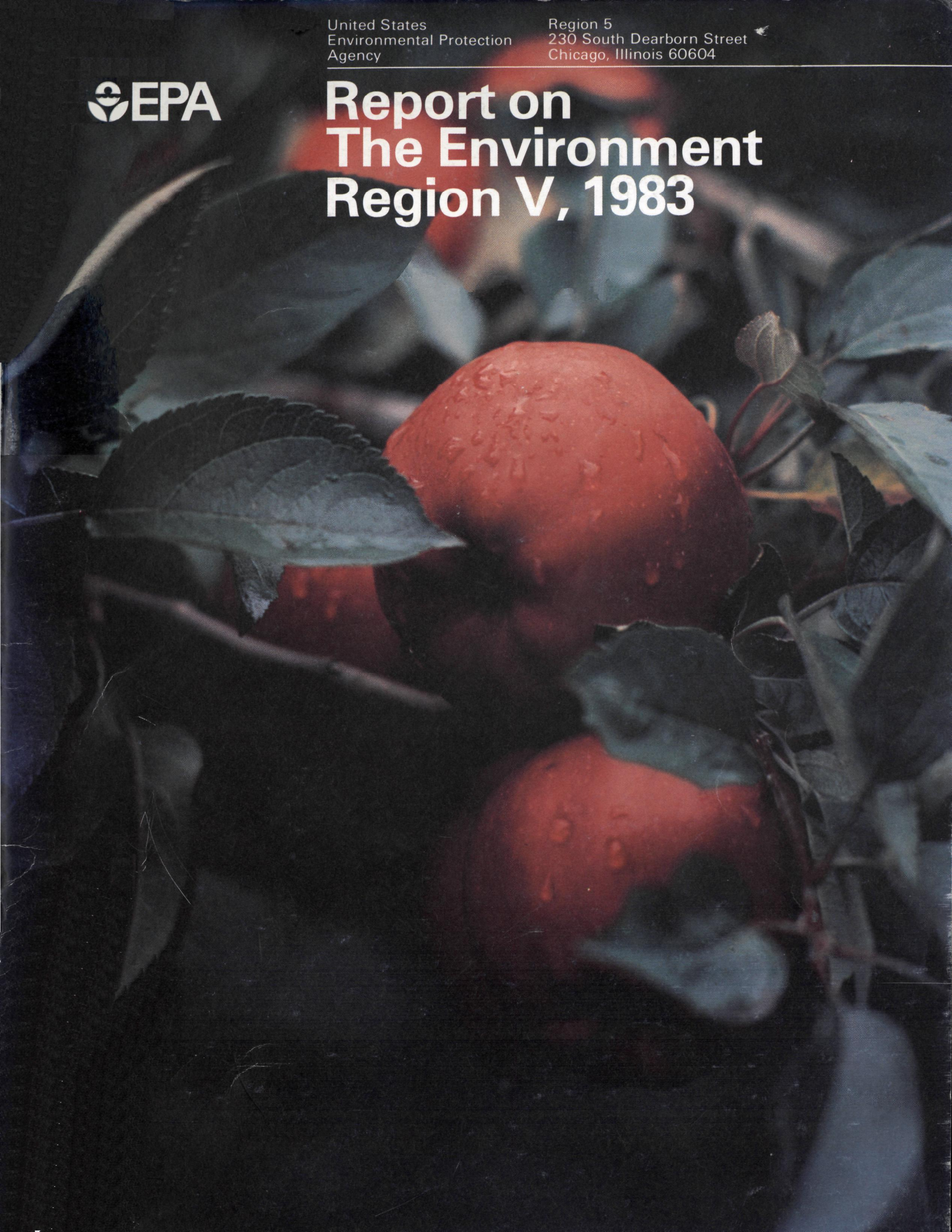


United States  
Environmental Protection  
Agency

Region 5  
230 South Dearborn Street  
Chicago, Illinois 60604



# Report on The Environment Region V, 1983







*As EPA enters its fourteenth year, we can look with pride upon its many accomplishments. This report specifically addresses our achievements during fiscal 1983, as well as the challenges that will confront us in the future.*

*It is my hope that this publication will be useful to those who are interested in improving our environment and preserving the cherished natural resources that are so plentiful in our Region.*

*It will take the best efforts of all of us—citizens, government agencies, environmentalists and industry—to rise to the tasks still ahead.*

*Valdas V. Adamkus*  
Valdas V. Adamkus  
Administrator, Region V



The six states that form the Environmental Protection Agency's Region V—Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin—have been generously endowed with natural resources that make the Region a leader in commerce, industry and agriculture.

Nestled along the shores of four Great Lakes, these states contain almost 46 million people and 121 million acres of the Nation's most productive farmland. The lakes themselves support huge recreational and fishing industries.

Underground coal reserves in Illinois, Indiana and eastern Ohio are the largest in the country, and smaller deposits of iron ore, copper, natural gas and oil are scattered throughout the Region. Timberlands and fisheries are plentiful.





But the very things that made the Midwest great also make it vulnerable to environmental damage. The Region's coal-fired power plants emit much of the sulfur dioxide that falls to Earth as acid rain, threatening wilderness in the Midwest as well as lakes, streams and forests in the Northeast.

Valuable topsoil, often tainted by fertilizer and pesticide residues, routinely erodes into streams, rivers and the Great Lakes. Industrial hazardous wastes present special disposal and contamination problems. The Region's high concentration of chemical, steel and paper industries also causes significant environmental impacts.

EPA is working in partnership with all Region V states to help address these issues and to find creative solutions to the challenges of the future.





## WASTE MANAGEMENT

EPA faces no greater challenge than protecting America from the consequences of improper hazardous waste disposal. There are thousands of abandoned waste dumps in farmers' fields and inner cities, in roadside ditches and on river banks—often contaminating our soil, water and air.

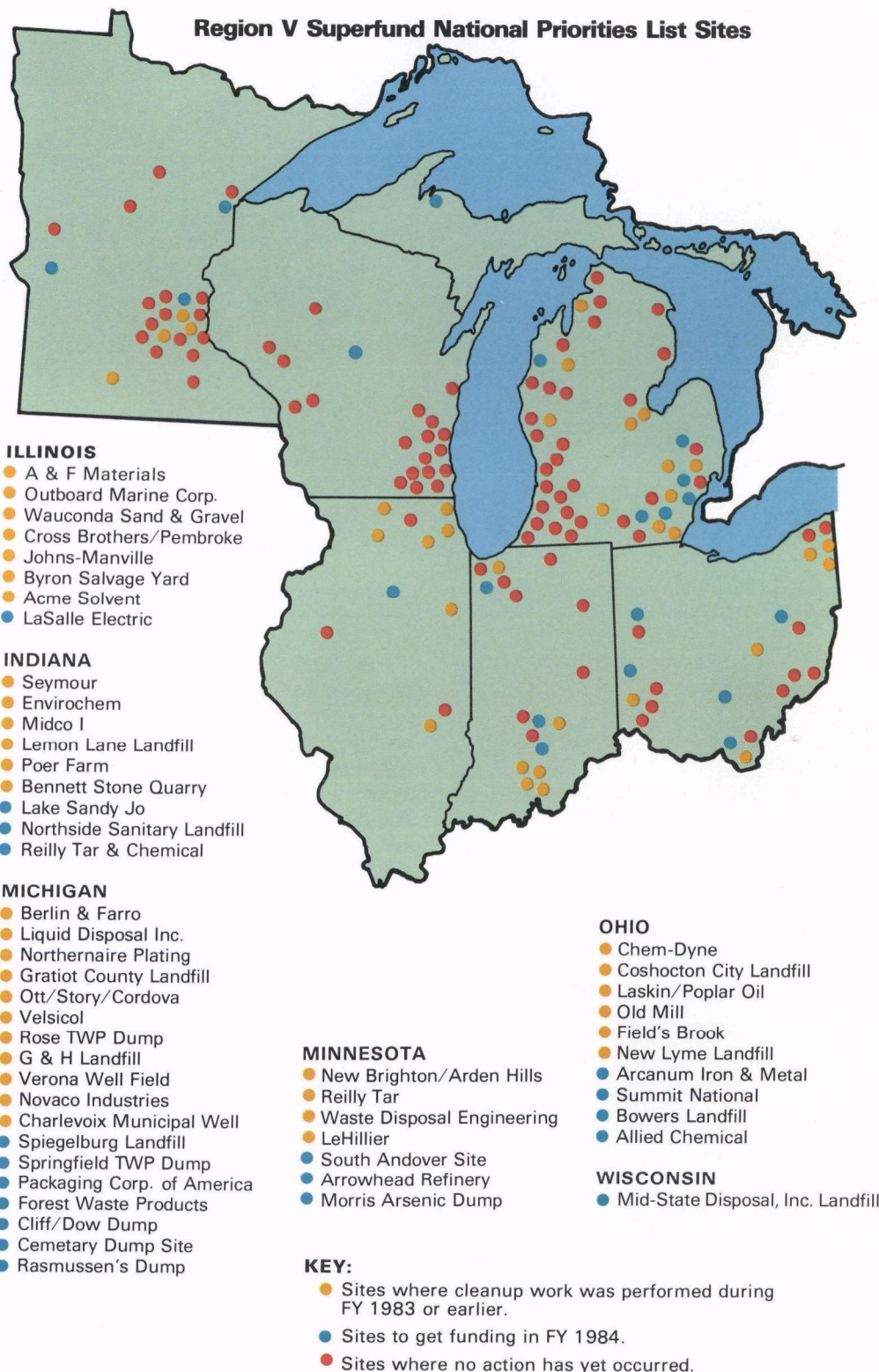


Because of the threat these dumps pose to human health and the environment, Congress passed the Comprehensive Environmental Response, Compensation and Liability Act in 1980. This law is commonly known as Superfund because it created a 5-year, \$1.6 billion fund to finance the cleanup of hazardous waste sites throughout the Nation. Eighty-seven percent of the Superfund money comes from taxes on the manufacture or import of certain chemicals and petroleum; the remainder comes from general revenues.

The most important aspect of Superfund is that it allows EPA to take immediate action when necessary to protect human health and the environment. Before Superfund, the Agency was unable to act so swiftly. EPA is now authorized to clean up a problem and then, where possible, to recover those expenses from the parties responsible for creating the problem.

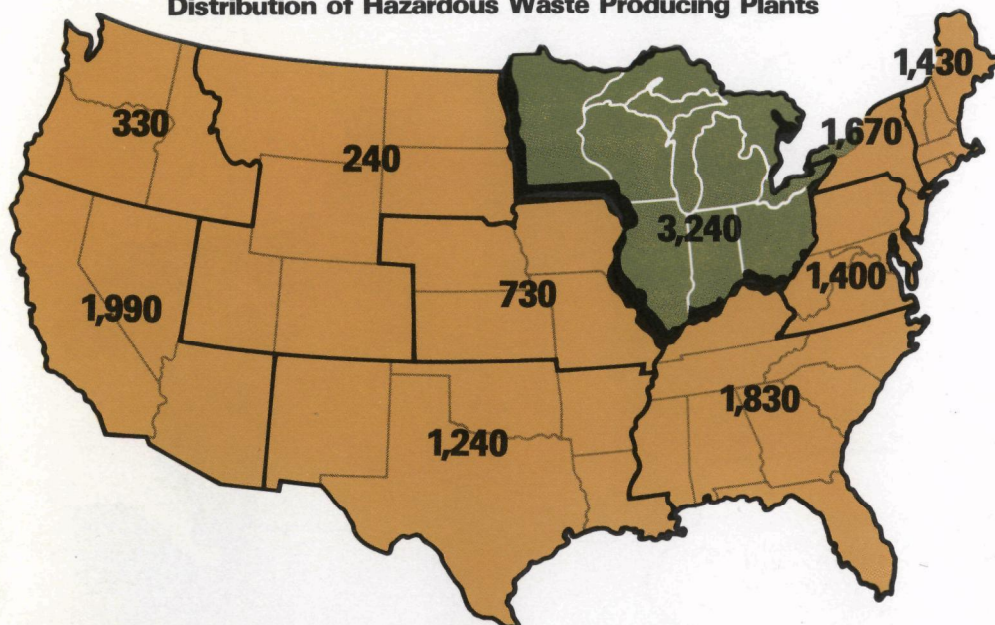
More than 2,900 abandoned hazardous waste dump sites are thought to exist in Region V and are being evaluated for their potential to endanger public health and the environment. Of these sites, 141 have been selected by the states and EPA for inclusion on the National Priorities List, a catalog of 546 sites throughout the Nation which are eligible for Superfund cleanups. The Midwest has more sites on the list than any other area in the country.

Thirty-one of the Region's 141 sites were in various stages of cleanup during 1983, ranging from exploratory studies to actual hazardous waste removal.

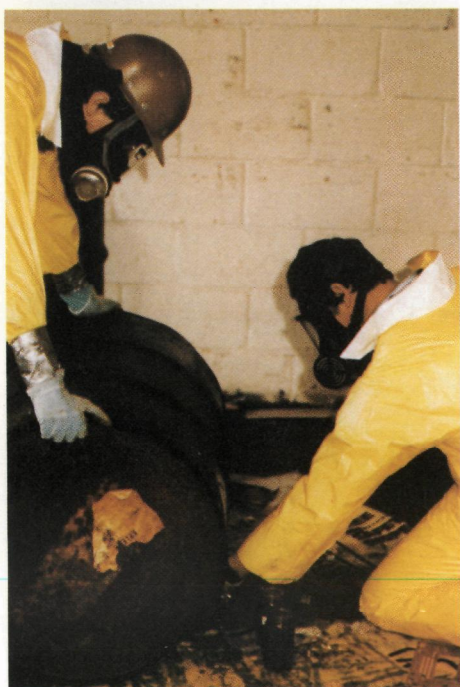




### Distribution of Hazardous Waste Producing Plants



Region V has the highest concentration of industrial hazardous waste producers in the United States—an estimated 3,240 in 1981, the most recent year for which data are available.



However, Superfund distinguishes between emergency situations that require immediate action to protect human health and sites that present a longer-range problem. EPA considers the special demands of each situation before deciding on the most appropriate response.

When immediate action is needed at a site, it usually involves neutralizing, isolating or removing chemicals to prevent fires, explosions, or public health risks. Ordinarily, these actions are limited by law to six months and a total cost of \$1 million. EPA can act quickly to alleviate dangerous situations at any abandoned dump site, whether or not it is on the National Priorities List.

In fiscal 1983, Region V supervised 29 immediate removals, 14 of which were at sites on the National Priorities List. The cost of these operations was \$6.6 million.

In several instances during 1983, immediate removals were sufficient to clean up a site and made further action unnecessary. After two drums exploded at the abandoned Alburn Incinerator site in South Chicago last summer, EPA supervised the removal of about 300,000 gallons of bulk wastes and 6,500 drums of flammable wastes. Superfund money financed the \$1.3 million cleanup.

EPA also acted swiftly to prevent potentially dangerous situations at three abandoned metal plating companies in the Region. At each location, containers of hydrogen and cyanide were found in close proximity. When these substances are mixed, they react violently to form the lethal hydrogen cyanide gas.

Hixon Plating, near a residential area in Bushnell, Illinois, was cleaned up in four days at a cost of \$45,500. Danville Plating, across the street from an elementary school in Danville, Illinois, was cleaned up in less than a month at a cost of \$89,500. Peerless Plating's acid and cyanide were removed from an abandoned Muskegon, Michigan, site in less than a month for a cost of \$70,000.

The heart of the Superfund program, however, is what the Agency calls "Remedial Cleanups." These cleanups, usually of large, severely contaminated sites, involve extensive studies and plans to ensure that the job is done in the best and most cost-effective way possible. Some remedial cleanups can take several years to complete.

Because industries in the six Region V states produce and handle more hazardous waste than any other area in the country, there are many related problems.



Among the worst of Region V's hazardous waste sites is the Chem-Dyne site in Hamilton, Ohio—a former chemical waste transfer, disposal and storage facility. Fires, explosions and fish kills have resulted from operations at the 10-acre site, and the air, soil, surface water and groundwater have been contaminated.

Almost \$2.7 million has been spent to remove wastes from the facility, where 9,000 drums and 220,000 gallons of liquid were abandoned. The completion of the Chem-Dyne surface cleanup in September, 1983, was a major highlight of the Region's Superfund program.

The Chem-Dyne cleanup was largely financed by 112 companies whose wastes were disposed of at the site, with the State of Ohio and EPA also contributing to the cost. EPA used its Superfund authority to negotiate a \$2.4 million settlement with the 112 companies, and has sued the operators of Chem-Dyne and major waste generators who have refused to participate in the cleanup.

EPA is now trying to determine the extent and severity of soil and groundwater contamination at the site, with that work scheduled for completion by the summer of 1984.

The surface cleanup of another National Priorities List site was completed during fiscal 1983 at the abandoned Seymour Recycling Corp. facility near Seymour, Indiana. More than 250,000 gallons and 60,000 drums of hazardous wastes were removed from the 14-acre site, which was considered one of the worst in the Region. This cleanup was entirely paid for by some of the companies whose wastes were found at the site.

Region V experts will work during 1984 to confirm the possible existence of buried wastes at Seymour Recycling and will also continue studies of nearby soil and groundwater contamination.

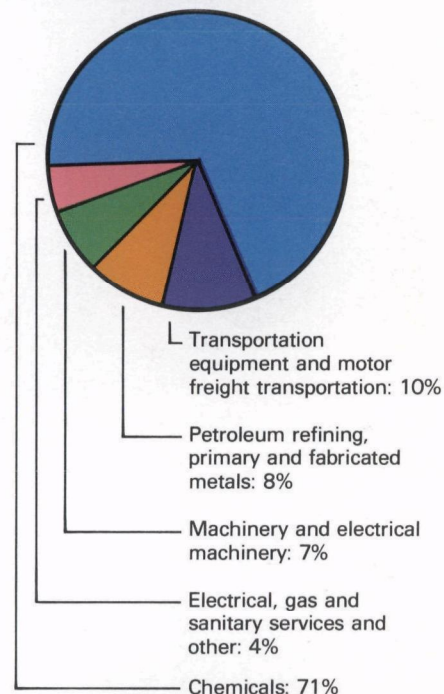
As the Superfund program has matured, EPA's budget for short- and long-term actions has increased. Nationwide, \$24.7 million was spent in fiscal 1983 on removal actions; \$64 million was spent on the development of studies, plans and cleanups for National Priorities List sites.

During fiscal 1983, Region V committed \$10.1 million for remedial cleanups at 28 sites. An additional \$6.6 million was obligated for immediate removals at 19 sites. Region V also recovered \$14.3 million in cleanup costs and completed negotiations that will yield more than \$57.5 million for work on 10 sites.

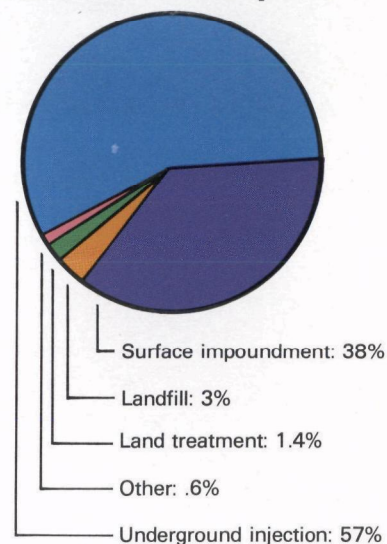
The Region has also helped the states update their existing data base on hazardous waste sites. During fiscal 1983, state and EPA investigators evaluated 570 sites based on available documentation and physically inspected 175 others. This program is helping EPA and the states identify sites that may need Superfund-financed cleanups in the future.

Much work remains to be done. More than \$31 million is budgeted for Superfund work in Region V during fiscal 1984, and the Region plans to provide additional cleanups by vigorously pursuing settlements with parties responsible for hazardous waste sites.

### Hazardous Waste: Who Produces It...

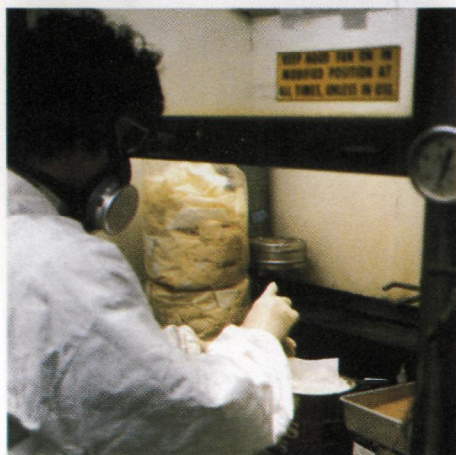


### ...And How It Is Disposed Of





## Dioxin



Almost daily, newspapers and radio and television stations carry stories about the poisoning of America by hazardous chemicals.

Public concern over this contamination is intense and was heightened in February, 1983, when the government announced that it would relocate the residents of Times Beach, Missouri, because of extensive dioxin contamination.

Dioxin was a contaminant in "Agent Orange," the defoliant used by U.S. forces during the Vietnam War. Many servicemen have reported that their exposure to Agent Orange has caused a variety of health problems, but scientists are mystified about exactly how this chemical affects the human body.

Dioxin, or more specifically, 2,3,7,8-tetrachloro-dibenzo-p-dioxin (2,3,7,8-TCDD) is created during the manufacture of 2,4,5-TCP, a chemical often used as an ingredient in certain herbicides. It is perhaps the most toxic man-made substance known and poses a threat at levels that, until recently, were too minute to measure.

EPA is responding to public concern over the effects of dioxin by developing a nationwide strategy to do the following:

1. Determine the extent of dioxin contamination throughout the United States and the associated risks to humans and the environment.
2. Clean up sites already contaminated by the chemical.
3. Evaluate ways of preventing future contamination.
4. Investigate methods of destruction or disposal.

EPA will work closely with other concerned government agencies, including the states and the Federal Centers for Disease Control, on this project.

Until more research is done, EPA's Cancer Assessment Group is regarding dioxin as both an initiator and promoter of cancer, that is, it is thought to cause cancer in humans and to accelerate the formation of cancers caused by other means.

Based on its suspected carcinogenic potency, the Agency estimates that individuals exposed to soil or fish tainted by dioxin could have a significant cancer risk under certain very limited exposure conditions.

As part of the Agency's dioxin strategy, Region V and the states have already begun taking soil and fish samples at several sites throughout the Region. First to be sampled were locations in Michigan, where dioxin has been found in fish from the Tittabawasee and other rivers.

In order to learn more about the occurrence and distribution of dioxin, Region V will sample a variety of industrial areas likely to be contaminated, as well as "control sites" where EPA does not believe production or extensive use of dioxin-contaminated products has occurred.



# Resource Conservation and Recovery Act

Just as Superfund was created to remedy the hazardous waste problems of the past, the Resource Conservation and Recovery Act of 1976 (RCRA) was written to prevent such problems in the future.

Because of RCRA, EPA is actively involved in managing hazardous wastes from the time they are created until their disposal or destruction. Through the use of a "cradle to grave" waste tracking system, EPA and the states can ensure that hazardous substances are being properly handled and disposed of.

EPA also issues permits to hazardous waste disposal, storage and treatment facilities that meet Agency standards for safe operation and maintenance. In Region V, about 1,600 existing facilities are qualified to legally operate until a final RCRA permit decision is made.

Before final permits are issued, each facility is inspected and its operating record is reviewed.

Region V is now evaluating the permit applications of 166 facilities and continues to process the applications of others. First priority is given to the largest facilities and those with the most potential for causing environmental harm.

The states, with financial help from EPA, provide considerable assistance in the RCRA permitting process. They review applications for completeness and accuracy, later helping to draft the actual permits.

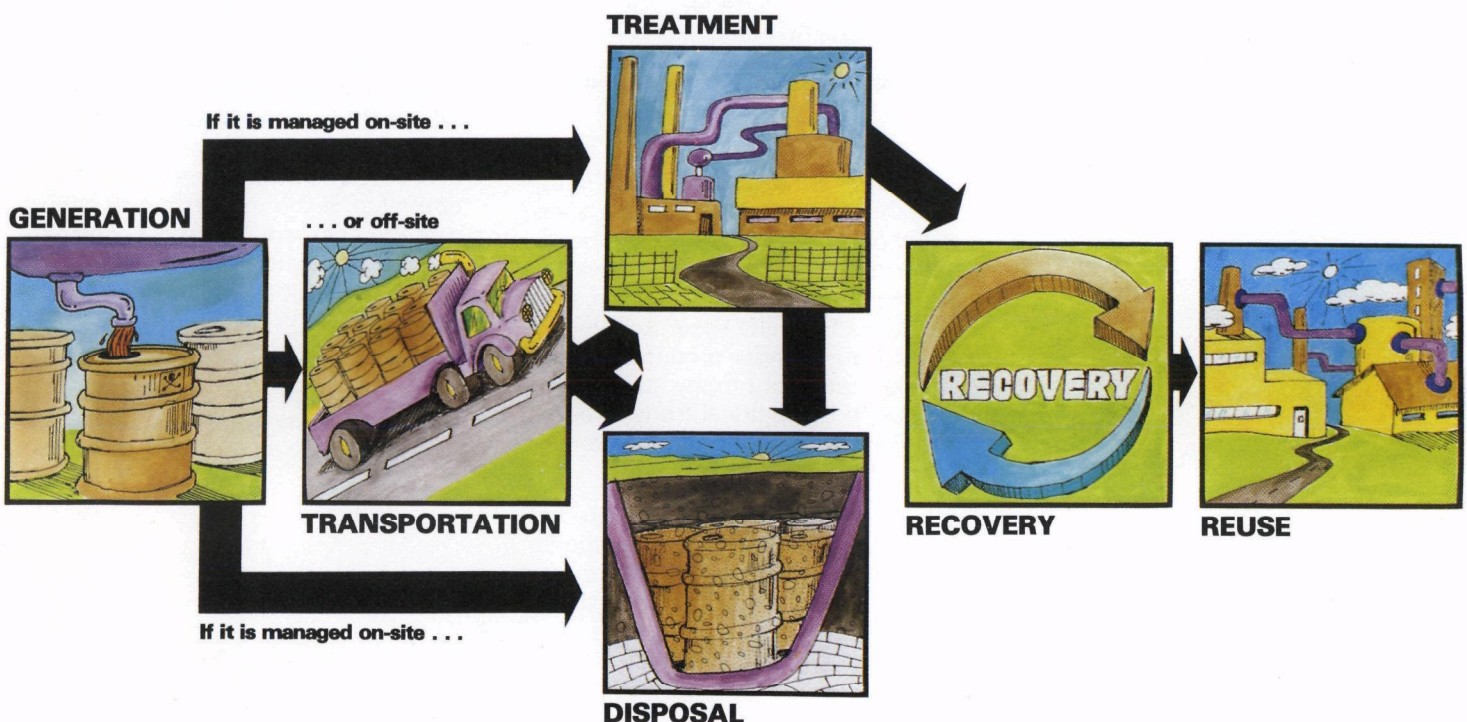
The RCRA permitting process makes special efforts to see that public opinion is reflected in the Agency's final decisions.

One of the Agency's highest priorities is to authorize states to operate their hazardous waste programs in place of the Federal RCRA program. To do that, a state must change its laws and regulations so that they conform to, or are stricter than, Federal laws and regulations.

States are expected to qualify for final authorization in 1985. All Region V states are seeking final authorization, which would entitle them to administer all aspects of the Federal RCRA program.

Part of the RCRA program involves making sure that waste handlers are meeting applicable standards. Sometimes this means on-site inspection or the review of records and reports. If a deficiency is found, warning letters or compliance orders are sent. When the violation is particularly serious, civil or criminal action is pursued.

In fiscal 1983, EPA and the states inspected more than 2,200 facilities in the Region and took more than 1,250 enforcement actions. These efforts helped bring at least 600 waste handlers back into compliance.





## Toxic Substances

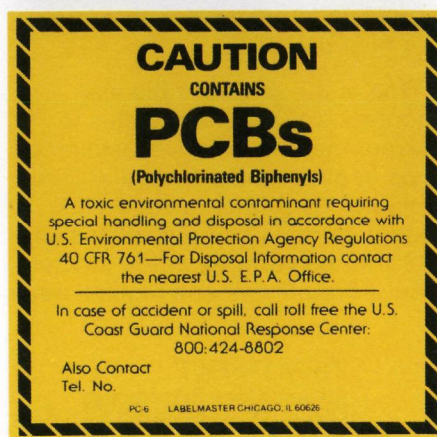
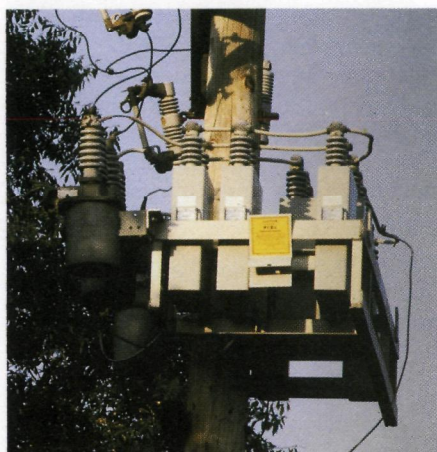
The Toxic Substances Control Act of 1976 (TSCA) was designed to control those chemicals that present an unreasonable risk to human health or the environment.

The act required EPA to compile an inventory of commercially available chemicals and authorizes EPA to prohibit or limit the manufacture, use or disposal of particular chemicals that present an imminent hazard to human health or the environment. The law also requires manufacturers to notify EPA 90 days before beginning production of a new chemical.

EPA's Region V office has developed an active inspection program to ensure compliance with TSCA and regulations developed under that law. During fiscal 1983, 58 facilities in the Region were inspected for compliance with the premanufacturing notification requirement.

EPA also requires manufacturers and processors to report information on the production and use of about 250 chemicals that may cause occupational or public health problems or environmental damage.

Of immediate concern to EPA are two substances regulated under TSCA—*asbestos* and *polychlorinated biphenyls (PCBs)*. At one time both of these chemicals were widely used because of their desirable physical and chemical properties. Their use was restricted after it was learned that they are persistent in the environment and can cause severe health problems. *Asbestos* is a carcinogen, and *PCBs* can cause skin, liver and reproductive disorders.



Since PCB regulations went into effect in 1979, Region V has inspected about 950 facilities. Only about half of those were complying with the regulations on use, storage, disposal, marking and recordkeeping. *PCBs* are no longer produced in the United States, but many still exist as insulation in electrical transformers and capacitors in utility networks, railroads and subway systems.

Because so many facilities are not complying with the *PCB* regulations, EPA will work with the Ohio Environmental Protection Agency and the

Michigan Department of Natural Resources to inspect 250 additional facilities during fiscal 1984.

In addition to performing inspections, Region V responds to emergencies involving spilled *PCBs*, takes enforcement action when necessary, and answers inquiries regarding the proper use and control of *PCBs*. In fiscal 1983, Region V initiated 118 *PCB* enforcement actions—more than 40 percent of EPA's national total.

*PCB* disposal and destruction is strictly controlled by EPA. Environmental engineers and specialists in Region V review applications from companies or research institutions who want EPA approval to dispose of the chemical. Those who can demonstrate their ability to provide efficient and safe disposal or destruction are authorized by the Region to do so.

During fiscal 1983, Region V approved disposal of *PCBs* at seven commercial destruction facilities and in one industrial boiler. One of the commercial facilities approved was the SCA Chemical Services Inc. incinerator in South Chicago. SCA has one of only three commercial incinerators in the Nation available to burn high concentrations of *PCBs*. EPA required strict controls on the operation of the incinerator to ensure that the company will safely destroy *PCBs* that might otherwise remain in the Midwest for lack of disposal options.

Region V also approved permits for 19 research and development facilities investigating treatment and disposal methods for *PCBs*.



## Asbestos

In order to carry out its duties under the Toxic Substances Control Act, EPA administers an asbestos control program in schools throughout the Nation.

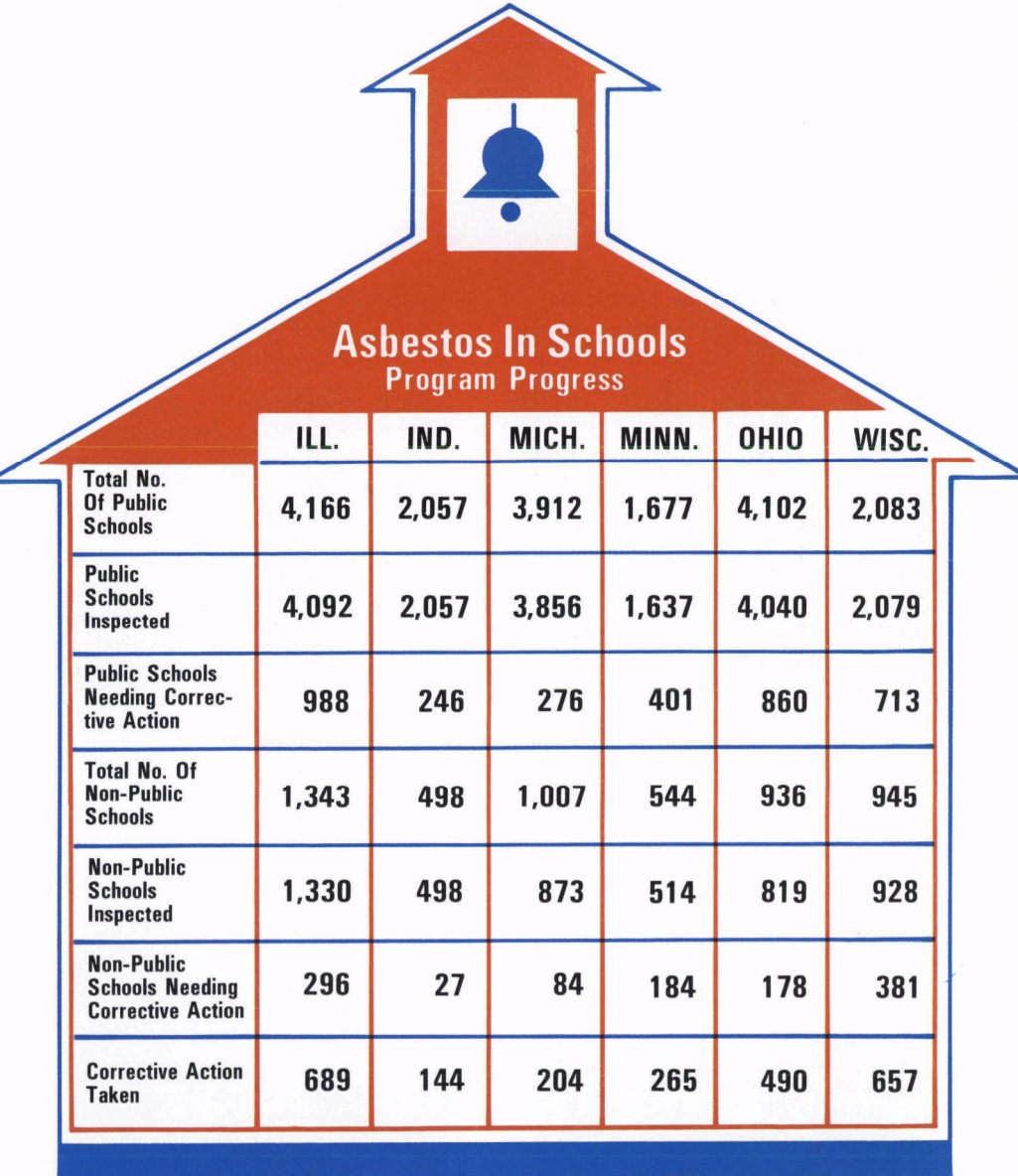
The program is designed to limit the exposure of students, teachers and staff to asbestos fibers from deteriorating ceiling tiles or sprayed-on insulation.

The 1982 EPA "Asbestos in Schools" rule requires school districts to check each of their schools for the presence of friable asbestos, easily crumbled fibers that were popular between 1940 and 1973 as fire-proofing and insulation materials. If friable asbestos is present, school districts must notify parents, teachers and school employees. Typically, school districts seal, encase or remove the asbestos.

Asbestos is valued for its heat resistant and indestructible qualities, but it can pose a significant danger to human health if it is not completely sealed in a product. Otherwise, it can break into tiny fibers that float almost indefinitely in the air. These fibers are smaller and more buoyant than ordinary dust particles and therefore are easily inhaled and swallowed.

The presence of asbestos particles in the body can cause lung cancer and asbestosis, a chronic lung disease that makes breathing increasingly difficult and, in severe cases, can cause death. Some fibers are expelled by the lungs; others remain in the body indefinitely and can result in other types of cancers that develop 15 to 40 years after the first exposure. Mesothelioma, one such disease, is a cancer of the membranes that line the chest and abdomen. It almost never occurs in people who have not been exposed to asbestos, and it is always fatal.

To safeguard children and school workers, EPA requires each school



	ILL.	IND.	MICH.	MINN.	OHIO	WISC.
Total No. Of Public Schools	4,166	2,057	3,912	1,677	4,102	2,083
Public Schools Inspected	4,092	2,057	3,856	1,637	4,040	2,079
Public Schools Needing Corrective Action	988	246	276	401	860	713
Total No. Of Non-Public Schools	1,343	498	1,007	544	936	945
Non-Public Schools Inspected	1,330	498	873	514	819	928
Non-Public Schools Needing Corrective Action	296	27	84	184	178	381
Corrective Action Taken	689	144	204	265	490	657

system to inspect all of its schools for friable asbestos and to maintain records of these inspections.

Region V helps school districts by conducting asbestos workshops and providing technical expertise. In addition, a program coordinator in each state helps school districts meet their obligations under the "Asbestos in Schools" rule.

Most of 23,270 schools in the Region were inspected between 1979 and 1982, when EPA operated a voluntary asbestos program for schools. Of the 22,723 schools inspected, approximately 4,634 required corrective measures.

EPA inspection of 42 school districts in Region V revealed that

about 80 percent of the inspected districts are not complying with the regulations. Noted were improper recordkeeping practices, improper sampling and testing programs and failure to notify and warn officials and parents that friable asbestos was present. EPA also discovered that some districts had taken improper corrective action, resulting in the continued presence of asbestos in schools.

Region V specialists, along with members of the American Association of Retired Persons, will inspect an additional 250 school districts in fiscal years 1984 and 1985. EPA will fund the efforts of the retired persons' association.



## Pesticides

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) charges EPA with controlling the manufacture, distribution and use of the 800 million pounds of pesticides used in the United States each year. Because 20 percent of those pesticides are manufactured and used in the Midwest, this Region has a major role in the enforcement of the act.

When properly used, pesticides can control disease-carrying insects and minimize crop damage. However, these same chemicals are also poisons that can endanger man, animals and the environment if used improperly.

Region V is responsible for seeing that pesticides are used safely and properly in its six states and that manufacturers comply with their responsibilities under the law. The Pesticides Section of the Waste Management Division:

1. Monitors pesticide use by professional pest control operators, aerial applicators, homeowners, industry officials, and farmers.
2. Protects the public by ordering manufacturers to stop sales of pesticides when products violate the terms of the law.
3. Assesses monetary civil penalties for major violations of FIFRA.
4. Supervises state inspections of the 3,200 pesticide manufacturers in the Region.
5. Oversees state-administered pesticide compliance programs.

All pesticides used in the United States must be registered with EPA. In order to obtain a registration, a manufacturer must provide the Agency with information regarding the pesticide's contents, toxicity, persistence in the environment,

short- and long-term environmental effects, safety and use, and effects on humans and the environment.

Before registering a pesticide, EPA is required to determine whether the product can perform its intended function without causing "unreasonable adverse effects" on human health or the environment.

EPA and the states collect and analyze pesticides to see that they are labeled in accordance with the registration they have been given by the Agency. It is illegal to use a pesticide for purposes, or in a manner, other than specifically directed on the label. In fiscal 1983, Region V issued 21 "Stop Sale" orders

### **Four pesticides that will be closely monitored by EPA in 1984 because of their adverse effects on humans or wildlife are:**

#### **EDB**

Ethylene dibromide. The registration for this substance for soil fumigation was suspended September 28, 1983 because of reported groundwater contamination incidents and health hazards for workers using the compound.

#### **Strychnine**

A rodenticide which is poisoning some endangered species in the western United States. The Agency is proposing to cancel uses which cause these effects, but may allow other uses to continue.

#### **Lindane**

An insecticide typically used in agriculture but also an ingredient in smoke fumigation devices and in flea dips for dogs. The latter two uses are no longer allowed.

#### **2,4,5-T/Silvex**

EPA is taking action to cancel all remaining uses of these herbicides.

because products were improperly labeled—in some cases due to inaccurate antidote instructions. Seven manufacturers also agreed, at EPA's request, to recall certain products from the market in fiscal 1983 because of serious FIFRA violations.

When attempts to work with a manufacturer fail, or when a particularly serious violation of FIFRA occurs, EPA may assess monetary civil penalties. The Region V Pesticides Section proposed 106 such penalties in 1983.

FIFRA requires that certain highly toxic pesticides be used only by, or under the supervision of, applicators who have been certified by the EPA or by states with an EPA-approved pesticides program. By October 1, 1983, there were 138,000 certified private applicators and 53,000 commercial applicators in Region V. The pesticides Section has played a major role in helping all of its states assume responsibility for the certification programs.

Along with certification, FIFRA authorizes EPA to delegate pesticides enforcement functions to the states. All six states in Region V, with the aid of EPA grants, have developed enforcement programs and are now assuming primary enforcement responsibilities under FIFRA.

Future work by the Pesticides Section will include laboratory audits to guarantee the accuracy of data submitted by pesticide manufacturers, monitoring of pesticide importers and exporters, continued oversight of state enforcement and certification programs, and the close monitoring of certain pesticides.





## **WATER QUALITY**

When Congress passed the Clean Water Act in 1972, its objective was "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

To this end, the Act sought "fishable, swimmable" waters throughout the country by July 1, 1983, and an end to pollution of navigable waters by 1985.



These goals are ambitious ones, and have not yet been entirely achieved. However, Region V water quality experts have worked closely with the six states to control the flow of municipal and industrial wastes to the Great Lakes and other waters. EPA has helped to finance municipal sewage treatment plants otherwise beyond the reach of some towns and cities and has assisted the states in developing management plans for their streams, lakes, and rivers.

To achieve the goals of the Clean Water Act, Congress required all dischargers to apply for and receive permits that significantly limit the amounts and kinds of pollutants they can discharge into navigable waters. This pollution control program,

known as the National Pollutant Discharge Elimination System (NPDES), required all dischargers to treat their wastewater so that it meets certain basic standards. Each state in Region V has been authorized by EPA to run the NPDES program and is in charge of issuing permits and ensuring compliance with them.

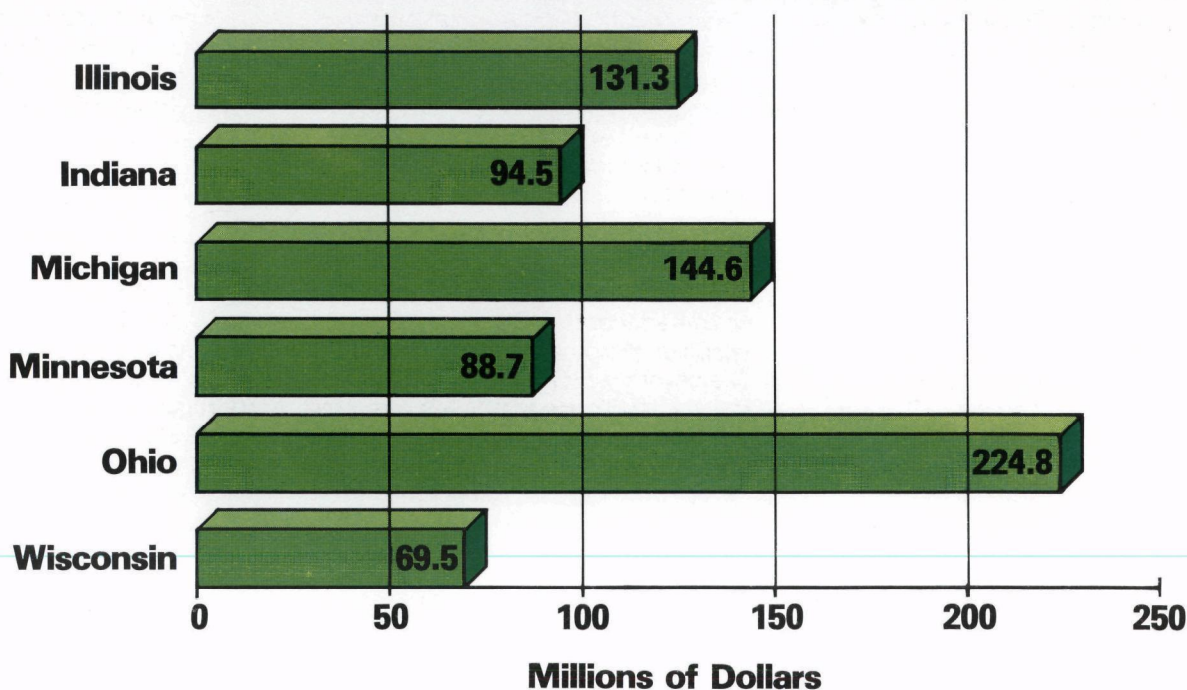
Nearly 1,500 major dischargers in Region V now hold NPDES permits, with 92 percent of them in compliance with those permits.

Because municipal wastewater can be just as damaging to water quality as industrial effluent, the Clean Water Act expanded an existing construction grants program to help municipalities build or improve sewage treatment facilities. Projects

funded range from sewer rehabilitation to sophisticated treatment plants handling hundreds of millions of gallons of sewage each day. Before any project is funded, it is reviewed for cost effectiveness and environmental compatibility.

Region V awarded \$753.4 million in construction grants during fiscal 1983 to help local governments build wastewater treatment plants and other facilities designed to improve water quality. Two hundred and ten projects were completed during that year, and 140 more are planned for fiscal 1984, when the Region expects to award \$782 million in grants.

### EPA CONSTRUCTION GRANTS, FY 83



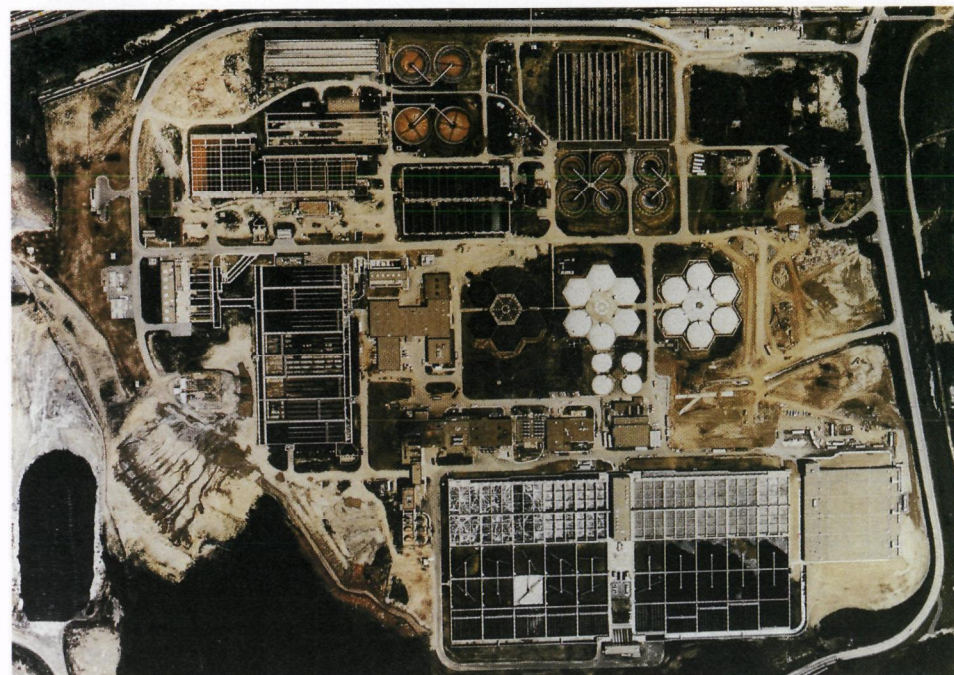


Detroit sewage, once the single largest contributor to the eutrophication of Lake Erie, is being effectively treated to meet conventional pollution control requirements. Construction of treatment plants such as Detroit's have helped reopen beaches and return fish to previously barren waters throughout the Region.

Despite significant improvements in many areas, many of the Region's waterways still have pollution problems. Fish consumption remains banned or restricted on portions of the Lower Great Lakes and on the Grand, Tittabawasee and Fox Rivers. Contaminated sediments have caused poor water quality and have restricted sports and recreational activities on segments of the Mahoning, Chicago, Cuyahoga and Ashtabula Rivers.

Of special concern to EPA are industries that discharge harmful chemicals into the Region's streams, lakes and rivers. Some industries are improperly routing toxic chemicals through municipal wastewater treatment systems, often with disastrous consequences to the treatment plants and the streams into which they discharge. Because of these toxicants, more than 100 municipalities in the Region have sludge contamination problems.

EPA and the states have identified 330 industries and 485 municipalities which discharge, or are likely to discharge, toxic chemicals. Controlling toxicants will be an important activity during 1984, as Region V works with the states to identify violations of water quality standards, assemble data, develop testing



The Northeastern Ohio Regional Sewer District's Southerly Wastewater Treatment Plant, Cleveland

requirements and define allowable levels of these chemicals in wastewater. EPA is also helping the states develop pretreatment programs that limit industrial discharges of certain chemicals into municipal sewer systems.

Sometimes industries violate the terms of their NPDES permits, discharging substances that kill fish or contaminate public water supplies. When this happens, EPA has several enforcement options. In fiscal 1983, Region V referred nine cases to the Department of Justice for prosecution—the most serious step the Agency can take. The Region also issued 21 legally binding administrative orders to force compliance with water quality standards, while the individual states also took action to make sure that dischargers complied with the Clean Water Act.

State and Federal initiatives, coupled with construction grants, helped reduce noncompliance rates by 47 percent for municipalities and 65 percent for industries during fiscal 1983.

Industries and municipal dischargers—called point sources—are major contributors to the Region's water quality problems, but they're not the only ones. Nonpoint sources, such as urban and agricultural runoff and septic tank seepage, also have a tremendous impact. EPA believes that water quality problems in many areas will persist unless these nonpoint sources are effectively controlled.





During the past 10 years, Region V has worked with the U.S. Department of Agriculture, several major universities and a number of local soil conservation districts to evaluate the impact of nonpoint source pollution and to develop methods for its control. EPA's Great Lakes National Program Office, located in Chicago, has actively encouraged the use of farming methods that reduce soil erosion. In addition, the states of Illinois, Wisconsin and Ohio have developed their own programs designed to minimize pollution from nonpoint sources.

Region V also helped states document basic water quality in their streams, lakes and rivers and provided more than \$138,000 in fiscal 1983 to help restore and protect publicly owned lakes. Ten of 27 lake restoration projects begun in 1976 are now complete.

The most ambitious lake restoration project in the Region took place at Lake Lansing, Michigan, where rich bottom sediments were dredged to remove the nutrients upon which algae and weeds were thriving. This project was completed in fiscal 1983 at a cost of about \$4 million.

A special emphasis in 1984 will be to improve the quality of the Grand Calumet River and Indiana Harbor in the Gary, Indiana, area. The Region plans to reduce harmful industrial and municipal wastewater discharges through aggressive monitoring and enforcement and will work to find environmentally sound methods of dredging the heavily contaminated sediments of the harbor and ship canal.

Region V has always been a leader in helping its states develop pollution control programs and in encouraging the states to assume active roles in managing environmental issues.

Michigan was the first state in the country to assume full responsibility for a NPDES program, Illinois for construction grants and Minnesota for pretreatment. All Region V states now fully operate their NPDES permit programs; five of the six operate all or part of their construction grants programs and four are preparing to operate pretreatment programs. Michigan will soon become the first state in the Region to operate its own wetlands protection program.

In addition to the construction grants and other financial help, Region V provided \$35.8 million in fiscal 1983 to help the states run their water quality programs.



## Wetlands



Region V is also acting to protect its remaining wetlands, which are vital to the growth and maintenance of a healthy environment. These low-lying swamp and marsh areas nurture young fish and animals and are nature's way of controlling erosion and floods.

For too long, wetlands were viewed only as another obstacle to development and growth. They were filled in and paved over to such an extent that only 30 percent of the Nation's wetlands still exist.

In order to minimize damage to wetlands, Region V routinely reviews applications for U.S. Army Corps of Engineers "dredge and fill" permits. At EPA's direction, the Corps can modify, restrict or refuse to grant permits for projects that will damage, or are likely to damage, valuable swamps and marshes.

Region V suggested permit changes that saved 380 acres of wetlands from destruction during fiscal

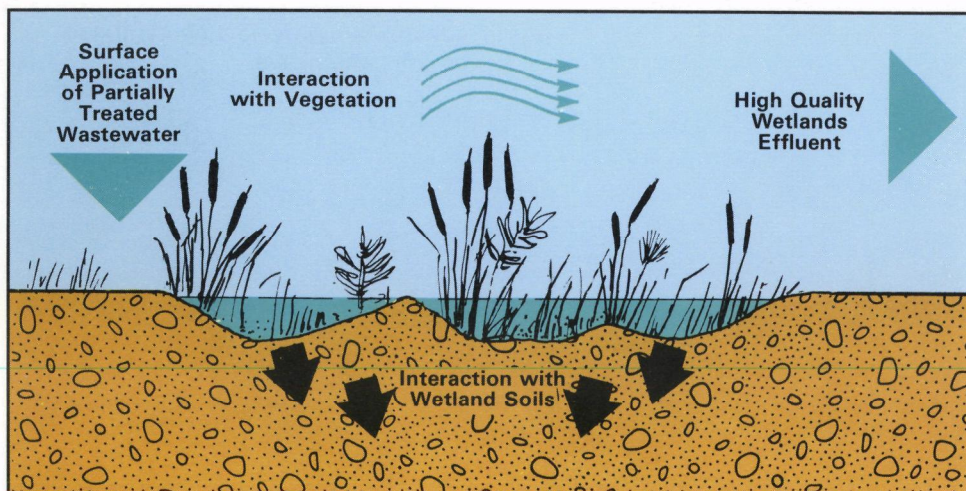
1983—a 91 percent reduction from the 416 acres that would have been destroyed if the permits had been granted without EPA's comments.

EPA is also working with the states to identify and protect the Region's unique wetlands.

Although wetlands are fragile environments that should be protected, EPA feels there are ways in which man can use these natural systems to help with his own environmental problems. As a result, Region V is studying ways of using wetlands to enhance traditional wastewater treatment processes. After sewage has been treated by normal means, the purified wastewater can be discharged into a swamp for further refinement. As the water soaks through the soil and vegetation, many remaining contaminants are filtered out before the water finds its way into underground aquifers or surface lakes and streams.

One of the more successful experiments in wetlands wastewater treatment is taking place at Houghton Lake, Michigan. As many as one million gallons of treated effluent are released each day into a 500-acre marsh near the town's sewage treatment plant.

Because of the complexity of natural systems, the use of wetlands for wastewater treatment purposes must be carefully designed and monitored. It is most suitable for small communities with a relatively small volume of effluent. Region V experts are now developing an environmental impact statement on the engineering, ecological and legal aspects of using wetlands for waste treatment purposes.





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## Drinking and Groundwater Quality



Even though the United States is generally known for the purity and safety of its drinking water, several thousand Americans become ill each year from contaminated water. To protect the public from such health hazards, Congress passed the Safe Drinking Water Act in 1974. The act was the first legislation to call for nationally enforceable drinking water standards.

Regulations issued in 1975 set limits on bacteriological, chemical and physical contaminants in drinking water. Schedules were established for routinely detecting and treating those contaminants in all water systems regularly serving more than 25 people.

EPA reviews drinking water regulations at least once every three years, as the Safe Drinking Water Act requires, and changes them when necessary. As part of that process, EPA has proposed new standards to more adequately safeguard public health from the threat of toxic compounds. If the proposed standards are adopted, public water systems will have to expand their detection and

treatment programs to include volatile organic chemicals and particularly hazardous substances such as asbestos and PCBs.

Region V provides technical help and money to public water systems and the states so that they can comply with the regulations and improve the quality of their water. Region V provided \$4.7 million in grants for this purpose during fiscal 1983 and has given Illinois, Michigan, Minnesota, Ohio and Wisconsin primary responsibility for their public water supply programs. Ninety-four percent of the Region's 8,300 community water systems are providing water that meets the requirements of the Safe Drinking Water Act.

Groundwater, which is the source of potable water for 50 percent of Americans, is normally of better quality and requires less treatment than surface water. However, it is especially vulnerable to many types of pollution, including leaking hazardous waste injection wells. A 1981 survey of the Nation's groundwater indicated that a significant number of drinking water sources are contaminated by volatile synthetic organic chemicals.



Region V officials are especially concerned about this type of contamination and have begun a 10-year program in which every underground community water supply in the six states will be tested for volatile synthetic organics.

Wells in urban industrial areas, near hazardous waste disposal sites, or in areas susceptible to contamination will receive first priority.

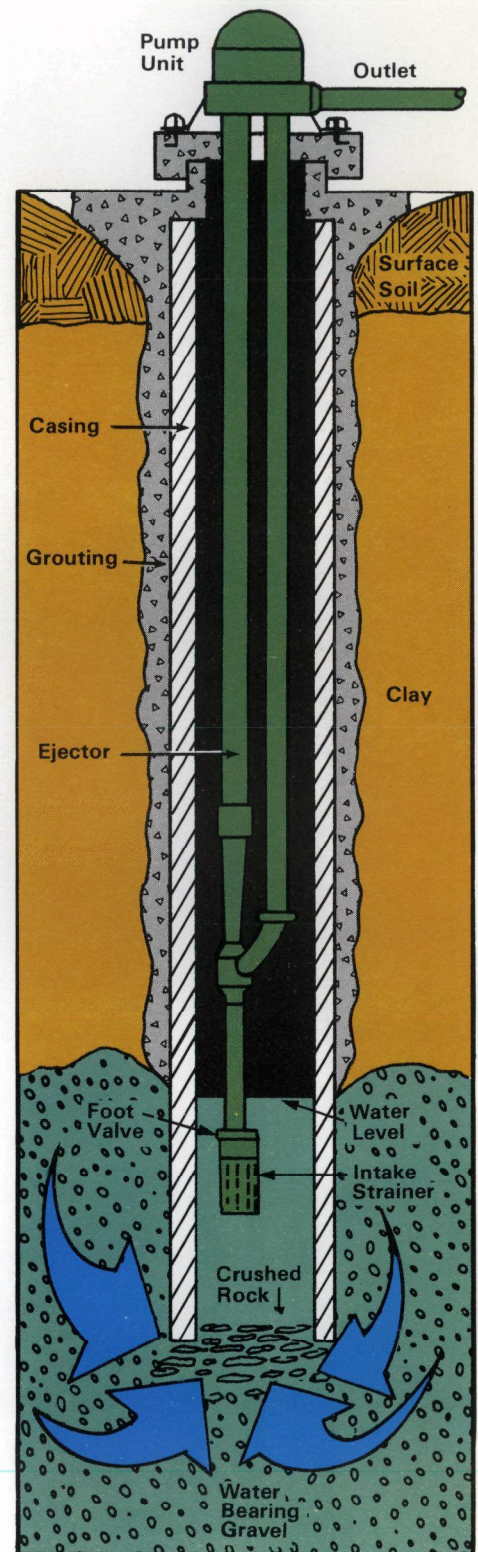
When chemicals are found in levels that could pose a health risk to people drinking the water, EPA will work with the states to find an uncontaminated water source or to treat the groundwater until it is acceptable under the Safe Drinking Water Act.

During fiscal 1983, approximately nine percent of all underground drinking water sources in the Region were tested. The states of Minnesota, Wisconsin and Ohio have already begun their own testing programs for volatile synthetic organics, and the Region intends to supplement the work of those and other states by providing funds and laboratory assistance as necessary.

In order to protect underground water supplies, EPA requires states to implement underground injection control programs. These programs require the licensing of underground hazardous waste injection wells to ensure that they don't poison drinking water supplies.

Region V water quality personnel worked with the states of Wisconsin, Illinois and Ohio during fiscal 1983 to help them develop underground injection well programs compatible with the Safe Drinking Water Act. Region V is administering the programs in the other three states.

Because of Congressional concern during fiscal 1983 about the integrity of hazardous waste injection wells, Region V participated in a special program to evaluate the regulations governing the operation and construction of those wells. Data gathered by the regions will be used by EPA to make recommendations on how hazardous waste injection wells can be made safer.



Drinking water well.





## GREAT LAKES

The Midwest has been graced with many resources, but none more dominant or life-sustaining than the Great Lakes. From the deep and turbulent Superior to the heavily traveled Ontario, the five lakes are the conduit through which much of the Nation's commerce moves.

Freighters carry iron ore from the mines of Duluth across Lakes Superior and Michigan to the steel mills of Gary, while grain from the Nation's "breadbasket" is shipped to the Mississippi and St. Lawrence Rivers for export.



In addition to steel mills and ports, the lakes support recreational and fishing industries with combined total revenues of more than \$1.1 billion a year.

Despite their awe-inspiring size, the lakes are especially sensitive to environmental insult. Only one percent of the water entering the Great Lakes system flows out the St. Lawrence River in any single year, leaving toxic pollutants to accumulate in bottom sediments or fish.

Municipal sewage, toxicants, industrial wastes and agricultural runoff have all contributed to the dramatic decline of the lakes. The most obvious problems were clearly apparent during the 1960's, when rotting fish, bobbing debris, and algae-choked waters shocked the international community into action.

Since then, EPA has worked to restore the lakes to their original grandeur. EPA's Chicago-based Great Lakes National Program Office, working closely with Region V's Water Division, tracks compliance with 1972 and 1978 U.S.-Canada Great Lakes water quality agreements. Those agreements mandate cooperative pollution control and research efforts in order to protect and improve water quality in the Great Lakes.

The U.S. and Canada have spent more than \$7.6 billion since 1972 to construct and upgrade municipal sewage treatment facilities in the Great Lakes Basin. Three hundred and ninety plants in the basin now are effectively treating 97 percent of the sewage, with a corresponding improvement in water quality.

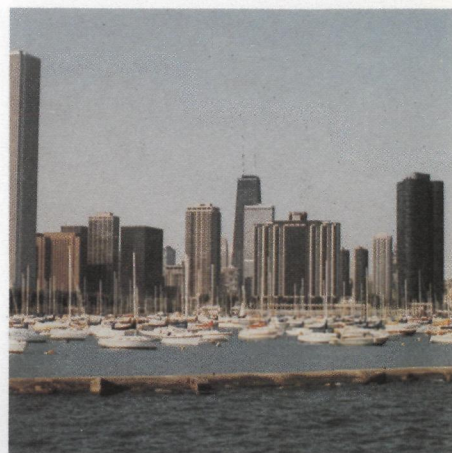
Industrial discharges into the lakes are now limited and monitored by the states and EPA water quality personnel. EPA has established a comprehensive data gathering network to measure pollutants in the water, fish, sediments and air of the Great Lakes ecosystem.

EPA also has helped identify 25 key "areas of concern" in the U.S. where the use of Great Lakes water is limited because of its poor quality. These areas are divided into two classes: Class A, where environmental degradation and impairment of beneficial uses is severe; and Class B, where some environmental degradation is obvious and where uses may be impaired. These sites are illustrated in the accompanying map.

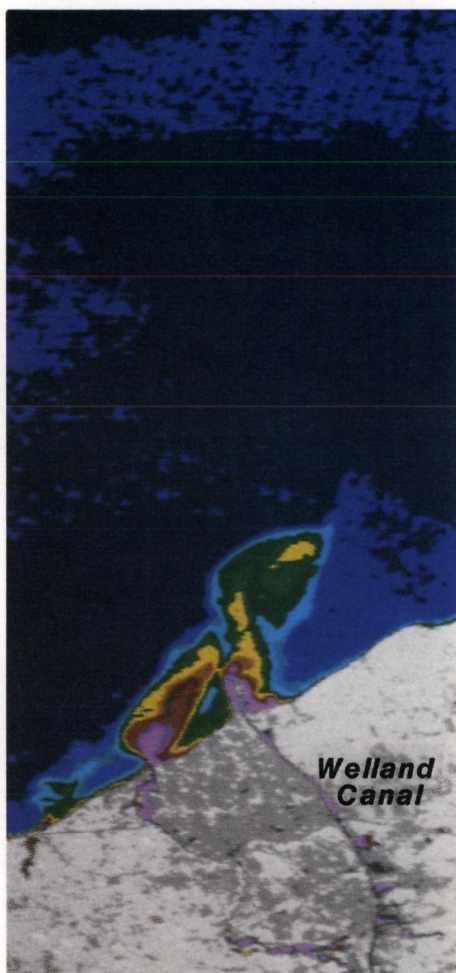
In 1984, the Great Lakes National Program Office will begin an intensive survey of the Detroit River, a Class A area of concern. The river's sediments are contaminated by PCBs and mercury—a situation that makes fish consumption restrictions mandatory. Recreational use of some parts of the river is limited because of sewage overflows and poor water quality. EPA, working with the State of Michigan, will determine what special measures are needed to restore water quality in the river.

The Great Lakes National Program office uses its research vessel, the Roger R. Simons, to assist in gathering data. During fiscal 1983, the ship cruised Lakes Michigan, Huron, and Erie. EPA scientists sampled the water and biota, using the on-board laboratory to check for biological activity and water chemistry.

Guided by the surveillance plan developed by the International Joint Commission (IJC), EPA is using the Roger R. Simons to regularly assess conditions in the lakes and to detect year-to-year







This photograph documents the flow of phosphorus into the U. S. waters of Lake Ontario. The white and grey colors indicate land, while bright blue, aquamarine, yellow, green, red and pink indicate varying concentrations of phosphorus. The blue shades signify the presence of phosphorus in amounts less than 1 milligram of phosphorus to 1 liter of water. The pink signifies the presence of phosphorus in amounts greater than 2.41 milligrams per liter.

changes. The IJC is a six-member board established by the U.S. and Canada in 1909 to protect the waters shared by both countries.

As required by the U.S.-Canada Great Lakes Water Quality Agreement of 1978, EPA keeps an inventory of dischargers into the lakes and reports annually on their compliance records.

The Great Lakes program office also acts as support staff for Region V Administrator Valdas V. Adamkus in his role as the Great Lakes National Program Manager and the U.S. cochairman of the U.S.-Canada Water Quality Board.

## PHOSPHORUS

Phosphates historically have been the biggest environmental insult to the Great Lakes. Phosphates, which come from fertilizer-laden agricultural runoff and industrial and municipal wastes, stimulate the growth of algae and deprive lake water of the diffused oxygen necessary to support aquatic life.

Considerable progress has been made in controlling phosphorus pollution in the Great Lakes since the passage of the 1972 Clean Water Act. Bans on phosphates in detergents, along with a vastly improved and expanded network of sewage treatment plants, have resulted in a dramatic decline of phosphorus discharges to the Great Lakes.

Twelve years ago, EPA ordered the cities of Detroit and Cleveland to reduce their heavy phosphorus discharges into Lake Erie. The Detroit wastewater treatment plant now complies with the international standard for phosphorus, and Cleveland is close to compliance. The overall amount of phosphorus going into Lake Erie from municipalities has dropped from 6,700 tons annually in 1975 to 2,700 tons annually in 1981.

Because of reductions such as these, U.S. wastewater treatment plants meet the international standard for phosphorus.

The problem of phosphorus pollution from agricultural runoff, however, has yet to be solved. Demonstration projects funded by the Great Lakes National Program Office have shown that soil conservation practices, especially minimum tillage, are effective in reducing the erosion of phosphorus-laden topsoil.

EPA believes that low-cost soil conservation practices, existing water pollution control regulations and detergent phosphate limits will effectively protect the Great Lakes from excess phosphorus.

Although phosphorus, sewage and industrial effluent have been significantly reduced, another type of pollution threatens the long-term well-being of the lakes and the people who use them. Toxic substances such as PCBs and DDT are ubiquitous in the Great Lakes Basin and are emerging as its most critical problem.

But PCBs and DDT are only two of the nearly 1,000 contaminants that have been found. Control programs have helped reduce the concentrations of some of these chemicals in area plants and animals, but sport and commercial fishing industries are threatened.

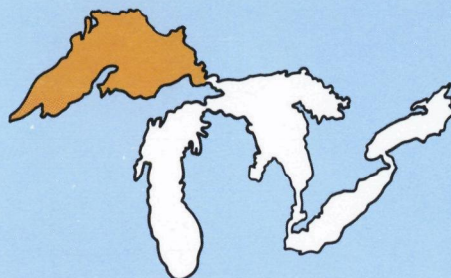
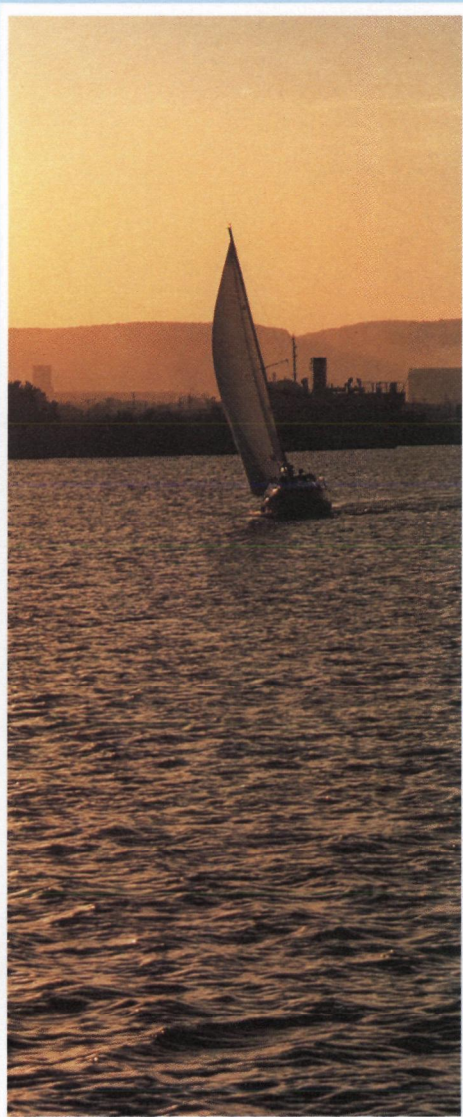
Contaminant levels in most large Great Lakes fish exceed U.S. Food and Drug Administration limits for commercial sale, and sports fishermen in all of the lakes are advised to avoid or restrict their consumption of certain kinds of fish.



## Areas of Concern







### LAKE SUPERIOR

Lake Superior, the largest, deepest and cleanest of the Great Lakes, has not entirely escaped pollution. Taconite mining residues, similar to asbestos particles, have been found in the drinking water of communities on the western shores of the lake, forcing them to install filtration plants for the first time.

PCB levels in lake trout still exceed the standards in the 1978 U.S.-Canada agreement, although levels of toxicants in herring gull eggs appear to be falling.

Eutrophication is not considered to be a serious environmental problem in Lake Superior.



### LAKE MICHIGAN

Lake Michigan, the only one of the Great Lakes entirely within the U.S., has serious contamination problems, partly because of the large amounts of PCBs discharged into Waukegan Harbor at Waukegan, Illinois, over a period of many years. Because it is a long, narrow cul-de-sac, Lake Michigan requires a longer period to flush itself of contaminants than do most of the other lakes.

Lake Michigan trout still contain the highest levels of PCBs and DDT in the Great Lakes system, except for Lake Ontario, and exceed U.S. Food and Drug Administration limits for commercial sale. Consumption advisories for sports fishermen are in effect in many parts of the lake.

Serious water pollution problems persist near certain metropolitan areas, most notably in the vicinity of Indiana Harbor.

Class A areas of concern are: Southern Green Bay, the Milwaukee Estuary, Wisconsin; Waukegan Harbor, Illinois; and the Grand Calumet-Indiana Harbor, Indiana, area.





### LAKE HURON

With the exception of Lake Superior, Lake Huron is the least polluted of the lakes. However, discharges into the Saginaw River have made the Saginaw Bay area a Class A area of concern.

Fish consumption bans are in effect for portions of the Saginaw River because of PCBs, PBBs and dioxin, and a fish consumption advisory is in effect for southern Lake Huron and Saginaw Bay. The bay has recently shown substantial improvement, mainly because of effective municipal wastewater treatment. But existing pollutants and a lack of controls on agricultural runoff complicate water quality problems there.



### LAKE ERIE

With an average depth of only 58 feet, Lake Erie has the smallest volume of water and is the shallowest of the Great Lakes. Since its drainage basin contains the largest population and is heavily industrialized, it is not surprising that Lake Erie has faced the most severe and widely publicized pollution problems.

At one time in the mid-1960's, massive algae blooms choked off oxygen to 65 percent of the lake's bottom water. Pollution, overfishing and other factors nearly decimated the lake's most desirable species of fish.

Many lakeshore beaches were closed because of pollution caused by untreated sewage and masses of algae.

Considerable progress has been made since then, especially in reducing municipal and industrial discharges.

Municipal dischargers are now complying with international phosphorus limits, and many area counties are encouraging farmers to use no-till methods that will reduce soil losses, resulting in improved water quality and reduced farming costs.

Seven areas of concern affect Lake Erie. They are located on the Rouge, Detroit, Raisin, Maumee, Black, Ashtabula and Cuyahoga rivers.



### LAKE ONTARIO

Since most of Lake Ontario's water comes from Lake Erie and the heavily polluted Niagara River, this lake is the most contaminated. It ranks only behind Lake Erie as the lake with the most phosphorus loading.

Portions of the eastern end of the lake have suffered oxygen depletion because of nutrients entering Lake Ontario from the Bay of Quinte. Although its water quality is better than Lake Erie's, Lake Ontario suffers from accelerated eutrophication due to excess phosphorus loading and toxic contamination. Industry has spilled Mirex and other toxic substances into the Niagara River and Lake Ontario, resulting in a fish consumption advisory for fish caught in both U.S. and Canadian waters of the lake.

As in Lake Erie, some improvement has been made, but continued efforts are necessary. To a considerable extent, improvement in Lake Ontario depends on improvement in Lake Erie.

In the U.S., the Class A area of concern affecting Lake Ontario is the Niagara River, where much improvement is expected when existing pollution control programs are fully implemented.





## **AIR QUALITY**

The Clean Air Act of 1970 directed EPA to establish air quality standards to protect human health and the environment. The Act made the states primarily responsible for controlling pollution to achieve those standards.



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There are two types of air quality standards that affect the residents of Region V: primary and secondary National Ambient Air Quality Standards. The primary standards protect public health, while the secondary standards protect public welfare as measured by the effect of air pollution on vegetation, materials and visibility.

The pollutants for which air quality standards have been established are total suspended particulates, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone (smog) and lead. In addition, EPA regulates the emission of certain hazardous air pollutants, such as asbestos and vinyl chloride.

Although the air in Region V is markedly cleaner than it was when the Clean Air Act was passed, pollution problems are far from being solved.

High summertime levels of ozone, caused by factory and automobile emissions, remain the most pervasive air pollution problem in the Region. Although Region V has an aggressive program to control the hydrocarbon emissions that create ozone problems, about 32 million people in the six-state area remain affected by unacceptable levels of this toxic gas.

Sulfur dioxide, produced mainly by coal-fired power plants, is still a pollution problem in many areas. More than seven million people in

the Region remain exposed to unacceptable concentrations of this compound, which is a major contributor to acid rain.

Carbon monoxide, deadly in high concentrations and, like ozone, mostly a product of car and truck exhausts, is a problem in the Region's large cities. The cities of Chicago, Detroit, Cleveland, Minneapolis, and St. Paul all exceeded carbon monoxide pollution standards in 1983.

Air pollution by soot and dust particles has been reduced in the Region by one-third. The reduction of these pollutants, grouped together and known as "Total Suspended Particulates (TSP)," was achieved through the use of pollution control technology and cleaner fuels.

Region V and its states have signed important air pollution control agreements with steel mills, chemical manufacturers, utilities, grain terminal operators and municipalities. Even though 90 percent of the 4,500 major industrial air pollution sources in the Region are in compliance with clean air regulations, seven million people continue to be exposed to excessive amounts of TSP. Because most stack sources have already been controlled, EPA is now emphasizing the control of dust from coal storage piles, roads, parking lots, and construction sites.

EPA also encourages states and industry to use environmental auditing, continuous in-stack emissions monitoring, and improved inspection programs to improve the Region's air quality.

Of special concern to Region V air quality officials are certain national parks and wilderness areas whose air must, by law, be protected from degradation. The four such areas in Region V are: Isle Royale National Park in Lake Superior, the Seney Wilderness Area in Michigan, and the Boundary Waters Canoe Area and Voyageurs National Park in Minnesota. Industrial growth and energy development near some of these areas are making it difficult to assure continued pristine air quality. EPA is closely monitoring state programs designed to protect these sensitive areas.

The Region continued its vigorous enforcement of the Clean Air Act during 1983, initiating half of EPA's air pollution enforcement actions nationwide.

EPA's emphasis is on working with states to achieve cleaner air. The threat of sanctions, such as the withholding of Federal highway funds, has produced conflict in the past between clean air and economic growth. The Agency's revised sanctions policy will not penalize those states that have made sincere efforts to comply with the Clean Air Act, even if they did not meet the deadlines for doing so. Implementing this new sanctions policy in 1984 with minimal harm to the Midwest's fragile economy is going to be a major challenge for Region V.



## Inspection and Maintenance Tampering and Fuel Switching

The control of industrial pollution has dramatically improved the Region's air quality, but in some areas, these efforts have not been enough. The air in several cities remains dirtier than the Clean Air Act allows, largely because of automobile emissions.

Cars and light trucks are the source of two of the most pervasive air pollutants in the United States—carbon monoxide and hydrocarbons. Carbon monoxide is harmful because it reduces the oxygen available to the brain and body cells and puts an extra burden on the heart and lungs. Hydrocarbons themselves are generally not harmful, but they react with sunlight and another pollutant, nitrogen oxide, to create smog. The main constituent of smog, ozone, is a severe respiratory irritant.

To control these pollutants in cities that could not meet clean air standards by the end of 1982, EPA required certain states to develop vehicle inspection and maintenance programs. These programs are designed to check the effectiveness of emission control systems on cars and light trucks. Often these systems do not work properly because of maladjustments and inadequate maintenance, tampering, and the use of leaded gas in cars designed for unleaded fuels.

Wisconsin and Indiana are starting inspection and maintenance programs in the Milwaukee, Gary and Louisville areas. Illinois and Michigan have both agreed to begin testing vehicles in the Chicago, East St. Louis and Detroit areas. It is possible that Ohio will have to do the same in Cleveland and Cincinnati.

The inspection programs make car and light truck owners responsible for taking whatever action is needed



to bring the emissions control system into compliance with EPA regulations. Testing programs in several states have shown that only about 15 to 30 percent of cars require repairs, with those repairs typically ranging in cost from \$18 to \$35. The most common repairs are carburetor adjustments, spark plug replacement, choke adjustments, air filter replacement and idle speed adjustment. Older cars are not expected to meet the same standards as newer models with sophisticated controls.

The pass/fail standards for each model year are set to be within the design capability of the automobile. Some states set cost limits on repairs so that drivers of older cars will not have to undertake expensive repair work such as ring or valve jobs.

The State of New Jersey, which has the oldest inspection and maintenance program in the country, has recorded a 28 percent decrease in carbon monoxide levels. State officials attribute this to vehicular inspections coupled with the increasingly stringent new car emissions standards required by EPA.

EPA hopes to supplement the air quality gains of the vehicle inspection and maintenance program with another initiative designed to deter people from illegally tampering with or removing the emissions control systems on their vehicles. The Agency is also cracking down on fuel switching—the use of leaded fuel in cars requiring lead-free gas.

During fiscal 1983, EPA proposed \$5.3 million in penalties against 10 Chicago-area gasoline retailers and seven distributors who allegedly sold leaded gasoline as unleaded. One penalty, against a Palatine, Illinois, petroleum company, was \$4 million—the largest single penalty ever proposed for violations of the Federal unleaded fuel regulations.

Use of leaded gasoline in cars designed for unleaded can damage their catalytic converters and increase tailpipe emissions 200 to 800 percent.

More than one million tons of hydrocarbons and 12 million tons of carbon monoxide spewed from the tailpipes of cars with defective emissions control systems during fiscal 1983.

EPA is encouraging all states to adopt their own laws prohibiting tampering and fuel switching. Meanwhile, the Agency will continue to seek out and prosecute those who violate the Clean Air Act.



## Acid Rain

As research continues to document the existence and consequences of acid rain, Region V is actively working to help develop strategies for its control.

Acid Rain is formed when nitrogen and sulfur oxides from fossil fuel combustion react with oxygen and water vapor in the air to form nitric and sulfuric acids. These acids return to Earth in rain, snow, sleet or hail.

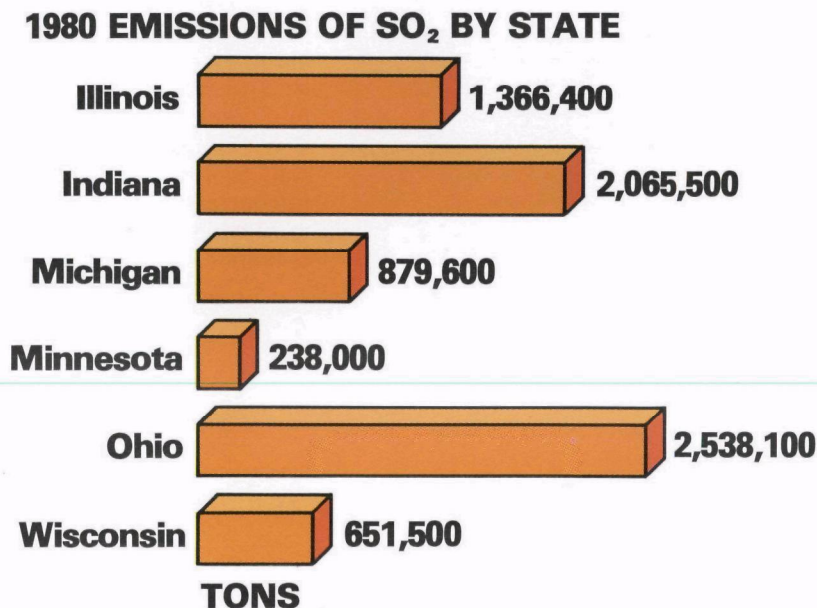
Even in the most pristine environment, rain is naturally acidic because carbon dioxide in the atmosphere reacts with rain to produce carbonic acid. That amount of acidity is enough to release minerals from the Earth's crust for plant and animal use, yet it is not enough to cause ecological damage.

Precipitation falling in the Northeast and other parts of the country is routinely five to 50 times more acidic than normal. Acid rain gradually lowers the pH of soil and water, causing the soil to leach its valuable nutrients and minerals into streams and lakes, where they can poison fish or affect their ability to reproduce.

Region V is particularly concerned about acid rain because its six states contain some of the largest coal-fired electricity generating plants in the United States. These plants are major sources of the sulfur dioxide that helps form acid rain. But Region V also contains lakes, streams and forests that are particularly sensitive to this type of pollution and that must be protected.

Air specialists from Region V have served on EPA's Acid Rain Task Force and are reviewing possible control strategies and their impact on Midwestern towns and cities. Special attention is being paid to the potential economic impacts which acid rain controls could impose on the coal producing states of Ohio, Illinois and Indiana.

Region V officials believe that acid rain control is not only desirable; it is imperative. But they stress that the tremendous costs of this control, like its benefits, must be shared by all—not just the citizens and industries of the Midwest.



### TOTAL SUSPENDED PARTICULATES (TSP)

A measurement of particles in the air (such as soot, ash and smoke). Includes nontoxic materials (dust and dirt) as well as toxic substances, such as lead, asbestos and sulfates. Natural and man-made sources contribute to TSP, which can adversely affect human respiratory systems to various degrees, depending on particle size and composition.

### CARBON MONOXIDE (CO)

A colorless, odorless, tasteless, toxic gas produced by incomplete combustion of fossil fuels. The automobile engine is the main source of this pollutant. CO is quickly absorbed by the blood and reduces the oxygen available to tissues, impairing visual perception and alertness. Continued exposure to elevated CO levels can threaten life. Persons with cardiovascular diseases are especially vulnerable to this type of pollution.

### OZONE (O<sub>3</sub>)

A colorless, pungent, toxic gas formed by a series of chemical reactions when hydrocarbons and nitrogen oxides, from automobiles and other sources, are exposed to sunlight. Ozone is the principal constituent of smog and is a severe irritant to mucous membranes, impairing lung function and aggravating existing respiratory disorders.

### SULFUR DIOXIDE (SO<sub>2</sub>)

A heavy, pungent, colorless gas formed primarily by the combustion of sulfur-bearing fuels, such as coal. SO<sub>2</sub> reacts readily with other atmospheric compounds and pollutants to form sulfates, a group of compounds that aggravate respiratory ailments—such as bronchitis, emphysema, asthma—and heart disease. Sulfates combine with moisture in the atmosphere to produce acid rain.

### NITROGEN DIOXIDE (NO<sub>2</sub>)

A brown gas formed during high-temperature combustion which reacts with hydrocarbons in the presence of sunlight to produce photochemical oxidants, or smog. It is also a pollutant in its own right and can affect lung tissue, reduce resistance to disease, contribute to bronchitis and pneumonia and aggravate chronic lung disorders. It is also a contributor to acid rain.



## Radiation

EPA administers programs designed to protect humans and the environment from exposure to harmful levels of radiation.

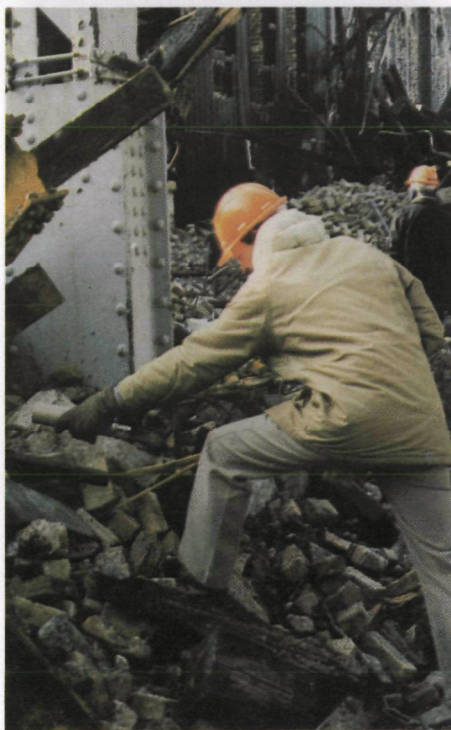
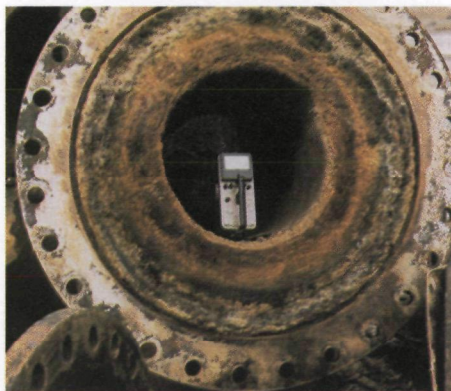
EPA's Office of Radiation Programs measures levels of radiation in the environment, analyzes data on its effects, issues standards to limit human exposure, and responds to emergencies involving radioactive materials.

There are two types of radiation: ionizing and nonionizing. Ionizing radiation, which comes from X-rays, nuclear power plants, uranium wastes and other sources, is radiation that can remove electrons from atoms. Its primary health effect is an increased risk of cancer.

Nonionizing radiation, from radio and television transmitters and microwave ovens, does not change the structure of atoms. However, it can heat body tissue, possibly producing biological effects.

EPA, concerned with both types of radiation, develops standards that limit human exposure to it. The Agency also has developed guidelines on the quantities and concentrations of radioactive materials that may be released into the environment.

As part of its environmental studies and support activity, the Office of Radiation Programs maintains a nationwide system that monitors background radiation as well as the amount of fallout from the atmospheric testing of nuclear weapons.



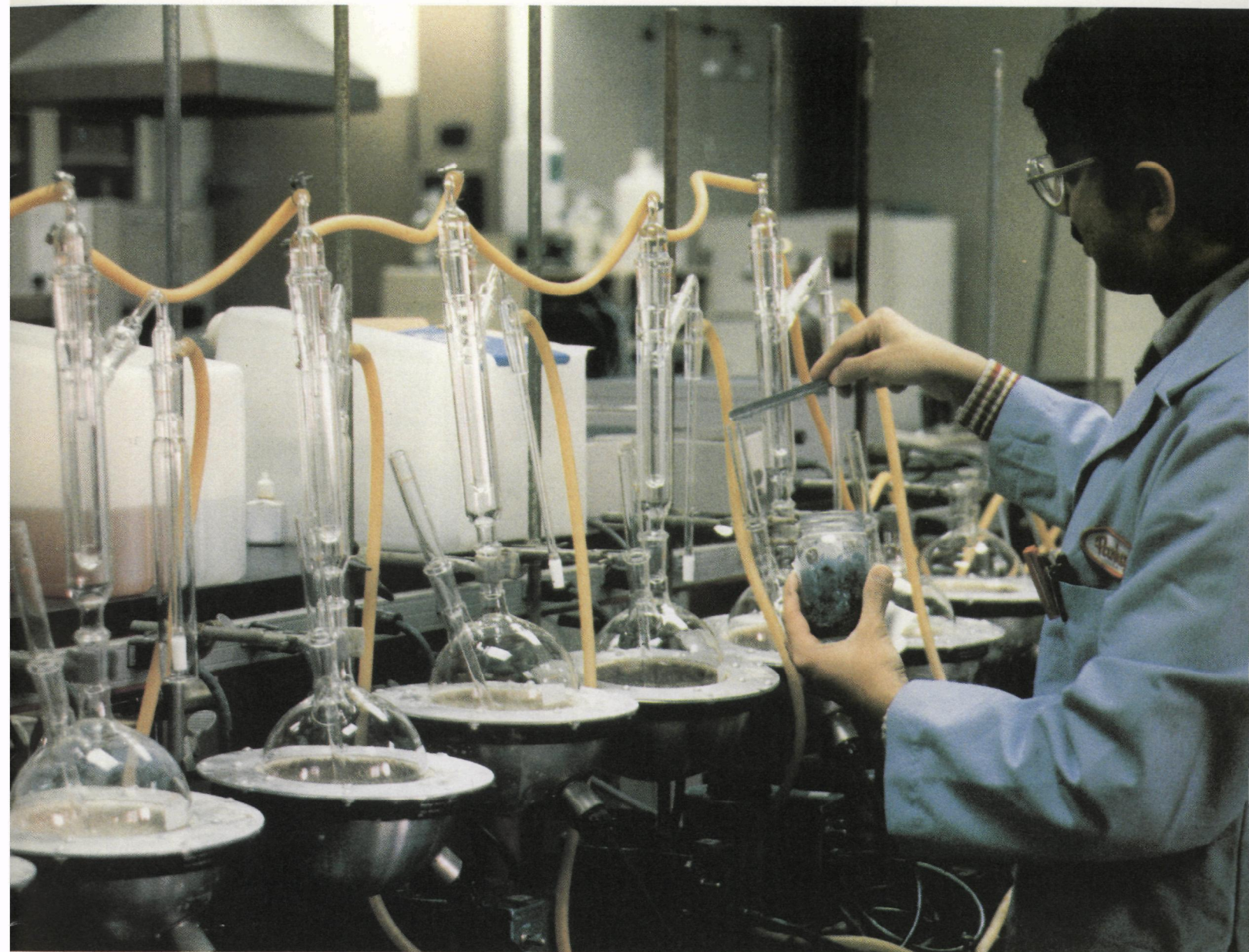
EPA checks air, precipitation, surface water, drinking water, and milk for radiation in each of the 50 states. Data from the system are used to determine normal background levels of radioactivity, to identify trends in radiation levels and to help officials protect public health in case of an emergency.

In Region V, radiation experts help other Federal agencies evaluate and test state and county emergency response plans. These plans are designed to protect people and the environment in case of a major release of radioactivity from any of the Region's 22 nuclear power plants. Agency personnel are also available to provide technical assistance if such an emergency arises.

Region V experts also survey and recommend cleanup options for sites contaminated by radiation and are investigating selected industries for potential radiation problems.

In the City of West Chicago, Illinois, EPA is working to determine the extent of radioactive contamination from a thorium extraction plant that operated in the city between 1931 and 1973. Radioactivity has been detected on the grounds of the plant, as well as at the city's sewage treatment plant, in residential areas, in a creek and in a park. The Agency is working with West Chicago officials to minimize human exposure to radioactivity. The Agency expects to recommend possible cleanup options.





## **ENVIRONMENTAL SERVICES**

If Region V were to be personified, the Environmental Services Division would be its hands, eyes and ears.

Working out of offices in Westlake, Ohio; Grosse Ile, Michigan; and Chicago, the professionals in this group do much of the Region's field, laboratory and emergency work.



Engineers, scientists and technicians from this division serve the Air, Water and Waste Management programs to achieve EPA's environmental goals.

The Environmental Services Division has five branches: the Central District Office in Chicago, the Eastern District Office in Ohio, the Environmental Monitoring Branch, the Central Regional Laboratory and the Quality Assurance Office, all in Chicago.

The Field Investigations Section, located in the district offices, takes air and water samples, monitors environmental control practices at Federal installations and helps with regional water supply and solid waste management programs as needed.

The Spills Response Section, working out of the Central District Office in Chicago, is capable of quickly responding to oil and hazardous materials emergencies anywhere in the Region. Its professionals are trained to help state and local authorities control such incidents without harm to human health or the environment. This section also develops and oversees cleanups of abandoned hazardous waste dumps requiring immediate action.

The Environmental Monitoring Branch manages and analyzes air and water quality data gathered in

the field. These data are stored in special computer systems linked to all Region V states, giving Agency program managers quick access to current information about environmental conditions in any particular location. This branch also oversees EPA grants and contracts relating to environmental monitoring.

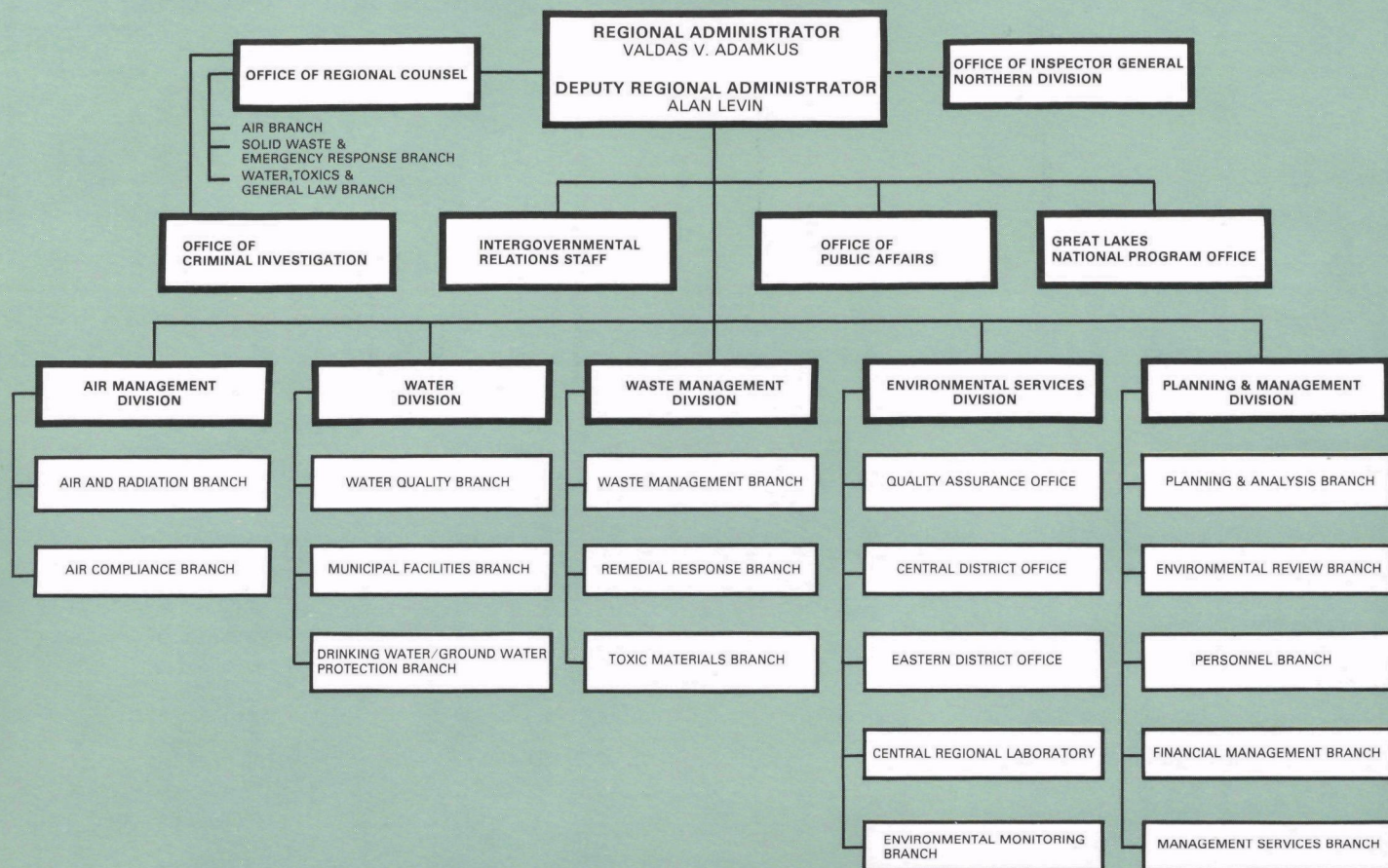
The Central Regional Laboratory in Chicago is the largest of EPA's regional laboratories. It provides analytical and technical support services to the air, water and waste divisions, the Central and Eastern district offices, and the states. When needed, the laboratory will perform tests for other EPA regions, analyzing air, soil, water, fish, and plants for traces of chemicals in amounts as small as  $10^{-15}$  grams.

Laboratory and field personnel are periodically audited by the Quality Assurance Office to see that they analyze and gather their data properly. Because the Agency's policy is to produce data of known quality, data gathering and laboratory procedures must be uniform among EPA's laboratories and anyone who does work for the Agency. Scientists from the Quality Assurance Office routinely check to make sure that states, private contractors and EPA's own labs have the proper staff, equipment and quality assurance programs to conform to EPA's standards. This section also certifies state and municipal laboratories that test drinking water under the Safe Drinking Water Act.





## U.S.EPA Region V Organizational Chart

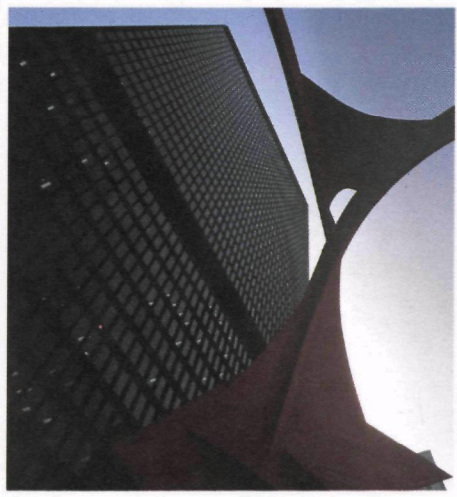


### For Further Information

If you would like additional information about specific U.S. EPA programs, please visit the Office of Public Affairs, U.S. EPA Region V 230 South Dearborn Street, Chicago, Illinois 60604, or call (312) 353-2072.

This office maintains a supply of EPA publications, operates and informal speakers' bureau and coordinates regional distribution of environmental films. There is no charge to the public for these services.

If you encounter an environmental problem, report it first to your local, and then your state, pollution control agency. Those numbers are listed on the right. For specific information about U.S. EPA programs call:



#### U.S. EPA Region V ..... (312) 353-2000

Air Pollution ..... (312) 353-2212  
 Automobile Problems  
   Catalytic Converters ..... (202) 382-2640  
   Certifying a Car for Sale ..... (313) 668-4277  
   Fuel Economy ..... (313) 668-4329  
   Fuel Switching ..... (312) 886-4577  
   Imports ..... (312) 886-6082  
   Tampering with  
   Emission Controls ..... (202) 382-2640  
   Warranty &  
   After-Market Parts ..... (202) 382-2940  
 Great Lakes  
   National Program Office .... (312) 353-2117  
   Hazardous Waste, Superfund (312) 353-9733  
   Oil & Chemical Spills  
   National Emergency  
   Response Center ..... (800) 424-8802  
   Region V Emergency  
   Response Center ..... (312) 353-2318  
   Pesticides ..... (312) 353-2192  
   Radiation ..... (312) 886-6175  
   Toxic Substances ..... (312) 886-6006  
 Water Quality  
   Wastewater Treatment .... (312) 353-2121  
   Drinking Water ..... (312) 353-2650  
   Wetlands ..... (312) 886-6678

#### ILLINOIS

Illinois Environmental Protection Agency  
 2200 Churchill Road  
 Springfield, IL 62706  
 (217) 782-5562  
 24-hour number: (217) 782-3637

#### INDIANA

Indiana State Board of Health  
 1330 W. Michigan Street  
 Indianapolis, IN 46206  
 (317) 633-0100  
 24-hour number: (317) 633-0144

#### MICHIGAN

Michigan Department of Natural Resources  
 Stevens T. Mason Building  
 Lansing, MI 48909  
 (517) 373-1220  
 24-hour numbers: (517) 373-7660  
 (800) 292-4706

#### MINNESOTA

Minnesota Pollution Control Agency  
 1935 W. County Rd. B-2  
 Roseville, MN 55113  
 (612) 296-7373  
 24-hour number: (612) 296-7373

#### OHIO

Ohio Environmental Protection Agency  
 361 E. Broad St.  
 Columbus, OH 43215  
 (615) 466-8508  
 24-hour number (within Ohio only):  
 (800) 282-9378

#### WISCONSIN

Wisconsin Department of Natural Resources  
 P.O. Box 7921  
 Madison, WI 53707  
 (608) 266-2621