



Pollution Prevention News



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COMMON SENSE INITIATIVE SELECTS SIX INDUSTRIES FOR COMPREHENSIVE REVIEW

EPA Administrator Carol Browner has proposed a major new initiative which signals a new generation of environmental protection. The "Common Sense Initiative" is marked by a commitment to goals, combined with a built-in flexibility to achieve those goals. EPA will move away from its focus on specific problems caused by individual pollutants, and will approach pollution on an industry-wide basis.

"The successes that are available if we continue down the path of traditional regulation are incremental at best," Administrator Browner said. "The current regulatory system is about going from A to B and B to C. The changes we undertake are about going from A to Z. I don't think anyone in this country, whether environmental leader or corporate CEO, believes incremental steps will achieve the kind of future we want."

The initiative has three goals. One is to eliminate problems caused by focusing too narrowly on a single pollutant or environmental medium. For example, when EPA rules under the Clean Air Act led to the installation of smokestack scrubbers, air quality was improved, but the scrubber waste contributed to water pollution.

A second goal is to stop the practice of making policy in response to emergencies. For example, Superfund was spurred by the Love Canal disaster, and the Safe Drinking Water Act was at least partly a reaction to water contamination in New Orleans. Administrator Browner noted that the result of this reactive approach is that there are 16 major environmental acts, overseen by 74 congressional com-

mittees and subcommittees, and thousands of regulations.

The third goal is to try to bridge the gap separating environmentalists and industry by holding regular meetings with EPA and interested parties to discuss differences and to try to reach agreement on major issues.

The Initiative will begin by focusing on six industries: iron and steel, electronics and computers, metal plating

and finishing, automobiles, printing, and oil refining. These industries were selected because of their importance to the economy and their environmental impact. Together, they are responsible for nearly 15 percent of the Gross Domestic Product and almost 4 million jobs. In 1992 they collectively spent over \$8.2 billion on environmental compliance and they released 345 million pounds of toxic substances, one-eighth of all TRI reported emissions. Some of the selected industries are dominated by large companies and others by small companies. Administrator Browner noted that small businesses, the nation's top job creators, have the most to gain from the initiative as they are often hardest hit by regulatory requirements.

For each industry, EPA will assemble a team composed of EPA officials, industry leaders, and representatives of national and grassroots environmental organiza-

"The current regulatory system is about going from A to B and B to C. The changes we undertake are about going from A to Z."

**—Carol Browner
EPA Administrator
July 20, 1994**

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Free Hand Press, Layout

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NEWS AND NOTES

PESTICIDE PACKAGING RULE

A joint effort by the Office of Water and the Pollution Prevention Division (PPD) has created a rule which highlights pollution prevention. The Pesticides Formulating, Packaging, and Repackaging (PFPR) Rule, part of the Source Reduction Review Project (SRRP), was proposed on March 31, 1994, and will be issued in final form in August 1995. The PFPR Rule details the pollution prevention practices that the industry can use to achieve the goal of zero discharge. Further, the technical development document provides an economic analysis demonstrating the economic benefits of utilizing the pollution prevention approach to compliance.

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RESOURCES FOR SMALL AND MEDIUM BUSINESSES

The Virginia Military Institute Research Laboratories is offering a publication, *A Pollution Prevention Manual for Small and Medium Size Businesses*, and a video, *Pollution Prevention and the Virginia Manufacturer — Making a Difference*, produced in cooperation with the Virginia Department of Environmental Quality and Virginia Manufacturers, to help companies establish voluntary pollution prevention programs or enhance existing programs.

The video and the manual are \$20 each or \$35 for both. For more information, or to order, contact Ron Erchul at 703-464-7331.

RESOURCES AVAILABLE

Several documents published by EPA's Office of Pollution Prevention and Toxics are available through PPIC (Tel: 202-260-1023, Fax: 202-260-0178):

► A 70-page Compendium lists documents developed in recent years under the Pollution Prevention Grant Program for states. The materials are indexed by state, subject matter, and type of document.

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COMMON SENSE INITIATIVE

Continued from page 1

tions, along with members of state environmental commissions, local government, labor unions and other groups that want to participate. The teams will examine each industry using the following principles:

► **Regulation** — Each team will review all relevant regulations for the industry to identify opportunities to get better environmental results at less cost, and seek to improve new rules through increased coordination.

► **Pollution Prevention** — The teams will promote pollution prevention as a standard business practice and a central ethic of environmental protection.

► **Reporting** — Each team will seek to make it easier to provide, use and publicly disseminate pollution and environmental information.

► **Compliance** — The teams will work to create a system that will assist companies that want to obey and exceed legal requirements while consistently enforcing the law against those that don't.

► **Permitting** — The teams will work to change permitting so that it works more efficiently, encourages innovation, and creates more opportunities for public participation.

► **Environmental Technology** — The teams will structure regulation so that industry has the incentive and the flexibility to develop innovative technologies that meet and exceed environmental standards while cutting costs.

Administrator Browner emphasized that "for the first time ever, every player with a stake in the outcome will be at the table — industry, communities, environmentalists, regulators. And for the first time ever, every major topic will be on the table." The industry teams are expected to develop recommendations within one year.

GREEN UNIVERSITIES

by Colleen Michuda

With hopes of lasting longer than the proverbial college trend, a number of universities have taken steps to “go green” — making comprehensive changes in the environmental orientation of their institutions, from academic offerings to facilities and infrastructure.

The “green university” ethic traces back to the efforts in 1989 of a group of six graduate students at UCLA to conduct a comprehensive environmental audit of UCLA’s operations. In October 1990, 22 university presidents from 13 countries met at the Tufts European Center in Talloires, France to discuss the role of universities in cultivating a sustainable future. The meeting resulted in a declaration of principles and actions; by the end of 1993, 178 university presidents in 38 countries had signed onto the Talloires Declaration.

Three examples of green universities in the U.S. are highlighted in this article.

Tufts CLEAN!

The Tufts CLEAN! (Cooperation, Learning, and Environmental Awareness Now!) program at Tufts University in Boston, Massachusetts emerged in April 1990 as a pilot pollution prevention program, which later grew into a full-scale greening of the university. An Environmental Improvement Committee oversees the implementation of the university’s environmental policies, which were developed jointly by representatives from the administration, faculty, staff, and students.

Outreach programs to the university’s campus community include newsletters, and a Campus Tour, which highlights the university’s progress in resource conservation and recycling. In addition, the Tufts Environmental Literacy Institute helps faculty from various disciplines incorporate environmental issues into their curricula. The university has undertaken numerous initiatives, including installation of energy-efficient motors and thermopane windows; a composting program for food and yard waste; and implementation of the recom-

mendations of a graduate students’ project with respect to hazardous materials and the disposal of photographic chemical wastes.

Brown is Green

Brown University in Rhode Island established its BIG (Brown is Green) program in August 1990 in response to rising energy costs and weak participation in recycling. Like Tufts, Brown University stresses student involvement in the greening process. For example, one major study involving student research examined the university’s heating system and explored options for the replacement of the outdated boiler system. Students living in the West House are required to take a class on “Efficient Use of Natural Resources,” which has helped students achieve a consistent 40 percent reduction in consumption of gas, electricity, and water within the house.

Brown has also instituted a number of greening measures for its facilities. For example, 750 showers were retrofitted with low flow heads, and 1500 exit sign bulbs were replaced with lower-wattage, longer-lasting bulbs. To promote the exchange of ideas and environmental initiatives, Brown set up an electronic conference called “Green Schools,” accessible through Bitnet or Internet.

George Washington Joins Up

Joining the ranks of green universities with a bang on Earth Day 1994 was George Washington University in Washington, D.C. GWU’s plan concentrates on four areas: curriculum, research, infrastructure, and outreach.

Although the new program is in the planning stages, GWU has been incorporating environmental ethics into its operations for a number of years. About 120 courses with an environmental focus are currently offered at the university, as are six environmental degree programs in both undergraduate and graduate studies. GWU has also been in the forefront of environmental research through its Center for Applied Environmental Technology.

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Colleen Michuda interned at EPA this summer. She is a senior at Notre Dame University.



FACILITY PLANNING

Beginning in July 1989, Oregon and Massachusetts became the first states to pass facility planning laws requiring industries to meet waste reduction goals and report on their progress. Since then, facility planning has spread to 28 states, engendering much debate and discussion over its merits. Do facility planning requirements stimulate pollution prevention thinking? Or are the requirements perceived as just another set of paperwork to be filled out? What works? What doesn't? We've asked several observers of the issue to offer their opinions and perspectives.

PLANNING REQUIREMENTS ENCOUNTER CHALLENGES OF IMPLEMENTATION

by Bob Style

As environmental regulatory agencies attempt to promote pollution prevention as the primary method of waste management, they have been struggling to define their role in the process. The voluntary nature of pollution prevention activities makes it difficult for these agencies to use the "stick" of regulation to encourage prevention. Toxic use reduction and pollution prevention planning requirements can be seen as a reaction to this situation and the desire to provide some "motivation" for the regulated community to adopt pollution prevention techniques.

Fifteen states have adopted facility-wide pollution prevention planning requirements as an attempt to spur companies into prevention oriented approaches. Prevention planning requirements have also found their way into draft versions of RCRA and Clean Water Act reauthorization bills currently being considered by Congress, as well as a number of state and locally based initiatives.

WRITAR has been tracking state pollution prevention planning requirements and is currently in the midst of a project, in cooperation with EPA's Pollution Prevention Division, to characterize the experience of state agencies and their interactions with the regulated community through these planning requirements. We surveyed agencies in ten states that have gone through one full cycle in the planning process (plan development and at least one progress report). States include AZ, CA, GA, ME, MN, MS, NY, OR, TN, TX, VT, and WA. Following is an overview of the responses received.

Compliance. All states reported relatively high rates of compliance with

the reporting requirements, ranging from 61% to 100%. Most states found they could achieve compliance rates in the high 90's after extending the reporting deadlines.

Consultants. Agency staff estimate that between 5 and 40 percent of the documents submitted to the state are developed by consultants rather than in-house facility staff. These estimates, however, are suspect and the role of consultants is likely to be even higher; documents submitted on company letterhead are not necessarily developed in-house.

State Resources. Agencies staff the planning effort in different ways. Some states have a single person in charge or reviewing plans as their full-time responsibility; others assign a larger number of staff to review the plans within a certain timeframe. Although it might be useful for staff to compare progress reports of a company for several years and to compare them to the original plan, there seems little likelihood that the same state staffer will review the documents for the same companies from year to year.

Budgets. Most states seem to spend \$200-450 per facility to implement planning requirements. New York, which dealt with only its largest 175 generators in the first round, spent the most per generator at \$8,695. Minnesota, with only one person responsible for reviewing all 478 progress reports, spent the least at \$115 per generator.

Uses of Information. States use the information collected to track reductions in the industrial sector and to report on their pollution prevention program's effectiveness. Other uses include targeting technical assistance efforts, developing a prevention database, and permitting.

The preliminary findings of this project unfortunately leave the most pressing question unanswered: Do pollution

For a medium to large size company, a good plan can cost as high as \$60,000.

Bob Style is at the Waste Reduction Institute for Training and Applications Research (WRITAR). A final report on the state planning requirement project should be available by January 1995. For more information, he can be reached at 612-379-5995.

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FACILITY PLANNING, CONT'D.

A UNIFORM APPROACH FOR STATE LAWS

John Scagnelli

The growing trend at the state level toward the enactment of legislation requiring companies to reduce their use of hazardous chemicals in manufacturing processes has led to a variety of approaches and requirements. A uniform state approach is urgently needed, particularly for companies with multi-state facilities.

Complying with different state waste minimization requirements can prevent companies from adopting a cost-efficient and uniform approach to waste reduction, particularly where reductions are dependent upon capital equipment expenditures and long-range engineering and planning requirements. Without a uniform approach, states are themselves creating disincentives and obstacles to pollution prevention.

Certain fundamental elements from different state approaches can be distilled to create a uniform model approach. First, the identification of goals or targets for hazardous waste generation for all industries should be pursued but such goals should be simply that — goals rather than statutorily or regulatory mandated targets. Common goals of 25% reduction of hazardous waste generation by 1995 and 50% reduction by 2000 have been identified in some states and can serve as useful guideposts for industry.

Programs for hazardous waste minimization should require reduction from a facility-specific baseline. Baselines should be identified through use of existing environmental reporting mechanisms. Toxics Release Inventory (TRI) reports already required to be submitted to EPA should serve as the basis for required

waste reduction plans to be submitted every three years to state environmental protection agencies, with annual required progress reports. State agencies should be directed to review the plans against the general goals, but the reductions should not be mandatory for each facility. Instead, the state agencies should be empowered to require each facility submitting a plan to document its progress based upon best available waste reduction technology within its industry. Deviations from the 25% and 50% reduction goals could be permitted based on the available technologies and industry circumstances.

The model uniform approach could require each state to establish grant programs to fund waste reduction programs and to provide technical assistance in waste minimization, with training provided by colleges and engineering schools. Each state could also be required to establish information clearinghouses to facilitate the transfer of technology for hazardous waste reduction.

Fees for hazardous waste disposal on a per pound basis should be established to fund the state technical assistance and clearinghouse programs, and to provide a further financial incentive for hazardous waste reduction.

The model uniform state approach suggested here is but one of several possible scenarios, but the fundamental point is clear — a uniform state approach is critically needed. Serious consideration should be given to establishing a national state hazardous waste minimization congress, with representatives of the environmental protection agencies of the fifty states invited to prepare a model uniform state waste minimization bill.

John M. Scagnelli is a partner and chairman of the Environmental Department at Whitman Breed Abbott & Morgan, New York, NY and Newark, NJ.

FACILITY PLANNING, CONT'D.

BUSINESS ROUNDTABLE BENCHMARKS SUCCESSFUL FACILITY PLANS

The Business Roundtable, an association of business executives, conducted a "benchmarking" study of facility level pollution prevention planning during the course of 1993. The goal was to determine both the common, as well as the unique, elements of successful pollution prevention programs. Six manufacturing facilities were selected as representing the "Best-In-Class:" Proctor & Gamble's Mehoopany, PA facility; Intel in Aloha, OR; Du Pont in La Porte, TX; Monsanto in Pensacola, FL; 3M in Columbia, MO; and Martin Marietta in Waterton, CO.

Key findings of the study

- ▶ All facilities had strong management support and a focal point for the facility-level pollution prevention program, such as a Senior Environmental Engineer, the Director of Environmental Management, or the Waste Management Team Leader.
- ▶ Successful facilities understood their corporate and plant cultures and implemented the programs consistent with those cultures.
- ▶ Facilities were successful when they were *not* told how to approach pollution prevention by corporate environmental groups or other outside forces. The freedom to choose the best pollution prevention method was key to success.
- ▶ Facilities had the ability to report progress against selected goals or initiatives on a monthly or quarterly basis.
- ▶ To be able to sustain a pollution prevention program, the projects had to be, on

the whole, cost effective. Unlike compliance projects, pollution prevention projects generally had to compete against capital improvement projects.

- ▶ No facility relied exclusively on source reduction techniques to achieve pollution prevention. All facilities included recycling and reuse in the efforts and some used the entire waste management hierarchy.
- ▶ Facilities continued to spend more on compliance than on pollution prevention, although they expressed the desire to shift the balance toward prevention.
- ▶ Each facility measured the success of its program differently, using a combination of reduced cost, reduced volume, improved public image, results against goals, ability to expand a facility, and other measures.
- ▶ Some facilities normalized waste volume to production; others did not. Each facility used a different method for tracking wastes/emissions. All facilities used PC-based systems to track waste streams, and customized spreadsheet packages to meet their own needs.
- ▶ Each of the facilities had matured from focusing on pollution prevention within current manufacturing processes to integrating pollution prevention in the pre-manufacturing decision phases. The benchmark facilities were working with raw material suppliers, equipment suppliers, and customers to prevent pollution at each step.

For a copy of the *Facility Level Pollution Prevention Benchmarking Study* (November 1993), contact the Business Roundtable, 1615 L Street NW, Suite 1100, Washington, D.C. 20036, Tel: 202-872-1260.

FACILITY PLANNING, CONT'D.

NEW FACILITY PLANNING STUDY EXAMINES INDUSTRY PERCEPTIONS

by Michael James and Susan Gouchoe

A new study entitled *Evaluation of the Effectiveness of Industry Pollution Prevention Planning Requirements & Guidance for Integrating Pollution Prevention Plans*¹ was recently completed by a group of graduate students at Tufts University. The study — based on interviews with environmental managers at 17 manufacturers in the Massachusetts area — provides insight into the perceptions of some industries on the effectiveness of pollution prevention planning requirements. The group also prepared a guidance document to help industry prepare comprehensive pollution prevention plans that can meet the requirements of multiple federal regulatory programs and many state programs.

The study included a review of the motivations, effectiveness, and barriers related to the pollution prevention planning process from an industry perspective. The interview results very strongly suggest that pollution prevention planning is internally driven and not solely a response to regulatory requirements. Cost savings, improved worker health and safety, and reduced risk of enforcement are significant motivating factors for pollution prevention planning. However, according to the participants, some elements common to a number of planning requirements have been valuable in identifying pollution prevention opportunities: financial accounting, materials accounting and chemical tracking, and process characterization.

One common theme is that industry finds it difficult to establish a connection between the planning activities associated with any one set of regulatory require-

ments and the subsequent results of the implementation phase. Industrial participants find that with the increased visibility of wastes and the generation of valid cost savings, it becomes easier to get management support for pollution prevention; in some cases pollution prevention becomes a self-sustaining activity. In addition to the classic benefits of the pollution prevention effort, a common benefit observed by industry was an improvement in health and safety performance among the employees.

Overwhelmingly, industry felt that the redundancy and the temporal relationships of the planning and reporting requirements mandated by the many different regulations restricts the implementation of pollution prevention projects during the first half of the year. Environmental managers noted the need to reduce the duplicative nature of the planning and reporting requirements, and simultaneously to coordinate the timing and data requirements between the multiple federal requirements and individual state requirements.

Forecasting a potential industry need for streamlined planning and reporting requirements, the students developed a guidance document showing how a company might develop one single pollution prevention plan that would reduce the redundancy of the many plans currently required while allowing compliance with many regulatory programs. Though not inclusive of the myriad of regulatory-driven pollution prevention planning requirements, the guidance is based on premise that a common thought process can be used for pollution prevention planning. These regulatory-driven planning requirements include such programs as the Storm Water Pollution Prevention Plan, SPCC plan, Slug Discharge Control Plan under the Clean Water Act, and the Accidental Release Prevention plan under the Clean Air Act. By preparing each element as outlined in the guidance, planners adopt a comprehensive multi-

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Susan Gouchoe is completing her joint M.S. in Civil & Environmental Engineering and Urban & Environmental Policy at Tufts University in Medford, Massachusetts.

¹ Prepared by Susan Gouchoe, Michael James, Kevin Lynch, Marcia Rose, Shawn Usher; July 1994.

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PLANNING REQUIREMENTS ENCOUNTER CHALLENGES OF IMPLEMENTATION

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prevention planning requirements lead to the discovery and implementation of pollution prevention projects in industry? Our initial impression, based on interviews and anecdotes, is that they do not. A key assumption behind the planning requirements is that through the process of developing a plan, industry will become "enlightened" about the usefulness of pollution prevention. This assumption, though, is at odds with twenty years of compliance with environmental regulations where the standard approach taken by industry is quite the opposite — use a minimum of effort and target the minimum compliance standards.

In reality, finding the necessary resources and using the information collected are issues both for the companies involved and the state agencies. For a medium to large size company, a good plan can cost as high as \$60,000. Companies predisposed toward implementing pollution prevention measures (often in response to other initiatives) have told us that the planning process drained resources away from implementation without yielding any new information. Companies that are not predisposed toward pollution prevention tend to minimize the amount of time and effort spent on planning, treating it as another instance of regulatory compliance.

On the state agency side, it appears that most of the resources in this area are directed towards outreach and assistance related to the plans. Relatively few funds are available or devoted to using the planning documents or to enforcing the planning requirement. The situation will only get worse as planning requirements are extended to a larger number of generators.

All of this may change as the pollution prevention field develops further. For the moment the challenge remains to find ways of turning planning requirements into a useful process of discovery and change.

PESTICIDE PACKAGING RULE

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This rule is one of the first to provide detailed pollution prevention information. Even before issuance of the final rule, PPD and the Office of Water will create an implementation manual directed to industry and will hold regional workshops to teach compliance.

For more information, contact Holly Elwood at 202-260-4362.

RESOURCES AVAILABLE

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- ▶ Reducing Lead Hazards When Remodeling Your Home (EPA 747-R-94-002, April 1994) offers practical advice on work practices and safety precautions.
- ▶ EPA Pollution Prevention Accomplishments: 1993 (EPA 100-R-04-002, Spring 1994) shows how pollution prevention policies have been incorporated into different EPA programs.
- ▶ To find out who's involved in EPA's wide-ranging Management Accounting and Capital Budgeting for Environmental Costs Project, consult the *Environmental Accounting Resource Listing*, recently revised and expanded to include internal and external sources of information, or *Directory of EPA's Environmental Network for Managerial Accounting and Capital Budgeting*, with more than 500 network member listings.

NEW FACILITY PLANNING STUDY

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media planning approach to analyze more efficiently their facility's operations and activities. The document promotes the concept that the facility planning process can be integrated with other business decisions, and will ultimately lead to a self-sustaining process.

For a copy of the report, contact the Civil and Environmental Engineering Department at Tufts University, 617-627-3211.

CLIMATE CHANGE

CLIMATE CHANGE ACTION PLAN

The Climate Change Action Plan released in October 1993 included 44 separate actions as part of a sustained effort to combat climate change. An April 1994 Program Update outlines objectives, approach, current status, upcoming milestones, and contacts for each action. Listed below is a sampling of actions and progress:

#1: Coordinate DOE's Rebuild America and EPA's Energy Star Building programs to expand markets for energy-efficient technologies in commercial and multifamily buildings. EPA has signed agreements with 9 Showcase Building Partners which will demonstrate energy savings of 40 percent or more; another 20 partners are being recruited. DOE will issue a competitive solicitation in FY 1995 to provide financial assistance in support of innovative programs.

#3: Establish State Revolving Fund for Public Buildings. DOE will award grants of up to \$1 million to states to develop an effective program of state revolving funds to finance energy efficiency investments in state and local buildings. The program will begin, if funding is appropriated, in January 1995.

#13: Establish Golden Carrot Programs for Industrial Air Compressors, Pumps, Fans and Drives, and Other Industrial Process Technology. Using the Golden Carrot approach that successfully produced an energy-efficient refrigerator, this program also establishes partnerships among industrial end-users, original equipment manufacturers, utilities, distributors, and state energy agencies to promote delivery of state-of-the-art efficient technologies to the marketplace. The new Golden Carrot program for electric motors is expected to be launched in the summer of 1995.

#17: Improve Efficiency of Fertilizer Nitrogen Use through the voluntary adoption of improved practices by farmers and ranchers. In addition, USDA scientists will develop new practices for optimum rate, timing, and placement of nitrogen fertilizer. They will also develop tillage, cropping, and water management systems that minimize nitrogen losses, maintain residues, reduce on-farm energy use, utilize improved crop varieties, and reduce soil erosion.

#22: Develop Fuel Economy Labels for Tires. Consumers often purchase replacement tires that have 20 percent more rolling resistance than original tires. Tires with higher rolling resistance yield lower fuel economy; a 20 percent change in rolling resistance would lower fuel economy 4 percent. With labeling, consumers might make different choices, and companies will have an incentive to improve the rolling resistance of their aftermarket tires.

#35: Launch Coalbed Methane Outreach Program. Through the program, EPA will work with the coal industry to identify methane recovery projects at 15 to 25 underground coal mines, which will reduce annual methane emissions by 2.2 million metric tons by 2000. The program was officially launched at a meeting on April 11, 1994 with EPA and over 100 industry representatives at the North American Coalbed Methane Forum.

#42: Launch Partnership with Aluminum Producers to Reduce Emissions from Manufacturing Processes. The goal is to achieve annual reductions in emissions of perfluorocarbons (PFC) CF₄ and C₂F₆ equivalent to 1.8 million metric tons of carbon by 2000. Beginning this summer, EPA will work with aluminum companies to identify reduction potential on a plant by plant basis.

FEDERAL FACILITIES

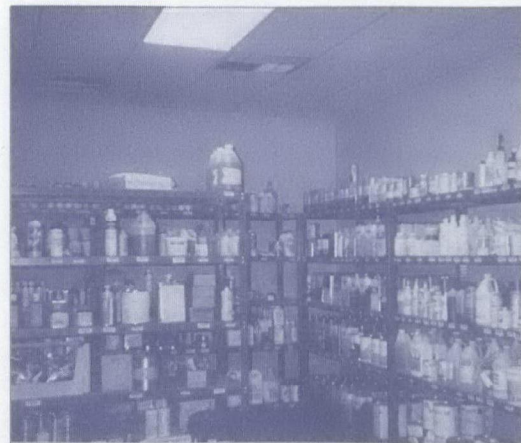
AIR FORCE PHARMACY SYSTEM CURES HAZARDOUS WASTE BLUES

Air Force bases have managed to cut hazardous material purchasing and disposal costs, as well as reduce the overall amount of hazardous materials they handle, by implementing a Pharmacy Program. Unlike a traditional supply system which simply orders and distributes material, the "Pharmacy" distributes hazardous materials to the user in the amount needed.

By utilizing the Pharmacy approach, the bases are able to keep track of where the material is used, for what purpose and in what quantity, thereby making reporting requirements easier to fulfill. In addition, the Pharmacy incorporates an intensified inventory control system which reduces the amount of material purchased to that actually used. Prior to this system, some bases, for example, had a three to six year supply of certain hazardous materials even though the shelf life of the materials may have been considerably shorter.

There are three main components of the Pharmacy system. The first is a single point for product request and authorization. Each request or requisition is reviewed by a team of experts in the areas of bioenvironmental engineering, environmental management, and logistics. A request is authorized only after the panel determines that it is the most environmentally benign, technically acceptable substance and is being used in the smallest possible quantity.

The second element involves distributing and collecting the hazardous materials. Because the materials are distributed only as needed, the Pharmacy retains responsibility for the location and condition of the hazardous materials. Shelf-life expiration, compatible storage, documentation, personnel training, and inspection are all the concern of the Pharmacy, thereby relieving the users of the burden. Unused materials can be returned to the



Hazardous Material Pharmacy at Altus Air Force Base, Oklahoma.

Pharmacy for redistribution, further reducing the waste stream.

The third element is the tracking system which connects the review/authorization and the distribution/collection processes. The tracking system should provide a record of all inventory transactions, access to the chemical and physical properties of the inventory, tracking of containers, Material Safety Data Sheet (MSDS) information, and the disposal or consumption data. This information can be used to analyze usage patterns, establish ordering requirements, provide data for regulatory reports, and plan emergency responses.

As in any large facility, the Pharmacies will impact and require the cooperation of many different people at the bases. Implementation of a Pharmacy program requires complete support from the top down in order to be successful. Once in place, the pharmacy system can have a dramatic effect. One of the Air Force Logistics Centers reduced its hazardous materials procurement costs from \$14 million to \$4 million in two years by using a single point of control and authorization.

For more information, contact Ms. Elizabeth Davis, Air Force Center for Environmental Excellence, (202) 536-4220.

(Adapted from an article by Elizabeth Davis in the Winter 1994 issue of the Air Force Journal of Logistics.)

CORPORATE NOTES

MONSANTO REWARDS ENVIRONMENTAL INITIATIVE

Monsanto Corporation has selected four winners of its third annual Monsanto Pledge Awards. The company created the awards in 1991 to recognize employees' contributions toward environmental, safety and health improvements. One hundred employee teams from around the world applied for the awards in four categories: operations, technology, community service, and marketplace. The company has donated \$100,000 — \$25,000 for each winning team — to environmental organizations chosen by the winning teams.

The winning entries

Community Service: A Monsanto team is managing a Superfund site in Woburn, Massachusetts, near Boston. Monsanto, working with local public officials and EPA, devised a cleanup strategy which will return the site to productive use — an interstate highway exchange and a regional transportation center will be built on the site. This project is novel because the cleanup methods were selected based on the future intended use of the land. The new Regional Transportation Center involves a \$30 million investment by state agencies and will include a 2500 car "park and ride" for commuters, which will help the Boston area comply with the Clean Air Act. The Woburn team selected the Woburn Redevelopment Authority to receive its \$25,000 grant.

Technology : Teams from several Monsanto facilities combined to develop a new process for making 4-aminosiphenylamine, an ingredient that makes rubber products more durable. The new process called PPD-2, which has been patented, reduces raw material needs by 58 percent and cuts organic and inorganic waste by a combined total of 95 percent. The new process eliminates the use of chlorine and

xylene. Chlorine had been responsible for most of the waste. If the PPD-2 process is used at a full-scale production facility, the process could save up to 56 million pounds of chemicals and more than 130 million gallons of wastewater annually. The Nature Conservancy chapters in Missouri and Ohio shared the \$25,000 grant.

Operations: An effort involving personnel worldwide resulted in a method for manufacturing the active ingredient in Roundup herbicide more efficiently, thereby reducing waste by 2.1 million tons annually. The new "fast catalyst" not only saves money — \$4 million per year — due to decreased disposal costs, but it also generated a one-time savings of \$7 million due to increased efficiency. This team selected seven groups from around the world to share its \$25,000 prize. The recipients are: the Neighborhood Greening Project in St. Louis; the University of North Carolina Cape Fear River Project; Lake Ponchartrain Basin in Louisiana; VZW Natuurreservaten in Antwerp; and three conservation projects in Australia.

Marketplace: A Monsanto team in Brazil developed a new crop rotation pattern that reduces soil erosion in the Cerrado region. Soil erosion has been a problem since soybean farmers settled the region twenty years ago. With the deterioration of the soil, the farmers move on, cutting down more of the rain forest and causing more erosion. The Monsanto team identified a rotation system using pearl millet, corn and sorghum. These crops worked well in rotation with soybeans, providing effective ground cover and additional cash crops. By improving the soil, the rotation system also has increased the annual yield for soy beans. The team divided its \$25,000 grant among three groups formed by landowners to learn more about no-till farming, and an organization that will study the Tuiuiu myceteria, the third largest bird in the world.

THE MONSANTO PLEDGE

The Monsanto Pledge is the company's environmental commitment. Since 1990, Monsanto has pledged to:

- ▶ reduce all toxic and hazardous releases and emissions, working toward an ultimate goal of zero effect;
- ▶ ensure no Monsanto operation poses any undue risk to employees or communities;
- ▶ work to achieve sustainable agriculture through new technology and practices;
- ▶ ensure groundwater safety;
- ▶ keep plants open to the community and involve the community in plant operations;
- ▶ manage all corporate real estate, including plant sites, to benefit nature; and
- ▶ search worldwide for technology to reduce and eliminate waste from Monsanto operations, with top priority being not making it in the first place.

CALENDAR

TITLE	SPONSOR	DATE/LOCATION	CONTACT
Fifth Annual Energy Efficiency Forum	Johnson Controls, U.S. Energy Assn	October 4 Washington, D.C.	414-274-4819
National Roundtable of State Pollution Prevention Programs	NRSPPP, Minn. OEA	November 2-4 Minneapolis MN	800-657-3843
The Emission Inventory: Applications and Improvement	EPA, Air & Waste Management Assn.	November 1-3 Raleigh, NC	412-232-3444
Computing in Environmental Management	Air & Waste Management Assn.	Nov. 30 – Dec. 2 Research Triangle Park, NC	412-232-3444
Building TRI and Pollution Prevention Partnerships	EPA, NEWMOA	December 5-8 Boston, MA	617-666-1431 617-628-9297
Environmental Technology Expo & Conference	EPA, Assoc. of Energy Engineers, others	December 7-9 Atlanta, GA	404-447-5083
Low- and No-VOC Coating Technologies International Conf.	EPA Air and Energy Research Lab, Research Triangle Inst.	March 13-15, 1995 Durham, NC	919-541-5816

LIVING "OFF THE GRID"

Homes across the country featuring energy conservation and energy independence will be open to the public on October 15 as part of the second National Tour of Independent Homes. The tour is sponsored by the Real Goods Trading Corporation and gives people the opportunity to tour homes and see the lifestyle available using renewable energy. Last year, nearly 10,000 people took part in the tours. To find out about touring homes in your area or to volunteer your home for the tour, call Karen Hensley at 1-800-762-7325.

LABORATORY WASTE MINIMIZATION WORKSHOP

A workshop on laboratory waste minimization will be held on November 14, 1994 as part of the American Chemical Society's Southwest Regional Meeting in Fort Worth, Texas. Topics will include: 1) Hazardous Waste Minimization in the Academic Laboratory; 2) Developing and Implementing a Pollution Prevention Program; 3) OSHA Standards and Hazardous Waste Minimization; and 4) Recycling Orphan Chemicals. Each topic will be followed by a discussion session, open to questions from the floor. For further information on the workshop program, contact Caroline M. Trupp at (202) 872-4467.

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