

FIRST THINGS FIRST

a strategy
against
water
pollution



A sweeping Federal-State campaign against water pollution was launched in late 1972 when Congress enacted the Federal Water Pollution Control Act Amendments. This law updated and strengthened earlier Federal water pollution legislation. It was a mandate for action.

This booklet explains the major elements of the strategy used by the U.S. Environmental Protection Agency (EPA) and the States in their attack on water pollution. It discusses as clearly and directly as possible the problems we now face, and what we are doing about them.

September 1974



U S. ENVIRONMENTAL PROTECTION AGENCY • WASHINGTON, D C. 20460

the problem

Most Americans know quite a lot about water pollution. Individually we may not know too much about chemistry, biology or oceanography, but we do know that our waters are in serious trouble. We see and hear evidence of water pollution everywhere we go.

We see signs that tell us not to drink the water, not to fish, and not to swim. We see lakes clogging from excessive weed growth. We hear about fish and shellfish that are unfit to eat. We hear about contamination of the underground water supplies on which many of our cities and rural areas depend.

Why? Our waters used to be clean.

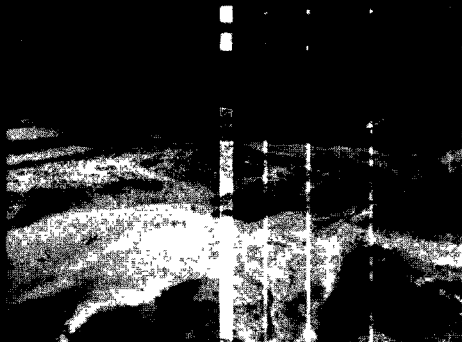
What happened?

Simply this: as our industry and population grew, we produced more and more industrial and human waste. Soon we were producing more than Nature's own purification system could handle, and our waters became overloaded with impurities. Now many of our lakes and rivers, harbors and bays are a national disgrace because they are fouled with human and animal wastes, chemicals and oil, sludge, and debris of all kinds.

Thousands of industrial plants discharge billions of gallons of wastes into our waterways each day. Much of it is inadequately treated; some isn't treated at all.

Public sewer systems dump another 40 billion gallons daily, including untreated sewage from more than 1,400 cities and towns and inadequately treated sewage from another 2,300 communities.

An additional 50 billion gallons a day—most of it untreated—comes from agricultural sources. This includes pesticides and fertilizers from farmlands as well as bacteria and chemicals from cattle and hog feedlots.



About 8,500 accidental and deliberate oil spills contaminate our coastal and inland waters each year.

Power plants and industries use some 130 billion gallons of water each day for cooling purposes. In the process they create *thermal pollution* by raising the water's temperature as much as 20 degrees before returning it to streams, lakes and coastal waters.

A huge volume of stormwater drains into waterways every day, bringing with it tons of pollutants and eroded soil.

More than 62 million tons of garbage, sludge, chemicals, explosives, debris and dirt are dumped off our coasts each year.

Where does all this waterborne junk and garbage come from? We still don't know all the facts, but here are some significant ones.

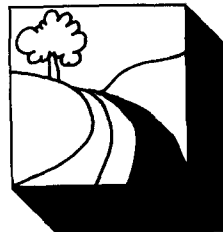
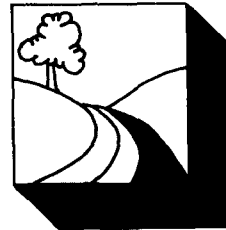
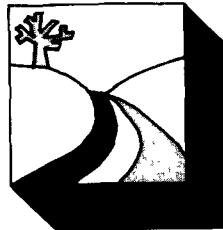
As a result of all this, a 1973 estimate held that one out of every three miles of streams in the United States was polluted. Moreover, as much as 665,000 square miles of the western Atlantic Ocean are now

contaminated with man-made pollutants.

We all know that our waters are polluted—but now we can do something about it. The 1972 Act gives us the tools we need to solve the problem. EPA, in turn, has devised a national water strategy to carry out the requirements of the Act so that these tools will be used to everyone's advantage.



Pollution contaminates the ocean and one of every three miles of our streams.



taking action

Congress intended the Act to achieve one major goal: by July 1983, the Nation's waters would be clean enough to protect fish, shellfish and wildlife and to permit swimming and other recreational use. Achieving this goal is an awesome and ambitious task; however, EPA and the States are waging an aggressive campaign to do just that.

Because of the scope and diverse nature of our problems, however, not everything can be done at once. We can't solve all of these problems overnight because the money and manpower available for the cleanup are limited, and the severity of water pollution varies from place to place. Those resources that are available, therefore, will have to be used so that the major problems receive the most emphasis. In other words, "First Things First."

For these reasons EPA devised its national water strategy. Each of the many water programs now underway is a part of that strategy; the emphasis given to each one reflects the priorities we must follow to get the most out of the limited resources at our disposal.

EPA's water strategy has developed from two main

principles: (1) we must move first to combat pollution where it is most serious; and (2) we must prevent clean waters from becoming polluted. The primary targets, therefore, are the two major sources of water pollution—industries and communities. Factories and sewage treatment plants are specific sources that can be readily identified; for this reason, they are commonly called "point" sources. The pollution they produce, therefore, can be defined and dealt with in a systematic way. The present strategy emphasizes the need to regulate these specific sources first, since they are the single most significant cause of water pollution and can be easily identified in most cases.*

*Some sources of pollution can't be recognized or defined so easily: for example, some cases involve the seepage of chemicals into lakes, streams and groundwater, or the washing of pesticides and fertilizers from farms into waterways. Since these "area" sources are hard to pinpoint, they are more difficult to regulate and control. EPA and the States are working on ways to control these sources, too—see pages 13-15.

EPA's strategy

These are the elements of EPA's sequential strategy for dealing with water pollution:

The States inventory and assess the present quality of their waters to define their most severe problems. This helps EPA and the States decide where to take action first. The severity of pollution in a particular body of water also dictates what method or combination of methods should be used to improve the water's quality.

EPA establishes national *effluent limitations* on what a "point" source can discharge into the water. These are developed for factories, power plants, sewage treatment plants, animal feedlots and other specific sources. The limitations reflect the degree of cleanup we can expect to achieve using the latest technology for controlling wastes. Depending on the pollutant in question, an effluent limitation may permit some discharge or no discharge at all.

Treatment plants, industries and other "point" sources must comply with an initial set of

effluent limitations by 1977. Then they must work to implement a second, even more strict set of limitations by 1983. The limitations, therefore, call on each specific source of pollutants to reduce its discharge over a period of time to meet the Act's 1983 deadline.

Consider a specific industry. EPA's guidelines on effluent limitations for the beet sugar industry call for no discharge of pollutants by July 1, 1977, provided that suitable land owned by the company is available for land disposal of waste products. If such land isn't available, some discharges into the water will be allowed; but all beet sugar plants will have to meet the "no-discharge" requirement by July 1, 1983.

Such limitations will do a lot to protect both the environment and human health and welfare. They are based on scientific and technical analysis and, since they apply equally to all plants within a particular industrial category, they introduce an element of economic equity between individual competitors in that industry. They are not intended to place a heavy financial burden on industries; in fact, they represent goals that are technologically achievable at economically realistic costs. This is

demonstrated by the fact that, of the 52 beet sugar plants in operation in mid-1973, 11 have already met the "no-discharge" requirement. Similar gains are being made in other industries, too.

To make sure that all effluent limitations and other requirements are met, EPA and the States issue *discharge permits* to all specific "point" sources of pollution. The 1972 Act makes it illegal to discharge any pollutant without a permit. This isn't a "license to pollute;" instead, a permit sets up a systematic time schedule that a plant must follow in reducing the pollution it produces. By following that schedule, the plant will cut its pollutant discharge to comply with the effluent limitations for 1977 and 1983. In effect, a permit is an agreement between a discharger and the government that sets specific limits on the content, volume and temperature of what may be discharged into the water. If a power plant, factory or treatment plant is unable to comply immediately with applicable effluent limitations, the permit sets a series of firm, intermediate targets through which the final goal can be reached by a specified date. A first round of permits is aimed at attaining a certain level of

improvement by 1977; a second round will follow to insure compliance with the tighter requirements of 1983.

In keeping with the strategy of hitting pollution where it's most serious and keeping clean waters clean, EPA is giving priority to issuing permits to the major and most significant dischargers and to new sources of pollution. This puts the biggest polluters on clean-up schedules and eliminates the possibility that discharges from new sources will lower existing water quality.

If a discharger violates the conditions of a permit, or discharges pollutants without a permit, he may be fined up to \$10,000 a day. Repeated intentional violations could bring fines of \$50,000 a day and imprisonment for up to two years. These provisions put some real "teeth" into the law.

EPA establishes *performance standards* for new plants in a wide variety of industrial categories. These standards are, in effect, strict effluent limitations. They insure that new plants have the best practicable pollution controls built in from the very beginning. In the case of the beet sugar industry, this means that all new plants must meet a

"no-discharge" requirement as soon as production begins.

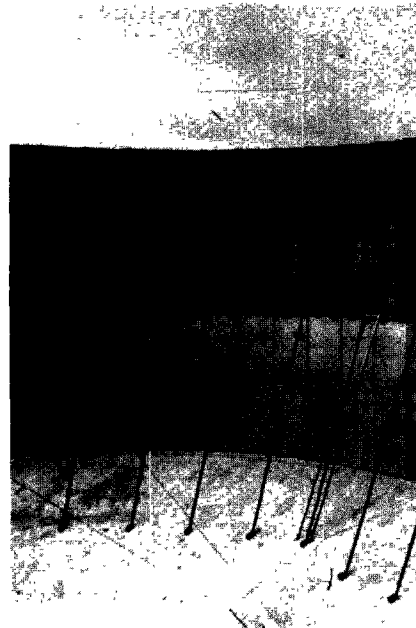
EPA also sets standards to regulate the discharging of toxic substances, such as cadmium and mercury. The 1977 and 1983 deadlines for limiting pollutant discharges do not apply in the case of toxic substances; steps to meet these standards must be taken more quickly, since public health and welfare might otherwise be severely affected.

Municipalities must insure that the sewage they produce is adequately treated. At the present time, untreated and improperly treated sewage accounts for 20 percent of the pollutant load dumped into the Nation's waters. To help them solve this problem, communities can apply for Federal grants to cover 75 percent of the costs of planning and building publicly-owned sewage treatment facilities. A total of \$9 billion has been allocated for this purpose through 1975.

Although \$9 billion is a substantial amount, it won't be enough to solve the problem entirely. In fact, the States have estimated that their total needs in this category will exceed \$60

billion! EPA, therefore, has to dispense its grants on a priority basis. Each State maintains a current priority list which ranks proposed projects in terms of their anticipated effect on raising the quality of waters within the State. These priorities insure that the money available for grants is used in the most effective way.

Communities may apply for Federal grants for the planning and construction of sewage treatment facilities.



Existing publicly-owned treatment plants must, if necessary, modify their treatment techniques to enable them to apply biological processes, or *secondary treatment*, to wastes by July 1, 1977. They may have to improve their treatment even further, since they must apply the *best practicable treatment* techniques by July 1, 1983. These requirements are defined by each plant's discharge permit. Again, communities can apply for Federal grants to help cover the cost of making these modifications.



EPA requires industries that discharge their wastes to municipal treatment plants to *pretreat* those wastes to remove any substances that might either harm the treatment plant's processes or pass through the plant untreated. This requirement applies to both new and previously existing sources.

In some cases, the States apply even more stringent controls to regulate pollutants. All of the discharge limitations discussed up to this point affect the content and volume of what is dumped into the waterways. Sometimes, however, the purity of the receiving waters serves as a standard for controlling pollution. For example, the States set minimum water quality standards for each body of water. If effluent limitations aren't enough to bring the quality of a particular river or stream up to meet those standards, industries and treatment plants will be compelled to comply with even tighter controls on what they discharge.

EPA seeks to involve the States as much as possible in carrying out water programs. In fact, the Act clearly notes that the States have the primary responsibility for controlling water pollution.

This is logical because the States—through local governments—know exactly what their specific problems are; they're also in the best position to develop and implement solutions that are tailored to local conditions. A campaign as complex as this nationwide fight against water pollution can succeed only if State and local governments use their expertise to the fullest advantage.

As EPA continues to plan and improve programs needed to implement the Act, the States are assuming an ever-greater role in administering them. The States can, and should, seek increasing responsibility in planning, reviewing grant applications, issuing discharge permits and seeing that the Act is strictly enforced. EPA, of course, will continue to provide assistance in the form of guidance, grants and planning on a national scale.

Planning will continue to serve as the basis for action against water pollution. A great deal of planning has already been done. Our present strategy, for example, could only be devised after each State inventoried and categorized its water quality problems. This provided a basis

for deciding where initial pollution control efforts should be directed. In addition, the systematic approach that is characteristic of careful

WATER PLANNING PROGRAMS

Planning is an essential part of any effort to improve water quality. Several distinct planning processes have been established; each of these has its own scope and purpose and depends upon the others for its ultimate effectiveness. Here briefly are the major planning activities that are helping us win the fight against water pollution:

One basic planning mechanism is the *River Basin Plan*. It's prepared under Section 303 of the Act and is primarily a State effort. The plan sets up procedures to manage the water quality of a river basin, which is the area drained by a river and its tributaries. The Basin Plan identifies and measures the pollutants found in waters within the basin and sets limits on what can be dumped into those waters. It also establishes priorities for building sewage treatment facilities in the basin.

The *Facilities Plan* (Section 201 of the Act) reflects the detailed planning that goes into the building of waste treatment facilities. It considers a multitude of technical and environmental data and serves as the basis for a commu-

planning will insure that we get the most for our money in the years ahead. Planning will proceed on several levels. Local

nity's application for a Federal grant to cover the costs of building or modifying its treatment facilities. To insure that the maximum benefit is gained from a given expenditure, facilities planning procedures call for a detailed comparison of all possible courses of action. In this way planners can choose the best alternative in a systematic way.

The *Areawide Waste Treatment Management Plan* (Section 208) deals with the serious water pollution problems that often plague built-up or highly industrialized areas. These are usually urban areas where water quality problems are so serious that special management and control techniques are needed. For this reason, areawide planning considers a lot more than just the technology of waste treatment—it is also concerned with such related issues as land use, zoning, development, transportation strategies, air quality and solid waste management. It also deals specifically with the problem of "non-point" sources of water pollution, such as urban run-off and erosion at construction sites. All of these things contribute to a comprehensive plan for managing and controlling quality in areas that need special attention.

governments, working closely with the States, will conduct the detailed facilities planning that will enable them to meet their communities' individual waste treatment needs. The States will continue their present planning efforts to manage the overall water quality of each river basin. They will also try to find solutions to the special problems associated with built-up and highly industrialized areas. These activities will be part of each State's annual water pollution program.

EPA will keep its responsibility for maintaining and revising the national water strategy. It will also give guidance whenever it is requested and, in some cases, will provide grants to cover planning costs. However, primary responsibility for devising concrete solutions to local problems will remain with the States.

EPA does whatever is needed to insure that the public has the opportunity to participate in all aspects of the water program. This requirement is spelled out in the Act itself. In general, this involves building effective public participation requirements into EPA's regulations that define

procedures for implementing the various provisions of the Act.

Public participation in water programs should be guided by one overriding principle: the earlier people get involved, the better. If opinions and ideas from citizens are received early—during the initial planning stage of a particular project, for example—the outcome of the project will reflect the community's preferences and goals. The individual citizen can thereby have a definite voice in deciding how his tax dollars are used. In addition to contributing to the planning process, concerned individuals and groups can carry out their own projects, limited only by their resources and imagination. For example, they can work on a particular problem of importance to their community. They can check on the progress made by local industries and treatment plants in cleaning up their discharges. And they can pass their knowledge on to other people who are less well informed.

EPA and State and local planning agencies, as well as individual citizens, will benefit from this policy of encouraging public participation. But most important of all, everyone must cooperate and do his part if our

Some sources of pollution are difficult to pinpoint and are hard to measure and regulate. Examples are acid drainage from mines (below); seepage of pesticides and fertilizers into waterways (right); and sedimentation caused by soil erosion (below right).





national campaign against water pollution is to succeed.

EPA is continuing its preliminary work on several other problems affecting water quality. Because we need to budget our time and resources to deal with water pollution systematically, these problems haven't received major emphasis so far. But as progress is made in the areas that are being emphasized, these issues will assume greater importance in terms of planning for action in the future. Briefly, these problems are:

Area Sources of Pollution.

These are sources that are difficult to pinpoint; therefore, it's hard to measure and regulate the pollution they produce. They are often called "non-point" sources, to distinguish them from the more specific "point" sources. There are many kinds of area sources, but here are some common examples: farms and orchards use pesticides and fertilizers that eventually wash into waterways; farms, construction sites and burned-out or improperly managed forests cause sedimentation through erosion of the soil; mining and oilfield operations contribute acids and other chemical compounds; and areas that rely

**Annually some 7,000 oil
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inland lakes and rivers.**



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practice cannot be
determined.**



All photographs in this publication from EPA's Documerica collection

on home septic tank systems yield plant nutrients which seep into lakes and streams.

Any effort to deal with these “non-point” sources is weakened by our lack of knowledge in this field. So, the States are now in the process of determining the seriousness of their area source problems. Once this is done and substantial progress is made toward our preliminary goal of controlling pollution from specific “point” sources, we will turn our attention to solving these area source problems. We must eventually control them due to the effect they can have in contaminating groundwater supplies and in clogging lakes with excessive plant growth due to high levels of nutrients in the water. EPA is now researching different techniques of restoring lakes and preserving essential groundwater supplies.

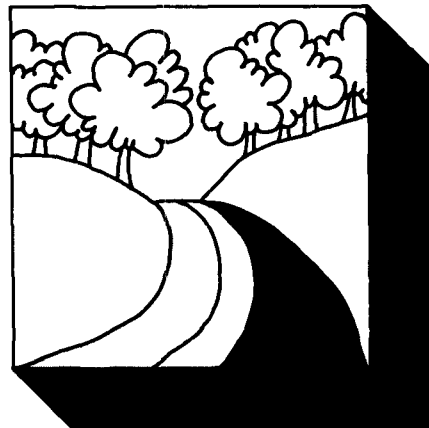
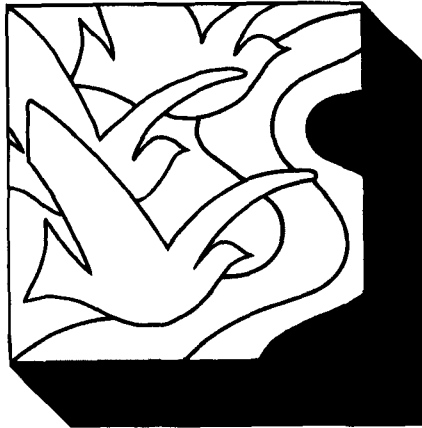
Oil Spills. About 7,000 oil spills—both large and small—occur annually in our coastal waters; another 1,500 spills contaminate inland lakes and rivers. EPA and other Federal agencies are exploring new techniques for both removing oil spills and lessening their adverse effects. This research, in conjunction with improvements in the design of oil tankers, should greatly reduce this danger to aquatic life.

Ocean Dumping. Over 62 million tons of assorted wastes—sewage sludge, dredge spoil, construction debris, explosives and toxic chemicals, to name a few—are dumped off our seacoasts each year. We still don’t have enough data to determine with certainty what the long-term effects of this practice will be.

EPA has recently started issuing permits to ocean dumpers and plans to continue issuing them at the rate of 1,000 each year. At the present time, though, special attention is being given to regulating—and, where appropriate, prohibiting—the dumping of hazardous or toxic materials. Additional research is also underway to help us project more accurately the long-term effects of dumping our wastes at sea.

ision

's strategy for dealing with water pollution is a comprehensive statement of what we have to accomplish and how we will go about it. We need to follow this strategy because we must use our limited money and manpower wisely and efficiently to accomplish our long-term goal of cleaning up the Nation's waters.



want more information?

Copies of the complete Water Quality Strategy Paper can be obtained at no charge from:

ENVIRONMENTAL PROTECTION AGENCY
WATER PLANNING DIVISION (WH-454)
ROOM 815, EAST TOWER, WASHINGTON, D.C. 20460

Other publications can be obtained from EPA, Office of Public Affairs (A-107), Washington, D.C. 20460. Items for sale are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, 92nd Congress. Free.

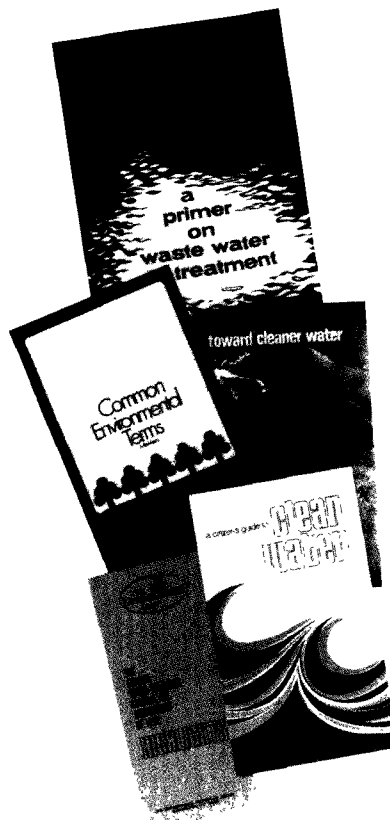
The Federal Water Pollution Control Act Amendments of 1972: Highlights. Free.

Toward Cleaner Water: the New Permit Program to Control Water Pollution. For sale by GPO (Stock number 1973 546-312/140), 50 cents.

A Citizen's Guide to Clean Water. Free.

A Primer on Waste Water Treatment. For sale by GPO (Stock number 1971 0-419-407), 55 cents.

Common Environmental Terms: a Glossary. Free.



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