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EPA JOURNAL



**Searching for
Environmental Safety**



How It Used To Be: This photo taken several years ago in the Denver area illustrates the "out-of-sight, out-of-mind" attitude that helped spawn the pervasive hazardous waste problems in this country.

Hazards and Solutions

In this issue of EPA Journal we examine the efforts being made to improve the safety of our environment by controlling hazardous wastes.

As Lee Thomas, EPA Assistant Administrator for Solid Waste and Emergency Response, points out in an interview the problem of hazardous waste emerged with the phenomenal growth of the chemical industry after World War II.

Gradually in the 1960's a growing awareness developed that hazardous waste disposal practices used then were inadequate.

But not until 1976 with enactment by Congress of the Resource Conservation and Recovery Act was there au-

thority for Federal regulation of current and future waste practices.

This law and the 1980 Superfund law, designed to clean up old waste sites, have triggered a massive drive to correct the threats from improper waste disposal.

The success of these efforts is vital if we are to emerge from what EPA Administrator William D. Ruckelshaus has described as "a troubled and emotional period for pollution control."

In this issue of the Journal we also carry the views on waste problems of two distinguished Congressional leaders—U. S. Senator Jennings Randolph, D-W. Va., and U. S. Representative James T. Broyhill, R-N.C.

A review of EPA's enforcement program in this issue is followed by a report on the first five sites cleaned up under the Superfund program. An overview of our knowledge and capability in dealing with dioxin, one of the most toxic man-made substances, is then presented.

A photo essay illustrates the forced air stripping towers built in Tacoma, Wash., with the aid of Superfund money to remove contaminants in drinking water wells.

Also in this issue we resume publication of a department called Update, brief news items about recent major EPA pollution control activities and developments. This department helps fill the

gap left by the recent discontinuance of a separate EPA newsletter titled Update.

The magazine also includes a statement by EPA's new Assistant Administrator for External Affairs Josephine S. Cooper on "EPA's Opportunity to Communicate."

Recent appointments to key EPA posts are also reviewed. Finally the magazine takes a look at one of the many rivers around the country endangered by pollution from mounting metropolitan area populations. In this case, it is the Cacapon, a tributary of the Potomac River with an Indian name meaning "Medicine Waters," which is at risk because of rapid second home development and several non-point pollution sources. □

EPA JOURNAL

William D. Ruckelshaus, Administrator
Josephine S. Cooper, Assistant Administrator for External Affairs
Jean Statler, Director, Office of Public Affairs
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Articles

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

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Front Cover: This serene view of Puget Sound at sunset with ducks in the foreground and a cloud-streaked sky above was taken by C. Biedel of Photri.

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Controlling Hazardous Wastes

An interview with Lee Thomas

Assistant Administrator for Solid Waste and Emergency Response

Aerial photo showing progress that had been made in 1979 in collecting barrels for removal at huge "Valley of the Drums" hazardous waste dump near Louisville, Ky. The cleanup is now nearing completion.



Lee Thomas

Q Is EPA making good progress in controlling hazardous waste in this country?

A We certainly are. In July 1982, EPA promulgated stringent standards for issuance of permits for land disposal facilities, essentially completing the core of the hazardous waste regulatory program. Standards are now in place for generators, transporters and most types of treatment, storage, and disposal facilities. Just three years ago, none of these standards were in place. We now have a cradle-to-grave manifest system in full use that allows tracking of each waste shipment from point of generation to final disposition.

With these standards in place the Agency has been able to shift its focus to issuing facility permits, enforcing the regulatory program, continuing the process of granting States authorization to run their own hazardous waste program in lieu of the Federal program, and filling in missing pieces of the regulatory program.

Together with the States, who are our partners in implementation, EPA's Regions have begun processing more than 1,400 treatment and storage permit applications. In addition, since January of this year, work has started on issuance of over 150 land dis-

posal and 108 incinerator permit applications.

EPA and the States conducted more than 14,000 inspections during Fiscal Year 1982, and issued 989 warning letters and 227 compliance orders. EPA and the States expect to increase the number of inspections during the current year to almost 17,000, a 13% increase.

EPA has also stepped up its investigation and referral to the Justice Department of criminal violations of the Resource Conservation and Recovery Act. In addition, 39 States have received interim or final authorization to operate their own hazardous waste programs, bringing much needed State resources and expertise to bear on the hazardous waste problem. At the same time, EPA is working to correct a number of other problem areas, including the special problems posed by dioxins, burning and blending of hazardous wastes in boilers, controlling generators of small quantities of hazardous wastes, and evaluating whether land disposal of certain hazardous wastes should be restricted.

Q How and why did we get into our present plight on hazardous waste? Couldn't these problems have been anticipated long ago?

A The problems of hazardous wastes are a relatively new problem that emerged with the phenomenal growth of the chemical industry after World War II. In the 40's, and 50's, wastes were disposed in, what was considered at the time, secure storage facilities. During the 60's it became more obvious that what was considered state-of-the-art storage technology for hazardous wastes was not an effective solution. EPA pointed out in its 1973 Report to Congress on Disposal of Hazardous Waste that Federal, State, and local legislation and regulations dealing with the treatment and disposal of nonradioactive hazardous waste were generally spotty or nonexistent. Not until enactment of RCRA in 1976 was there authority for Federal regulation of hazardous waste practices. Given the permissive legislative climate, generators were under little or no pressure to expend resources for more sophisticated management of their hazardous wastes. There was little economic incentive for generators to dispose of wastes in adequate

ways because the costs of adequate management were higher than the costs of widespread and accepted practices. While scattered cases of public health problems from hazardous waste were known at the time, no one, I believe, anticipated the enormous number of problem sites later identified under the Superfund program.

Q How long will land disposal of hazardous wastes continue?

A Land disposal will be needed into the foreseeable future. First, some wastes, such as sludges containing heavy metals, cannot be destroyed but can be safely treated and then disposed of either on or in the land. Other wastes should be treated or recycled. Treatment processes such as neutralization, incineration, or concentrating and separating wastes for recycling all result in residues that must be disposed of on the land. Therefore, it is difficult to envision a time when land disposal of hazardous wastes will not be needed. However, most, if not all, wastes can be detoxified and stabilized and rendered virtually nonhazardous before they are disposed of on the land.

Q Should some contaminants be banned completely from any sort of land disposal?

A Our regulations already prohibit or restrict the land disposal of reactive wastes, ignitable wastes, incompatible wastes, such as strong acids or caustics, and containerized liquid wastes. In addition, we are examining a number of rule changes, including a restriction on the disposal of bulk liquids in landfills, and standards for air emissions from land disposal facilities.

Along with these controls we are identifying wastes that are highly mobile, toxic, and persistent and have a high tendency to bioaccumulate. We will explore the availability of alternate management technology for these wastes, as well as the costs and environmental impacts of these alternate technologies. Based on these considerations, we intend to prohibit additional wastes of this type from disposal in or onto the land.

Q How many hazardous waste facilities have now been granted permits?

A Eighty.



Q What is the box score on the number of permit applications pending and expected?

A There are approximately 1,500 permit applications pending at EPA and in authorized States. We expect to process an additional 1,100 applications in FY '84.

Q GAO in a recent report criticized the widespread lack of compliance with ground-water monitoring requirements at hazardous waste dumps. What is your reaction and what steps are you taking to deal with this problem?

A The Agency is taking a number of steps to improve compliance with the ground-water monitoring requirements.

We are developing a comprehensive inspector's manual for ground-water monitoring system evaluations. In addition, we plan to conduct training sessions for State and Regional inspectors to make sure that inspections detect violations. This program should be operational soon. The Agency also intends to hire additional personnel in key skill areas.

EPA is taking a number of steps to increase the level of compliance in the authorized States.

First, as a condition for receipt of fiscal year 1984 grant monies, States are to provide comprehensive reporting regarding compliance at individual facilities. The Agency is now developing data management capabilities to provide an up-to-date picture of compliance with the ground-water monitoring regulations, track enforcement actions, and identify situations requiring Regional Office attention. This data management system is expected to be operational by January of 1984.

Second, at least one Region has instituted monthly meetings between the responsible State agencies and EPA that have worked well in improving communication and solving problems in coordination. Based on this pilot, we will develop national guidance to assist the other Regional Offices in developing similar programs.

Finally, some of the Regions have begun to bring enforcement actions in States that are reluctant, or lack authority, to do so. For example, some States may not impose administrative penalties for violations but must go through their judicial systems. The

Agency may impose administrative penalties in authorized States under Section 3008 and is expanding its use of this authority.

Q How aggressive will EPA be in recovering money spent from Superfund? How much has been recovered so far?

A EPA has collected \$3.9 million in cost recovery actions thus far in the Superfund program.

The Agency also has referred a total of 17 cost recovery actions to the Department of Justice in FY-82 and 22 actions in FY-83 to date.

In addition, EPA has established a work group to organize the complex process of identification, collection, and maintenance of cost documentation and decision documentation to support an effective cost recovery program. Guidance to EPA's regional offices has been prepared and issued; cost recovery training workshops in regional offices are under way. In addition, EPA is examining procedures for distribution of unallocated Superfund expenditures on a site specific basis for cost recovery purposes. The cost recovery program is expected to increase in intensity as more Superfund remedial actions are completed in FY-84 and FY-85. □

U.S. Sen. Jennings Randolph, D.-W. Va., and U.S. Representative James T. Broyhill, R.-N.C., were invited to present their observations because of their special knowledge and interest in hazardous waste and environmental problems generally. However, their views do not necessarily represent the positions and policies of EPA.

The State of Hazardous and Municipal Waste Control

By U.S. Senator Jennings Randolph, D.-W. Va.



Senator Randolph is the ranking minority member of the U.S. Senate Committee on the Environment and Public Works and a former long-time chairman of this committee.

The invitation to submit this article on the state of hazardous and municipal waste control gave me an opportunity to reflect on the progress that has been achieved in my twenty years of involvement with this issue. During this period the Congress has been increasingly responsive to the problems of hazardous waste, but much remains to be accomplished, both by all levels of government and by those who generate and dispose of hazardous and solid wastes. There is more to be done before we can guarantee that public health and natural resources are truly protected from the hazardous constituents of solid waste.

I began my work on this issue with enactment of the first Solid Waste Disposal Act in 1965. In that year it was only a second title added to the bill amending the Clean Air Act. The 1965 Act represented a cautious effort to advance our understanding of the dimensions and scope of the burgeoning problem of solid waste disposal. We set the stage for fostering development of new technology to manage municipal refuse and encourage recycling activities. With revisions to the law in the Resource Recovery Act of 1970, a bold step was taken toward addressing the seriousness of the waste disposal problem. In addition to guidelines for regulating unsightly open dumps and incinerators, we began to study the serious problems associated with land disposal of toxic and radioactive materials. My interest was spurred by the fact that West Virginia has consistently ranked in the top ten States in production of hazardous wastes.

The amendments that were ordered reported by the Environment and Public Works Committee this summer are to some extent a reflection of the problems we uncovered in the development and implementation of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (or "Superfund"). For the 546 sites listed on the updated National Priorities List, the Environmental Protection Agency estimates landfilling and surface impoundments of hazardous wastes are the two primary sources of contamination problems. Seventy-five percent of the sites listed involve some degree of groundwater contamination.

To prevent the development of future "Superfund" sites, it is necessary to institute controls that will discourage land disposal of hazardous substances when alternatives to that disposal can be used, and to assure that land disposal facilities meet certain technological standards to prevent migration of contaminants. These requirements must be met as expeditiously as possible. A recently released draft of an EPA survey indicates that nearly four times as much hazardous waste is generated in the U.S. every year as suggested by previous estimates. The preliminary data suggest that 150 metric tons of hazardous waste were generated in 1981 compared to an estimate of 40 million metric tons. The survey also indicates that 41 percent of this quantity is either disposed of in surface impoundments or landfills. These startling figures underscore the importance of seeking alternatives to managing the problem.

Provisions in the pending amendments would both encourage minimization of the amount of hazardous waste generated and prohibit land disposal of some hazardous wastes. This in turn would spur the development of innovative technology to mitigate hazards and provide safe treatment and disposal methods. Enactment of the amendments will fulfill the public policy mandates anticipated when this issue was first debated in 1965.

I remain concerned that in light of the attention that has been directed to hazardous waste management and disposal, attention to municipal waste disposal has languished. States which were actively pursuing implementation of solid waste management plans have been forced to curtail their efforts in the absence of Federal grant money. The importance of prudent handling and management of municipal wastes far exceeds cosmetic considerations. Municipal facilities will continue to receive a measure of hazardous materials present in domestic materials and the wastes of "small generators," and through illicit disposal practices. In the absence of comprehensive State management plans, implementing the sanitary landfill criteria and the ban on open dumping, community and municipal disposal

Continued on page 6

The Effective Regulation of Hazardous Waste

By U.S. Representative James T. Broyhill, R.-N.C.



James T. Broyhill (R.-N.C.) is the ranking minority member of the House Committee on Energy and Commerce which has jurisdiction over most environmental laws, including RCRA and Superfund.

The 1960s will always be known as an activist decade. In no context is this more apparent than in the rise of the environmental movement. Reacting to several legitimate concerns about the degradation of our environment, Congress passed numerous laws to address these problems. The earliest national environmental laws, such as the Clean Air Act of 1970, were relatively simple, deferring in a large degree to the expertise of the implementing agency. Congress adopted a broad brush approach for clean-up, directing EPA to fill in the gaps and carry out the mandate.

The 1980s are spawning a new approach to environmental legislation. The environmental laws of the '80s are being drafted as regulatory, rather than legislative documents. They contain long lists of activities which EPA must carry out, and each specific activity has a deadline by which it must be performed. Many of these deadlines are enforced by so-called "hammers," where some penalty (usually to the regulated community) is imposed if the arbitrary deadline is missed. Under this new form of legislation every possible area of regulation is covered, and a solution to every potential environmental problem is demanded. The result will be a crushing regulatory burden on EPA which will prevent the Agency from effectively prioritizing its activities to best address our nation's health and environmental problems. The bottom line is less protection for the American people. In no area is this trend more apparent than in the regulation of hazardous waste.

The American people are justifiably concerned about the generation, handling and disposal of hazardous waste. EPA's slow implementation of the Superfund law, passed in 1980, has added to this concern, along with the recent realization that we are faced with many more Superfund sites than we originally believed. The American people want these sites to be cleaned up through the Superfund law, and want to see vigorous implementation of the Resource Conservation and Recovery Act (RCRA) to ensure that no new sites are created. I believe that these efforts will be hindered by the additional regulatory burdens being placed on the Agency.

One hundred thirty-three new sites have been recently added to the Superfund priority lists. Clearly, the Superfund law will need to be extended when it expires in 1985, and the fund must be expanded. But EPA needs the freedom and flexibility to initiate cleanup activities promptly. I fear that any Superfund reauthorization may contain so many additional burdens and have so many strings attached that this prompt cleanup will be impossible.

Many such burdens have surfaced during the reauthorization of RCRA. As currently reported, the House reauthorization bill contains an unbelievable *twenty-two* legislative deadlines, the Senate bill *twenty-three*! The bills delve into every detail of hazardous waste regulation. Some examples of specific regulatory requirements include the following:

- certain wastes are specifically listed for a possible land disposal ban;
- decisions are required within a certain time frame on other wastes;
- notification is required concerning handling of waste—derived fuels;
- recordkeeping and storage standards are required for these fuels;
- decisions are required on the listing of 17 categories of wastes;
- a decision to list used oils is needed; and
- standards are required for recycled paper just to name a few.

The hazardous waste program is designed to regulate wastes from cradle-to-grave by establishing a paper trail tracing the movement of the waste, and by ensuring that the wastes are handled properly all along the way. Congress should establish a framework through which EPA can accomplish these goals, but must not attempt to dictate every detail of the program. Congress does not have the scientific and technical expertise to make such decisions.

Some would say that EPA can carry out any statutory mandate if (1) the desire is there, and (2) there are adequate funds. I strongly disagree, and my reasons for doing so can best be illustrated in an example. EPA has been very slow in implementing Section

Continued to next page

facilities will persist as a public health threat.

In addition to seeing the 1983 Solid Waste Disposal Act amendments enacted, there are a number of areas I would like to address in the present Congress. At the head of the list is action on a measure to provide compensation to those who have suffered illness or injury from inadvertent exposure to hazardous substances. The fact that there currently is no measure for redress to victims represents a major inequity in present statutes. I strongly supported including a provision to accomplish this purpose in the 1980 Superfund debate. In the interest of quickly enacting the urgent needed clean-up mechanism, it became necessary to hammer out a compromise that would be more broadly accepted than the one initially proposed. The provisions dealing with compensation for out-of-pocket medical expenses were dropped in that compromise. The public deserves to have recourse in obtaining needed medical care and compensation for losses associated with involuntary exposure to hazardous substances. I am

optimistic that this situation can be corrected before the end of this Congress.

A second legislative challenge is posed by the absence of a clear-cut groundwater protection plan. Many existing laws address limited aspects of groundwater contamination and protection issues, but a coherent national policy to foster this vital resource does not exist. Over half the population relies on groundwater as a drinking water source. Contaminated aquifers are extremely difficult to remedy. It is far preferable to adopt a plan to assure that States, municipalities and communities are taking necessary steps to maintain and protect potable groundwater supplies.

The major components to complete the foundation of a sound public health and environmental protection program for solid and hazardous waste management are falling into place. Much work remains if the "cradle to grave" system for tracking and managing hazardous wastes envisioned by the 1976 Solid Waste Disposal Act Amendments is to be achieved. Until such time as the mandates of the Solid Waste Disposal Act are met to the letter, there will remain a

continued need for remedial efforts such as Superfund.

One of the most gratifying aspects of my affiliation with the waste disposal issue has been the broad based public support for aggressive action. The public is aware and increasingly well educated as to the consequences of improperly handling hazardous and solid wastes. The issue is highly visible owing to a number of dramatic contamination incidents. No one wants to discover that his neighborhood or community is afflicted with problems similar to Times Beach or Love Canal. The public will continue to demand strong laws and vigilant enforcement to assure them of a safe and healthy environment.

Congress, EPA, and the States share equal responsibility for providing a legal and regulatory format to assure proper management and disposal of hazardous and municipal wastes. Through the cooperation of regulated industries and concerned citizens this problem can be brought under control. □

The Effective Regulation of Hazardous Waste *Continued*

112 of the Clean Air Act, regulation of hazardous air pollutants. The problems with implementing this section were just as pervasive under the Carter Administration as they are under the Reagan Administration. The EPA Air Office under the Carter Administration did not complain of a lack of funds, and no one would question the desire of the Agency to control hazardous air pollutants, and yet very little has happened.

In my opinion, the problem exists in the law itself. The definition of hazardous air pollutant contained in Section 112(a)(1) is long, convoluted and hinders decision-making. Once the Administrator establishes that a pollutant is "hazardous," it must be "listed." Once listed, an emission standard must be established.

The emission standard must be set at a level that provides an "ample margin of safety." This has been interpreted by many commentators, including the General Accounting Office, to mean a zero emissions level. It would be impossible to economically control stationary sources, especially existing sources, to this level. Companies would go out of business.

The complexity and rigidity of this section has led EPA to the conclusion that it will be very difficult to justify Section 112 standards to the regulated community. The result is that the Agency requires exhaustive health effects data in support of a standard, and this takes a great deal of time to compile. While EPA moves to build a case that can stand up in court, the health of the American people may be adversely affected. The law, therefore, hampers EPA, does not allow any balancing of risks versus costs, costs versus benefits, and the result is inaction. Instead of giving EPA the flexibility to regulate these pollutants appropriately based on risk to health and cost of control, Congress has placed an unreasonable burden on the Agency.

Congress could greatly increase EPA's budget for the regulation of hazardous waste, and it would still be impossible for the Agency to develop regulatory programs to cover every detail specified in the pending RCRA bills, within time frames allowed. It is not easy to find new people with the necessary scientific or technical background, bring them on board and train them. All budgets are by necessity limited, and any organization must prioritize its activities. EPA may soon be unable to do this efficiently.

This problem is magnified by the cumulative effect of these numerous regulatory

requirements being mandated by Congress. I am *not* opposed to the intent of most of the various provisions of the pending RCRA bills, but taken together these provisions result in an overwhelming burden that will seriously damage the Agency's ability to function. And this is only one of the laws that the Agency administers. If this trend continues in other laws, EPA's top management will have the same difficulty prioritizing activities within the Agency as the Solid Waste Office will have within its program area. EPA will be pulled in different directions by different interests, different Congressional Committees, and Subcommittees. The ability to address our most serious environmental problems will be lost.

Unfortunately, recent controversies surrounding EPA have put the Agency in the limelight and caused many Members of Congress to try to take more control over the regulatory functions delegated to it. The American people want to see our hazardous waste problems resolved, but I strongly believe that the cumulative effect of piling one regulatory burden after another on EPA guarantees failure. The health of our country's citizens and the purity of our environment will suffer needlessly as a result. □

Enforcement Drive Mounts

By Tom Kelley

Illegal dumping of hazardous wastes into the Nation's rivers and streams causes severe problems

Illegal dumpers of hazardous wastes are being investigated, charged and prosecuted at a steadily increasing rate by both state and federal enforcement departments. The federal drive took on new emphasis with the establishment of an investigation branch in EPA's Criminal Enforcement Division in October 1982.

In the fiscal year since then, 28 corporations and individuals have been convicted in federal courts of environmental crimes, a dramatic increase from 11 in FY 1980, nine in FY 1981 and 11 in FY 1982. Twenty-four other cases, including fifteen involving illegal dumping of waste, have been referred to the Justice Department for prosecution and some 160 cases are currently under investigation.

Courtney M. Price, EPA Assistant Administrator for Enforcement, says the rising enforcement rate reflects the recruitment and assignment of 22 criminal investigators to EPA field offices. She says indictments, grand jury investigations, and convictions are at "historic highs" and as the Agency gains experience the impact of the program "can only increase."

Enforcement officials emphasize that most hazardous and toxic materials are generated by a relatively small number of manufacturers and most of it—some 300 million tons a year—remains under their control. The remaining 150 million tons is disposed of as waste but not all is of high toxicity. Du Pont Company's Chambers Works Plant in Deepwater, N.J., near Wilmington, Del., for example, technically produced 40 million tons of waste in 1981 (more than a quarter of all industrial waste produced) but 99 percent of it was water of low toxicity which had been used in treating the material produced by the manufacturing process to render it safe. The remaining one percent included not only basic toxins but also biological material, carbon that was used to neutralize the toxins and silt from the Delaware river.

Most hazardous wastes are generally and legally disposed of either by injecting them underground (some 57 percent) or in surface pits, ponds or lagoons. Some are incinerated.

Recent experience has shown that most

Tom Kelley is a well-known Washington area free lance writer.



violators plead guilty when the cases against them are properly prepared. The vast majority of the toxic waste cases involve polychlorinated biphenyls, commonly called PCBs. Many of the violators now being prosecuted in Federal courts are charged with felonies, under the Resource Conservation and Recovery Act, (RCRA) rather than with misdemeanors, the maximum permitted by the Clean Water Act and the Toxic Substances Control Act.

The longest jail term yet secured in a Federal environmental prosecution resulted from the conviction of Robert Earl "Buck" Ward, of the Ward Transformer Company, in the U.S. Court for the District of North Carolina. Ward was sentenced to two-and-a-half years in prison and a \$200,000 fine.

Ward, who had contracted to dispose of 7,500 gallons of oil containing PCBs in a safe manner, disposed of it instead by spraying it along 211 miles of highway in fourteen rural North Carolina counties.

Three other precedent-making cases were concluded in recent months. On May 10, Vernon L. Baseman, President of Nuclear Engineering Services, of Antigo, Wisconsin, and David R. Faulkner, a company truck driver, were indicted in United States Court for the District of New Mexico for illegally distributing PCB-contaminated oils. In 1981, Nuclear Services had been awarded a Department of Defense contract for the removal and proper disposal of drums containing waste oils contaminated with PCBs from McClellan Air Force Base in California. Under the contract the company was required to incinerate the oil but instead sold the waste to a dealer in Albuquerque.

Baseman pleaded guilty to two counts of illegal distribution and on Sept. 16 was sentenced to fines of \$1,000 on each count. Charges against Faulkner, the truck driver, were dismissed with the provision that the indictment could be reinstated should he violate a one-year probation.

The case against Quality Research Laboratories, Inc., of Cornwells Heights, Pennsylvania, followed a similar pattern. The company, its president and principal owner, Michael Yaron and his brother, Barak Yaron, a plant foreman, were indicted on May 2 on five counts of making false statements, unpermitted storing and disposing of hazardous substances, and failure to notify of the release of a hazardous substance. The wastes included 1-1-1 trichlorethane, toluene, phenol, cresol, corrosive acids, benzene, xylene and methylene chloride.

The company and the Yaron brothers pleaded guilty to a variety of charges on Aug. 17. The company and Michael Yaron both admitted to disposing of hazardous wastes without a permit under the Resource Conservation and Recovery Act. Michael Yaron also pleaded guilty to two misdemeanors, submitting false information under RCRA and failing to report the release of hazardous substances.

Barak Yaron pleaded guilty to one

misdemeanor for failure to notify of a release of a hazardous substance. The company and Michael Yaron also agreed to pay a private company to clean up the site in a manner approved by EPA. On Sept. 26 the company was fined \$10,000 and Michael Yaron was fined \$15,000 and given six months in jail. Barak Yaron was fined \$5,000 and placed on probation for two years.

The case against the A. C. Lawrence Leather Company of Danvers, Mass. involved the direct defrauding of the EPA as well as the illegal dumping of hazardous wastes. This case was cited by Judson W. Starr, director of the Justice Department's new environmental crimes unit, as particularly deserving of criminal sanctions. It resulted in two separate indictments under the Clean Air Act, Superfund, RCRA and related legislation. The company and five executives were fined a total of \$475,920 after a jury conviction and several pleas of guilty.

The company had received nearly \$250,000 in grants from the Environmental Protection Agency between 1977 and 1981 to conduct a study to help establish "reasonable" methods for disposing of the toxic wastes produced in treating leather. Following a six-week trial, a jury convicted the company of defrauding the government by filing false reports with the government while they were, in fact, dumping the waste from their tannery at Winchester, N.H., directly into an adjacent river. EPA found the study was worthless.

Three of the defendants, Weymouth E. Marshall, the company president; Robert F. Goodspeed, the vice president; and Francis E. Stone, manager of the tannery, also pleaded guilty to a second indictment charging them with burying more than 1,000 leaking barrels of perchloroethylene on the grounds of the Winchester plant. The chemical, a degreasing solvent used in preparing sheepskin hides, is suspected of being a cancer-causing agent.

During sentencing proceedings, Starr, the chief prosecutor, told the court that Marshall and Goodspeed were the persons "most responsible" for the crimes and asked that they be sent to prison.

The company was fined \$388,420 by Federal District Judge Martin F. Loughlin, more than half of which was for the repayment of the study grants. Marshall, of Gloucester, Mass., was fined \$15,000 and given a one-year suspended sentence on condition that he perform "community service" while under two years probation.

Goodspeed, of Northhampton, N.H., was fined \$22,500, given a suspended sentence of one-year, and placed on two-years probation.

Francis E. Stone, of Swanzey, N.H., manager of the tannery, was fined \$27,500, given a one-year suspended sentence and required to perform "community service" for two years while on probation.

Richard S. Johnson, also of Swanzey, the plant superintendent, was fined \$25,000, and was also given a suspended one-year

sentence and put on probation for two years. Lawrence K. Barber, of Waynesville, N.C., the tannery's former engineering director, was fined \$17,500 and given a suspended five-year sentence and put on probation for two years.

Federal enforcement efforts are coordinated with increased enforcement by the states. Eleven states in the northeast exchange information on violations through a Hazardous Waste Coordinating Committee and most of the eleven are developing their own investigating apparatuses.

In Massachusetts, prosecutors have established a link between some of the men convicted and organized crime. The Massachusetts Attorney General's office recently prosecuted its first case involving organized crime figures.

A Plymouth Superior Court Judge sentenced eight defendants in a case involving the transporting of 850 drums of poisonous waste in 1980. The Samson Tank Cleaning Co., of Bayonne, N.J., had contracts with several New Jersey chemical companies.

Edward F. McLaughlin, Massachusetts Assistant Attorney General, said officials had assumed that illegal dumping was being conducted locally by relatively small operators but have found evidence that organized crime is now frequently involved.

McLaughlin told the Boston Globe that illegal dumping can be "extremely rewarding. . . . You can make \$5,000 to \$10,000 a day and that's what makes it attractive to organized crime."

The New Jersey case developed after State investigators found a prescription medicine bottle in a pile of hazardous waste. The bottle was traced to a woman who lived in a housing project in Plymouth. The project's trash was picked up by the John Albert Company, a local firm.

The leaking barrels of highly flammable chemicals were traced to a New Jersey manufacturer who had paid the Samson Tank company to dispose of it. The investigators arranged for a federal wiretap on Samson and found that John Albert, the firm's head, was the "kingpin" of an interstate dumping operation. Samson brought the waste to Plymouth, Kingston, Middleborough and Halifax, all in Massachusetts. The John Albert Company then dumped it in remote places. Albert was indicted and pleaded guilty to conspiring to dispose of hazardous waste illegally. He was fined \$5,000 and given a three-year suspended sentence. McLaughlin said his office agreed to the suspension because Albert is already under a five-year sentence in New York for truck hijacking and will begin a two-year sentence for dealing in drugs.

Richard French, of Lewiston, Me., who was described as the go-between for the New Jersey operator and the John Albert Company, also pleaded guilty and was given a suspended sentence of two years. He had already been convicted and jailed on a separate charge of illegal dumping. □

The First Five Cleanups

By Carl Gagliardi

When EPA formally removed the first five waste sites from the Superfund's National Priority List on December 20, 1982, it put behind it the first lessons in how to use the program.

The variety of EPA's approaches to cleaning up these sites illustrates some patterns public officials will see again as the Agency tackles the problem of cleaning up the 546 sites now on the National Priority List.

A report on the corrective actions taken at the first five Superfund remedial sites removed from the list follows:

A State Takes the Lead:

Luminous Processes, Georgia

One of the first hazardous waste sites cleaned up under the Superfund program was an abandoned watchmaking factory labeled the "most radioactive waste site in Georgia." At one point, the EPA said the radioactive waste at this site was "relatively uncontrolled," and Georgia officials were saying the contamination had spread off the site.

Luminous Processes, a defunct manufacturing facility four miles west of Athens, Georgia, employed about a dozen people until it ceased manufacturing around July 1978. The company painted glow-in-the-dark watch and clock dials with the radioactive isotopes radium 226 and tritium.

Luminous Processes started operating in 1952 and was originally licensed by the U.S. Atomic Energy Commission (AEC). When Georgia received authority from the AEC to issue licenses for the uses of certain radioactive material in 1969 (then one of 25 states authorized by the AEC to do so), responsibility for regulation of the company was delegated to the state's Department of Health Resources (DHR).

In August 1977, Luminous Processes applied to the department to renew its license to use radioactive material at its facility. Three months later, the state sent officials of the department and the state's Environmental Protection Division (EPD) to visit the facility. The division inspectors, wearing protective clothing, conducted a detailed survey. They found traces of radioactive contamination both inside and outside the facility. In March

1978, Department of Health Resources officials and officials of the U.S. Nuclear Regulatory Commission inspected the site and found 20 violations of the state's health rules and regulations.

Later that year, Luminous Processes told the health officials that it was going to stop all its activities at the Athens plant. State officials told the company that it would have to amend its permit before it could decontaminate the plant property and that the company should submit a plan to do so.

In April 1979, the Department of Health Resources issued the amended permit. Luminous Processes hired contractors to decontaminate the property by removing radioactive dirt, along with the buildings and other structures. But the cleanup was stalled when Luminous Processes defaulted on its payments to the contractor. The company hired another contractor but again defaulted, leaving the job unfinished. Luminous Processes later went bankrupt, leaving the public with the cost of clean up.

Left on the site when Luminous Processes went out of business were a septic tank and barrels of radioactive earth dug up from the field where the tank had drained. They were left above ground and unguarded. A few nuclear warning symbols on the barrels and a cordon of rope were all that stood between the radioactive waste and potential trespassers.

Georgia Governor George Busbee formed a task force of state agencies to seek EPA's help and to begin legal proceedings against two companies—Luminous Processes and Radium Chemical Co. of Woodside, N.Y.—and seven individuals for violating Georgia's Radiation Control Act. The suit called for \$750,000 in actual damages and \$5 million in punitive damages. Governor Busbee then asked EPA to provide financial assistance under the Superfund program. The Luminous site was nominated as Georgia's number one priority, and the state requested funding for a planned removal.

EPA identified the site on the Interim National Priority list of 115 sites published in October 1981. It was the only Georgia site on that list.

(Carl Gagliardi is an EPA Headquarters Press Officer)

While waiting for financial assistance from EPA, the state task force completed detailed studies of the site and prepared a decontamination plan. Based on this plan, the state attorney general's staff asked contractors to submit estimates for removing radioactive material on the site and transporting it to a burial facility outside of Georgia. For the time being, the Department of Health Resources erected a fence around the closed watch factory to keep people from wandering onto the site.

In January 1982, EPA completed its review of all the information on Luminous Processes submitted by the state, and the agency allocated the necessary fiscal year 1982 federal funds (\$700,000) for remedial planning and cleanup of the site. Georgia agreed to take the lead in the project. Under a cooperative agreement between the state and EPA, Georgia committed money for its 10 percent share of the project.

In April 1982, EPA and the state signed a cooperative agreement, under which EPA provided \$731,629 and the state paid \$81,292, 10 percent of the total cost. Later that month, the governor signed it.

After advertising for bids, Georgia signed a contract with O.H. Materials Co. of Findlay, Ohio, to remove and dispose of the radioactive material. Work began in June 1982. Later, the state amended the contract to include disposal of additional soil and of contaminated materials inside the building. Excavated areas were filled with dirt, and the topsoil was revegetated. Over 18,000 cubic feet of radioactive material in 2,400 drums were removed and shipped to a licensed radioactive waste disposal site in Richland, Washington. O.H. Materials completed its job in a little more than a month at a cost of \$754,394—\$58,527 below the estimated \$812,921.

For the EPA, the cleanup of the Luminous Processes site represented a number of firsts in the development of the complex Superfund program: it was one of the first sites in the nation where remedial activities were completed, and it was the first involving cleanup of low-level radioactive materials under the Superfund. More important, the site had been rendered harmless. Gov. Busbee

thanked EPA for "excellent financial and technical assistance." And the Athens Banner-Herald called the Luminous Processes site cleanup a "testimony to the value of the Federal Superfund."

EPA Takes Over: Chemical Minerals Reclamation Co., Ohio

In one of the worst hazardous waste sites in Ohio, more than 2,000 drums of organic solvents, paints, resins and pesticides were stored haphazardly in and around a warehouse building which was in danger of collapsing. Much of this material was highly flammable, creating a fire and explosion threat, as well as a threat to anyone who came in direct contact with the release of vapors or runoff.

Chemical Minerals, an inactive reclamation, recycling and warehousing facility, is situated along the banks of the Cuyahoga River in Cleveland, Ohio. Rodney Cronin, who operated the company, leased the property from the Plain Dealer Publishing Company. The first drums of hazardous waste were brought to the site in 1979, when the Plain Dealer Publishing Co. was ordered by the federal district court to clean up another one of its sites in the Cleveland area. A U.S. marshal looked on as the drums were moved to the Chemical Minerals site.

Later that year, EPA sued the owners, and a court issued a temporary restraining order and a final court order that gave the agency the authority to remove the hazardous wastes and charge the costs to the owners.

In July 1979, the owners began cleaning up the site, but on July 2 the following year, a fire swept through a four-story warehouse on the site, sending thick black smoke over the West Side Cleveland neighborhood. Eight people were treated after inhaling the smoke, and Cronin was forced to shut down the site.

Six 3,500-gallon vats and 2,000 drums remained on the site. On February 27, the U.S. Coast Guard, working under authority of the Clean Water Act, was called in to remove several hundred of the leaky drums to prevent the hazardous waste within from running off into the Cuyahoga River. Then, the site was turned over to EPA for Super-

fund action, and it was one of those listed when the agency's Interim Priority List was published in 1981.

In November 1981, Cleveland's air pollution commissioner discovered that vandals had broken into the warehouse and tipped over several drums. Worse still, he found that teenagers were breaking through the concrete caps on drums containing toluene and benzene and were inhaling the fumes. In the wake of these discoveries, authorities began calling for a quicker cleanup.

On November 20, 1981, EPA approved the use of \$455,000 from Superfund—in addition to \$10,000 in Coast Guard money already spent—to remove and dispose of all the drums and the sludges in the vats. EPA sampling revealed that six of the drums contained oil contaminated with polychlorinated biphenyls (PCBs).

The first step in the cleanup process was to separate all the drums into compatible groups and to bulk them together to make disposal easier. All the liquid wastes were incinerated at the Rollins Environmental Services facility in Bridgeport, N.J. All solid wastes and sludges were solidified and land-filled. All told, more than 25,000 gallons of organic liquids and 4,000 gallons of inorganic liquids from vats and drums were removed from the site. A total of 1,600 drums were disposed of as well.

By May 25, 1982, EPA's removal action was completed. The city of Cleveland demolished the warehouse and removed its remains. Since the site was free of contaminants, it was taken off the National Priorities List.

Voluntary Cleanup: Walcott Chemical Warehouses, Mississippi

Until the early 1960s, the Walcott Chemical Company operated a fertilizer mixing plant in two warehouses in Greenville, Mississippi. The owner closed and abandoned the property, and because the owner was delinquent in paying taxes, the site became the property of the state. In one warehouse, drums, bins and bags containing mineral spirits, formic

Abandoned radioactive watchmaking factory near Athens, GA.



acid, nitrates and caustics were found in various stages of deterioration. Several large tanks outside the facility were filled with unknown materials.

The site, which is in a residential area and is close to several businesses, showed no evidence of either ground or surface water contamination caused by materials that had been spilled on warehouse floors or soil surrounding the warehouses.

However, in April 1981 the Greenville Fire Department filed a complaint against the warehouses with the Mississippi Department of Natural Resources (MDNR). After investigating the site, the department found 168 drums of chemicals in the warehouses.

In July 1981, the Mississippi Department asked EPA's Region 4 office to inspect the warehouses. EPA's Field Investigation Team started collecting samples of the materials on the site on July 12, and the agency turned them over to the state for analysis.

That same month, the state designated Walcott Warehouses as its top priority hazardous waste site under the Superfund program. Because of the potential for fire or explosion near a residential area, the site was included on EPA's first list of 115 top priority Superfund sites.

From the beginning, state officials took the lead in cleaning up the site. After looking at the site's field investigation reports, they decided that the best way to clean it up would be to remove the materials.

The state determined that Illinois Central Gulf Railroad owned the land on which the warehouses were built and had leased the land to Walcott Chemical, which had since gone out of business. After lengthy negotiations, the railroad agreed to clean up the site.

On May 3, 1981, the company's contractor, Modern Petroleum Technology, a Laurel, Mississippi firm, began removing drums from the warehouse, storing the chemicals in new drums and removing the material from the site. The railroad arranged to transport some of the materials to companies that could use them. Some of the chemicals were not contaminated with hazardous waste, and these were stored at local landfills.

A State's Call for Help: Chemical Metals, Maryland

The Chemical Metals Industries site in Maryland is actually two sites in a neighborhood in South Baltimore separated by a series of row houses. Chemicals, including cyanide, ammonia compounds, acids, caustics and heavy metal salts, were leaking onto the ground from more than 1,500 plastic and metal 55-gallon drums in various stages of deterioration. One large pile of drums was actually stacked up against the outside of one of the row houses. Maryland state inspectors found nine above ground tanks, seven of which were filled with unknown wastes.

On one site stood a processing plant; on the other was a storage facility. In between were the residents of the block of row houses—mostly elderly—who complained that chemical spills burned children and released fumes so intense they could not open their windows. Some residents complained to EPA officials that the sneakers of children who played in the neighborhood were slowly being eaten away by the pooled chemicals.

The chemicals were leaking into the ground with each rainfall. Agency officials warned that the chemicals, if mixed, could cause an explosion and fire or could be washed into nearby Gwynn Falls, which drain into Baltimore Harbor. And, when the air around the site was monitored, it was found that low concentrations of hydrogen cyanide and other organic vapors toxic to humans were drifting away from the site.

Despite these complaints, Chemical Metals continued to operate its facility without the necessary permits. After one of Chemical Metal's creditors filed a \$10,000 suit against the company in April 1981, it was placed in receivership. In a routine inspection of the site in August 1981, a state inspector discovered that the facility had been abandoned.

State officials, concerned with the safety of the residents in the nearby row houses and fearful that more contaminants were stored underground, called for federal help, citing their lack of resources to handle these hazardous wastes.

In September 1981, the Coast Guard

installed fences, removed flammable trash and installed sorbent barriers (barriers designed to restrict the spread of wastes while absorbing some portion of them). On October 9, 1981, responsibility for the cleanup of the site shifted to EPA, clearing the way for the agency to use Superfund money for the rest of the cleanup. Maryland designated Chemical Metals its number one priority for cleanup, and EPA placed the site on the Interim National Priority List as one of the top 100. Chemical Metals would be the first site in Maryland cleaned up under the Superfund program.

EPA's on-scene coordinator determined that the threat to nearby residents could be removed within a week by sampling, analyzing, categorizing and finally disposing of all the wastes at the worst of the two properties, the processing plant. And the storage facility could be rendered harmless by securing the drums and assuring the integrity of the storage and process tanks, including removing the liquids leaking from deteriorated tanks. In all, these measures would cost \$58,000.

After EPA issued a demand that the owners—who were assigned as receivers of Chemical Metals Industries—pay for the cleanup, the agency signed a contract with J&L Industries to serve as the prime cleanup contractor. Maryland contributions covered laboratory work, technical support and oversight.

The contractor began removing the drums on October 21, 1981, and the removal proceeded normally for two days, when potentially explosive zirconium was discovered at one location. EPA set aside more cleanup funds to remove the explosive materials, pump hazardous waste from the underground storage tanks, remove contaminated soil and debris and install and sample monitoring wells to check for groundwater contamination. Parts of the site were also capped and seeded.

By the time the work was finished on November 25, over 19,500 gallons of bulk liquids were removed from underground storage tanks, and 30,000 pounds of salvageable scrap metal and 1,561 drums were

removed. EPA spent a total of \$205,000 in Superfund money, with the remainder of the \$346,000 cost for the cleanup coming from Baltimore and the state of Maryland. The receivers for Chemical Metals reported to EPA that no funds were available to help pay for the cleanup from the insolvent company.

Federal and State Agencies

Join Forces:

Butler Mine Tunnel, Pennsylvania

When, on July 29, 1979, an oil spill into the Susquehanna River at Pittston, Pennsylvania, was reported to the Pennsylvania Department of Environmental Resources (PADER), state officials began looking for the source of the spill. They traced it to an alleged illegal dumping of millions of gallons of toxic waste and oil into an abandoned coal mine through a borehole three and a half miles inland from the river. The wastes had worked their way through the abandoned mine and out the Butler tunnel into the river, which was a source of drinking water for Danville and a popular river for recreation. Toxic waste was being discharged from the tunnel at a rate of 1,000 gallons a day. Department of Environmental Resources officials found several cancer-causing substances in the waste oil, including dichlorobenzene. Later, cyanide compounds were also found in the spilled waste.

Pennsylvania asked EPA to help stop the discharge. The agency's on-scene coordinator investigated Butler Tunnel on July 31, 1979, using funds under the Clean Water Act. EPA concluded that sorbent booms and filter fences should be installed at the site immediately, that the oil should be sampled to identify the chemicals in the spill and that the oil should be recovered and temporarily stored on the site until they chose the best way to dispose of or treat it.

The samples showed the oil contained sludge, aromatics, phenols, alkyl resins, hydrocarbons and other chemical compounds. EPA closed the affected area of the river to the public and began looking for the source of the discharge. It was critical that the source be found as soon as possible, since the flow of waste into the river was continuing.

On July 31, the on-scene coordinator sent a cleanup contractor to the site, and EPA's Environmental Response Team was sent to the area the next day. By the time the discharge was controlled, 18 federal, state and local agencies and 27 contractors had been involved.

Beside using sorbent booms and filter fences to control the discharge, the agency erected security fences at the Butler Mine Tunnel and tested the air when it was discovered that potentially explosive and flammable vapors were coming from the waste. Booms were placed downstream from the point where the oil was discharged to divert the floating oil, which had flowed 35 miles downstream, back to the river bank, where it could be removed from the river.

By August 10, the flow of oil was restricted to an area just a half a mile downstream from the tunnel.

In mid-October, the on-site coordinator, who was continuing the Department of Environmental Resources investigation into the dumping of toxic waste into the Butler Mine, turned up evidence that several thousand gallons of cyanide waste had been injected into the mine through the boreholes. EPA officials were afraid the chemical would mix with acidic mine water to form hydrogen cyanide gas, which could seep through the boreholes. This discovery led federal and state officials to shift their priorities and open up a second phase of the cleanup effort: to make sure the public's health was not affected by cyanide gas.

For the next few weeks, a team of EPA contractors, dressed in special suits, uncapped each borehole and tested for traces of the gas. After they sampled and monitored hundreds of such boreholes, they found evidence of the gas in only six of them, and those samples showed only low levels of the gas. This led them to the conclusion that most of the cyanide had left the mine already.

Once the agency was certain that no cyanide gas was trapped in the Butler Mine Tunnel, the only major problem left was to find a way to stop the globs or large single discharges of oil waste from escaping the tunnel into the river. Two such discharges had taken place in September 1979 and

March 1980, making it clear to EPA officials that something long-term would have to be done to control these chronic discharges. After studying the problem, EPA in December 1980 had an automated containment device and monitoring system installed in the mine tunnel at its discharge point in the Susquehanna. Although there have been no other discharges, the state has maintained this equipment ever since.

The cleanup of the Butler Mine Tunnel and the Susquehanna recovered 61,000 gallons of oily waste and tested 247 boreholes. The Department of Environmental Resources turned up evidence that the waste was disposed of by a ring of illegal dumpers from several states. They suspected this ring of dumping up to two million gallons of oil and chemicals a month by injecting them into the old coal shafts through one of the boreholes above the mine.

Those suspected of the illegal dumping were put under surveillance by the department, and they were the subject of a grand jury investigation. Pennsylvania issued an administrative order to a suspected polluter in August 1979. Several polluters later were convicted in state courts. They received sentences ranging from stiff fines to up to 20 years in jail.

The federal share of the cleanup—\$2.2 million—was paid for entirely by Clean Water Act funds before the Superfund Act became law. But the site was included on the list of 115 Interim National Priority sites, because it was uncertain whether the Butler Tunnel was still a danger to the environment. When it was clear that the site was cleaned up, it was removed from the list. □

Making the Superfund List

By David Cohen

Just before the Labor Day weekend, EPA Assistant Administrator Lee M. Thomas, speaking before a packed press conference at the Agency's Waterside Mall Headquarters, described a major step forward taken under the Superfund program to abate problems posed by abandoned hazardous waste sites around the country: EPA proposed that an additional 133 such waste sites be added to its National Priorities List, bringing the full complement of sites on that list to 546.

"The sites appearing on the list become immediate candidates for fund-financed long-term cleanup efforts," Thomas said. "They also become priority targets for private-party cleanup efforts through enforcement actions by states and EPA. We can now begin to take the steps at these new sites which ultimately will abate the dangers they pose."

Once site selection for the priorities list has been made, the necessary investigations and engineering studies for cleanups at the nation's worst sites which demand long range—or remedial—action can be worked out in conjunction with state governments. Action can occur through direct federal contracts, cooperative agreements under which states take the lead, and private-party cleanups based on voluntary or court-ordered actions.

Thomas warned that the expansion of the list "does not mean that bulldozers will be pulling up at the new sites tomorrow to complete cleanup. There is no quick fix to problems of this magnitude and complexity."

He noted that one of the lessons EPA has learned in its efforts to clean up abandoned sites under Superfund was that problems must be properly assessed. "Development of field and feasibility studies, monitoring and sampling, geologic and hydrologic determinations, and construction and disposal plans are all part of a time-consuming process," he said, "but they are essential for assuring that legal requirements are fulfilled and that construction and other actions are successful in abating hazards. We continue to expand the state of the art in a field of engineering that's in its infancy."

EPA is not limited to long-term actions under Superfund, Thomas added. The Agency is authorized to take immediate actions—called removal or emergency actions—to prevent site conditions from deteriorating or to prevent direct public contact with hazardous substances at the priority sites. EPA has initiated 189 of these removals which can be authorized at both priority list sites and sites not listed on the National Priorities List. Some 59 sites on the priority list have required emergency removal actions.

Under the new expansion, Nebraska and Nevada are the only states which do not have a site on the priority list. New Jersey has the most sites with a total of 85. Michigan is next with 48 sites, then Pennsylvania with 39, and New York and Florida with 29 each. The heaviest concentration of abandoned waste problems, according to the list, occurs in a belt of states stretching from Minnesota to New York across the northeastern part of the country. Across the southern border, Florida (29 sites), Texas (11), and California (19) contributed the greatest numbers to the list.

The National Priorities List is compiled primarily from a scoring system called the Hazardous Ranking System, designed to help evaluate the relative risk to public health and the environment posed by inactive or abandoned hazardous waste sites. Candidates for the list are proposed by the states and EPA regional offices and selected strictly on the basis of scores, with the exception that each state is allowed to designate one top priority site.

The ranking system considers pollution from abandoned sites via three pathways—air, groundwater, and surface water—which are measured for potential impacts. Fire, explosion hazards, and the possibility of people coming into direct contact with contaminants receive separate evaluations for possible emergency-response actions.

Of great interest at the press conference was an answer given by Thomas which seemed to re-open a subject that former EPA Administrator Anne Burford tried to close last December when the first 419 sites on the list were proposed. Burford said then that

she felt that reauthorization of Superfund after 1985 would not be necessary. When asked about reauthorizing the fund, Thomas replied, "The issue of reauthorizing Superfund is one that the current Administrator and I, along with others in the Agency, are now reviewing. We have a task group that is looking at where we've come with the Superfund Program and projections for the future. I think we will be in a position to draw conclusions and make recommendations by the first of the year."

Thomas was also asked if the "political and administrative turmoil" in the Superfund program before he took over has had any great effect. His answer: "I think it has had some fairly significant impacts. It's had an impact in that we probably have more funding than we thought we were going to have for the upcoming year. It's had an impact in that I spend a lot of my time testifying before congressional committees. It's had an impact in that I spend a lot of time talking with the press. It's had an impact in that I think we took a really thorough look at the Superfund program as far as our regulations and the progress we were making under the fund. And it's had an impact on a lot of the people who work in the program. These people work very, very hard and, I think, many of them got painted by a broad brush. These people are making good headway in a very difficult and complex program, and I think that has not come out clearly."

Two proposed modifications to the priority list process also were announced during the press conference. First, states will be able to flag sites where direct contact with hazardous materials poses a special threat. A toxic waste found in the soil could present such a case, for example.

Second, federal facilities with hazardous waste problems will be added to the priority list at the next updating in order to focus attention on the worst sites, although such facilities are ineligible for fund-financed action.

Both of these actions will require an

(Cohen is an EPA Headquarters Public Affairs Officer)

Location by EPA regional boundaries of the 14,100 hazardous waste generators known to be operating in 1981, the latest year for which complete national data are available. Region 5, with headquarters in Chicago, had the largest number of generators—3,240.



amendment to the National Contingency Plan, which prescribes general methods for addressing abandoned site problems under Superfund.

Superfund itself was authorized by Congress in December 1980 with passage of the Comprehensive Environmental Response, Compensation, and Liability Act. The statute authorizes a trust fund which is to accrue to \$1.6 billion by 1985, with roughly 86 percent of that amount coming from taxes on

hazardous waste generators and handlers and 14 percent coming from federal revenues. Besides making funds available for direct federal cleanup, the statute also empowers the government to compel private parties responsible for the site to take cleanup action. This authority also may be used to require cleanup at sites not on the priority list. Under the law, EPA must update the priority list at least one time each year. Thus far, five site restorations have been completed under the lengthy, complex and

expensive procedures required for long-term, remedial cleanups.

According to Thomas, "The update we've announced should add to the growing momentum in the Superfund program. Such measures are aimed at hastening the time when the numbers of sites cleaned up is greater than new site additions." □

An Overview on Dioxin

By Donald Barnes

(Excerpts from testimony before the Subcommittee on Natural Resources, Agricultural Research and Environment of the House Committee on Science and Technology, June 30, 1983)

My testimony this morning focuses on 2,3,7,8-tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD), what is generally considered to be the most toxic of the 75 chlorinated dibenzo-p-dioxins (CDDs). Although other CDDs are present in the environment and are being addressed, most public attention is being focused on this particular dioxin. My remarks are divided into three sections. In the first, I will briefly describe some of the situations in which EPA has been involved with 2,3,7,8-TCDD in the environment. Next, I will discuss the data and the methods we have used to assess the potential for human health effects in these cases. Finally, I will describe some of the gaps in our knowledge about 2,3,7,8-TCDD and the research that would help fill those gaps.

EPA first became aware of the hazards associated with 2,3,7,8-TCDD through laboratory animal studies conducted in the 1960s and early 1970s. At that time, the scope of the Agency's "dioxin problem" was defined by the presence of 2,3,7,8-TCDD as an unavoidable contaminant in certain pesticide products. During the 1970s, the Agency took action to restrict the use of certain of these pesticide products and to obtain more information about the toxicity of 2,3,7,8-TCDD and analytical methods for detecting its presence in the environment. Some of these efforts involved extensive cooperation between EPA, various academic institutions and environmental groups, other Federal agencies, and industry. By the end of the decade, this cooperative venture had succeeded in developing a reliable method to detect TCDD in some media in the low parts per trillion range. (One part per trillion is roughly equivalent to the thickness of a human hair compared to the distance across the United States.)

Donald Barnes is Science Advisor to the Assistant Administrator for Pesticides and Toxic Substances. He has been chairman since 1980 of EPA's Chlorinated Dioxins Work Group, which has been assisting in the coordination of EPA's involvement in dioxin-related matters. Barnes has also been EPA's representative on the Cabinet Council's Agent Orange Work Group.

In 1979, based on extensive animal data and epidemiologic information, the Agency took emergency action to suspend certain uses of 2,4,5-T and Silvex, two pesticide products which contain 2,3,7,8-TCDD. That ban remains in effect at this time.

Also in the late 1970s, the Agency took action in connection with a series of dumpsites along the Niagara River in New York, some of which were found to contain 2,3,7,8-TCDD wastes. These wastes were found along with a range of other hazardous substances which had resulted from previous manufacturing operations in the area. During the same time period, the Agency provided technical assistance in the successful cleanup of a smaller dioxin-contaminated dumpsite in Missouri.

By 1979, the possibility of a range of dioxin emissions from combustion processes had become an issue. During this period, the Agency carefully investigated the question of the emission of 2,3,7,8-TCDD, other TCDD isomers, and tetrachlorinated dibenzofurans (TCDFs) during the combustion of polychlorinated biphenyls (PCBs) at two hazardous waste incinerators in the midwest.

In 1980 and 1981, the Agency participated on a United States team, headed by the Food and Drug Administration (FDA), which met with Canadian officials to determine the presence of 2,3,7,8-TCDD in fish in the Great Lakes, assess the significance of these findings, and discuss ways to reduce or remove any sources of contamination.

In 1980, the Agency issued a rule that requires 60-day notification to EPA prior to the disposal of most 2,3,7,8-TCDD contaminated manufacturing wastes. This 60-day period gives the Agency the opportunity to assess the risks associated with the proposed disposal and to take action if those risks are judged too unreasonable.

In 1981, furthering its assessment of the emissions from combustion processes, EPA completed a series of studies of TCDD emissions during the combustion of municipal wastes. TCDDs, including small amounts of 2,3,7,8-TCDD, were detected at four of five facilities sampled. An interim evaluation of the significance of these TCDD

emissions for human health was issued in November 1981, and it was concluded that the emissions "do not present a public health hazard for residents living in the immediate vicinity" of the facilities tested.

More recently, the Agency has been active in identifying sites in several states, predominantly in Missouri, which have been contaminated with 2,3,7,8-TCDD as a consequence of manufacturing activities or the injudicious disposition of wastes.

Finally, I would like to mention that an EPA Task Force on Dioxins, with representatives from several program offices, is currently developing an overall strategy which will recommend specific actions and coordination mechanisms to address the wide range of dioxin questions. The top management at EPA now has this strategy under review.

I have included this chronology neither to seek commendation nor to evoke sympathy, but rather to illustrate that the Agency is no stranger to 2,3,7,8-TCDD and the challenge it presents to those required to make decisions regarding unreasonable risks to human health and the environment.

The data base on 2,3,7,8-TCDD toxicity is extensive, but certainly not exhaustive. Much of what we know has been obtained from animal studies. For example, we know that the material is lethal to a variety of animal species when administered in single, small doses (less than a millionth of a gram in some species). We know that there is a 1000-fold range of toxic response among various species in these lethality studies. We know that 2,3,7,8-TCDD is carcinogenic in rats and mice at very low doses (via both ingestion and dermal absorption), resulting in a variety of tumors in these animals. We know that, as a carcinogen, it can at least behave as a promoter, a compound capable of eliciting frank carcinogenesis in animals which have been previously exposed to other carcinogens, and as a cocarcinogen. We know that the compound can interfere with reproductive success in females, especially pregnant ones, of several species (including rats, mice, rabbits, and monkeys), often at very low doses. We know that the material can affect elements of the immune system in test animals. In addition, there are a

number of other effects which have been observed, including organ damage (for example, to the liver and thymus), metabolic disruptions, and significant enzymatic changes.

In the area of human health effects, our folder of known information is somewhat slimmer. This is partially due to the fact that most human data are obtained from occupational exposure and industrial accidents. In these cases, it has been difficult to estimate the level of 2,3,7,8-TCDD exposure in individual cases or to distinguish the effect of concomitant exposure to other chemicals. In any event, there is general agreement in the scientific community that chloracne, a persistent, acne-like condition which can be disfiguring but which is not life-threatening, is associated with persons acutely exposed to 2,3,7,8-TCDD. Chloracne can also be evoked by a number of chlorinated hydro-

carbon chemicals in addition to 2,3,7,8-TCDD. Other effects which have been associated with these exposure incidents, and which are generally considered to be short-term, include liver dysfunction, effects on the immune system, and various neurological complaints.

A series of reports has associated human exposure to 2,3,7,8-TCDD-containing chemicals and a rare form of cancer, soft tissue sarcoma. This possible link was first reported in a pair of studies of Swedish workers, and additional, but not definitive, support for the association was found by re-assessing studies completed here in the United States, in which isolated cases of soft tissue sarcomas have been found in 2,3,7,8-TCDD exposed populations. However, other studies both here and abroad have failed to

confirm this association. This possible association is being explored in a number of current or planned studies by various government agencies.

In considering risk, one must remember that it is a function of two variables: hazard and exposure. A reduction in the size of either variable will result in a comparable reduction in risk. For example, even the most hazardous substance will be of no risk, if its exposure to people and the environment can be reduced to zero. In evaluating risk, the Agency combines hazard information (data on inherent toxicity) and exposure data to arrive at quantitative estimates of risk. To illustrate, I will briefly discuss how the Agency assesses carcinogenic and reproductive effects.

The Agency assesses the excess risk of cancer using the methods of the Cancer Assessment Group (CAG), whose guidelines were published in 1976. Briefly, the Agency first examines the data base to make a determination as to whether the chemical substance is a carcinogen. In addition to the qualitative question, a quantitative extrapolation to low environmental doses is performed in order to estimate a rough upper bound for the risk, using a linear, non-threshold procedure. This presumes that the initiation of cancer is a non-threshold phenomenon; that is, there is some risk, perhaps very small, at any exposure above zero. In the case of 2,3,7,8-TCDD the Agency has based its quantitative analysis primarily on the linearized, multi-stage extrapolation model, although several others have also been used on occasion. It should be pointed out that these procedures result not in an absolute prediction of the risk, but rather a "ballpark" estimate of the upper limit of risk which we do not believe will be exceeded. The actual risk is likely to be some value less than this upper limit, possibly zero. These extrapolation procedures indicated that 2,3,7,8-TCDD was quite potent compared to many other carcinogens evaluated using the same techniques.



The magnitude of the risk depends heavily on the level of 2,3,7,8-TCDD to which people are exposed and the likelihood that this exposure results in an absorbed, toxicologically active dose. Usually, we do not have definitive information on human exposure. In lieu of such data, the Agency makes certain assumptions, usually of the "reasonable worst case" variety, so as to err on the side of public safety. For example, in the case of TCDDs emitted from combustion sources, the Agency assumed that a person might spend his entire life at the spot of highest estimated ground level concentration, that all TCDDs inhaled would be retained, and that TCDDs attached to particles would be completely biologically active. "Reasonable worst case" estimates of exposure, when combined with the extrapolation results, lead to an estimate of the upper limit of risk.

In contrast to cancer, the Agency has generally regarded reproductive hazard as one for which there exists a level of exposure below which it is not expected that an adverse effect will occur, the so-called "threshold assumption." In assessing this type of risk, the scientist uses an adequate study in which an administered dose level resulted in no observed adverse effects (NOAEL) in test animals and compares it to the generally smaller level of estimated human exposure. The ratio of the NOAEL to this estimated human exposure is referred to as the margin of safety.

In the case of 2,3,7,8-TCDD, the Agency used a study in which rats were followed over three generations to determine the effect of 2,3,7,8-TCDD on the reproductive success of the animals. Although the authors of the study reported that no consistent adverse effects were observed at the lowest dose tested, EPA scientists concluded that statistically significant effects were observed at that dose and that the study lacked sufficient statistical power to conclusively demonstrate a NOAEL. This issue has been the source of considerable debate. Therefore, in comparing the lowest dose tested to the estimated exposure dose in humans, the Agency speaks of a "confidence ratio,"

instead of a "margin of safety."

In recent decisions associated with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or "Superfund"), the Agency has also made use of risk evaluations generated by the Centers for Disease Control (CDC). In general, CDC uses methods which are comparable to those of the Agency.

In a typical 2,3,7,8-TCDD-related situation, Agency scientists provide decisionmakers with the results of a risk assessment; i.e., estimated upper limits of cancer risk and confidence ratios for reproductive effects associated with various exposure scenarios. The assumptions and limitations of the approach should be explicitly stated. At this point, risk assessment ends and risk management begins.

The distinction between risk assessment and risk management has been highlighted in the recent report of the National Academy of Sciences (NAS) entitled *Risk Assessment in the Federal Government*. Generally, risk assessment is an objective, scientific evaluation of the magnitude of the risk, independent of considerations of what should be done about that risk. Risk management is the decisionmaking process, involving more subjective, societal judgments which consider certain non-risk factors when selecting an appropriate response to the risk. In a speech delivered at the NAS, EPA Administrator Ruckelshaus emphasized this difference, stating that the two processes should remain separated within a regulatory agency.

In its letter of invitation to these hearings the Subcommittee has asked EPA specifically, "What evidence on the effects of dioxin on human health justifies establishing a dioxin concentration standard of one part per billion in soil and how should such a standard be interpreted and used?" I believe your question may have been promoted by EPA's recent relocation action under "Superfund," and EPA welcomes the opportunity this hearing affords to clarify what has been erroneously characterized by some press reports as an EPA "safe" level of dioxin.

First of all, there is no simple level which will give rise to equivalent risks in all cases. Even if one were to decide on an acceptable

level of risk, the key question of exposure must be addressed on a site-specific basis before making any estimate of an acceptable level of contamination in the soil. For example, a decisionmaker could conclude that greater than 1 ppb of 2,3,7,8-TCDD in the soil of one person's front yard might represent an unreasonable risk, since such a person might not be expected to easily or reasonably limit his exposure to this soil. That same decisionmaker could conclude, however, that many times that level is acceptable in an isolated spot at a manufacturing site or at the bottom of a reclaimed dumpsite where people are unlikely to be exposed. In sum, the determination of an acceptable level is dependent upon many factors, and it is an oversimplification to seek a universally applicable level.

Second, the act of establishing a level is no longer in the realm of risk assessment; instead, this is the province of risk management. In assessing risks, scientists can, for example, present the decisionmaker with a graphical summary illustrating the possible range of risks associated with various exposure scenarios and contamination levels in the soil. In reaching the risk management decision, the decisionmaker weights all the elements of the risk assessment; i.e., the qualitative case, the quantitative case, the exposure assessment, and the limitations and uncertainties involved. In addition, the decisionmaker factors in non-risk considerations, which might include feasibility and cost of clean-up, possible alternative actions, consistency with regulation of other risks, and concerns of the affected community. In sum, while the scientists may agree that a certain spectrum of risk is associated with different levels of contamination and exposure, precisely where on that spectrum a decisionmaker determines the appropriate level to be will vary as factors specific to a given situation are considered.

Thus, EPA has not adopted a generally applicable action level for "Superfund" purposes; rather the Agency continues to make decisions on a site-by-site basis, taking into consideration both the CDC health advisories and any special on-site circum-



stances in determining action at individual sites.

Finally, I would like to address some of the gaps in our scientific knowledge about toxicity of 2,3,7,8-TCDD in the environment and what type of research would improve the scientific data base for decisionmaking.

1. Toxicity of 2,3,7,8-TCDD in complex mixtures

Most of the data generated to date has been with 2,3,7,8-TCDD alone. In the environment, however, we usually encounter the compound in combination with other materials and associated with particulates; e.g., soil or fly ash. The effects of dioxins in the presence of these other materials need to be investigated to answer questions of synergism and bioavailability. Promising techniques for assessing "TCDD equivalents" of

such complex mixtures should be developed further.

2. Exposure issues

We need to know more about the ways 2,3,7,8-TCDD moves in the environment; e.g., possibility of volatilization, bioaccumulation from soils into fish, dermal penetration, and the amount of soil children might ingest.

3. Disposal/destruction methods

Currently, adequately tested and practical methods for disposal and/or destruction of dioxin contaminated materials are limited. Much work remains to be done to determine how best to deal with this material once it has been discovered in the environment.

4. Epidemiological studies

Various Federal agencies are now conducting epidemiological studies to investigate the possible effects of 2,3,7,8-TCDD in humans. There are additional studies which could be

conducted, involving populations near more recently discovered contamination sites.

5. Background levels

It would be helpful to know the background level of 2,3,7,8-TCDD in various parts of the environment, such as land, various foods, and human tissue. This information could serve as valuable benchmarks.

6. Related compounds

There are 74 other chlorinated dibenzop-dioxins and 135 chlorinated dibenzofurans, some of which are also of concern and appear in the environment. Activities need to be encouraged to deal with these compounds on a rational, deliberate basis.

7. Mechanism-of-action studies and pharmacokinetics

Important information is currently being deduced about the first stages of toxicity induced by 2,3,7,8-TCDD and related compounds. As we obtain more fundamental knowledge about what is happening at the molecular and cellular level, the possibility of our being able to understand exactly how and why 2,3,7,8-TCDD exerts its toxicity increases. This information may help us explain the basis of the species variability and where humans fall in this range of reactions. Moreover, we may then be able to assess the toxic potential of literally hundreds of related toxic chemicals without devoting to each individual compound the mass of resources we have had to dedicate to 2,3,7,8-TCDD.

As a final word, I would like to observe that it is important that we keep the dioxin problem in a proper perspective. I believe we need to address the dioxin issue in a rational, deliberate manner. At the same time, we should not permit this legitimate concern to cause us to neglect other legitimate concerns, such as those embodied in the pools, pits, and lagoons of abandoned dumpsites, the emission of toxic pollutants into our air and water, and the potential for unreasonable risks associated with chemicals to which we are exposed daily. As scientists and regulators, we have an obligation to maintain a balance among all of these concerns. □

The Towers of Tacoma

Fifty-foot tall air stripping towers were built recently with approximately \$1 million in Superfund money in Tacoma, Wash., under an EPA contract to correct a pollution problem affecting some of the drinking water supply for this city. Approximately five million gallons a day of water is pumped through these fiber glass towers. As the water cascades back down the towers through a porous material, air is forced upward from underneath to strip the chemical pollutants which are discharged into the air in low concentrations through the tower tops. The EPA Region 10 office, headquartered in Seattle, is investigating to determine if nearby industries are the source of the pollution contaminating the well water. □



This photo shows funnels and fans at bottom of towers.

Stripping tower is lifted into place by a crane.



Workmen complete project at base of the towers.



Philip Wong, Region 10 environmental engineer, explains operation of the towers to a visitor.



New EPA Appointments

Courtney M. Price

John Martin

Jean Statler

Gregg Ward



Six new appointments have been made recently at EPA and five key officials have been confirmed in their posts at the agency by the U.S. Senate.

Courtney M. Price was confirmed as Assistant Administrator for Enforcement and Compliance Monitoring for the EPA. Price had been serving as Special Counsel for Enforcement at the EPA. Previously, she was Associate Administrator for Rulemaking at the National Highway Traffic Safety Administration in 1982-1983 and Deputy Chief Counsel at the Administration in 1981, staff attorney in the Office of the General Counsel at the Department of Energy in 1979-1981 and prior to that, an associate attorney with two law firms in Los Angeles.

A native of Jackson, Miss., Price received her A.B. degree from the University of Alabama in 1963 and her law degree from the University of Southern California in 1975.

Jack Ravan has been confirmed as Assistant Administrator for Water Programs. Ravan had previously served as EPA Regional Administrator for the agency's regional office in Atlanta in 1971-1977.

A graduate of the U.S. Military Academy, Ravan had served since 1982 as Director of Project Development, Clean Water Group, Wheelabrator-Frye in Atlanta. Earlier he had served in several State and business posts in Georgia.

John C. Martin has been confirmed as Inspector General of the EPA. Martin has been serving as Assistant Inspector General at the Department of Housing and Urban Development since 1981. Previously, he was Supervisory Special Agent for the Federal Bureau of Investigation in 1976-1981; Special Agent, FBI, in 1971-1976; Assistant to the City Manager, City of Rockville, Maryland in 1968-1971; and Deputy City Manager, City of Wilkes Barre, Pennsylvania in 1967-1968.

Confirmed earlier by the Senate were Josephine S. Cooper as Assistant Administrator for External Affairs and A. James Barnes as General Counsel.

Four of the six recent appointments made by EPA Administrator William D. Ruckelshaus have been in the Office of External Affairs under Assistant Administrator Cooper. They are:

—Jean Coultas Statler as Director of Public Affairs.

Statler joined the EPA on July 25 as a special assistant to Cooper. Prior to that she was Legislative Counsel for energy and environment for the U.S. Chamber of Commerce, directing its lobbying efforts in Congress.

Before being named Legislative Coun-

sel at the Chamber in December, 1981, Statler was the environmental reporter for two years for the Chamber's national weekly newspaper, Washington Report. Statler began her government career in 1976 as chief speechwriter for Sen. Charles Percy (R., Ill.).

A native of Jacksonville, Ill., Statler received her bachelor of arts degree in 1976 from Southern Methodist University in Dallas, Texas. She majored in journalism and was a member of the staff of SMU's campus newspaper and radio station.

—Gregg Ward as Director of Congressional Liaison.

Ward served as Director of Governmental Affairs for the Sheet Metal and Air Conditioning Contractors' national association for the last six years, where he was responsible for the management of all legislative and regulatory affairs. Before that he served as the trade association's Assistant Director of Labor Relations.

From December 1975 to May 1977, Ward was a Special Assistant to the Regional Administrator in the Philadelphia office of the U.S. Department of Housing and Urban Development (HUD). Prior to that, he was a legislative aide with the Department of Justice.

A native of Syracuse, N.Y., Ward received his bachelor's degree in business

Allan Hirsch

Deborah Steelman

Nathaniel Scurry

Dr. Benjamin C. Dysart III



administration from the University of North Carolina in Chapel Hill in 1972.

—Allan Hirsch as Director of Federal Activities.

For the past year Hirsch was Deputy Director of the International Institute for Applied Systems in Vienna, Austria. Prior to that he was Deputy Assistant Administrator for Environmental Processes and Effects Research in EPA's Office of Research and Development. He began his governmental career in the U.S. Public Health Service and later became an Assistant Commissioner when the Federal Water Pollution Control Administration was formed in 1966.

After that, Hirsch moved on to key positions with the National Oceanic and Atmospheric Administration in 1972 and the U.S. Fish and Wildlife Service in 1974 and returned to EPA's Office of Research and Development in 1979. He earned his bachelor's and master's degrees in zoology at Michigan State University and a PhD in conservation from the University of Michigan. He was a Fulbright Scholar at Canterbury University in New Zealand in 1956-1957.

—Deborah Steelman as Director of Intergovernmental Liaison.

Steelman was most recently the legislative director for Senator John Heinz

(R-PA). Previously, she was Deputy Director of the Missouri Department of Natural Resources and energy issues in the Washington office of Governor Christopher S. Bond of Missouri. In 1979 she worked as an assistant public defender in Kansas City, Mo.

A native of Missouri, Steelman has a law degree from the University of Missouri and is a member of the Missouri Bar. She received a master's degree in political history from the University of Missouri in 1979.

Also appointed was Nathaniel Scurry as Director of the Office of Civil Rights. Scurry has held four positions in the Office of Management and Budget, including Chief of the Reports Management Branch from November 1981 to the present; Assistant OMB Director for Civil Rights Policy, October 1979 to November 1981; Senior Budget Examiner, August 1971 to June 1979, and Equal Employment Opportunity Officer, June 1978 to June 1979.

Scurry was also Deputy Director of the D.C. Budget Office, an operations research analyst/mathematician for the National Bureau of Standards and a quality control data analyst for General Electric. He graduated from Clark College in Atlanta in 1970 with a degree in mathematics and did graduate work at George Washington University in Washington, D.C.

Administrator Ruckelshaus also appointed Dr. Benjamin C. Dysart III, a nationally recognized expert in water quality, to EPA's Science Advisory Board. Dr. Dysart is a professor of engineering in the environmental systems engineering department at Clemson University. He is being appointed to the Environmental Engineering Committee of the Advisory Board.

Dr. Dysart has considerable experience in the environmental concerns of energy production, non-point source pollution controls, environmental impact assessment, design of water quality monitoring programs and national water resources policy. In addition to his position at Clemson, Dr. Dysart is President of the National Wildlife Federation, a member of the Association of Environmental Engineering Professors, and a member of the Water Pollution Control Federation. □

Update

A review of recent major EPA activities and developments in the pollution control program areas.

AIR

Truck Standards

EPA has issued standards that will reduce tailpipe emissions of hydrocarbons and carbon monoxide from most heavy duty gasoline trucks by 90 percent. The 90 percent reduction, which is required by the Clean Air Act, uses 1969 truck emissions as a baseline.

The standards, which go into effect with the 1987 model year, apply to trucks weighing up to 14,000 pounds, representing more than 70 percent of the vehicles in this class. They will for the first time require the application of catalytic converter technology to these vehicles. Catalytic converters have been used to control emissions of hydrocarbons and carbon monoxide on passenger cars since the 1975 model year. These controls will cost an estimated \$223 per truck.

Equivalent emission standards for heavy duty diesel trucks go into effect beginning with the 1985 model year.

Auto Recall

EPA has ordered General Motors Corporation to recall approximately 112,000 1979 model year vehicles that are exceeding the federal emission standards for carbon monoxide.

EPA has determined that these vehicles have average CO emissions which exceed the 1979 federal emission standard of 15 grams per mile.

The affected vehicles are 1979 Chevrolet Chevettes equipped with the base option (L-17) 1.6 litre engine and automatic transmission. California vehicles are not included in the recall.

Under the recall provision of the Clean Air Act, GM has 45 days to submit a plan to remedy the pollution problem on these vehicles or to request a hearing. Once EPA has approved the plan, GM will notify owners whose cars are involved. The cars will be repaired by GM dealers at no cost to the owners.

GM had indicated that it would voluntarily recall these vehicles but that it would limit free repair to those which are under five years old and have mileage under 50,000 miles when brought to the dealership. While this limitation reflects GM's interpretation of its responsibility under the Act, GM and EPA are in litigation over this issue. EPA believes the Act requires GM to recall and repair all of the cars at no cost to the owner. This order assures that all of the vehicles will be appropriately repaired pending the outcome of the litigation.

Fuel Economy

U.S. automobile manufacturers have achieved nearly a 100 percent improvement in fuel economy over the last decade, according to 1984 model year mileage figures released recently by EPA.

The agency said that when the mileage estimates were first published in 1974, domestic cars averaged 13.2 miles per gallon (MPG). The projected fleet average for the 1984 domestic models is 25.6 mpg, up 94 percent from 10 years ago. The projected fleet average for all 1984 foreign and domestic cars is 26.9 mpg, improvement of 89 percent from the 1974 level of 14.2 mpg.

The top rated model for 1984 is the Honda Civic Coupe at 51 mpg, the first gasoline-fueled vehicle to top the ratings since the 1976 model year. Other high mileage vehicles, except for the Toyota Starlet, are all diesel-powered, with the fuel economy estimates ranging from 50 to 43 miles per gallon.

The top domestic cars are all diesel-powered vehicles produced by Volkswagen of America, Ford and General Motors, with the VW Rabbit rated highest at 47 mpg, closely followed by the Ford Escort and Lincoln-Mercury Lynx at 46 mpg.

Air Policy

EPA has issued its formal policy on how and when economic sanctions might be applied to areas not meeting air quality standards.

The new policy formalizes the announcement made by EPA Administrator William D. Ruckelshaus last June when he indicated that the agency will not impose sanctions such as construction bans or funding restrictions in areas which had approved plans but failed to attain air quality standards by the Clean Air Act deadline of December 3, 1982.

Sanctions will not be imposed, Ruckelshaus said, solely for failure to attain air quality standards when reasonable efforts have been made to carry out EPA-approved implementation plans.

Basically, EPA wants the states to correct the deficiencies in their State Implementation Plans in areas where standards haven't been met, and then to fully implement their plans. The policy sets out in a general manner the steps necessary to accomplish that objective, and describes the legal consequences of failure to do so.

The recent announcement does not impose or lift any sanctions in any area. Instead it provides states with the opportunity to correct the deficiencies in their State Implementation Plans before EPA proposes construction or funding restrictions.

ENFORCEMENT

Cleanup Agreement

EPA recently announced that 246 companies have agreed to clean up the Environmental Conservation and Chemical Corporation (Enviro-Chem) site, a major hazardous waste site in Zionsville, Ind., near Indianapolis.

This is the largest number of companies ever to agree to such a settlement. The cleanup is expected to cost \$2.9 million. The settlement was subject to a 30-day public comment period.

At the same time, the Department of Justice, at EPA's request, filed suit against the site's owners and operators and 26 other companies which sent waste to the site but who did not participate in the settlement. The suit, filed under the federal Superfund law and the Resource Conservation and Recovery Act, seeks to recover \$300,000 in funds spent by EPA earlier this year to reduce potential danger to the public health and the environment.

Enviro-Chem began operations at the site in 1977. By 1982, the 6 1/2-acre site was packed with 25,000 drums, 56 bulk tanks with over 300,000 gallons of contaminated sludges and water, 1.5 million gallons of contaminated water in ponds

and on the surface and 5,200 cubic yards of contaminated soil, all raising the concern of possible explosion and fire, as well as contamination of nearby streams and drinking water supplies. In July of this year, EPA began an emergency cleanup of the site under Superfund.

PESTICIDES

EDB Action

The EPA has ordered the immediate emergency suspension of ethylene dibromide (EDB) as a soil fumigant for agricultural crops. At the same time, the agency announced the cancellation and phase-out of all other major pesticide uses of EDB.

In taking this emergency action, EPA cited significant new evidence that EDB is contaminating groundwater supplies in a number of states. Laboratory test results have shown EDB to be a carcinogen and mutagen that causes reproductive disorders in test animals.

EDB, a persistent halogenated hydrocarbon, has been registered as a pesticide since 1948. Over 300 million pounds (150,000 tons) of EDB are produced annually in this country. Over 20 million pounds of that are used as a pesticide. The remainder is used as an additive in leaded gasoline. Of the 20 million

pounds of EDB used for agricultural purposes, over 90 percent is used as a soil fumigant. The use of EDB as a soil fumigant was suspended. The remaining EDB is used to fumigate stored grain, on grain milling machinery, as a fumigant to quarantine citrus and other tropical fruits and for a number of minor uses.

The emergency suspension, the most restrictive measure EPA can take under the law, will immediately halt the sale and distribution of EDB registered for soil fumigation. It is applied prior to planting to control nematodes and other soil insects. As a soil fumigant it is used on citrus and fruit trees, soybeans, pineapples, cotton, tobacco, peanuts, and over 30 additional fruit and vegetable crops.

Pesticide Controls

EPA has taken final regulatory action on two pesticides, strychnine and lindane, following an intensive risk and benefit review of both products.

The agency is cancelling the use of strychnine, a common rodent control bait poison, for prairie dog control and a number of other small rodents and mammals because it has the potential of destroying both nontarget and endangered species. These uses account for approximately 20 to 25 percent of the outdoor, above ground uses of strychnine which were the issue of the agency review. Zinc phosphide is considered a viable

alternative to the cancelled pesticide uses for prairie dog control.

In addition to prairie dogs, the agency's cancellation action on strychnine also includes uses for the control of deer mice, meadow mice, chipmunks and woodchucks on rangeland, pastures and cropland; and all rodents and small mammals with the exception of ground squirrels, woodchucks (around rock piles and lava outcrops), jackrabbits (around airports), and porcupines in nonagricultural sites.

EPA's action on lindane, an insecticide used in homes, farms and for treating hardwood logs, includes the cancellation of indoor uses in smoke fumigation devices and the use of dips on dogs to control pests other than mites. All other uses of lindane will be continued with certain restrictions.

RADIATION

Standards

EPA Administrator William D. Ruckelshaus recently issued final standards to reduce the amount of radiation released during uranium milling operations and to require the safe long-term disposal of uranium mill tailings. The standards are designed to reduce significantly public exposure to radiation from mill tailings.

"At the same time," Ruckelshaus said, "I am struck by the wide divergence of views as well as a number of scientific and technical uncertainties toward these standards. We expect that engineering studies at inactive sites and our activities to regulate radionuclides under the Clean Air Act will assist us in updating and refining information which may cause us to review these standards in the future."

There is substantial uncertainty in the health effects estimates because of uncertainties in the rate of release from tailings sites, the exposure people will receive from its decay products, and from incomplete knowledge of the effects on people of these exposures.

The new standards, proposed on April 29, 1983, will require proper disposal of tailing piles to be effective, in most cases, for 1,000 years. Radon releases from the piles will be limited to less than 20 picocuries per square meter per second. A picocurie is a trillionth of one curie, the standard measure of radiation. Current unregulated tailing pile release rates are typically 10 to 50 times greater than the new standards.

TOXICS

Incineration Permits

EPA has made a tentative determination to issue special and research permits to transport and dispose of mixed liquid organic compounds by incineration ships at a designated site in the Gulf of Mexico. The final decision will not be made until after the public has had an opportunity to comment.

The permits would go to Chemical Waste Management, Inc. of Oak Brook, Ill. and Ocean Combustion Service, B.V., of Rotterdam in the Netherlands. The vessels are the M/T Vulcanus I and M/T Vulcanus II.

The proposed special permits would authorize the applicants to use the vessels over a three-year period to transport and incinerate at a designated site in the Gulf a total of 300,000 metric tons (approximately 79.7 million gallons) of mixed liquid organic compounds including PCBs and low concentrations of dioxin. DDT will be incinerated under a separate six month research permit.

Chemical Review

EPA and the Department of Labor's Occupational Safety and Health Administration (OSHA) have announced a joint call for information to consider regulating the industrial chemical 4,4'-methylenedianiline (4,4'-MDA).

The effort by the two agencies follows an earlier decision by EPA to accelerate study of 4,4'-MDA. The purpose is to determine whether 4,4'-MDA poses significant risks to human health and to examine the appropriate control measures to limit such risks.

4,4'-MDA is used primarily as an intermediate chemical to aid in formation of other chemicals and plastics such as polyurethane foams and other polyurethane products.

The National Toxicology Program (NTP) conducted studies on 4,4'-MDA and found it to be carcinogenic in both laboratory rats and mice. EPA and OSHA scientists reviewed the NTP studies and agreed there is evidence that 4,4'-MDA is a carcinogen in animals and could pose a risk to workers manufacturing and processing the chemical.

WATER

Protection Programs

In an effort to prevent contamination of underground sources of drinking water, the EPA has announced proposed regulations that will establish EPA-run underground injection well control programs in the 23 states and territories that have not accepted the responsibility for running their own programs.

When these Underground Injection Control (UIC) programs are established, there will be a UIC program either in operation or nearing approval in all 57 states and territories. This will ensure that all underground sources of drinking water are protected nationwide from underground injection wells.

The regulations will establish Underground Injection Control programs in Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Idaho, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New York, Pennsylvania, Tennessee, Virginia, American Samoa, Northern Mariana Islands, and the Trust Territories. All Indian lands in these 23 jurisdictions, and in states which do have primary enforcement authority for the UIC program but do not have jurisdiction over Indian lands, are also included.

The agency has made a comprehensive effort to grant states primacy. The 23 states and territories that did not accept the program, either because they didn't apply or because their programs were not adequate, were aware that EPA would be implementing its own program in the absence of their own. These states can apply for primacy in the future.

AGENCYWIDE

Personnel Efficiency

A task force of the National Academy of Public Administration is conducting interviews of EPA employees who work in 14 cities with a view to improving personnel efficiency within the 12,000-employee agency.

The interviews are part of a comprehensive six-month review of budgetary and personnel practices by the National Academy, under contract to EPA.

Specific personnel issues being examined include communications between headquarters and regional offices and laboratories, staffing, performance appraisals, merit pay, incentive awards, salaries, employee rights, affirmative action, executive utilization, career development and labor relations.

Small Business

EPA will sponsor a conference with members of the small business community early next spring to evaluate the problems small businesses have in complying with environmental regulations. The conference is intended to help the agency develop a policy for dealing with those problems.

Agency officials said that over the next few years small businesses will be investing thousands of dollars to comply with environmental regulations. They often will not have the necessary resources and time to handle the extensive amount of paperwork and red tape that accompanies the regulations. The major objective of the conference is to find ways to help small businesses comply with the regulations, yet remain economically competitive.

The conference is scheduled for March 4-6, 1984, at the Capitol Hilton Hotel in Washington, D.C. Registration forms with additional information will be available in November. Questions should be directed to the Conference Secretary at 382-4538 or 800-368-5888. □

EPA's Opportunity to Communicate

(Excerpts from testimony by Josephine S. Cooper, EPA Assistant Administrator for External Affairs, at her confirmation hearing before the U.S. Senate Committee on Environment and Public Works)

I am honored . . . to appear before you today in connection with my nomination by the President to serve as EPA's first Assistant Administrator for External Affairs because I fully share your interest in seeing that EPA aptly implements the laws that Congress has charged it with overseeing.

As one who has worked closely with the Agency and the issues which concern it—first as an EPA civil servant for 12½ years and later as a member of the Environment Committee's staff—I also am honored by the expression of confidence placed in me by the President and Administrator William D. Ruckelshaus.

In executing its mission to protect the American people from threats posed by various pollutants to human health and the environment, EPA is often the final arbiter among a wide spectrum of interests and opinions. The Agency's decisions are rarely non-controversial. Its actions are seldom uncomplicated. Its policies are never without far-reaching implications. My experience with the Agency and with this Committee make me acutely aware of the sensitivity and volatility of environmental issues.

Public scrutiny is a necessary component of any democratic institution, and this fact is especially pertinent at EPA because the Agency is responsible for much of what the American people hold dear to them—knowing that the air they breathe, the land on which they live, and the water they drink are protected. There can be no substitute for complete dissemination of essential material by EPA on a timely basis. Anything short of that breeds distrust by both Congress and the public, which in turn hampers the Agency's ability to be effective.

Administrator Ruckelshaus has said that "EPA is determined to operate in a fish bowl and will attempt to communicate with everyone from environmentalists to those we regulate as openly as possible." I applaud his statement, and I am prepared to do all that is necessary to realize its aim.

The establishment of the Office of External Affairs is recognition of EPA's intent to fulfill this pledge. Four essential outreach offices will be coordinated under one roof at the



U. S. Senate Majority Leader Howard H. Baker Jr. with Josephine S. Cooper at her confirmation hearing before the Senate Environment and Public Works Committee as EPA Assistant Administrator for External Affairs

Assistant Administrator level. Those offices are:

Public Affairs which provides press services, publications and a new program for community relations.

Federal Activities which is responsible for coordinating the efforts of the Federal agencies to meet our environmental objectives to keep the Federal community abreast of EPA actions, and to provide technical assistance to other Federal agencies as needed.

Intergovernmental Liaison which develops a working relationship with State and local officials to assure that these key constituency groups are kept apprised of appropriate Agency activities.

Congressional Affairs which must be sensitive and responsive to members and their staffs while representing the Administration's position on environmental policy.

These four offices share responsibility for tracking information within EPA that is often highly technical in nature, translating that information into a meaningful form, and disseminating it to the various audiences. Together, the External Affairs offices constitute a goodly part of what accurately may be described as the voice of the Agency.

It is my firm conviction that such a voice must speak with candor and honesty, clarity and simplicity. There must be full cooperation between EPA and outside groups achieved within the framework of applicable rules and procedures. The Agency must strive to provide information efficiently and even-handedly to all involved parties.

When William Ruckelshaus returned to EPA, he readily observed that EPA had experienced some serious problems in effectively communicating Agency policies and regulations. He immediately moved to restore the

credibility of the Agency through measures like providing the fullest possible public participation in EPA's decision-making process.

Under my leadership, I am hopeful that the Office of External Affairs will extend this effort to make EPA more accessible and forthright in its public dealings.

Understanding this from your Committee's perspective—as a former staffer—I see the next year as being especially critical in light of the issues pending, such as clean water, acid rain and clean air, hazardous waste and toxic substances.

During the time I have observed the four offices which comprise External Affairs in my capacity as a Special Assistant to the Administrator, I have been extremely impressed by the skilled and competent professionals who staff them. Many of these people have had to endure numerous reorganizations and changes in job roles which, quite frankly, often seemed counter-productive. As a former civil servant myself, I know how disruptive such changes can be. I also understand that internal communication can be as important as external communications. Improving morale at EPA is a critical investment in environmental protection. We will do our best to render useful information services within the Agency, as well as to outside groups.

Mr. Chairman, my statement underlies a basic conviction: to operate effectively and restore public confidence in its efforts, EPA must be completely open and fair-minded in the dissemination of accurate and timely information to all interested parties. The Office of External Affairs must provide a competent and well-managed delivery system which can assure that end. Even the most technical information and complex issues must be made intelligible for the general public. □

River at Risk

A bird on a branch of a white sycamore tree watched the Cacapon River passing below it as shifting breezes periodically sent red and yellow leaves scudding across the stream surface.

Suddenly the kingfisher splashed into the river and emerged with a small silver fish in its heavy beak. The bird flew back into the sycamore, slapped its prize against the tree trunk, and then flipped the stunned fish into the air and caught it with the head facing down its throat. With a single gulp, the kingfisher completely swallowed its meal.

This bird has many human competitors who also fish in the rills, riffles, rapids and swirling pools of West Virginia's Cacapon River, one of the Potomac River's most beautiful tributaries.

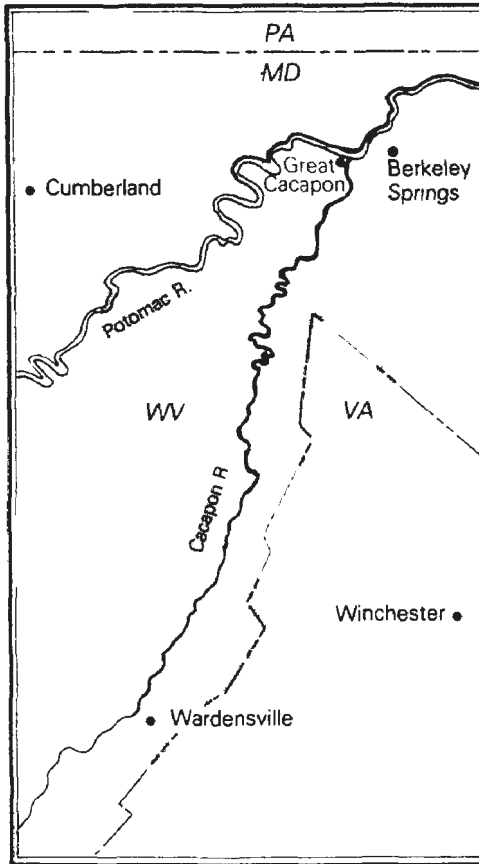
Canoeing, swimming, and sight-seeing are other activities which draw many visitors to this stream which has been studied by the National Park Service for possible inclusion in the National Wild and Scenic Rivers program.

Recognizing that West Virginia residents living in the river corridor are strongly opposed to Federal controls, the National Park Service has completed, but not yet released, a final report recommending procedures by which the river could be protected primarily through local and state efforts.

Unless action is taken, the Park Service fears, mounting population pressures and rapid second-home development in the Cacapon Valley could lead to serious degradation of the river. In addition, cattle wastes and pollution from other non-point sources may jeopardize the purity of the river's waters. Much of the river land is not protected by zoning regulations.

The approximately five million people in the Washington and Baltimore metropolitan areas live only about 100 miles from the Cacapon.

The desire of many urban residents to buy property on a quiet country stream is fueled by certain West Virginia real estate companies which advertise in Baltimore newspapers about the opportunity to buy "a cheap cabin on a redneck mountain river."



Map showing location of Cacapon River

Other ads contend that West Virginia's high unemployment rate "gives you Po' Boys' riverfront farmsteads."

The Cacapon springs to life in West Virginia's Hardy County under another name, Lost River. The initial section of the stream is so known because a portion of it sinks underground while traveling over a porous limestone bed. The disappearance of the surface water near Wardensville, W. Va., leaves a jumbled path of large boulders marking what had been the river. Campers sometimes hold picnics in the middle of this "river."

The stream reappears again some 2.5 miles down its course when it gushes out at the bottom of the hemlock- and sycamore-forested north slope of Sandy Ridge. The born-again river is now known as the Cacapon as it flows into Wardensville and on to the Potomac some 80 miles away.

The stream now often foams as it surges over rocky rapids and through lofty gorges, an irresistible attraction to canoeists during spring high water levels.

Bass, trout, pickerel, sunfish and eels are caught by fishermen who often visit favorite spots along the Cacapon. Not the least of its attractions are the opportunities this stream offers for swimming and river walking.

During low water you can splash on foot down the middle of this stream for long distances, a pastime known by Thoreau as "fluvial walking" and one he often enjoyed.

In other deeper sections of the river you can float down this stream on your back carried by the current and glide by the green forested hills and banks bedecked with wild flowers.

As you drift with the river, startled turtles who had been sunning themselves on floating logs dive hurriedly into the water. Your silent approach can frighten a green heron on the bank, causing it to fly off with a disgruntled squawk.

Nearing the Potomac the Cacapon meanders in large loops and wide pools. Outside Great Cacapon, the last town on its route, the river passes under the great stone arches of an ancient railroad bridge.

It enters the Potomac below a bluff near Berkeley Springs, W. Va. The panoramic view from this bluff, showing the confluence of the Potomac and the Cacapon, surrounding farmlands and a series of mountain ridges fading into the horizon, was described by the National Geographic as one of the most beautiful in America, according to a sign which once stood at this location before it was stolen a few years ago by vandals.

On a recent weekend visitors who walked along the banks of the Cacapon to its meeting with the Potomac were struck by the placid beauty of the location.

Even the rumbling of a coal train over the railroad trestle could only detract momentarily from the serenity of the river scene. Down the Potomac an osprey, a fish hawk, sailing above the water in quest of a meal, veered off toward Washington.

Overhead a great straggling V of snow geese flew east toward their coastal winter home. The setting sun painted the Cacapon in gold and then sank below the horizon, leaving an observer in the dusk to wonder whether this river can be preserved or whether, once again, the truth of Oscar Wilde's epigram will be proved:

"Every man kills the thing he loves."—C.D.P. □

(See back cover for photo of Cacapon River)



*Illustration of a kingfisher
ready to dive into a stream to catch a fish.*

*Back Cover: A scenic stretch of the Cacapon River, a tributary which joins the Potomac River near Berkeley Springs, W. Va.
Photo by Gerald Ratliff of Wonderful West Virginia Magazine.*



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