particular option to a specific facility. A list of companies and organizations who can provide needed services or equipment, such as used oil handlers and vendors and consultants can be included in a directory of resources.

Newsletters are a relatively inexpensive way to reach a wide audience with pollution prevention information and announcements about seminars, availability of assistance, and the like. Some programs mail newsletters to every waste generator or even to all industrial concerns, but many programs must limit distribution to those with an active interest in pollution prevention. Many States also include pollution prevention information in other State newsletters on waste management.

• Education

Educational activities are the second most common program component, considered essential by many because of the need to transfer large volumes of information to different audiences. The information provided will ultimately be applied to a specific site.

Industry-specific seminars are widely used to educate company officials about pollution prevention. Such sessions are usually no more than one day long so they do not place a strong time demand on the business managers. Often, the seminar begins with a keynote speaker from either industry or the political arena, who serves as a draw for the session and sets the tone. The rest of the session is divided between suppliers describing their prevention-oriented products and services and industry officials describing how their firms implemented pollution prevention. Program staff members generally serve as facilitators, except when they are uniquely qualified to provide technical assistance. Pollution prevention topics can also be covered in general waste management seminars.

Designed for a broader audience, one- or two-day conferences often cover an issue such as newly-mandated requirements (e.g., facility-wide pollution prevention planning, new regulations regarding releases to air). They draw heavily on industrial participants for content. Conferences might include a special breakfast session with business Chief Executive Officers at which management issues such as motivating company staff are discussed.

Some assistance programs work with adult education programs at community colleges to incorporate pollution prevention into waste management and related courses.

Many programs develop curricula to incorporate pollution prevention into traditional education programs at both the university and K-12 levels

• Technical Assistance

From the beginning, providing technical assistance has been a key component of prevention programs. At one time, technical assistance was considered the primary method for directly aiding industry.

Technical information, provided in the form of fact sheets, manuals, and guides, can be considered both as technical assistance or information dissemination. In some programs, providing written information is the only form of direct assistance given.

Many programs provide on-site technical assistance to promote pollution prevention, using a variety of mechanisms. In some cases, program staff visit and assist specific industrial facilities. In several programs, full-time staff is supplemented by using personnel specifically employed to conduct on-site assistance; often supplemental staff are student interns or retired engineers. Commonly, interns focus on a particular facility for a set period of time (e.g., an academic marking period) and may have no prior or future contact with that or any other industrial facility. In these situations, program staff actively support the students. By contrast, retired engineers typically move from facility to facility and can become very much like adjunct program staff.

- **Research and Financial Assistance**

Many prevention programs conduct applied forms of research such as on-site demonstrations and pilot projects. Nearly always conducted in collaboration with industrial facilities, these projects may be staffed by either program personnel or the facility's own employees. Because a project typically requires expenditures of between $50,000 to $200,000, limited budgets allow only high priority concerns to be addressed. Research can also be funded by grants or loans to facilities, usually under the condition that the information that is developed must be made public through reports and facility tours.

- **Awards**

A popular feature of many programs is an awards program to recognize businesses for exceptional pollution prevention efforts. Political leaders such as governors or mayors are usually involved in the awards ceremonies, and both they and the award recipients enjoy the favorable publicity which results. The awards provide an incentive for companies to adopt prevention practices, and award winners can become excellent champions for prevention in the business community.

2. Small Business Assistance under Clean Air Act

Each State is required by law to establish a technical assistance program to help small businesses comply with the new Clean Air Act amendments. These programs are not always coordinated with existing pollution prevention assistance programs.

In addition to fostering many innovative regulatory approaches, the Clean Air Act Amendments of 1990 require each State to set up a small business assistance program as part of its overall plan for implementing the new law. Congress recognized that small businesses frequently lack the technical expertise and financial resources necessary to evaluate regulations and determine the appropriate set of actions for compliance. Therefore, Congress included the provision to assure that small businesses that are stationary sources of air pollution would have access to the technical assistance they need to be able to comply. Each State is required to adopt a small business program and submit it to EPA for approval by November 15, 1992.

Under this program, States will help small businesses determine which requirements apply to them and help them obtain required permits. In addition, States will provide information as well as direct technical assistance on how to use pollution prevention techniques to avoid accidental releases. Each State will establish an advisory panel to monitor progress and coordinate these activities through a States ombudsman.

At the national level, EPA will establish a small business ombudsman and operate several technical service centers and telephone hotlines to provide support to State and local agencies as they develop small business assistance programs. The centers and hotlines will provide a broad range of assistance covering topics including Clean Air Act requirements, control technologies, pollution prevention methods and alternatives, emission measurement methods and air pollution monitoring devices, and prevention of accidental releases.

3. Economic Development and Business Assistance Programs

Most States and many communities support economic development and business assistance programs which sometimes provide technical assistance and funding for environmental purposes. Their potential for promoting pollution prevention is still largely untapped.

In addition to programs specifically designed to promote pollution prevention as described above, State and local governments also support a variety of other programs to foster economic development and assist businesses. Although the primary purpose of such programs is economic improvement, they could be enlisted to promote pollution prevention as a way to realize the potential cost savings from energy efficiency and waste reduction. Managers of business assistance programs indicate that many of the questions they receive from their clients are related to environmental compliance matters. At this time, however, there are few links between pollution prevention and general business assistance programs.

State and local business assistance programs were established to attract, retain, and encourage the growth of companies. Such programs seek to aid businesses by either helping them find the resources they need to solve a problem or by building companies internal capabilities to address their own problems. There is a bewildering array of programs (see Exhibits 2-2 and 2-3, page 53), but they typically cluster around common problems facing business: general business advice, marketing, financial, production technology, facilities and siting, regulatory compliance, staffing, and infrastructure. Within each category,a variety of subcategories of programs is found in most States:

- **General Business Advice**
  - Management Counseling
  - Business Planning
  - Management Training
  - Dial-In Electronic Bulletin Boards
- **Financial**
  - Loans/Loan Guarantees
  - Grants
  - Loan Packaging/Grantsmanship
  - Tax Incentives
  - Venture Capital
- **Marketing**
  - Market Research Services
  - Foreign Trade Information/Services
  - State Manufacturers and Service Company Directories
  - Cooperative Marketing Programs
- **Production Technology**
  - Technology Extension Services
  - Technology Data Base Search and Referrals to Experts
  - University/Industry Cooperative R&D
  - Technology Demonstration Centers

- **Facilities and Siting**
  - Site Assessment and Qualification
  - Requirements Assessments
  - One-Stop Business Licenses Service
- **Regulatory Compliance**
  - Zoning Advice
  - Environmental Compliance Support
  - Environmental Compliance Support
  - Environmental Impact Statement Preparation Assistance
  - Public Health and Safety Compliance Support
- **Staffing**
  - Employment Services
  - Employee Training Program
  - Displaced Worker Training Programs
- **Infrastructure**
  - Transportation
  - Utilities
  - Telecommunications

Federal, State, and local economic development and business assistance programs are most likely to incorporate pollution prevention when it is viewed as a component of traditional business concerns rather than as a unique or new category of business problem. A successful effort will go beyond transferring technology to finding the requisite resources, arranging for training or for new hires if needed, reconfiguring facilities, and so forth.

Economic development departments and councils and the Chamber of Commerce are often the lead agencies for small business recruitment, retention, and support services. While in a given community these agencies or non-governmental organizations might not provide any pollution prevention service, they usually refer companies to people and programs who can provide important business assistance services and are adept at facilitating networking among agencies.

Some of these business-oriented organizations provide direct, hands-on help with environmental concerns, although this help has primarily involved developing environmental impact statements. There is growing interest in pollution prevention within even this kind of service, however, because a business that prevents or minimizes waste and uses less toxic materials will have an easier time getting needed permits and developing impact statements.

Many States have passed stringent environmental protection legislation. In order not to discourage business formation, growth, and recruitment by such legislation, States increasingly have initiatives to (a) keep businesses informed of requirements and (b) assist them in implementing the requirements in a timely fashion.

Technology-related information services are available throughout the United States, many operating on a regional and national basis. An example is the Southern Technology Assistance Center (STAC) at university campuses in Florida. A NASA-funded Regional Technology Transfer Center, STAC provides access to an extensive variety of public and private data basis, offering customized searches for companies. Staff will work with a client in person or over the phone to define a search, identify relevant literature and experts to speak with, and to prepare proposals for obtaining government funds for pollution prevention efforts.

Private sector companies also offer pollution prevention information services as part of their general packages. Large on-line vendors such as DIALOG have several environmental data bases that can be searched. Service firms like TELTECH, Inc., provides customized data searches and access to experts, much like that provided by STAC, for a single fee. To facilitate use by start-ups and young companies, the firm is

under contract with the State of Minnesota to provide technical assistance to qualified small businesses; similar arrangements are being developed with at least two other States.

Funding for purchasing technology or services takes a variety of forms. For example, traditional loan programs for production equipment can be tapped. Agencies like the Texas Department of Commerce welcome pollution prevention as just one of many production-relevant uses of their loan program. Funding sources are not just limited to government agencies. Utilities, because their profits are tied to the mandates of a regulatory commission, can be an excellent source of pollution prevention funds. For example, Puget Power has a commercial program providing grants and technical assistance to builders making energy efficient structures; funds can be used for pollution prevention technology so long as it is tied with reductions in energy demand.

B. Voluntary Toxics Reduction Programs

Under special Federal and State initiatives, firms are committing to making significant reductions in toxic releases.

EPA and several States are implementing special programs to encourage industry to *voluntarily* reduce their generation of toxic wastes. These ambitious pollution prevention programs are designed to get industrial sources to make significant reductions in toxics quickly and with an unprecedented degree of flexibility. While the topic of voluntary reduction programs is covered in this voluntary action section, it is important to note that these efforts are typically administered through the environmental regulatory agency. Implementation at a given firm may bump into some of the regulatory concerns discussed in the next section on regulatory integration.

1. EPA's 33\50 Program

EPA's "33/50 Program" aims to demonstrate that voluntary reduction programs can augment the Agency's traditional regulatory approach by achieving targeted reductions more quickly than would regulations alone. The 33/50 Program derives its name from the program's overall goals -- an interim goal of a 33 percent `reduction by 1992, with an ultimate goal of a 50 percent reduction by 1995 in environmental releases and off-site transfers of 17 high-priority toxic chemicals. Releases reported in the 1988 Toxics Release Inventory (TRI) are being used as the baseline.

In 1988, almost 6,000 companies reported to the TRI that about 1.6 billion pounds of chemicals were either released to the environment or transferred off-site to waste management facilities. In early 1991, EPA approached the 600 companies releasing or transferring the largest amounts of the 17 targeted chemicals to see if they would voluntarily develop reduction programs. Almost half responded to this initial approach, pledging to reduce toxic releases or transfers by 201 million pounds; by July 1992, more than 700 companies had made pledges to reduce over 300 million pounds.

The central theme of the program is to promote continuous improvement through toxics use reduction, equipment and process changes, and improvements in handling and operations. By emphasizing pollution prevention, EPA hopes to instill a new management ethic that will achieve even greater reductions than the 33/50 goals.

Many companies making commitments to 33/50 reductions indicate they welcome the opportunity to get formal recognition for what they have undertaken internally. The effort corresponds well to industry efforts to incorporate total quality management into their operations as well as with industry-sponsored programs such as the Chemical Manufacturer Association's Responsible Care Program.

EPA's program consists of four major elements:

- Outreach to companies to encourage participation,
- Public recognition for commitments,
- Technical assistance to overcome barriers and adopt prevention strategies, and
- Evaluation of the effectiveness of these cooperative efforts.

The national program targets parent companies with the highest releases. EPA's Region VII (located in Kansas City and covering four midwest States) is implementing a geographic variation of this approach by targeting its efforts to the five counties and three metropolitan areas in the Region with the highest TRI releases. The Region, working in cooperation with the States involved, met with business and civil leaders and company representatives in each of the identified areas to encourage voluntary community-wide reduction goals for all reported TRI releases.

2. State Toxics Reduction Programs

Efforts to get industry to make voluntary reductions have been an important part of many State pollution prevention programs for some time, and EPA's 33/50 Program is building on the foundations built by these State efforts. States are working with EPA's 33/50 Program in several ways. Some States are using their offices to promote the participation of industries in the 33/50 Program, and others are tracking the reductions as part of their own toxics programs. Some States have their own version of 33/50, sometimes to reach industries or facilities that would not be contacted by EPA's program. Several States include discussion of the 33/50 Program in pollution prevention workshops and conferences and distribute information on technologies that can be applied to achieved reductions.

EPA and State toxic use reduction efforts are better coordinated now. Some conflicts remain, however, when State goals are different from EPA's goals.

When it began, EPA's 33/50 Program was not well coordinated with the States, and was a particular problem for those States with new, mandatory facility planning requirements and ambitious reduction goals. After this initial period, during which a State advisory group was formed to help iron out some of these relationship problems, States and EPA are now working together to foster voluntary reductions. Many States use EPA's program as a way to leverage participation in their own programs.

Despite the success of voluntary reduction efforts, some difficult issues remain. For example, some States now have statutory goals for toxic use reductions for businesses in their States that are more ambitious that EPA's 33/50 Program goals. State officials report that some businesses are stalling on meeting State goals because of this. Some report that businesses are reluctant to make voluntary commitments for fear that they will become requirements in the future. Others fear that their new release levels will be used as the

baseline for percentage reductions that are required later -- making percentage targets more difficult for them to meet than for their competitors who did not take voluntary action now.

C. Incentives Programs

Some States are trying incentive mechanisms such as tax benefits and expedited permits to promote pollution prevention. Because they are still new, their effectiveness and many implementation issues are not yet known.

Mechanisms that provide incentives to encourage firms to take voluntary environmental protection action are receiving increased attention at all levels of government. Under a variety of policies and programs, States may provide tax benefits, low interest loans, expedited permits, or other benefits to those who take certain positive environmental steps such as implementing pollution prevention measures.

While not strictly regulatory in the traditional sense of command-and-control requirements, implementation of these mechanisms may involve some of the trappings of more traditional regulatory programs. For example, fairness dictates that there be clear criteria and a process to assure that only those who truly qualify for incentives receive them. Outstanding performance can only be identified for awards if there is a benchmark to be measured against. If a policy results in granting financial benefits or regulatory relief, there will be considerable interest in how these decisions are being made.

Governments at all levels are looking for ways to improve efficiencies in their environmental programs and want to know more about alternative policies and how they work (or do not). However, since most policy initiatives of this kind are relatively new, their effectiveness and the implementation issues they face have not been studied.

Exhibit 2-2

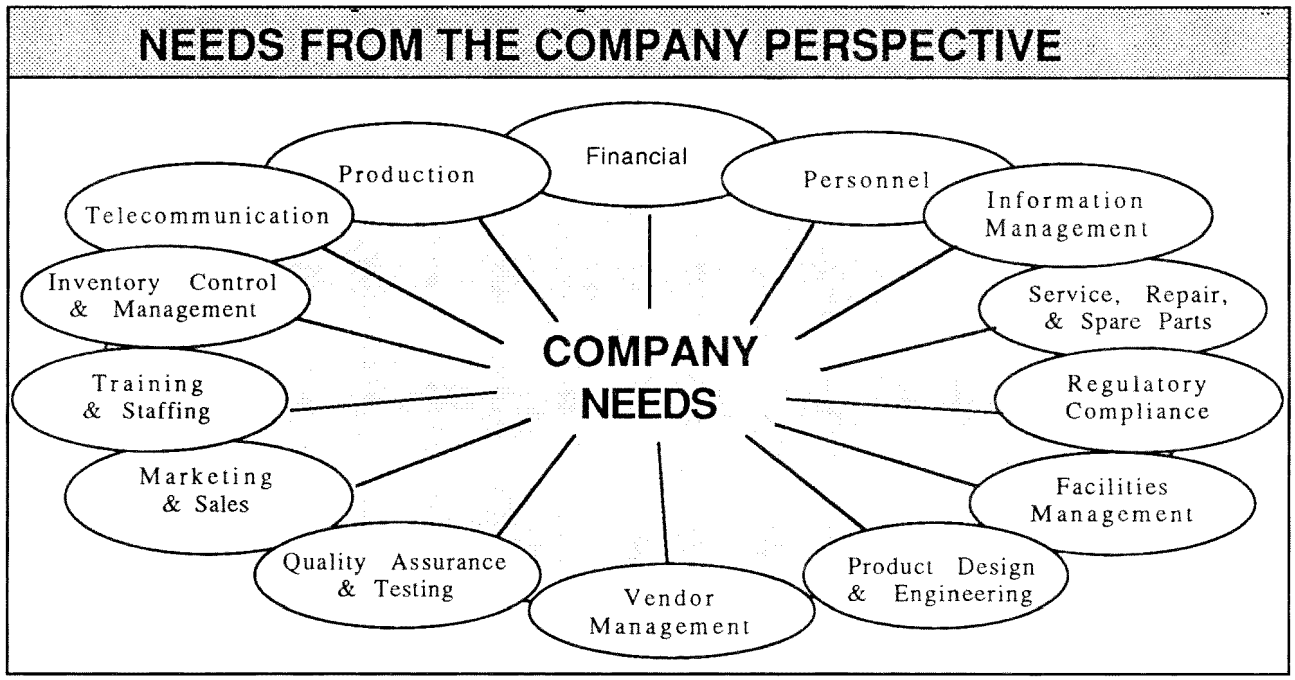
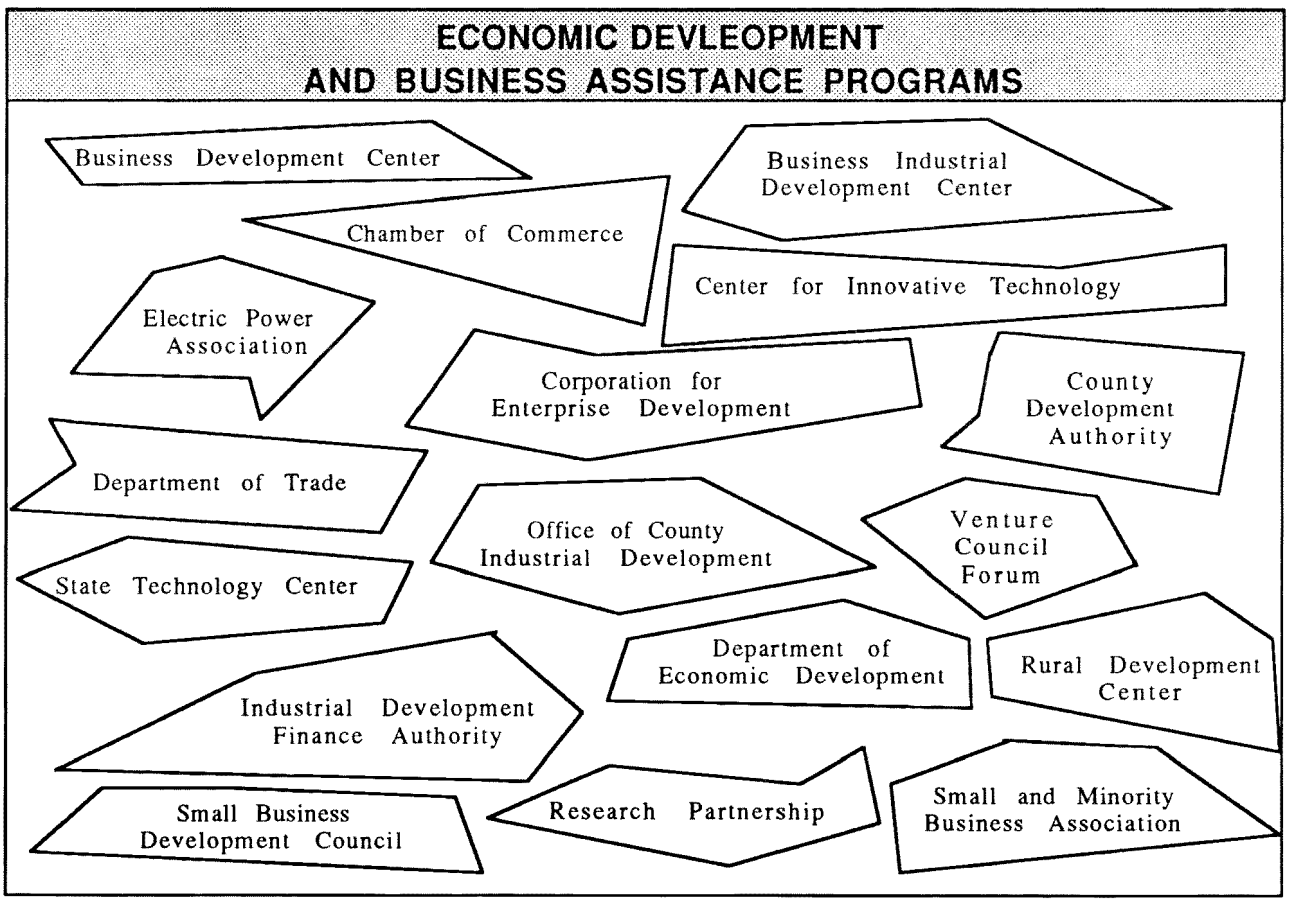


Exhibit 2-3



III. PROMOTING PREVENTION THROUGH REGULATORY MECHANISMS

There are many opportunities for integrating pollution prevention into the current media-specific program structure. Staff responsible for developing regulations can be directed to identify and consider pollution prevention alternatives when developing technology requirements and standards. Environmental authorities can be broadly interpreted to allow prevention best management practices to be incorporated into media-specific permits. Single-media inspectors can be trained to identify at least the simplest prevention opportunities as part of routine inspections. And enforcement staff can push for incorporation of prevention measures in settlement agreements with violators. While there are opportunities for making significant progress in fostering prevention through the single-media programs, there is a danger that steps taken to prevent pollution in one media could result in transferring the pollutants to another; implementing prevention measures might even cause a violation of requirements in another media. For these reasons, a mechanism is needed to assure that cross-media matters are identified and addressed.

The use of regulatory mechanisms to promote pollution prevention is increasing, but the practice is new and still relatively rare.

Until recently, most State and local pollution prevention efforts have been voluntary -- relying on education, technical assistance, and incentives to persuade companies to change their practices. Now that the concept of pollution prevention has caught on as the most desirable way to achieve environmental protection goals, there is growing anecdotal evidence of efforts to incorporate pollution prevention into the mainstream of environmental regulation and enforcement. Unfortunately, lack of information makes it difficult to fully assess the extent to which pollution prevention is entering into the myriad of individual regulatory decisions that constitute the day-to-day operations of State and local governments.

While still far from a widespread practice, EPA and many States have started incorporating prevention provisions into some permits and enforcement settlement agreements. Further evidence of a trend toward a more regulatory approach is the fact that nearly a third of the States have recently adopted laws requiring industrial facilities to develop pollution prevention plans -- although it is still uncertain whether States will be able to require the facilities to actually implement the plans.

Federal and State regulation writers are also starting to consider pollution prevention opportunities when developing standards and regulations, so future "best available technology" requirements can be expected to include prevention measures. For example, the Pollution Prevention Act of 1990 requires EPA to consider the impact of proposed rules on opportunities for source reduction. To begin implementing this requirement, EPA has identified 17 industrial categories for which source reduction opportunities will be intensely evaluated during rule development. The Agency has adopted specific principles for analyzing, developing, and implementing rules for these industries that emphasize source reduction and multi-media issues.

There is a continuing debate about the desirability of regulatory approaches to pollution prevention.

There are constituencies in both the public and private sectors who fear that regulatory approaches to pollution prevention could strangle the potential for progress. They argue that pollution prevention does not lend itself to regulation because it is, by its very nature, a continuous improvement effort that must be developed on a site-specific basis. Further, monitoring and recordkeeping to "prove" reductions throughout a production facility would be burdensome at best and simply impossible in some situations. Companies that have made significant reductions through voluntary action fear that future prevention regulations might not acknowledge their early reductions, requiring them to reduce pollution by the same percentage amounts as their competitors who did nothing to reduce emissions on their own. Some technical assistance providers are particularly concerned that regulatory actions to require prevention could undermine the trust they have built with their clients that has resulted in significant voluntary progress.

Meanwhile, many supporters of traditional environmental programs are concerned about changes that a shift to pollution prevention might entail. They argue that the current system of regulations and enforcement was built because of a failure on the part of industry to address environmental concerns, and point out that noncompliance is still common. Consequently, they are more comfortable with "bright line" enforceable regulations and requirements and distrust the degree of mutual cooperation between regulatory agencies and industry that is necessarily involved in pollution prevention. While acknowledging the shortcomings of the existing system, they fear that more flexible implementation of regulatory requirements could be manipulated to circumvent compliance with the laws and ultimately weaken environmental protection.

Despite the misgivings, most would agree that some integration of pollution into regulatory programs is both inevitable and necessary. Because even voluntary actions can be thwarted by the realities of the existing environmental regulatory system, many observers believe that the full potential of the prevention approach cannot be realized unless and until it has become an integral part of all environmental protection activities. The existing regulatory system presents powerful opportunities for promoting prevention. Perhaps the most "teachable" moments for promoting prevention come when a facility is applying for a permit or has been found in violation of an environmental requirement. In a growing number of cases, the government has successfully negotiated significant and *enforceable* commitments from permit applicants or violators for implementing prevention measures. However, most existing environmental regulations -- and the programs that have grown up to implement them -- are still based on single-media, end-of-pipe approaches. If these older requirements and implementation systems remain in place without appropriate adaptations, they could serve as a significant drag on progress toward pollution prevention.

The line between regulatory and voluntary approaches to pollution prevention has already blurred, and sorting out an appropriate relationship between the two approaches remains a major unresolved issue.

Already, the line between regulatory and nonregulatory approaches is becoming increasingly blurred. Some aspects of voluntary programs could be termed "quasi-regulatory." For example, recordkeeping and reporting might be required in order to determine who should and should not be entitled to an incentive such as a tax break, expedited permit, or grant or loan. The facility planning laws that have passed in about a third of the States typically straddle the enforceability issue; they require facilities to develop pollution prevention plans but do not give States the authority to assure that plans

are implemented. Regulatory programs are being forced to address issues raised by the growth in voluntary prevention efforts, seeking to find ways to acknowledge voluntary reductions and not to penalize voluntary actions by raising the hurdle for compliance higher for prevention leaders than for others. And while there may never be an overarching requirement for pollution prevention, more and more individual regulations will be developed that incorporate pollution prevention measures.

Advocates of both regulatory and voluntary programs agree that strict regulations governing discharges and emissions, waste disposal, and liability provide strong incentives for companies to adopt pollution prevention. While it is apparent that a link between voluntary prevention efforts and environmental regulatory programs is needed, the form and shape of the association is far from resolved. An intransigent regulatory system might actually derail voluntary efforts, but greater flexibility in implementing and enforcing existing requirements could provide them with a significant boost. Yet it is unrealistic to expect that all important polluters will take voluntary actions, for there are many noncompliers even when regulations are in place. Meanwhile, contacts with the regulatory agency -- such as when a facility applies for a permit or has been found in noncompliance -- can provide some of the best opportunities to promote prevention actions that go beyond what is required.

Organizational structure and top management support affect the likelihood of successful integration of pollution prevention into mainstream programs.

At this point, efforts to integrate pollution prevention into traditional regulatory programs are still in the early exploration stage. Only a few State and local governments have even initiated activities in this regard. Since this is still such a new area of activity, there has been little analysis of the issues facing regulatory programs trying to incorporate pollution prevention into their routine activities. This section describes several kinds of integration efforts and the opportunities and problems they present. Also included is a general discussion of the facility planning laws now in place in about a third of the States.

Many alternative structures are possible for integrating pollution prevention into regulatory programs such as permit writing and enforcement. There are different views as to whether pollution prevention should be housed in a separate unit. Those supporting establishing a separate unit suggest that until the prevention concept is more widely known, understood, and adopted within regulatory agencies, a special staff devoted to prevention is needed to help spread the word and be agents of change. Others suggest that setting up a special unit reinforces the notion that prevention is an "add on" activity having little to do with mainstream environmental programs. Because of the institutional resistance to change, either approach requires a coordinating mechanism that reaches into each media program and has sufficient clout to push for change. No organizational approach will work, however, without top management leadership and follow-through.

A. Multi-Media Integration Efforts

Because one of the biggest advantages of pollution prevention is that it promotes consideration of all potential environmental impacts and provides fundamental solutions, most observers believe that a multi-media approach would be the ideal. Generally, the States experimenting with multi-media permitting and/or enforcement are doing so by setting up special task forces or teams. Representatives from the various media groups participate on a team addressing

targeted facilities or geographic regions. The task force or team approach allows the environmental problems of a facility to be identified and addressed comprehensively. Another benefit is that media program staff become exposed to the requirements and issues of the other media programs -- experience they then bring back to their home programs. This approach also fosters networking and cooperation among programs. Participation in multi-media projects can be linked to job promotion opportunities as well. Some of the difficulties of the team approach are common to other "matrix" management situations: unclear supervisory controls, program managers' concern about loss of staff to accomplish already heavy workloads, and the need for extensive planning and coordination. For these reasons, only a few multi-media efforts have actually been attempted thus far, and these have typically been conducted at very large and environmentally significant facilities.

A very few States have begun implementing major reorganizations that emphasize functions that cut across all media (e.g., permit writing) rather than single-media laws and programs. Some of these reorganizations were undertaken in part to improve the State's ability to promote pollution prevention in regulatory activities and/or to foster implementation of new toxic use reduction laws. There is evidence to suggest that some other State reorganization efforts are mostly concerned with improving regulatory efficiency. Since these reorganizations are quite new, it is too soon to tell how well they will work and what specific problems they face.

Lessons from the history of efforts to integrate environmental programs provide insights into the barriers to be overcome.

There is a long history of efforts to promote better integration of environmental programs. Most have met with limited success at best. An understanding of the long-standing institutional barriers and the current climate for change will help set the context for a discussion of multi-media opportunities for promoting pollution prevention.

The 1986 study *Fragmentation and Integration in State Environmental Management,* led by Barry G. Rabe of the Conservation Foundation, examined several State efforts to integrate environmental programs. The study found that impediments to integration can be found among all the major players involved. For example, many environmental agency staff members have been trained in narrow, medium-based specializations, and they are sometimes reluctant to assume new, broader responsibilities that involve understanding disciplines outside their area of expertise. At the division level, media program managers are resistant to efforts to re-invent or re-shape the regulatory wheel, particularly in times of heightened competition for resources among programs. Meanwhile, legislators tend to cling to their authority over individual programs through the structure of committees and subcommittees that have been created over the years. And the researchers and activists who have developed expertise are reluctant to give up their roles as the experts in favor of integration.

The 1986 study concluded that several impediments to integration are enduring, and participants in the 1992 workshop on "Building State and Local Pollution Prevention Programs" echoed many of the same themes. These impediments will need to be addressed if future integration efforts are to be successful.

- Lack of analytic framework. Integration efforts have faltered because of an absence of clearly formed ideas and the difficulty of analyzing cross-media pollution and how it is addressed through integrated management. While a holistic approach has theoretical appeal, there are no reliable, precise models for understanding cross-media pollution or the impacts of integrated management. Since the 1986 study, comparative risk has become a unifying theme for setting environmental problems,

and there have been some improvements in data availability as well as in analytical tools. However, the science for risk analysis and cross-media impact analysis is still quite crude. The economic and environmental benefits of facility-wide pollution prevention adds a compelling new unifying theme.

- Lack of qualified staff. Few professionals or agencies have the training or resources to develop cross-media understanding. There are few enticements for developing expertise in more than one area and there is little cross-fertilization between disciplines; the professional organizations themselves are organized on a single-media basis. Permit writers tend to be junior staff and inexperienced; turnover is high. There is intense competition for skilled personnel, and States are unable to compete with industry. Lack of qualified staff is a fundamental problem that may even be more critical now if pollution prevention is to be the objective of integrated permits. Devising appropriate pollution prevention measures requires significant expertise in industry operations as well as understanding of multi-media impacts and the requirements of a variety of environmental laws.

- Strong constituencies for media programs. Media program mangers are generally comfortable with the existing system. Each medium has a political constituency -- internally and externally (agencies, environmentalists, and industry) -- that has considerable dominion over a particular sphere of policy making. These constituencies are still suspicious of concepts such as providing for more flexible interpretation of regulations in exchange for greater overall facility reductions that might lead to weakening the media-specific controls they have won. However, there is growing recognition that the complexity of environmental requirements may be getting in the way of achieving the best environmental and economic benefit from the investments in pollution control that are being made. Consequently, since integrated permitting is perceived as a solution to this problem, there is probably greater potential for building the needed political support for it now.

- Absence of resources for innovation. Agencies simply lack the time and funding to pursue integration efforts. Agencies are already strapped tending to basic duties and occasionally trying to coordinate. If anything, resource constraints are even greater than they were during the 1980s. To help States develop staff capability in this area, EPA has recently provided limited support to States for strategic planning, pollution prevention programs, and projects to help foster innovative efforts. Most observers believe that more resources will need to be freed up for integrated activities. There is strong support, especially on the part of top environmental agency managers, for allowing for more flexible use of resources made available through the various environmental program grants.

- Inflexible requirements. There is little room for flexibility in the current system of environmental laws and requirements. It is acknowledged that a whole-facility approach to permitting and compliance might suggest ways that greater overall reductions in pollution would be best accomplished if some relief were provided in meeting regulations for releases to a single medium. The lack of mechanisms for making such trade-offs has derailed some attempts at integrated permits and enforcement settlements.

- Program-specific budgeting and accountability measures. The current systems for budgeting and overseeing States for implementation of national environmental programs provide limited opportunities for cross-media integration activities. While there are efforts to reform these systems, opportunities are limited by legal constraints as well as by long-standing practice. Under the current

structure, State grants are legally tied to specific program appropriations, so there is limited room for funding of multi-media activities. Meanwhile, program oversight still emphasizes numerical measures of program-specific activities such as permits issued and enforcement actions taken.

Authors of the 1986 study offer the following as requisites for a successful effort to integrate environmental programs:

- A well-articulated and clear policy concept;
- A political constituency for integration;
- A triggering event -- problem or crisis -- to capture attention to integration as a potential solution; and
- A policy entrepreneur with technical expertise, negotiating savvy, and political clout to move the idea.

Conditions now meet at least some of these criteria, and may lead to a greater push toward integration. The concept of pollution prevention, and the notion that it is best accomplished on a facility-wide basis, is gaining widespread support. Fiscal constraints at all levels of government and general economic conditions are forcing a search for more efficient ways to achieve environmental protection. For at least some kinds of facilities, integrated permitting and compliance efforts may provide a solution.

B. Pollution Prevention in Environmental Permits

Because they are designed for individual sites, environmental permits present potentially valuable mechanisms through which pollution prevention and source reduction measures can be specified.

Most environmental laws and regulations are ultimately implemented through the issuance of permits to individual facilities. Permits specify the conditions under which a facility may operate and the amount of emissions or pollutants that can be released to air, water, or land. Because permits are designed on a site-specific basis, tailored to the particular needs and conditions of an individual facility, they are ideal mechanisms through which pollution prevention and source reduction can be implemented. The process of applying for a new or renewed permit itself presents a unique opportunity for examining the practices and operations of a facility, identifying source reduction and waste minimization opportunities, and developing plans for reductions.

1. Integrated, Multi-Media Permitting

The lack of coordination among various environmental programs and permits is viewed by many as a significant barrier to implementing source reduction. Despite a general understanding about the unity of the environment, environmental programs have become increasingly fragmented instead of becoming more integrated. Over the years, the trend has been to continue subdivision of environmental programs into highly specialized and largely autonomous components. At the Federal, State, and even local levels, there are now

separate regulatory programs and permit systems addressing air, water, and land, with relatively few ways to coordinate related elements. Statutory schemes require permits under each law, each issued in accord with a different schedule, so the impact of releases to the environmental is rarely evaluated simultaneously. In some situations, the result can be a transfer pollution from one medium to another.

During the 1970s and early 1980s, largely in response to industry concerns about burdensome procedures, many States tried to improve the administrative efficiency of their permit systems. Such reforms as appointing permit coordinators, providing for consolidated permit applications, and creating permit information centers were tried. Although many States had substantive integration as their goal, reforms often resulted only in streamlining the process to provide regulatory relief. Most of the reform efforts were ultimately abandoned, with only some of the procedural coordination reforms surviving.

An integrated permit could be used to consolidate all requirements and source reduction goals in a single, enforceable document. Since developing such permits is very resource-intensive, the approach is probably realistic only for very large facilities presenting very high risks (or for very small facilities where developing an integrated permit might result in resource savings).

With the growth in understanding of cross-media impacts and the desire to promote whole-facility source reduction, many States agencies have recently renewed their interest in integrated permitting. Under a new law in one State, 10 to 15 facilities will be selected to participate in a pilot program of integrated permitting. Each participating firm will receive a facility-wide permit specifying all releases to air, water, and land. Each firm is required to prepare a plan specifying numerical source reduction goals; the plan will be incorporated into the facility-wide permit. In a "pre-pilot" effort, the State established procedures for writing and enforcing facility-wide permits, using a team approach involving a member from each media program and the State's pollution prevention office. EPA will assist in the pilot program under terms of a new Memorandum of Understanding with the State. Although this State's pilot program may be the most formal, several other States are also experimenting with ways to coordinate permitting activities through special teams and projects.

An integrated permit system offers the potential of consolidating all requirements and source reduction goals in a single, enforceable document -- a potentially powerful tool for promoting pollution prevention. However, integrated permitting should not be perceived as a panacea. Perhaps the biggest drawback is that integration requires a significant amount of early planning -- a labor-intensive activity that is hard to justify, particularly in a time of budget crisis and staff shortages. Many in the business community are not interested in pursuing integrated permits because they too are concerned about the resources involved and the potential for significant delays.

Integrated permits have thus far only been tried at a handful of large facilities. The facilities were usually targeted based on the amount of the releases; sometimes volunteer facilities were solicited. Typically, a special team or task force was set up to write the permit, comprised of members representing the various media programs. In some cases, external organizations were also involved in the development and review process. The Amoco-Yorktown project, under EPA leadership but with extensive participation from States and external parties, documents the value of a comprehensive emissions inventory. The project found that 20% of benzene emissions at the plant could be eliminated through economically profitable source reduction measures. However, the project also found that major sources of emissions are not covered under the Toxic Release Inventory.

While the additional resources required for coordination among offices may be justifiable for large facilities, particularly if the overall reduction opportunities are great, it may not make sense to use limited resources this way for small or even medium-sized facilities. On the other hand, it may be most cost-effective to establish a streamlined multi-media permit process for certain categories of small facilities, perhaps establishing a special unit to handle them. To examine integration opportunities for small businesses, EPA established a Printing Industry Cluster. The objectives of the cluster approach are to promote industry use of safe chemicals and pollution prevention practices, coordinate development of new rules to promote prevention, and develop pilot projects to test incorporation of pollution prevention methodologies to reduce the cost of reporting and permitting requirements.

The promise of integrated permitting must also be tempered by acknowledgement that the impediments that stifled permit integration efforts in the past still exist and will make any future efforts a difficult prospect.

2. Pollution Prevention in Permits

Provisions governing permitting under the individual media statutes can be interpreted to have sufficient flexibility to allow for inclusion of pollution prevention measures as a condition of the permit. For example, a State or local agency could require pollution prevention "best management practices" (BMPs) as a permit condition under the Clean Water Act or Clean Air Act. Agencies could design BMPs on a case-by-case basis or develop generic BMPs that would be applied to all facilities in a given industrial category.

Facilities may be most receptive to seeking technical assistance and implementing pollution prevention measures during the period between issuance of the facility's permit and the date when the facility must come into full compliance (sometimes up to three years later), because the facility has no fear of enforcement during this time.

Nearly a third of the States now have facility planning laws that require facilities to develop source reduction/toxic use reduction plans. These laws typically require certain types of facilities to assess their production processes, identify opportunities for source or toxic use reduction, set quantifiable goals, and establish a plan for meeting these goals. As noted earlier, the State laws do not generally have enforcement provisions that will assure implementation of the plans. Incorporating appropriate components of the plans into the various media permits would be one way of assuring compliance.

At this time, however, the facility planning programs are not linked to the permitting system. Many observers believe that such a link would be an effective way to promote pollution prevention. Consolidating the planning program with existing permitting programs could help to cut down on the extra work that the planning process requires of industry. Within regulatory agencies, consolidation could counteract the notion that pollution prevention is an "add on" program that is not as important as the agency's mainstream activities. Combining the planning and permitting programs would foster integration of pollution prevention in both companies and regulatory agencies.

Several policy and technical issues remain as obstacles to writing and enforcing permit conditions for pollution prevention.

Several issues need examination when determining whether and how to pursue a policy of incorporating pollution prevention into media-specific permits. The issues centers around two key questions:

(1) What is the role of numerical pollution reduction goals? and
(2) Is it possible to effectively require BMPs?

Traditional permit conditions typically spell out numerical standards that must be met for discharges and emissions, and may also specify the kinds of equipment and operating procedures that will be used. Although permits are tailored to a particular facility, the development of an individual permit is ordinarily preceded by a long regulatory process to establish the environmental and technology standards to be applied to similar facilities and environmental conditions. The development of technology requirements also typically includes analysis of the costs and benefits of alternatives as well as the economic feasibility of applying them in an industry. Individual permit requirements are based on the receiving environmental media (e.g., water body or air quality region) within the context of the national standards and regulations.

There is no such regulatory and standard-setting history and expertise in the area of pollution prevention yet. Requiring specific pollution prevention measures or BMPs to be adopted is contrary to the notion that firms are in the best position to determine how they should achieve compliance. There may be standard general maintenance or housekeeping BMPs that could be readily applied to all facilities of a kind, but most other BMPs will need to be designed on a site-specific basis. The question then becomes, however, what investment in pollution prevention is reasonable and realistic to expect from a given facility -- in other words, under what circumstances would a company's plans for pollution prevention be judged so inadequate that a permit would not be issued? If site-specific prevention BMPs became a required part of permits, would it be necessary to consider economic feasibility on a site-by-site basis?

A facility pollution prevention plan will generally include reduction *goals,* but implementation will take place in most cases through a gradual, continuous improvement process. The amount of progress that will be made depends on many variables, and many of these are simply not predictable. One of the dangers in incorporating reduction goals as enforceable standards for a facility to meet is that this would create a disincentive to establish ambitious goals. Facility planning requirements under the new laws are multi-media, but it is unclear how they could be incorporated into the single-media permits that now exist. Most prevention experts agree that there are situations where the greatest overall reduction at a facility can be achieved at the expense of perhaps violating an individual standard in one medium. Developing a mechanism that will fairly address these trade-off issues will not be an easy task. It should be noted, however, that the trade-off issue is not unique to regulatory programs; the issue emerges in voluntary programs as well.

Even when prevention permit conditions are in place, compliance monitoring and enforcement will be difficult.

Advocates for a regulatory approach to pollution prevention believe that it would assure industry progress because the requirements could be enforced. However, assuring compliance with pollution prevention requirements will be difficult even if requirements *are* in place. Inspections to see whether a company has installed its planned process changes, input product substitutions, and other changes in operations would be time and resource intensive, and to be thorough would require inspectors to have a level of expertise that they rarely have. Based on its experience with the way other programs have developed, industry fears that it could be required to prove reductions at every step along its production process -- that it will have to set up an onerous monitoring and reporting system to satisfy concerns about the ability to enforce.

No doubt these considerations are reflected in the way most of the facility planning laws have been designed thus far. Firms are required to develop plans, but implementation is not "enforceable" in the traditional sense of the word. Firms are expected to get pressure for implementation because they must publicly disclose their emissions and reduction plans. Meanwhile, many States are beginning to explore how to translate facility plans into permit requirements and other regulatory steps to give them additional "teeth."

Permit writers will need extensive training and technical support to be able to incorporate pollution prevention provisions into permits.

A major concern for incorporating pollution prevention into permits (either single-media or multi-media) is the need for training and technical support for permit writers. They will need to have -- or at least have ready access to -- industry-specific technical expertise to be able to develop appropriate prevention provisions or evaluate plans submitted by individual facilities.

Some pollution prevention training efforts are underway. In EPA's water program, for example, Federal and State permit writers receive a general introduction to prevention concepts as part of an overall permit writing course. However, this orientation-level material does not equip a permit writer for writing actual prevention provisions to be included in a permit. The water program also developed a one-day special pollution prevention workshop for NPDES permit writers covering existing BMPs that can be leveraged to achieve prevention. The course also presents a model BMP/pollution prevention plan that can be used by States with facility planning requirements in new toxic use reduction laws.

The need for industry-specific training on a cross-media basis is recognized. Given the complexity of regulatory requirements affecting a single facility and the potential for cross-media impacts, some argue that emphasis should be given to developing staff who are expert in particular industries. There are many individual efforts to develop appropriate materials and courses at the Federal, State, and local levels -- as well as by the private sector. However, the need for a more coordinated training strategy is illustrated by the fact that there are no fewer than four EPA-funded projects to develop training courses on pollution prevention for the metal finishing industry.

C. Pollution Prevention in Inspections and Enforcement

The second way that regulatory agencies directly interact with the regulated community is through the compliance monitoring and enforcement process. Several State and local governments are beginning to train inspectors to recognize pollution prevention opportunities and promote adoption of prevention measures while they are conducting their routine, on-site compliance monitoring activities. Some agencies are leveraging the "teachable moment" of finding a company in violation of environmental requirements by including prevention provisions in enforcement settlements.

1. Pollution Prevention in Inspections

For many years, inspectors for a variety of regulatory functions have been giving informal advice and referrals for pollution prevention. Some inspectors from publicly-owned

treatment works (POTWs), who visit industrial facilities as an important part of their activities -- particularly in large cities -- have been providing pollution prevention information for eight years and longer. The potential for including prevention in regulatory inspections is receiving considerable attention and appears to be a growing practice.

- **Technical Assistance**

An inspector from a regulatory agency is many times the only on-site government representative a facility will see. The inspector can offer information that is specifically appropriate to a facility, raise pollution prevention as an option and opportunity, and direct the facility to other organizations that can help. Because of time constraints and lack of other resources, however, inspectors are often limited to mentioning simple options in the context of their other activities at the site. For example, an inspector might notice pollution prevention opportunities while walking through a facility and suggest that those opportunities be explored. The inspector can give the facility literature specific to that industry or to wastes generated or a list of resources such as books, articles, and technical assistance programs.

Using inspectors to provide technical assistance does present a potential role conflict, however. Many inspectors are uncomfortable with wearing both a "white hat" and a "black hat" at the same time. It is difficult to be providing assistance to the facility with one hand while documenting violations with the other. Further, if the facility follows advice given by an inspector that results in later noncompliance, the facility could use this fact as an affirmative defense in an enforcement action. For these reasons, both government attorneys and inspectors are wary about blurring the enforcement and assistance roles. Some agencies have addressed the role conflict issue by clearly separating the regulatory staff from the assistance staff. In other agencies, inspectors provide only general, written information about pollution prevention and refer facilities to assistance providers for help.

Some States have a fundamental disagreement with EPA about enforcement philosophy that is highlighted by this issue. These States argue that the goal of their compliance programs is environmental improvement -- and that enforcement is only one tool for achieving compliance; providing technical assistance is also valuable. They feel forced to follow EPA's enforcement approach because they fear EPA will intervene in their cases or take away their grants or enforcement primacy.

- **Multi-Media Inspections**

Recognizing that pollution prevention is best accomplished on a facility-wide basis, some States (as well as EPA) are experimenting with multi-media inspections. A team of inspectors representing the various media programs inspects a facility at one time. This provides a complete picture of the facility's operations and compliance problems, which can then be used to develop a comprehensive, multi-media enforcement action that can be used to encourage facility-wide pollution prevention efforts.

Like integrated, multi-media permitting, the concept of multi-media inspections (and subsequent enforcement) presents an attractive approach to promoting pollution prevention. However, the same impediments to integrated permits apply: the advance planning and coordination involved is resource-intensive; programs are already strapped for resources; media program managers are reluctant to give up control; current budget and accounting systems provide no incentives; and there is a lack of qualified staff.

In addition, the task of training multi-media inspectors is daunting. For a comprehensive multi-media inspection, an inspection team would need inspectors who are qualified to

conduct the most complex level of inspection for each program. In addition, the team leader would need leadership and team building skills, project manager training, ability to recognize cross media impacts, and ability to evaluate and merge diverse reports and information. An active program to develop such leaders would be critical to the success of a multi-media inspection program at the Federal, State, or local level. If the objective were to also identify potential pollution prevention opportunities, still more training would be required. Clearly, such a qualified individual would be hard to develop, and once developed, would be hard to retain as a government employee.

Inspectors themselves may need serious convincing about the advantages of multi-media inspections. In a 1991 survey of State inspection programs conducted by EPA, inspectors in half of the 31 States responding said they were "definitely not" interested in conducting multi-media inspections in the future, and only 6 States said they were "definitely" interested. Six States reported good success with multi-media inspections, while two reported poor experiences. The most commonly reported reasons cited for not being interested in multi-media inspections were lack of budget and training, poor organizational cooperation, division of responsibilities among several State agencies, and bad past experience.

To be effective in identifying pollution prevention opportunities, inspectors will need extensive industry-specific training.

There are alternative approaches to conducting multi-media inspections by teams of program-specific inspectors. Most inspectors conduct inspections for a single media program, and become expert in the regulations, requirements and procedures for that media -- which they then apply to a variety of different types of facilities. An alternative approach is to develop some inspectors who are expert in particular industries, such as industries that are targeted as significant polluters in multiple environmental media. Industry expert inspectors would be more familiar with the specific processes of the industry and could conduct a multi-media inspection. They could also keep up with technological and pollution prevention developments relevant to the industry to be able to provide technical support permit writers and enforcement officials on these matters.

Regulatory agency staff training has become an important part of many State and local pollution prevention programs. While there is growing interest in integrating the prevention concept into regulatory activities such as permitting and enforcement, most regulatory agency staff have little or no background or experience in pollution prevention techniques. They may also be weak in understanding the opportunities, limitations, and tradeoffs involved in implementing prevention measures in a given industry setting. In many States, regulatory staff are trained by staff from the technical assistance programs because of their direct experience in applying pollution prevention principles to industrial facilities.

2. Pollution Prevention in Enforcement Actions

State and local enforcement actions can be potentially powerful mechanisms for promoting pollution prevention. A facility found in violation of environmental requirements has a strong incentive to seek ways to come into compliance, and the regulatory agency is in a persuasive position for encouraging source reduction and other pollution prevention measures.

The first level of enforcement response, usually reserved for minor violations, is a notice of noncompliance (or other comparable action). Some State and local agencies discuss source reduction opportunities in the cover letters they send out with these notices. In one State where multi-media inspections are performed, such letters are viewed as being most

successful when pollution prevention is suggested as a way to address "group violations" (for instance, air and water violations from the same activity). The letters can also refer the violator to a pollution prevention technical assistance program for confidential advice.

Pollution prevention provisions can also be included in settlement agreements in administrative and civil judicial enforcement cases. Handled differently from State agency to agency, provisions range from requiring assessments of source reduction opportunities to requiring firms to implement specific technologies or practices. Since settlement provisions are designed on a site-specific basis, they provide the same kind of opportunity as permits do for tailoring prevention measures to the conditions and needs of a particular facility. At the Federal level, an EPA policy (February, 1991) on Supplemental Environmental Projects states that settlements may include enforceable provisions for prevention measures as a means for correcting the underlying violation or in addition to the actions needed to correct the violation. Exhibit 3-1 (page 68) contains examples of how pollution prevention was achieved through enforcement agreements.

Including prevention provisions in enforcement settlements raises issues about equity and potential abuse of government power.

Whether and how to include prevention provisions in enforcement actions raises several issues that are still being debated. Some feel that a firm which agrees to take steps to reduce pollution beyond what the law requires should receive a reduced monetary penalty. (In fact, there is reason to believe this is already happening, but it is difficult to document.) Others perceive such penalty reductions as wholly inappropriate, pointing out that the prevention measures might give the company a dual economic benefit from both the reduced penalty and the cost savings realized from source reduction. Still others think it an abuse of government power to use enforcement leverage as a way to get companies to do more than they are legally required to do. Some believe that only prevention measures that are clearly tied to the violation at hand should be incorporated into the enforcement action.

Once prevention provisions are included in enforcement actions, they become, in effect, a permit or regulation governing that facility's operations. Many of the same issues that were discussed regarding integrated permits and inspections then come into play. And like permitting and inspections, enforcement personnel will need extensive pollution prevention training and access to technical expertise to be successful.

Information about pollution prevention in enforcement actions and sample language is being shared through a special bulletin board on the EPA-sponsored Pollution Prevention Information Clearinghouse. However, anecdotal evidence based on discussions with environmental attorneys suggests that few of them know about or use the system.

EXHIBIT 3-1

POLLUTION PREVENTION IN ENFORCEMENT SETTLEMENTS

Following are examples of how pollution prevention was successfully incorporated into EPA enforcement settlements under the Toxic Substances Control Act (TSCA) and Community Right to Know Act.

In 1990, in exchange for an agreement by Sherex Polymers (Lakeland, FL) to install equipment within 12 months that would reduce existing filter cake waste by 500,000 pounds per year and to increased in-process recycling of its fatty acids by approximately 250,000 pounds per year, EPA agreed to reduce its $294,000 fine for failing to file a TSCA Premanufacturing Notice by $42,000.

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EPA agreed to reduce the final penalty for 3-V Chemical (Charlotte, NC) for not making arrangements to test an imported chemical that was subject to a TSCA testing requirement. In exchange for the $31,000 penalty reduction, 3-V entered a binding commitment to carry out a leak detection and repair program and to install in-process recycling equipment to reduce the generation of 1,1,1-trichloroethane and dichloromethane at the source.

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Seekonk Lace Company (Barrington, RI) failed to meet the reporting requirements under the Federal Emergency Planning and Community Right to Know Act in its use of acetone to dissolve acetate threads that held lace strips together. In exchange for a $10,000 reduction of the penalty, Seekonk made process changes that virtually eliminated the use of acetone in the process.

D. Facility Planning Laws

In recent years, there has been a growth in interest in facility planning as a means for achieving pollution prevention. About one third of the States now have some form of facility planning requirement in their laws related to pollution prevention. Many have mandated facility planning, while others define facility planning as an advantageous but voluntary procedure. The movement toward facility planning in many States can be credited for expanding the scope and increasing the sophistication of the facility planning procedure. Much of what can be described as the current model for facility planning has been codified in State laws and is being disseminated to facilities as sound business practice.

1. Phases of Facility Planning

Facility planning for pollution prevention can be broken into four phases:

Assessment	Comprehensive review of all manufacturing and production processes that use, generate, or release toxic or hazardous materials.
Identification of Efficiency Opportunities	Identification of possibilities for more efficient use or processing of those materials in all the processes in which they appear.
Option Ranking	Ranking of options according to criteria developed by facility management, then prioritizing and scheduling them for implementation.
Implementation	Implementation of selected options, including monitoring their effectiveness and ensuring their proper use through ongoing, regular management and personnel communication procedures.

The planning procedure is then periodically renewed through continual review and response to developing business conditions.

Elements of Facility Plans

Some of the State statutes go into great detail as to what the facility planning process should involve and the form in which it should be documented. Many of these States are further enhancing that definition through new regulations, guidance manuals, and planning assistance. In addition to providing a basic blueprint for facility plans, State laws usually also include a system of plan summaries that can serve as the document of record. They also require progress reporting designed to spark periodic review of the planning process and its effectiveness.

Although there are many variations, State laws generally include the following in facility plans. (The Texas law is a notable exception. It details plan content but approaches it less definitely.)

- A policy statement of management support for pollution prevention, and a schedule for meeting these goals.

- A statement of reduction goals, the reasoning behind them, and a schedule for meeting these goals.
- A description of efforts initiated in the past that qualify as pollution prevention and an assessment of those efforts' successes and failures.
- A detailed, numeric description of current processes in which toxic chemicals are used and hazardous wastes generated (usually produced by teams reviewing and assessing those processes).
- Identification of pollution prevention options in specified areas, including (at a minimum) changes in a product or its formulation, substitution of raw materials in existing processes and products, equipment modification or modernization, and changes in operating and maintenance procedures.
- Detailed financial and technical analyses of practical application of identified options in light of current operating conditions.
- Detailed criteria or rationale for choosing or discarding identified options for implementation.
- A detailed schedule for implementing selected options, and procedures for measuring and monitoring their progress in achieving reductions.
- A description of opportunities for employee involvement and training.
- Certification by responsible corporate officials or facility managers.

E. Wastewater Pretreatement Program: Opportunity for Pollution Prevention

There are opportunities for incorporating pollution prevention into each of the environmental regulatory programs. However, several unique aspects of the wastewater pretreatment program make it a particularly attractive program through which pollution prevention can be promoted. The pretreatment program touches on Federal, State, and local responsibilities and so seemed appropriate for special attention in considering ways to build State and local capacity for pollution prevention.

The national pretreatment program was established to prevent pollutants discharged from industrial facilities from interfering with the operation of publicly owned treatment works (POTWs), passing through the treatment plant into the environment, contaminating municipal sludges, and exposing treatment plant workers to hazardous chemicals. The program is also intended to improve opportunities for recycling and reclaiming municipal and industrial effluents and sludges. The objectives of the pretreatment program are met mainly by regulating commercial and industrial facilities that discharge toxic or unusually strong conventional wastes.

The approximately 1,500 local wastewater programs (representing 2,000 POTWs) that are required to have pretreatment programs in place handle about 80 percent of the nation's indirect industrial discharges. (The overwhelming majority of POTWs -- about

90 percent -- are *not* required to have pretreatment programs because they do not handle industrial wastes). EPA and delegated States are responsible for assuring that local POTWs fulfill their part in carrying out the program. Under the program, POTWs apply national categorical standards to individual facilities, regulate discharges from facilities in additional industrial categories, place supplemental limits on pollutants, and monitor compliance.

A pollution prevention approach could help wastewater treatment plants control toxics and reduce costs of complying with mounting environmental requirements.

Although POTWs have made significant progress in meeting program goals, pressure is mounting for more effective control of toxics through the pretreatment program. Some of the pressure is coming from the costs that the POTWs themselves must bear to be in compliance with environmental requirements now coming into place governing such matters as releases to the air, sludge management, and re-use of water. Compliance costs are significantly higher and options more greatly limited if the POTW is handling toxics.

The pretreatment program is also facing external pressure for reform because several studies have revealed that the program has given insufficient attention to the control of toxics. POTWs have been successful in supplementing the categorical standards with local limits for at least some pollutants, but comparatively few of these limits are actually based on site-specific criteria for surface water and sludge quality, potential for interference with the POTW, or worker health and safety. The slow progress at the local level can be attributed in part to the limited availability of criteria and technical information for making these determinations and to the lack of standards for sludge. In addition, many POTWs do not have numerical limits for toxics in their own surface water discharge permits. When there are no toxic limits in the POTW's permit, there is limited incentive for the POTW to push for a reduction in toxics by its industrial users.

Promoting pollution prevention is one way that the national and local pretreatment programs can begin to address these concerns. Several pilot POTW pollution prevention efforts suggest that further investments in improving local POTW capacity in this area would be beneficial. Some communities participating in a pilot effort to provide source reduction assistance to their dischargers have been able to avoid coming under the pretreatment requirements altogether because they eliminated regulated contaminants from entering their wastewater facilities; others have been able to avoid buying costly new equipment needed to treat certain toxics. Some large cities are beginning to incorporate pollution prevention as an integral part of their wastewater programs. Exhibit 3-2 (page 73) is an example of pollution prevention language now contained in a municipality's wastewater treatment plant discharge permit.

From the national standpoint, POTWs are the logical entry point at the community level for the introduction of prevention concepts and the development of local strategies. Compared with other government agencies, POTWs have the most contact with their regulated industrial community. Wastewater inspectors, as a group, have the extensive understanding of industrial process operations that is necessary for identifying opportunities for waste minimization and source reduction. In addition, other forces affect the POTW's relationship with its contributing industries.

- Sewers are treatment plants are the "court of last resort" for disposal of toxic wastes. In a 1986 report to Congress, EPA estimated that 43-62 percent of hazardous wastes entering a treatment plant biodegrade. Of the remaining hazardous waste, 14-16 percent concentrates in wastewater sludge, 14-25 percent vaporizes into the atmosphere, and

from 8-18 percent passes through to the receiving waters. In that same year, EPA identified 529 drinking water treatment facilities downstream of POTW discharge points. Some wastewater sludge disposal lagoons have been listed as toxic clean-up sites.

- POTWs will soon find themselves in a regulatory "squeeze play" when they find that the toxics wastes that do not biodegrade during treatment have nowhere to go. New requirements for the control of toxics in effluent discharges, air emissions, and sludge will make it increasingly difficult to pass these pollutants along.

- Population increases and industrial development will increase pressure for residential and commercial sewer hook-ups. Source reduction and water conservation strategies can decrease the need for expanded or more sophisticated facilities -- and save substantial costs to the ratepayer and community.

- To continue the political support needed to meet increasing costs and ever-increasing regulatory requirements, many POTWs will need to find ways to make it easier for their customers to comply. Helping businesses adopt pollution prevention measures can be a politically attractive approach because of its dual economic and environmental benefits, and its potential for lowering the POTW's need for revenue to acquire capacity.

A "demand-side" strategy for wastewater treatment programs holds promise as a way to improve the environment while reducing costs.

Because in the past, wastewater treatment programs have emphasized treatment plant construction, some State and local waste treatment agencies still tend to focus on increasing capacity to treat pollutants rather than develop a strategy which also includes source reduction or waste minimization initiatives. The potential economic benefits of such a "demand side" strategy include:

- Decrease in the need for construction subsidies to expand POTW capacity.

- Reduction in the cost required to comply with POTW sludge regulations.

- Reduction in costs associated with long-term loss of water, ground-water, and air quality from toxics at the POTW and industrial facilities.

- Community economic improvements because businesses are reducing costs through waste minimization, source reduction, and toxics recycling.

EXHIBIT 3-2

POLLUTION PREVENTION IN WASTEWATER PERMITS

Pollution prevention language in a Phoenix, AZ, wastewater treatment plant's NPDES discharge permit.

5. BEST MANAGEMENT PRACTICES

a. Educational Source Control Program

By March 26, 1992, the permittee shall submit a program description to EPA and ADEQ for implementing an educational source control program to reduce toxicity. At a minimum, the program will require the permittee to:

1. Educate the public regarding the impacts that result when oil, antifreeze, pesticides, herbicides, paints, solvents, or other potentially harmful chemicals are dumped into drains.

2. Investigate other education programs targeted at residential and commercial sources of toxic pollutants (waste minimization and source reduction).

3. Educate the public as to the proper use (e.g., application methods, frequencies, and precautions) and proper management of fertilizers, pesticides, herbicides, and other potentially harmful chemicals;

4. Educate automobile service business personnel as to the proper disposal of oil, antifreeze and any other potentially harmful chemicals.

5. Investigate programs which provide convenient means for people to properly dispose of oil, antifreeze, pesticides, herbicides, paints, solvents, and other potentially harmful chemicals (recycle if possible).

b. Pollution Prevention through Point Source Control Measures

1. By April 1, 1992, the permittee shall:

Submit a study plan acceptable to EPA to determine whether all significant controllable sources of pollutants are identified and regulated under the pretreatment program, and to identify feasible waste minimization measures that will reduce or eliminate toxics loadings to the treatment plant.

2. By October 1, 1992, the permittee shall:

Submit a report on controllable sources of pollution and recommend changes in the pretreatment program, where needed.

3.By December 1, 1992, the permittee shall:

(a) Submit a report on waste minimization that identifies reduction target sources (both industrial and domestic), feasible waste technologies and measures. The discharger should investigate waste minimization measures for at least the following pollutants:
arsenic, cadmium, chromium, copper, cyanide, lead, nickel, selenium, silver, thallium, zinc and mercury.

(b) Submit a schedule of implementation for the report required under paragraph 3.a.

4. The permittee shall implement the waste minimization measures and pretreatment program improvements identified in the report submitted under paragraph 3.a. above in accordance with the schedule of implementation.

5. Beginning January 1, 1992, and continuing quarterly thereafter, the permittee shall submit a progress report detailing efforts of compliance with applicable requirements listed in paragraphs 1. through 4. above.

Building State and Local Pollution Prevention Programs

APPENDIX

SELECTED BIBLIOGRAPHY

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Participant List: Building State and Local Pollution Prevention Programs
January 21-23, 1992 • Chantilly, Virginia

Stephen Albee, Office of Wastewater Enforcement and Compliance, US-EPA
Keith Anderson, Massachusetts Department of Environmental Protection
John Atcheson, Pollution Prevention Division, US-EPA
Carol Andress, Northeast Midwest Institute
Scott Bernstein, Center for Neighborhood Technology
Janeth Campbell, Florida Department of Envrionmental Protection
Jolen Chinchilli, Chesapeake Bay Foundation
Olga Corey, Pollution Prevention Division, US-EPA
Brenda Davis, Woodrow Wilson School, Princeton University
John Dernbach, Pennsylvania Department of Environmental Resources
William Dickinson, Extension Service, US Department of Agriculture
Theresa Dodge, Los Angeles County Sanitation Districts
Paul Doyle, National Conference of State Legislatures
David Duncan, Fairfax County Fire and Rescue Department
Tono Eulo, California Local Government Commission
Kate English, Staff of Congressman Howard Wolpe
Terry Foecke, WRITAR
Stephen Gage, Cleveland Advanced Manufacturing Program
Linda Glass, Pollution Prevention Policy Staff, US-EPA
Karl Graham, City of Cincinnati
Hillel Gray, National Environmental Law Center
David Hartley, California Departmentof Toxic Substances Control
Jeanne Herb, New Jersey Departmentof Environmental Protection and Energy
Frances Irwin, World Wildlife Fund
Cindy Kelly, Environmental Programs, International City County Management Association
Robert Kerr, Kerr and Associates
Paul Keough, Deputy Regional Administrator, Region I, US-EPA
Maurice Knight, Louisiana Department of Environmental Quality
Harry Lane, Conservation and Renewable Energy, US Department of Energy
Eleanor McCann, Air, Radiation, and Toxics Division, Region III, US-EPA
Richard Morgan, Global Change Division, Office of Air, Noise and Radiation, US-EPA
E.A. Mosher, League of Kansas Municipalities
Warren Muir, INFORM
R. Nick Odum, Jr., Springs Industries
Fran Packard, League of Women Voters
LeRoy Paddock, Assistant Attorney General, State of Minnesota
Jay Pendergrass, Environmental Law Institute
Larry Rice, City of Elgin, Illinois
Stephanie Richardson, North Carolina Office of Waste Reduction
Manik Roy, Environmental Defense Fund
Eric Schaeffer, Pollution Prevention Policy Staff, US-EPA
Priscilla Seymour, Texas Water Commission
Senator Dick Springer, Portland, Oregon
Jeff Tryens, Center for Policy Alternatives
Michael Walker, Toxics Litigation Division, US-EPA
Barbara Wells, National Governors' Association

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* Also participating were State and Local Environment Committee members George Britton, Larry Cole, Scott Fore, Lillian Kawasaki, Tom Looby, Don Richardson, and Jim Powers, as well as EPA Office of Cooperative Environmental Management staff Chuck Evans, Donna Fletcher, and Abby Pirnie

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