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EPA JOURNAL

Water
for Living



A Water Review

In this issue of EPA Journal, we report on several different aspects of water use and abuse by people.

EPA Administrator Anne M. Gorsuch reviews drinking water problems and the legislation designed to help cure these ills. Deputy Administrator John W. Hernandez outlines the administration's views on aspects of the Clean Water Act.

Eric A. Eidsness, EPA's new Assistant Administrator for Water, explains the approach he is taking to improving the agency's water programs. An article on the Charles River in Boston outlines progress made by a citizen-state-federal team in curbing the environmental maladies of this ancient waterway.

An article on the lake trout in the Great Lakes explains how these fish could help serve as indicators of the water quality for these lakes. Another article gives a report on how hot water discharges from a municipal power plant helped Canada geese survive a bitterly cold winter.

Other stories on water and pollution include one about a nationally recognized waste treatment pilot plant in Missouri and a survey on the effectiveness of some drinking water filters.

In an interview, Dr. Earnest F. Gloyna, chairman of EPA's Science Advisory Board, gives his views about environmental problems and opportunities.

This issue also reports on a number of new appointments which have been made at EPA.

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An aerial view of a spectacular section of the California coast.



EPA JOURNAL

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Articles

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

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Drinking Water Problems and Solutions 2

EPA Administrator Anne M. Gorsuch analyzes the Safe Drinking Water Act.

Clean Water Act Improvements 5

Proposed amendments seek mid-course corrections.

Water for Living 9

Assistant Administrator Eidsness outlines his approach to the water program.

Better Days for the Charles River 13

A report from Boston on progress made by a citizen-State-Federal team.

Science for the Future 15

An interview with a noted scientist, Dr. Earnest F. Gloyna.

Lake Trout: Bellwether for the Great Lakes 18

Trout could help indicate the future quality of water in the lakes.

Superfund Contingency Plan Announced to help Clean up Sites 22

Administrator Gorsuch proposes new guidelines for hazardous wastes.

Appointments and Awards 24

New woman assistant administrator among those named.

Missouri Treatment Plant Recognized 27

Waste treatment facility honored in national contest.

Conference on Fire Ants 28

Ways of curbing the fire ant will be examined at a June meeting.

Giant Geese Survive Another Winter 30

Hot water discharges from power plant help geese through frigid winter.

Some Drinking Water Filters Found Effective 32

New tests done for EPA show filters can remove chemicals.

Front Cover: Little girls feeding ducks on Washington Lake near Seattle, Wash.

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Drinking Water Problems and Solutions

By Anne M. Gorsuch, EPA Administrator



The Safe Drinking Water Act, whose authorization expires September 30, has been an important part of the body of environmental protection laws since its enactment eight years ago. The Act authorized EPA to set uniform drinking water standards nationwide, requires drinking water systems to notify their customers of failures to meet standards and monitoring requirements, and also deals with controls on underground injection wells to protect drinking water aquifers.

Like other laws, of course, the Act may need to be revised from time to time to reflect changing conditions. EPA is now weighing a number of proposed changes following public comment and meetings held earlier this year.

Among those questions:

How should EPA and States use exemptions and variances for small drinking water systems that have trouble meeting standards?

Should the public be notified of every standard violation, no matter how minor, affecting drinking water supplies?

Should the standards be separated into categories, i.e., those applying to all systems, those applied flexibly by the States, and those of a non-regulatory nature such as "health advisories?"

In considering these proposals and the broader question of how EPA can best meet its responsibilities to taxpayers, it should be kept in mind that several objectives of President Reagan's administration are highly relevant to the Agency. These include regulatory reform, protection of the environment without impeding economic progress, a closer partnership with the States, and better controls on Federal spending.

Regulatory reform does not mean deregulation, the wholesale abandonment of rules. Rather it describes the simplifying of the regulatory process, lifting the burden of paperwork and attendant delays and costs to industry and the public.

We already have made substantial progress in this area. An example was the settlement last July of lawsuits dealing with

protection of underground drinking water supplies from contamination by fluids from injection wells. Briefly, the history of this case is that in 1980 EPA issued rules requiring States to develop programs to protect these water supplies from such contamination. Subsequently a number of companies and the State of Texas sued EPA over the regulations. The settlement we reached last year provided protection of valuable underground drinking water sources without imposing expensive, unnecessary requirements on industry. The agreement is expected to save the affected companies \$65 million to \$75 million over five years, and does away with certain repetitive testing requirements related to injection wells, reduces the number and frequency of reports required, and clarifies regulatory language. EPA proposed some of the settlement's terms as amendments to State Underground Injection Control programs, and after receiving public comment, these became effective March 5 this year.

The drinking water program is an outstanding example of what we mean by a close partnership with the States. Forty nine out of 57 States and jurisdictions such as U.S. territories and possessions have primacy now in this area, where they have adopted EPA standards or imposed more stringent ones of their own, and are responsible for enforcement. (EPA directly runs the other eight but is encouraging them to assume primacy where possible.)

In fact, the increasing role of State governments in the drinking water program has made it possible in part to scale down our 1983 proposed budget by \$14.1 million and 44 personnel to a total of \$69.8 million and 456 employees. The economies also reflect simplified administrative requirements, reduced regulatory demands, and a focus on the most serious State problems.

Congress clearly envisioned that the States should play a major part in the control and regulation of drinking water supplies when the law was enacted, as indeed legislators intended in other environmental legislation now on the books. Historically, State and local governments have undergone a remarkable maturing in their ability to manage a wide range of problems. The

fastest expansion in government work forces has been under way for years not in Washington, D.C. but at the State and local level. Since 1960, the number of employees in the latter categories has more than doubled, from six million to 13 million. They now outnumber their Federal counterparts by more than four to one. It only makes sense that the nation should take advantage of this increase in staffing and competence and give more responsibility and control to the local level, where officials often have a better grasp of problems and conditions.

At the same time EPA will continue to provide support of our regulatory office's promulgation of revised drinking water standards. This includes studies on the occurrence and health effects of contaminants in drinking water, including underground sources of such supplies. Our research also will continue to support the development of treatment technology that is both cost-effective and technically feasible.

As a measure of the changing nature of environmental problems, EPA now is considering various ways of controlling a group of chemicals known as volatile synthetic organic chemicals (VOCs) frequently found in drinking water supplies, especially ground water. The chemicals get into such supplies as a result of improper industrial discharges, by leaking from underground storage tanks, or by seepage from landfill disposal sites.

Efforts to curb these toxins in our drinking water have been uncoordinated in the past. We are considering a number of ways to control these compounds. Whichever course we choose, it will come only after a thorough scientific and public review of the issues.

EPA is considering several options to bring some national order to this situation. These include continuing to give guidance to the states on controlling these compounds; requiring regular monitoring for the compounds, again relying on the states for implementing controls; or issuing EPA-enforceable standards for some or all of the compounds. Whatever course we choose, it will come only after a thorough scientific and public review of the issues.

EPA currently is considering controls on up to 14 volatile organics, but other, similar compounds also may be of concern to the agency.

Traces of volatile organics have been found in about 10 percent of drinking water wells studied by various groups, including EPA. Rivers, lakes and other surface waters subject to industrial discharges also are likely to contain the compounds but usually at levels considerably lower than those found in contaminated ground water. Slow-moving ground water lacks the ability of a flowing, surface waterway to flush itself of pollutants.

Levels of contaminants like trichlorethylene and tetrachloroethylene in ground water can be up to 1 or more parts per million. Typical readings in contaminated surface water usually are much less than five parts per billion.

Water treatment methods effective in controlling volatile organics include aeration and filtering through granular activated carbon. The choice of a cleanup method would be left up to the water utilities.

Preliminary EPA estimates indicate that the cost of controlling these organics in larger drinking water systems (10,000 or greater population) could add roughly \$1 or \$2 to customers' monthly water bills. The monthly increase to users of smaller systems with this type of contamination could range from \$5 to \$14.

EPA plans to hold technical workshops in several parts of the country on the best approach to curbing these organics in drinking water.

After reviewing comments at these gatherings and any other written comments received, the agency will propose a course of action sometime later this year. In the meantime, EPA will continue to give guidance to the states on acceptable levels of these contaminants in emergency situations. □



Clean Water Act Improvements

*Excerpts from testimony by
Deputy Administrator John W. Hernandez
before the House Subcommittee
on Water Resources*

EPA and the Administration are fully committed to the Act's fundamental objective of restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters. We believe that the Clean Water Act is basically a sound statute. Most of the problems associated with the Nation's clean water program we believe have resulted from the way in which the Act has been implemented, not from the Act itself.

I would like to focus on some of those problems, primarily relating to effluent limitations, pretreatment, and the national permit system.

We face a major responsibility in attempting to continue the many positive and constructive initiatives begun under the Act while correcting those aspects that have not worked out as intended. The challenge before us is to draft reasonable requirements while avoiding the extremes of over regulation or under regulation. This requires a willingness to examine new approaches and to re-examine existing and old ones.

Industrial Effluent Guidelines

The Clean Water Act requires compliance with technology based industrial effluent guidelines in two phases. Industries were required to comply with the first level of control known as Best Practicable Control Technology (BPT) by 1977. BPT standards were met by approximately 81% of the affected industrial categories by the July 1, 1977, deadline, and a full 94% of industries have now met the appropriate requirements.

A second level of control, Best Available Technology Economically Achievable (BAT), is required for "toxic" pollutants by 1984. Control of "non conventional" pollutants must be achieved no later than 1987. Best Conventional Technology (BCT) for the traditional "conventional" pollutants must be met by industry in 1984.

Progress toward the second level of BAT/BCT controls has been less successful.

We do not believe that industry can meet the 1984 compliance deadlines, chiefly because the Agency has encountered substantial difficulties and time delays in promulgating these guidelines. The reasons for these delays are discussed at greater length in my statement for the record. Briefly stated here these delays developed because no comprehensive information for toxic materials existed requiring development of an extremely large data-collection and analysis program.

On the basis of our experience with the BPT level of control, we have found that well-

operated biological treatment systems can effectively control many of the toxic materials of concern. Because BPT effluent guidelines for controlling conventional pollutants provide treatment that is also effective in controlling toxic organics and heavy metals, in some cases further control measures may be unnecessary.

The substantial progress already achieved through BPT was not achieved without incurring major costs however. Industry may ultimately spend as much as \$18 billion in complying with BPT requirements.

While we believe the basic content of the Act is sound, some revisions deserve serious consideration. First, we agree with the generally held opinion that the Agency's BAT promulgation schedule cannot provide for an orderly industrial implementation program by the July 1 1984, compliance deadline. We believe, therefore, that an extension of this deadline is warranted to provide industry with adequate lead time in which to comply with additional treatment requirements.

Second, we recognize that we cannot tailor broad-based regulations to cover all site-specific environmental conditions. Therefore consideration should be given to a waiver of BAT/BCT requirements where BPT standards are left in place and where dischargers can demonstrate that their current level of treatment provides for meeting water quality standards, and fully provides for meeting water quality standards, and fully provides the necessary environmental protection.

Some have suggested that we eliminate BAT altogether in favor of a water quality control program with a BPT floor. Although we believe that water quality based control programs can be used down the road, we do not think that we can rely strictly on the water quality based control approach in the immediate future.



Pretreatment

The Clean Water Act requires EPA to establish pretreatment standards for indirect industrial dischargers to keep their waste flows from interfering with the operation of publicly owned treatment works (POTWs), to prevent the pass through of inadequately treated wastes to receiving waters, and to avoid the contamination of municipal sludges.

EPA has adopted two kinds of pretreatment standards: *general* and *categorical*. The general pretreatment regulations were promulgated June 28, 1978 and established the administrative and procedural framework for the National Pretreatment Program.

Some categorical standards have been promulgated by EPA and others are being developed. The most far-reaching of these, the electroplating standard, was amended in January 1981 and is currently in force for parts of the industry.

However, the program has been the target of extensive criticism. Cities contend that

variations in discharge standards for the same pollutant between industrial categories is unjustified and administratively confusing. They also argue that mandatory national categorical standards do not give enough flexibility to cities who already have extensive and successful local programs. Industry asserts that the removal credits provision of the general standard is unworkable and results in treatment for treatment's sake.

The Administration's review of the program indicates many of these criticisms are legitimate. We have already initiated some remedial actions. To address others we will be requesting that Congress make some modifications in the Act. Our goal is to have an environmentally sound, genuinely workable, and cost effective program. Basically, we believe that more flexibility is needed in the Act, and that more control and responsibility for pretreatment must be given to local government.

To promote certainty and facilitate municipal planning, the Agency is moving

ahead with development of its comprehensive sludge policy. Taken together, these and other actions should result in real progress and avoid the extremes of over regulation and under regulation.

Permits and Enforcement

The National Pollutant Discharge Elimination System (NPDES) provides for the issuance of permits to all direct point-source dischargers. The Act provides for permit issuance both by EPA or by State authorities where EPA has approved a State's permit issuance program. To date, there are 33 States with approved NPDES programs.

EPA and the States have issued 65,000 "First round" BPT permits. Many of these permits were reissued, but only for two or three year terms and have again expired. Progress has been made in municipal permit issuance where 75% of the majors and 30% of the minors have been issued. Also, over





11,000 five-year industrial permits have been reissued. Nonetheless, at present, 30,400 permits have expired and need to be reissued, and over the next three years, the remainder of the first round permits will expire.

Most of the expired permits remain in effect under provisions of the Administrative Procedures Act which allows for automatic extension pending reissuance, provided timely and complete permit applications are submitted. However, the combination of the volume of permits that need to be reissued plus the uncertainty involved in developing BAT limits in the absence of promulgated guidelines poses the largest implementation problem for the NPDES permit program.

Effluent guidelines for all industry categories will be promulgated in FY 1982 and 1983 and this will significantly reduce the time required to develop permits for the industries covered. In addition, EPA plans to evaluate making greater use of general permits, especially for minor facilities. This will allow permitting authorities to cover classes of facilities in a single permitting action and thereby conserve resources for major, complex facilities that need individual permits without loss of environmental protection.

Finally, we are revising the Consolidated Permit Regulations to streamline our permit

issuance procedures. The major benefits will be an increase in State flexibility in administering permit programs, a reduction in costs and reporting burdens for permittees and the States' operating permit programs, and an expedited permit process through streamlined regulations and application forms.

Beyond these regulatory and administrative actions, we believe consideration should be given to extending the life of an NPDES permit from a maximum of 5 years to a maximum of 10 years. This statutory change would allow more efficient and effective use of current levels of permitting resources and provide more certainty over time for wastewater treatment requirements determined by permit limitations.

In addition, the concept of partial State NPDES permit program approval is being considered. Partial approval may provide further incentive for certain States to assume elements of the NPDES program.

With respect to enforcement of permits, EPA's activities prior to FY 1981 focused primarily on industrial compliance and enforcement. As a result of these efforts and industry's response, there is presently a 90 percent major industrial compliance rate. Beginning in FY 1981 increased emphasis has also been placed on municipal compliance and enforcement, and there is now a 76 percent compliance rate for major facilities. We are also considering significant changes to our discharge inspection techniques that we believe will make our water enforcement effort more effective and efficient.

Other Issues

In view of the complexity of the Act, and the history of its implementation, even lengthy testimony will not cover all of the issues.

Management of municipal sludge is of course one area that will be receiving increasing attention as the problems of sludge treatment and disposal grow every day with the implementation of more sophisticated control measures.

A further issue of special concern involves a recent court decision designating dams as point sources under the Clean Water Act. As we do not believe that most dams and reservoirs pose a significant threat to water quality, and in view of the over two million dams in the United States, thousands of which might require permits under this decision, we are looking at possible legislative amendments to address this situation.

Development of State Water Quality standards and the application of national EPA water quality criteria to local conditions will also be examined closely.

The section 404 dredge and fill program is another area that will receive close scrutiny in the months ahead. Presently, the program is under review by an Administration regulatory reform task force. This group will assess the problems in the program and provide recommendations at a later date.

Conclusion

In conclusion, we believe the Clean Water Act can and will remain the principal effective means for achieving clean water across the Nation. Cleaning up our streams and rivers, our ponds and lakes, our harbors and estuaries is indeed a sound, necessary and practical national objective. Most of the problems we have encountered can be resolved efficiently and effectively through the administrative and regulatory mechanisms available under the Clean Water Act. However, greater flexibility in implementing the Act will add significantly to our effectiveness and will reduce the costs of compliance. □



Water for Living

An Interview with Frederic "Eric" A. Eidsness Jr.
EPA Assistant Administrator for Water

Q What are your main goals in your new post as Assistant Administrator?

A I am firmly committed to the goals of environmental protection and a strong economy. These are goals I share with the President and the Administrator. While I will be working to help achieve these overall goals through regulatory reform, I have two management goals of my own which are essential to meeting the broader goals.

One is to open up our regulatory development process from the beginning and to work cooperatively with state and local governments and the regulated community in the process. The second goal is to get control of resources in the Office of Water and to better manage those resources from the top down. From what I've witnessed since I've been here there is fertile ground for doing that.

Q What approach do you plan to take to achieve these goals?

A I hope that by setting clear policy direction and by constant dialogue with my top managers and mid-level managers that I can instill in them a perspective of environmental protection that reflects my local orientation. I hope to show the people in the Office of Water that EPA in Washington is not the center of the universe. The center of our attention should be that particular lake or stream out there whose water quality must be improved or protected. We need to recognize that those who are closest to those bodies of water



are just as concerned as we are about the protection of the environment in general and water quality in particular.

On my second goal of managing resources more effectively, we have initiated a number of new management policies. One of these policies is the development of annual work plans for each of the administrative units in the Office of Water. These work plans will be developed and used by the lower and mid-level managers and not by the Assistant Administrator for Water. Soon after coming here last September, I became keenly aware that EPA's management and resource planning documents have been designed for the principal purpose of letting the agency comptroller and the Congress know where the money's going. The old system did not serve the purpose of managing our resources to meet our commitments. In the future, our work plans will be used to provide information for the manager to understand his commitments, how his resources are to be used and in what priority, what outputs are expected and when.

Another initiative is the institution of a lead role concept. As an example, we have various branches and divisions within the Office of Water doing the same, if not similar, work with little or no cross fertilization of ideas, experiences, and approaches. As an example, the lead role concept applied to risk assessments for human health would assign the responsibility for development of methodology and data analysis to the Office of Drinking Water. One of the benefits of this concept is that when I have a problem, I can call my office directors in the room and ask just one of them "What happened? Why wasn't the job done right?" This approach to fixing responsibility will also reduce overlap, duplication of effort and maximize the use of our resources.

Q What is the basic philosophy that will guide you in your new post?

A I don't believe that EPA is wiser, more powerful or more motivated in protecting the environment than anyone else. I think that generally the average citizen, small town, big city, industry, and State will do the right thing if they understand what the problem is. I view as unfortunate the attitude exhibited in the past by certain EPA officials that everybody is presumed guilty until proven innocent and that the only organization that can define and solve environmental problems is EPA. This has resulted in a reputation of arrogance that is ill deserved by most EPA employees and in regulations that are overly complicated with procedure and



which get in the way of state and local initiatives. I guess that to sum up my philosophy, I believe that by opening up on internal processes, working cooperatively with others and simplifying our regulations we will make greater strides in protecting the environment.

Q What parts of the water program in your view are in the most urgent need of redirection?

A Perhaps the greatest challenge that faces both EPA and the States is to bridge the enormous gulf between industrial and municipal pollution control regulations and discharge permits which translate these regulations into reality for the individual municipalities and industry. We know that permits have been written that do not reflect good scientific and economic analysis, or are based on regulations that have not been subjected to adequate peer review and public debate. In other instances no regulations exist. Permit writers are put in the most untenable position of making fundamental public policy, public finance or industry investment decisions without policy oversight, without peer review, and without public debate. So we're going to take steps to try to identify the specific problems and remedies associated with this gap so that the permit writers won't be de facto rule makers.

Q What are your views on regulatory reform?

A Reforming environmental regulations is an absolutely essential piece of the President's overall national agenda. The Office of Water's basic approach taken in the past was to write into regulations all that the Acts would allow. The result of this approach has been a mountain of rules, regulations and guidance which attempt to identify every possible situation that a State or local government or member of the regulated community might find itself in and to prescribe a remedy. The consequence of this practice has been to overly complicate and in many cases obscure the basic intent of the Acts. Now we're trying to go back through these complicated regulations to identify essential requirements. At the same time we're trying to reduce procedural requirements so that we can get regulations geared to results rather than to following procedures. However I want to point out that the regulations we are tackling have been built, defined and redefined over the past ten years by their application and court suits. We are not revising these regulations with a meat cleaver but are carefully going through them with surgical tools to cut out the fat and leave behind regulations which are lean, clearly reflective of the statutory requirements and which demonstrate an attitude that those who read them are at least as intelligent and fair minded as those who wrote them.

Most importantly, the regulations revised under this Administration will reflect a strong commitment to environmental protection which we believe will withstand time.

Q Do you see a need to shore up leadership and management oversight in the Office of Water?

A Yes. The Office of Water publishes reams of so-called guidance documents every year. Frequently, one of these documents might say something to the effect that, "it is the agency policy that . . ." The effect of such "policy" statements is twofold on states, local governments, and regulated community. (1) They get mixed signals from different program offices. (2) By declaring something is agency policy in a rather casual manner in a guidance document, it becomes the agency policy even though it is not set by the leadership of the agency. In order to solve this particular problem we are tightening control over guidance documents and we have a policy on "policy". Although that usually gets a lot of laughs when I mention it, it's a pretty serious matter. This policy on policy in effect states that there are only three kinds of policy for EPA Water. One is regulations, the second is a self-standing policy document signed by the Administrator of EPA, and the third is a self-standing policy

document signed by the Assistant Administrator for Water. Everything else is guidance. Guidance, furthermore, should be construed as EPA's best judgment on one cost effective way of solving a problem that reflects the best science and experience we and the States have had over the years.

Q What are your views on the subject of sludge disposal?

A Sludge management is going to be one of the great challenges of the 1980's. The volume of sludge has increased steadily in the last decade and is expected to increase dramatically in the future. Simultaneously, suitable disposal sites are diminishing nationwide and in some areas of the country are becoming unavailable. Nobody wants to have a sludge management or solid waste disposal facility in his back yard.

The problem comes home to EPA because most of the sludge is produced by environmental control equipment that is required by EPA under the Clean Water Act, the Clean Air Act, the Safe Drinking Water Act, and the Resource, Conservation, and Recovery Act.

Municipalities are among those who are pressed hardest to determine suitable methods for disposing or reusing sludge. For example, sewage sludge is a byproduct of municipal waste treatment. The chemical properties of this sludge vary according to the type and amount of industrial waste which is discharged into municipal treatment facilities. Not knowing what their regulatory choices are, municipalities are finding it increasingly difficult to plan for the cost effective disposal or reuse of sludge. EPA has a responsibility under the Clean Water Act to prepare sludge management guidance. This has become a major priority within the Agency for the current year. I am confident that the exercise will not only provide municipalities with a wide range of choices for disposal and reuse of sludge as it relates to the characteristics of that sludge but will also allow them to make choices based upon an understanding of the environmental and health risks that may be associated with various

options. I would like municipalities to share the burden of making such determinations with the regulatory agencies. I believe they will do so and do so responsibly as they recognize better than we at the Federal level that the lower the risk the higher the cost.

Q What are your views concerning EPA's responsibilities to protect the oceans from pollution?

A I must confess that I have a strong affinity for the oceans having spent my youthful days diving on Florida's coral reefs and in later years serving in the Navy. I've always viewed the oceans as the last great frontier—as a source of sustenance for a large part of the world's population, as a reservoir of ecological wealth and enjoyment and as a medium which ties nations together. The oceans are also vast, complex, and mysterious to us and it is not clear what the fate and effects of pollutants in the oceans are.

Notwithstanding the importance of the oceans as a resource and the uncertainty regarding their ability to assimilate wastes, I think the oceans should be considered as a viable option for waste management, at least for an interim period. Recent scientific research supports this position.

The Agency has begun the task of revising the regulations which control the dumping of sludge into the ocean. In a general sense I would like to see two key features in the regulations. One, that a very rigid environmental test be established for determination of those sludges which are suitable for ocean disposal without causing unreasonable degradation. Two, that the burden of proof is placed on the polluter to show that there will not be unreasonable degradation of the marine environment and that all feasible land-based alternatives are less suitable from an environmental point of view. I think the role of economics in such determinations will become more important where the environmental risks of a land-based alternative versus an ocean disposal alternative are equivalent.

Q What does a regulatory agency do when it cannot predict the fate and effects of pollutants in the ocean or any other medium?

A The environment does not lend itself to precise predictability. This is true whether one is considering waste disposal in the air, on land, or in the ocean. The answer to your question lies in science and in process. We get as much factual data and information as we can; we apply the most sophisticated analytical procedures and analysis that we have available to us; and we discuss and debate the facts and hypotheses in open public forums. Once having made a decision we rely upon monitoring and further research to assure that adequate protection is being provided. Finally, we review the situation periodically and adjust decisions according to the evidence using a similar process. Our various planning and permitting tools serve this need to review past decisions.

I believe that the EPA can do a better job in coordinating with other Federal, state, and local agencies in conducting research, and in developing analytical procedures and monitoring programs which will reduce the uncertainty with respect to the fate and effects of pollutants in our waters.

I like to think of pollutants as resources waiting to be rediscovered. As we plan for the management of our sludge, whether it is for ocean dumping or some land disposal method, we should give equal if not greater attention to resource recovery and reuse. I am optimistic that as resources become more scarce, as cost effective technologies become available, and as the public becomes more demanding of reutilization of resources, that the focus of the future will be more on the side of resource recovery than it will be on waste disposal. I am optimistic about the future in this regard.

Q Are any new steps needed at the Federal level to assure that Americans have a safe supply of drinking water?

A A major objective of this administration generally, is to delegate fully the authority and responsibility for the administration of various environmental programs to the States where the environmental laws permit. The Safe Drinking Water Act envisioned a primary role and responsibility for States in the regulation of public water supplies and controlling injection of contaminants into ground water aquifers. In keeping with this overall policy we will be working very hard to fully delegate these responsibilities to state agencies.

With respect to public water supply systems, I believe that the Agency should develop with states strategies which are more effective at anticipating and dealing with the special problems faced by the 62,000 rural community systems. In the past, EPA's attention and resources have been focused primarily on the 2,000 or so major water supply systems. These urban systems provide potable water for the vast majority of the American people. For the most part they are professionally managed and they are and will continue to be subjected to microscopic oversight by state regulatory agencies and their customers.

Groundwater is another area where the Agency should focus more of its attention and resources. Old timers have said of the hardness of the water that comes from the well at my Colorado homestead "you can scarce get a bite to drink." My personal concern with well water is more a matter of aesthetics and convenience, but as the Assistant Administrator for Water, I cannot help but be concerned with the existing and potential future contamination of ground water from a public health point of view. Statistically, greater than half of our population receives its potable water from the ground.

Groundwater, once contaminated, takes years, if not decades or centuries, to purify. Groundwater protection is fundamentally a land use issue. State and local governments by far have the greater powers to make determinations concerning siting of facilities, designation of underground sources of water supply and the like. States also

have extraordinary powers under their various health laws to prevent and control ground water pollution. I believe that the EPA should work with the States in the continued development of state ground water protection strategies. Our principal focus should be on assuring that our regulations governing water supply systems, underground injection, dump sites and the like are well coordinated and that our enforcement posture supports state strategies concerning ground water protection.

Q Are water quality standards still a useful tool in protecting and enhancing our water ways?

A Water quality standards are an important and logical next step to ensuring adequate protection of beneficial uses of water nationwide. The Clean Water Act envisioned that technology based standards would be set as a floor below which municipal and industrial dischargers could not go. The Agency is committed to getting into effect as soon as possible regulations governing the control of toxic substances from industrial dischargers. Even with these regulations in effect, and technologies in place, the question remains: is there adequate protection of beneficial uses and water quality? The answer will lie in the strength of a state's water quality standards program.

There is a major effort underway currently to upgrade the quality of EPA's guidance concerning the states' adoption and implementation of water quality standards.

The standards regulations which EPA will be proposing stress the designation of beneficial uses and numeric criteria sufficient to protect those uses on a site specific base. The regulations will also propose a policy of protection of uses currently attained with no allowance for degradation of those uses.

I am sure some States will be concerned with the resource implications of revising their standards along these lines, but I am convinced that the regulated community will be more than

willing to bear their fair share of the burden of developing monitoring data, analysis, and information necessary to revise standards as it is in their self interest to do so. No elected official or industry principal wants to make an investment in pollution control unless it is well founded in scientific bases and has public support. To help avoid some of the confusion and misconception that has grown over the years regarding water quality standards, the EPA is trying to focus attention on five basic questions which we believe capture the essence of the standards setting process. These questions are: What is the use to be protected and how is it characterized in physical, chemical and biological terms and in terms of social and economic value? To what extent does pollution impair or support the use relative to other factors? What level of point source pollution control is necessary to restore and protect the use? What level of nonpoint source pollution control is feasible that will restore and protect the use? Is it worth it?

This last question should be taken in light of a policy of antidegradation but it is an important question to ask when considering the costs and benefits of pollution control technology that may be required to meet water quality standards in the future.

Q In your judgment are America's waterways getting cleaner, holding their own, or deteriorating?

A The only honest answer to that question is that I don't know. Surely it's a mixed bag and I would prefer not to bore your readers with the same worn out horror stories and success stories that have been printed and reprinted so many times over. The fact of the matter is, environmental trends are subtle except in the rare instances of overt signs of pollution such as fish kills. I don't think the answer lies necessarily in collecting more information. EPA's water programs currently place approximately 3.9 million work hours of burden on the regulated community and state and local governments to collect information. I think the answer to the question lies in how the data is used and who

uses it. I see three ways in which we can do a better job of determining environmental results or trends in environmental quality. First, assert the need for states to take a stronger role in assessing improvements in water quality. This will be a clear reversal of past trends where EPA has always assumed that it was the appropriate institution to make such determinations. Secondly, the focus of analyzing environmental trends and results should be on specific media on a geographic basis. States should review their long term monitoring data and develop qualitative assessments which address the physical, chemical and biological characteristics of the aquatic environment, the uses made of it and any pollution events or occurrences which have been observed.

The third approach, which is less satisfactory from a scientific point of view, is to use surrogate measures. For example, knowing that we have reduced the discharge measured in pounds of pollutants in a particular water body over a particular period of time, is an indicator of the effectiveness of pollution control requirements, whereas counting the number of violations of NPDES discharge permits does not relate at all to the environmental consequences of pollutant loadings.

Q What are your views on local government and water quality management planning?

A I have a very strong orientation toward local government as a result of my past experience as a health department official, local planner and a consultant to local government and industry. Let me answer that question by first being very frank about local government involvement in water quality planning under section 208 of the Clean Water Act and one reason why this Administration has not shown support for continual Federal funding of areawide agencies to carry out planning. Lack of implementation of water quality management plans in my view is a direct result of the inability of the planning

agency to adequately define the problem. This inability was due either to the agency's unquestioned acceptance of a problem statement made by a state or federal agency or from having taken a one dimensional approach at defining the problem.

On the flip side of the coin there have been numerous local success stories.

In view of the lack of familiarity with the Clean Water Act at the start of planning and the lack of focus in EPA's guidance as to what should be planned for, local governments have made substantial gains.

I think we should look ahead at water quality management planning in terms of a new phase: one in which the planning under Federal grants is highly focused on specific streams or lakes which are considered to be the most valuable and those that are most threatened from pollution. Local governments have an opportunity for additional funding under the Clean Water Act to carry out planning provided they can make the case to the state pollution control agency that they are better equipped to conduct the necessary studies.

On a more philosophical level, section 208 of the Clean Water Act provides a very important handle for local governments to join together on a voluntary basis to develop the institutional and technical capacity to deal eyeball to eyeball with the regulatory agencies. This local role is essential as we move into an era of reassessing our water quality goals in the context of revisions to state water quality standards.

I am confident that many local planning organizations will continue to play a major role without Federal assistance.

Q Do you see a change in emphasis on management of the construction grants program for publicly owned treatment works as a result of the 1981 amendments?

A Yes. A new construction grants bill contained two very significant messages from my point of view as a former local government official. First, that Federal grant funds are to be

targeted to restoring and maintaining water quality and designated beneficial uses of water. Secondly, that local governments are to assume a greater responsibility for assuring that they have the requisite financial and management capability to construct, operate and maintain waste treatment facilities.

Many of the horror stories that you have heard of regarding the high cost of wastewater service I believe are attributable to a lack of attention given to the details of how a community is going to implement its capital improvements program from the financial management point of view. This in turn is an outgrowth of the large federal grant share and over-complicated regulations.

The construction grants regulations reflecting the new amendments are being revised and shortened to reflect more clearly the statutory requirements set forth in the bill. One new emphasis that will be placed in these regulations will be the requirement that the grantee demonstrate its ability to finance and manage the construction, operation and maintenance of treatment facilities funded under this program.

I believe that this is not only a principle of good local government—to plan in advance of a major capital investment—but also necessary to assure that the Federal investment in such facilities is protected. □



Rowing teams and sailboats on the Charles River with the Boston skyline in the background.

Better Days for the Charles River

"It is a fact that the Charles River serves its people in many ways—a drop to drink, a fish to fry, a reach to row. Beyond all of these, though, it brings needed beauty and refreshment and value to our lives. If for no other reason, it is worth caring for."

Commenting on the Charles River improvement efforts, Lester A. Sutton, EPA

The progress in improving the water quality in the historic Charles River which meanders for 80 miles from its source in rural eastern Massachusetts to its mouth at Boston Harbor is a striking example of cooperation between local citizens and the State and Federal governments.

A key role in forging this partnership was played by the Charles River Watershed Association, a citizen's group dedicated to the river's protection and improvement. The association also has been active in pushing for action to correct environmental ills.

As a result of these cooperative actions, Rita Barron, association executive director, reports:

All significant sources of untreated sewage discharges into the Charles River have been eliminated.

Treatment of industrial discharges into the river is required by National Pollutant Discharge Elimination System permits.

Operation of municipal landfills on the banks of the Charles which once spilled pollution into the river has ended.

The Charles River association has noted that while "in some areas the water is seriously degraded and land use ugly . . . much beauty does exist and more than the skeptics will acknowledge. The treasure may be tarnished, but it is no less a treasure."

Commenting on the Charles River improvement efforts, Lester A. Sutton, EPA

Region 1 Administrator, said:

"The Charles River is one of our most important and historic waterways. We have placed a high priority on its restoration because of its unique location as a major recreation resource. The Charles is a major attraction of the Boston metropolitan area in all seasons and deserves the significant efforts that local, state and federal governments, as well as the Charles River Watershed Association, have invested in restoring and preserving it."

A major factor in the improvement of the quality of river water in the Boston Harbor area was the installation of compressor-operated air diffusers on the basin bottom in 1978 which help mix the fresh and salt layers in the river.

Salt water seeps through locks and dams into the Charles River Basin starting in the spring. Before the diffusers were put in, the salt layer covered the entire bottom of the basin by the end of August.

Because of its greater density, salt water remained at the bottom of the river, below the fresh water flowing continuously into the river from upstream areas. As a result, the Charles River Basin was stratified with horizontal layers of fresh water at the surface and salt water at the bottom.

While the fresh water layer contained an ample supply of dissolved oxygen, the bottom layer was a repository for decomposing



Rowing on the Charles

organic material which consumed oxygen. The decomposition without oxygen produced hydrogen sulfide, a compound which when released as a gas smells like rotten eggs.

Rising air bubbles from the diffusers on the bottom of the river now act as pumps, raising water from the bottom layer to the surface for natural reoxygenation, while churning and mixing both layers. The bubbles also add oxygen to the water.

Now, on pleasant days, canoes, sail boats and power craft can be seen on the river. Rowing competitions are frequently held on the Charles River. Many universities, private secondary schools, and boating clubs have racing shells. The annual Head-of-the-Charles Regatta attracts hundreds of racers who compete over a three-mile course in shells of various sizes.

The wide variety of habitats along the Charles include brush, shrub, swamps, hardwood groves, and open fields. These attract songbirds, hawks, owls, ducks, geese, warblers and ospreys, some of them full-time residents and others migrants. An early morning canoe trip in May can be a bird watcher's delight. The diverse variety of plants is enjoyed by naturalists and others. White-tailed deer and muskrats are often seen in the upper and middle reaches of the river.

Fishermen can catch trout in the upper portions of the Charles, perch, pickerel and

bass in the middle stretch, and carp, suckers, and pumpkinseeds in the Charles River Basin.

Other major developments other than those described earlier which have helped to improve the conditions of the river include:

- New sewage treatment plants have been built for several towns, and grant funds are supporting Milford's current expansion and upgrading to advance treatment in that critical reach of the upper Charles.
- Two chlorination/detention centers were built with federal assistance to handle contaminated storm water and sewage overflows in the lower Charles Basin.
- The 208 watershed management study has had the active cooperation of the Charles River Watershed Association. In fact, the regional planning agency subcontracted with the association to conduct public participation programs around the state to provide the public with accurate information about the project.
- The Land and Water Conservation Fund, which is partially supported by the Department of Interior, helps localities buy local recreation land by reimbursing them for part of the cost. This program has helped provide the incentive to local communities to buy public lands. The Charles River Watershed Association has participated actively in this project. It received a grant to prepare a

detailed greenway plan for a major segment of the Charles River Corridor, and this project has now been completed. The association encourages communities to buy river front lands and emphasizes the importance of shoreline protection and intelligent land use.

"The Charles River Watershed Association has achieved many fine results, but its efforts could not have succeeded without the cooperation and active assistance of the Division of Water Pollution Control of the Commonwealth of Massachusetts," according to the association's executive director, Rita Barron.

A publication issued by the Charles River Watershed association asks the question:

"What's ahead for the people's river?"

The answer given by the association:

"Much depends on the river's people. In every city and town in the watershed, decisions are being made that determine the quality of the watershed environment. Dramatic issues meet the public eye readily enough, but few land use choices and few official attitudes fail to be reflected in the well-being of the Charles. Perhaps no better opportunity exists to help the Charles than being part of those local decisions." □

Science for the Future

An Interview with
Dr. Earnest F. Gloyna
*Chairman,
EPA Science Advisory Board*



brought to bear in a decision-making process ultimately depends upon the research accomplishments within a given area. The responsibilities of the Environmental Protection Agency are unique in that not only must there be a scientific basis for pollution control applications, but new methodologies must be developed for the future. Consequently, research is of utmost importance.

For research to be useful within the decision-making process of the EPA, it is logical that the research be directed to resolving the longer-range objectives of the agency. A large potential pool of available researchers exists within the national laboratories, academic community and industrial research complexes. For most effective utilization of these combined talents, it appears that there should be a judicious decision by government to use the best of all available human resources and nurture these pools of expertise. Certainly, if academic research is abandoned, the seed corn for future research competence will disappear.

Q EPA Administrator Anne M. Gorsuch is insisting on better scientific review to improve the quality of the Agency's regulatory decisions. What role can the Science Advisory Board play in improving EPA's scientific work?

A We live in a technologically oriented society. Therefore, it is imperative that the EPA decision-making process includes a serious scientific review procedure. Regulatory controls must be based upon proven scientific concepts, adaptable technology and achievable goals.

This administration has recently established a new process for improving the scientific adequacy of agency regulatory and standard setting actions. Numerous examples exist in which the scientific basis of the agency's decisions has been challenged by individuals or groups who have charged that either the scientific evidence did

not justify a particular standard level or that the process of agency review did not adequately address public concerns over the quality of the data used in standard setting.

Administrator Gorsuch has noted that the consequences of such challenges are that the agency's credibility has suffered a serious erosion and the public is far less inclined to regard agency action as balanced and objective.

To help remedy this problem the Science Advisory Board has been given a significant role in reviewing scientific data supporting key regulatory actions being developed by EPA.

Q Drawing on your experience as a college dean and your extensive work as a researcher and engineer, how do you think the Agency can receive the best results from research dollars invested?

A The level of scientific and technological input that can be

Q Do you see any conflicts between EPA's sponsorship of research and its responsibilities as a regulatory agency?

A As EPA's role as a regulatory agency becomes more defined, the need for additional scientific input and technological innovation will become more pronounced. Regulations concerning environmental ques-



tions must have a sound scientific basis. Regulations that impact upon the future cannot be clearly developed nor understood without an ongoing research component and readily understood technological implementation program.

Q How can the quality of undergraduate and graduate school engineering students and faculties, particularly those working on environmental issues, be maintained and improved?

A A former Committee, of the National Research Council of the National Academy of Sciences which I chaired, found that there were four reasons for special concern with environmental manpower. These are:

- time schedules and specific goals that are imposed by environmental legislation;
- specific directions in environmental legislation which call for federal study of the appropriate labor markets and stimulation of manpower development in certain occupations;
- high levels and patterns of expenditures that are anticipated in achieving environmental goals; and
- the fact that environmental pollution control programs are highly reliant on the public sector.

The Committee concluded that a large-scale shortage of pollution control manpower was not apparent nor was a shortage likely to develop in the near future. However, shortages will occur in *selected* and highly specialized environmental engineering and science areas. The true environmental manpower problem will not occur because of an inadequate number of bodies but because the educational level of people available to work effectively just will not be up to the task.

Let there be no mistake about the fact that the flow of top-level graduate students into environmental programs has declined because the competition for undergraduate engineers by employers continues to withdraw some of the most talented from graduate studies. The professional leadership, research and the teaching pools are at a critical level.

A major newspaper commented:

"It is beginning to be seen in official Washington that the United States has absent-mindedly permitted decay to seep into the system for training the "engineers" who are indispensable to an ambitious, high-technology problem-laden society.

Q What is the relationship between scientifically adequate regulations and cost-effective regulations?

A Scientific adequacy, technical feasibility and cost effectiveness are terms that really should convey the same ultimate

meaning in environmental pollution control. However, some people sometimes forget that there are judgmental factors that must enter the decision-making process, and even such terms as scientific adequacy may convey some grey areas of understanding.

Q What is your view of EPA's peer review process?

A The Executive Committee of the Science Advisory Board reviewed the Administration's peer review process when it was in draft form. The board believes this process represents a reasonable compromise between concerns over the scientific quality of EPA contracts, publications, and informational materials and the need for the dissemination of data among interested professionals and the general public.

Q What issues will the Science Advisory Board review in 1982?

A High level radioactive waste disposal standards, national ambient standards for sulphur dioxide and particulates, national emission standards for hazardous air pollutants, health assessment for organic solvents, exposure assessment guidelines, research outlook, effluent guidelines for organic chemicals, critical assessment document for acidic deposition, criteria for sludge disposal, and maximum contaminant level for organics in drinking water. □

Lake Trout: A Bellwether for the Great Lakes



*This is a photo of a painting of lake trout
done by the noted nature artist Bob Hines.*

Millions of young lake trout are again being stocked in the Great Lakes this spring as part of a long-range effort to restore this native species to a self-sustaining fishery of great commercial and recreational value.

The stocking of these fish is being done by the U.S. Fish and Wildlife Service in cooperation with State and Canadian conservation agencies as part of an experimental process which could have extraordinary consequences.

While many factors could be involved in the fate of these young fish, their future will, to some degree, provide a significant indicator of the quality of water in the Great Lakes.

A recent U.S. Fish and Wildlife Service report noted that the lake trout species "is becoming widely respected and accepted as a symbol of ecosystem well-being—at once a bellwether of improvement, a 'miner's canary' to warn of new threats, and an indicator of conditions generally."

The population of the lake trout which swam in the Great Lakes was once in the millions. However, this resource crashed in the late 1940s and early 1950s after it had supported a highly profitable commercial fishery industry for almost a century.

The factors which caused the collapse of this fishery, according to the Fish and Wildlife Service, were:

- Overfishing, greatly aggravated by the demand for more food during World War II.
- Heavy predation by the parasite sea lamprey.
- Deteriorating water quality in the Great Lakes.

In order to deal with these problems the United States and Canada formed the Great Lakes Fishery Commission in 1956 which, with funds from both governments, underwrites control of the sea lamprey, coordinates fishery research and management,



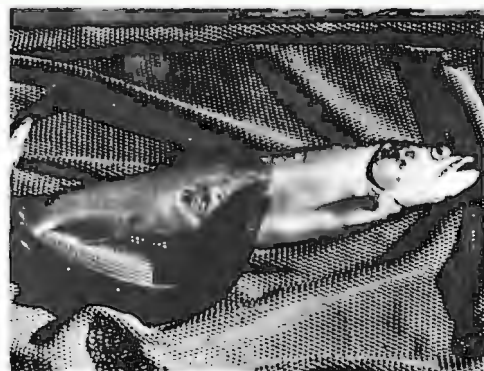
A New York Department of Environmental Conservation helicopter dropping young lake trout into Lake Ontario as part of a stocking program using fish provided by a Federal hatchery.

and promotes rehabilitation of damaged fish resources like the lake trout.

The commission has brought the sea lamprey under control primarily with the use of chemical lampricides and is now stimulating the rehabilitation of various species of fish such as the lake trout.

A serious problem still being fought by EPA and the Great Lakes states is toxics pollution. The state departments of natural resources or state public health departments for Michigan, Indiana, Wisconsin, Illinois, and New York have issued health advisories for people who eat Great Lakes fish. Each state

has specific recommendations as to species to be concerned with (all include salmon and lake trout) and size categories (the larger fish contain higher contaminant levels). Each of these states is concerned about PCB pollution and the New York advisory for Lake Ontario also warns against eating any lake trout over 21 inches in length because of a mirex contamination problem. While the U.S. Food and Drug Administration has the legal authority to regulate interstate sale and distribution of commercial fish, it is the states which issue advisories for sports fishermen.



The parasitic lamprey shown here feeding on a fish.

Left: This catch was evidence of the plentiful supply of large lake trout fishermen used to take from the Great Lakes.

Right: Young lake trout being placed in Lake Michigan.

The lake trout, which spawn in the lakes rather than traveling up a tributary stream like many other fish, thrive best in the three upper Great Lakes which have deeper and colder water than the shallower and warmer Lake Erie and Lake Ontario. These silvery fish are avidly sought by sport fishermen and the average catch weighs between three and six pounds.

While efforts to improve the lake trout populations have been underway for many years in the Great Lakes, it was not until last fall that the U.S. Fish and Wildlife Service found conditions sufficiently encouraging to warrant reaffirming the concept of restoring the lake trout population as a self-sustaining resource.

The Service stated that "the feasibility of a restored, self-sustaining lake trout resource in the Great Lakes was viewed with some skepticism when lake trout stocking began in earnest 20 years ago. More than a little doubt prevailed then about the ability of stocked trout, and even more so of their

possible offspring, to endure a degraded environment.

"In recent years, however, suppression of the lamprey and improvement in habitat quality have considerably brightened prospects for lake trout restoration. Biological research and environmental monitoring have also convinced many that trout restoration deserves renewed attention as a valid concept, and that the goal of a self-sustaining resource in a rejuvenated environment is not only achievable, but economically desirable as well . . . the lake trout, apart from its well-established economic value, is perhaps the species most capable of fully tapping the productive potential of the Great Lakes because of its superior adaptability to available habitat.

"Recognizing the great potential of the lake trout as a food source and of the lakes to again produce it in volume for the benefit of all, the Fish and Wildlife Service accordingly

reaffirms its belief that restoration of this native species to self-sustainability in the Great Lakes remains a vital, attainable goal with considerable social and economic merit."

At the same time, the Service emphasized that unrelenting efforts must be continued to curb the population of the parasitic sea lamprey and to restore and enhance the quality of the waters of the Great Lakes.

"Evolving Service participation with the U.S. Environmental Protection Agency (EPA) and other agencies in water quality surveillance . . . must therefore continue to be supported if not accelerated.

"For without a basis by which to gauge water quality and the effectiveness of pollution abatement programs now underway, the goal of reestablishing stocks of environmentally sensitive fishes could be pursued unwittingly as a futile, waste exercise."

Since the late 1950s, approximately 100 million young trout, generally 10- to 15-month-old fish, have been planted in the



Great Lakes, primarily in the three upper lakes, Superior, Michigan, and Huron. Most of these fish have been provided by Federal fish hatcheries.

The Fish and Wildlife Service has said that "there is reasonable expectation that, given the chance, these fish would survive to maturity and accumulate in numbers eventually sufficient to sustain the species' own regeneration throughout most of the lakes."

Yet, the Service notes, the goal of self-sustainability is elusive.

"Several factors, most notably environmental and genetic, are properly viewed with suspicion as impeding reestablishment. Of progeny that may be produced in the wild by the sparse broodstocks so far created, few if any seem able to survive their first year.

"No factor would seem to be as pervasively suspect, however, as that of the planted trout's widespread, rapid, excessive, and premature withdrawal by fishing. Of the planted trout that otherwise prosper, dis-

treasingly few survive for long the obviously too-high fishing pressure to which they are subjected in many areas during their pre-adult years and early adulthood."

Since lake trout do not generally begin to breed until they are seven years old, the high mortality rate in their youth prevents the development of adequate broodstocks.

The Service has pointed to "premature and excessive" catches of the stocked trout as "the major obstacle to the species' potential reestablishment as a self-sustaining resource."

While Federal hatcheries can continue to produce millions of young lake trout, the Fish and Wildlife Service has noted that once the fish are planted in the lakes, they become the trust responsibility of the State or other jurisdiction into whose waters they are placed.

Since the Federal agency has little regulatory authority, it has urged the States and other agencies with jurisdiction to attempt to curb the over-fishing which it con-

tends has played the major role in frustrating attainment of the goal of developing trout stocks which can regenerate the species.

In addition to tighter fishing controls, the fate of the lake trout will also depend heavily on continued stocking programs, progress in sea lamprey control, and improvement in curbing the discharge of toxic substances and other pollutants into the Great Lakes.

Because of the magnitude and enormous cost of coping with these problems, the complexity of jurisdictional controls, and the long time required for these fish to breed, the Fish and Wildlife Service does not expect any swift successes.

Even under the best of circumstances, the Fish and Wildlife Service believes it will be another 10 to 15 years before lake trout will be breeding again in large numbers in many areas of the Great Lakes. □

The Superfund Contingency Plan To Help Clean Up Sites



Christopher C. DeMuth, Executive Director, Presidential Task Force on Regulatory Relief, and EPA Administrator Anne M. Gorsuch at press conference announcing the national contingency plan

EPA is proposing, in the Superfund National Contingency Plan, guidelines for coordinating federal and state responses to hazardous substance spills and for cleaning up hazardous waste sites. Administrator Anne M. Gorsuch recently announced the proposed national guidelines for cleaning up wastes.

In December 1980, Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act authorizing federal action in cleaning up older, abandoned dumps. (Four years earlier, the Resource Conservation and Recovery Act had already authorized federal regulation of still-operating dumps.) The 1980 law—known as Superfund because of its unwieldy official title—required EPA to develop a new National Contingency Plan.

The Superfund law itself outlines federal responsibilities for response to spills of hazardous substances and for cleanup of abandoned hazardous waste sites. It sets up a \$1.6 billion trust fund over five years, consisting of taxes on the manufacture of certain chemicals and general revenues appropriated by Congress.

"Safe and effective toxic waste management is one of the primary environmental goals of this Administration," said Mrs. Gorsuch. "This plan reflects our commitment.

"The NCP, which outlines government response to the difficult problem of hazardous waste cleanup, exemplifies regulatory reform in the Reagan Administration. Its provisions are concise, its language non-technical, and its requirements flexible," said Mrs. Gorsuch.

Christopher DeMuth, Executive Director, Presidential Task Force on Regulatory Relief, said, "In the 14 months since President Reagan was inaugurated, this Administration

has been striving—successfully, I believe—to make government more responsive and efficient. Our main means of accomplishing this is through regulatory reform. Today's proposed NCP proves that federal regulations need not be cumbersome or costly."

The new plan authorizes response to waste sites and oil spills on air, land, and water. This includes responding to explosions or fires, massive releases of toxic chemicals into streams or rivers, and spills caused by train derailments.

In conjunction with the plan, EPA is compiling a national inventory of state-selected hazardous waste sites. The agency will select 400 priority sites for possible action. The first 115 of these sites were announced last October.

The proposed National Contingency Plan sets criteria for determining where, when, and how Superfund monies will be spent. It describes two categories of cleanup: immediate removal in response to acute emergencies, and more limited, planned removal in response to less serious threats. It also sets up an eight-step process for determining the extent of cleanup, beginning with a determination of whether or not a site is on EPA's inventory and thus eligible for remedial action. Sites are "scoped" to see what action is needed. Then alternatives based on environmental, economic, and engineering criteria are developed.

The final remedy will be the most cost-effective that protects public health, welfare, and the environment.

The Plan allows for extensive state and local participation in cleanup activities by giving States the necessary guidance and authority to manage their own site cleanups.

EPA is planning to use both cooperative agreements and contracts to allow the states to assume as much responsibility for field response as they are capable of undertaking and are willing to accept. EPA estimates that in 1983 some \$34 million will be transferred to the states for field activities.

The National Contingency Plan recognizes that cleanup needs vary significantly from

site to site. "On one site, drums may be removed, the surface scaled, graded and revegetated. In another, a system may be built for trapping and treating leachate so that pollutants do not escape the site. We have learned that every feasible alternative must be examined to see if it can be tailored to the unique problems of the particular site. The remedy will depend on many variables such as the substances present, hydrogeology, soil conditions, climate, size and proximity of population," said Mrs. Gorsuch.

"Superfund was intended by Congress to be a non-regulatory, non-standard setting law—because the Congress realized, as we all realize, that cleanup of these sites is very new. There are no easy answers to the issues confronting us. In some cases, we may be asking for answers which the state of the art or science are not yet ready to provide. We must ensure that the state of the art and science are given the maximum amount of flexibility in which to give us these answers.

We can find the answers by initiating an aggressive cleanup program—and by learning and refining as we gain experience. In this regard, I am confident that the National Contingency Plan can be used to usher in a new era of environmental technology and application.

"The Reagan Administration believes that a policy of straightforward regulation and careful resource management, combined with an unshakable environmental commitment, is our mandate from the American people. And I believe that this policy will result in a swift cleanup of existing environmental hazards. Waste site cleanup will be our environmental legacy to future generations." □



Lavelle



Appointments and Awards

A Presidential appointment for an EPA assistant administrator post and selections for three key EPA jobs were announced recently.

President Reagan appointed Rita M. Lavelle to be assistant administrator for solid waste and emergency response. She will direct the hazardous waste control program and the \$1.6 billion "Superfund" program which provides for emergency cleanup of chemical spills and hazardous waste dumps.

Named by EPA Administrator Anne M. Gorsuch as Associate Administrator for Legal Counsel and Enforcement was Robert M. Perry, who had been serving as the agency's general counsel.

Appointed by EPA Administrator Anne M. Gorsuch as Regional Administrator for EPA's Region 2 Office in New York City was Jacqueline E. Schafer, a former professional staff member of the U.S. Senate Committee on Environment and Public Works and former legislative assistant to U.S. Sen. James L. Buckley of New York.

Named by Administrator Gorsuch as director of the Office of Intergovernmental Liaison was Brad Cates, a former member of the New Mexico Legislature.

Selected by Administrator Gorsuch as EPA's new chief administrative law judge was Edward B. Finch, who has been acting in this capacity since November, 1981, and has been an administrative law judge with the agency since September, 1975.

Meanwhile, Heather Mackey Ford, a civil engineer with EPA's Region 4 Office in Atlanta, has been recognized by the National Society of Professional Engineers as one of the federal government's top engineers.

Commenting on the appointment of Lavelle, Administrator Gorsuch said:

"Rita Lavelle brings over 12 years of professional experience in state government and private industry to the agency," said EPA Administrator Gorsuch. "She has demonstrated expertise in getting results, as shown by her record with the executive branch of government in California, with a mid-sized chemical firm and with a large diversified international corporation." Lavelle will direct all EPA's work on hazardous and other solid wastes.

Since 1978, Lavelle has initiated, directed and managed several programs for Aerojet-General Corporation subsidiaries, including ones for divisions which manufacture chemicals and industrial and chemical intermediates, nuclear and chemical waste treatment systems, liquid rocket engines for the aerospace industry, and high-speed marine propulsion systems for defense applications.

Lavelle, 34, earned her bachelor's degree in biology and mathematics, with a minor in chemistry, from College of Holy Names, Oakland, Calif., in 1969 and continued graduate work at the University of California at Berkeley in physiological chemistry and stoichiometry (the study of biological cell shapes and functions). She earned a master's degree cum laude in business administration from Pepperdine University in Los Angeles in 1980.

From 1969 to 1976, she was the consumer affairs department information officer with the State of California, state director of consumer education, and publications assistant in the office of then-Governor Reagan.

She was director of marketing for Intercontinental and Continental Chemical Corporation in Sacramento, Calif., from 1976 to 1978. Lavelle's responsibilities included development of corporate guidelines to comply with the Resource Conservation and Recovery Act. At EPA, one of her tasks will be to administer nationwide compliance with this law by both business and government sectors.

Perry



When Lavelle joined Aerojet-General Corporation, she became director of communications for one subsidiary, Cordova Chemical Co., until 1979, moving to a similar communications position for the largest subsidiary, Aerojet Liquid Rocket Co., in 1979.

She is a member of several professional organizations, including the American Chemical Society, the American Institute of Chemical Engineers and the California Council for Environmental and Economic Balance, as well as numerous aerospace and defense organizations. In 1981, she was named one of the outstanding women in aerospace by *Aerospace Magazine*.

Commenting on the appointment of Perry as Associate Administrator for Legal Counsel and Enforcement, Mrs. Gorsuch said "the position of Associate Administrator for Legal and Enforcement Counsel was created to bring together all of the legal functions within the agency. A better job can be done with fewer resources by integrating our legal shop and eliminating duplication. Bob Perry is a lawyer's lawyer, who will ensure that top legal and policy judgment is applied to strong enforcement and legal programs."

Perry, 46, served as a trial attorney in the Land and Natural Resources Division of the Department of Justice from 1964 to 1969. Between 1961 and 1964, he was on active duty in the Office of the Judge Advocate General, U.S. Army. Perry currently serves that office as lieutenant colonel in the U.S. Army Reserves.

From 1969 to 1981, Perry worked as trial counsel for Exxon Corp.

Perry received his master of law degree from Georgetown University in 1961. He earned his J.D. degree and bachelor of arts in history in 1959 from St. Mary's University in San Antonio, Texas, his hometown.

Schafer



Explaining the selection of Schafer, as the new regional administrator in New York, Administrator Gorsuch said:

"Jackee Schafer has a thorough understanding of the complex laws under which EPA operates. She also has a broad knowledge of the special problems of the New York and New Jersey area, thanks to her experience with Senator Buckley. EPA is fortunate to have such a highly qualified person to take over one of the agency's most challenging regional assignments."

Mrs. Gorsuch also paid tribute to Richard T. Dewling, who has served as acting regional administrator in Region 2 for the past year. "The solid work of professionals like Dick Dewling and his staff makes it possible for Jackee Schafer to step into a region that is already functioning in an effective, efficient and responsible manner. I know Jackee will be able to count on continuing support from the regional staff."

Before Senator Buckley's election in 1970, Schafer worked on his campaign and handled all environmental issues for him. From 1967 to 1970, she was an analyst in the banking studies department and a research assistant in the research department of the Federal Reserve Bank of New York.

In recent years, Schafer has worked extensively in Republican organizations. She researched environment and energy issues for the Reagan/Bush campaign, prepared a transition report on the Council on Environmental Quality for the Executive Office of the President, and served on the Arlington County, Va., Republican Committee.

A native of Greenport, N.Y., Schafer holds an A.B. in Economics from Middlebury College, Middlebury, Vt.

Cates



Cates, the new director of the Office of Intergovernmental Liaison, recently resigned while serving his fourth term in the New Mexico Legislature to take the EPA position. He was vice chairman of the House Judiciary Committee and a member of the Education Committee. Active in national legislative matters, he is on the board of directors of the American Legislative Exchange Council and a member of the Law and Justice Committee of the National Conference of State Legislatures.

In addition to his legislative duties, Cates has been an Albuquerque lawyer since 1975. He served as staff attorney for Ranchers Exploration and Development Corp., a New Mexico mining company, from June 1979 to December 1980.

After leaving Ranchers, Cates was a Reagan delegate to the Republican National Convention and a member of the Reagan-Bush Campaign staff. In the past year, Cates has spent extensive time in Washington on various projects, including serving as a consultant to the EPA Administrator.

"Brad brings a unique combination of legal, natural resources, and intergovernmental experience to EPA's top management team," said Administrator Gorsuch in announcing the appointment "EPA is fortunate to have such a highly qualified person as its intergovernmental liaison at a time when state and local governments will be assuming greater responsibility for administering federal environmental programs."

As Director of Intergovernmental Liaison, Cates will supervise a staff of 10 and coordinate all state and local government liaison by the agency and with the White House. There are also 50 intergovernmental liaison employees working in the 10 EPA regional offices.

In addition to his duties as IGL Director, Cates will serve as a counsel to the Administrator.

Finch



Cates received his bachelor's degree in business management from New Mexico State University in Las Cruces, N.M., in 1972. After attending the University of Arkansas law school in Fayetteville, Ark., he received his law degree from the University of New Mexico in Albuquerque in 1975.

As chief administrative law judge, Finch will head a team of law judges who are responsible for conducting administrative hearings requested by parties against whom the agency has brought legal action under environmental laws. The judges, like all administrative law judges for federal agencies, work independently of the agency to ensure the fair and impartial adjudication of cases over which they preside.

Finch, who has had extensive experience in handling cases for the agency, most recently presided over the hearings on the cancellation of the herbicide 2,4,5-T. The hearings have been recessed and the parties are currently in settlement negotiations. Finch also presided over the first case brought under the Clean Air Act to enforce emission standards. His decision resulted in the 1978 recall by an automaker of approximately 250,000 automobiles for the repair of faulty emission devices.

From 1973 to 1975, Finch was with the Consumer Product Safety Commission. He began as director of compliance and was an attorney-advisor to the chairman of the Commission prior to joining EPA.

Finch was employed as an attorney with the Federal Trade Commission in 1956 and was assistant director of its Bureau of Consumer Protection when he left in 1973.

In announcing Finch's appointment, Mrs. Gorsuch also paid tribute to Herbert L. Perlman who passed away in October 1981, while serving his tenth year as the agency's chief administrative law judge.

"The agency certainly feels the loss of such a dedicated professional as Herb Perlman," Mrs. Gorsuch said. "His legacy of sound environmental decisionmaking, however, makes it possible for us to continue in an effective and responsible manner. We are indeed fortunate to have someone with Ed Finch's experience to fill this void."

Finch served in the Navy from 1942 to 1945 and graduated from Catholic University School of Law in 1954. He was admitted to the D.C. Bar in 1955. Shortly thereafter, he was admitted to the bars of both the U.S. Court of Appeals for the District of Columbia Circuit and the Supreme Court of the United States.

Ford



Ms. Ford, who won recognition as one of the federal government's top engineers, has worked in the hazardous waste program at EPA's regional office in Atlanta, Ga., since 1979.

She was responsible for the technical review of the first hazardous waste treatment and storage facility to receive a permit in the southeastern states. She also is the EPA regional liaison with the Department of Transportation, providing technical assistance on the shipment of hazardous wastes. □



Aerial view of nationally recognized waste treatment plant near Kansas City, Mo.

Missouri Treatment Plant Wins Recognition

The National Society of Professional Engineers recently named a pilot waste treatment plant near Kansas City, Mo., as one of 1981's ten outstanding engineering achievements in the United States.

EPA funded 85 percent of construction costs for the demonstration plant in the Little Blue Valley Sewer District after finding that the design by Burns & McDonnell Engineering Co., Inc., was "innovative and alternative."

The benefits of the design come primarily from its simplicity. The system is modular, self-contained, operates independently and has only three pieces of machinery with moving parts.

"The system permits small communities and industries to provide simply operated, economical treatment facilities which exceed oxidation ponds in effluent quality on substantially less land area," according to Burns & McDonnell. "We see not only domestic applications but international markets for such an effective and simply run process.

"It lets nature do the work machinery used to do. Each module in the system combines the three step process of conventional biological wastewater treatment into one

basin. Much of the piping, pumps, tanks and other equipment associated with conventional treatment plants is eliminated. The three moving parts in the Burns & McDonnell design are a compressor, a mixer and a sludge wasting pump.

The demonstration plant has been in operation for over a year. The cleaned water from the plant meets or exceeds all United States federal and state government secondary effluent requirements, according to Burns & McDonnell.

Data from the demonstration plant indicates the design can reduce capital costs for new wastewater treatment facilities by as much as 60 percent from those of conventional biological-treatment facilities and lower operating costs by as much as 45 percent.

The Little Blue Valley Sewer District plans to build four ten million gallons per day modules beginning in 1982. Total treatment capacity will then be 40 million gallons a day, enough to clean the water for the 358,000 residents of Jackson and Cass Counties, in the State of Missouri.

The design also makes a municipality eligible for an 85 percent rather than the 75 percent currently allowed for conventional wastewater treatment systems.

"As wastewater enters the oval-shaped basin in the demonstration plant, air is injected into it," explained Cerwick. "Next, the aerated wastewater flows around the oval mixing with the microbiological culture in the basin. As the liquid reaches the clarifier section, the pressure of the incoming wastewater pushes clear effluent water toward the surface and into a system of drainage pipes. Solids settle back into the wastewater under the clarifier by gravity, and microbiological organisms assimilate these wastes, too."

"The key element is the design of the intrachannel clarifier. The clarifier, which operates entirely without moving parts and which Burns & McDonnell plans to patent, is the system's heart.

By eliminating much of the equipment used in conventional wastewater treatment, the Burns & McDonnell design used only a fifth to a half of the land area required for other treatment systems.

The system also is nearly odor free because the wastewater is continually aerated and does not stagnate. Microorganisms which occur in nature "eat" the wastes and eliminate the need for chemicals to treat the sewage, the design company reports.

Because the Burns & McDonnell design is modular, a community or industry with seasonal changes in demand for wastewater treatment could build a sufficient number of basins to meet peak demand, but then run only enough modules to meet current demand.

"In the off-season, the modularity of the system allows a resort community, for instance, to shut down most of the system and greatly cut its operating costs," said Burns & McDonnell.

The simplicity of the system could also make it cost-effective for airports, power plants, military installations and industrial facilities that are located miles away from the nearest municipal sewer system.

The economical design and high effluent water quality allow the user to process his wastewater independently and reuse the wastewater directly into some industrial processes, an important factor in water scarce regions. □

Conference on Fire Ants



In heavily infested areas such as this field there may be as many as 50 fire ant mounds per acre.

A symposium on the issue of fire ants and their control will be convened by EPA and the U.S. Department of Agriculture June 7-10 in Atlanta, Ga. A recent application from the state of Mississippi to conditionally register an insecticide called Ferriamicide has prompted a fresh look at the fire ant problem.

The symposium will consider the full range of fire ant issues, including the resurgence of ants following treatment control techniques, the benefits and risks of existing chemicals, new chemicals now being developed, and the potential for new management techniques. In addition to EPA and USDA, the symposium will include scientists and other experts from the public and private sector.

"It has become clear to me that we cannot evaluate the Ferriamicide application in isolation from all the many issues surrounding the control of the fire ant, which has infested nine southern states and Puerto Rico," said Dr. John A. Todhunter, EPA's Assistant Administrator for Pesticides and Toxic Substances.

"The control of fire ants has been difficult for decades and has raised a number of significant scientific issues. In that light, a hasty decision to either grant or deny the application of Mississippi would be inappropriate at this time," he added.

Over 230 million acres in the South are now infested with fire ants, including parts of Mississippi, Arkansas, Texas, Alabama, Florida, Georgia, Louisiana, North Carolina, South Carolina, and Puerto Rico. They are currently spreading through Texas at about 25 miles per year.

Fire ants, which were accidentally introduced into the United States from South America in 1918, are combative pests that inflict painful stings on both people and livestock. In some cases, they cause serious allergic reactions to those who are hypersensitive. The fire ant's sting causes an immediate reaction of white blisters.

The ants are about a quarter of an inch long. They are found not only in rural areas but in urban back yards, recreation areas, parks, and cemeteries. They build mounds which can reach 18 inches in height and 1 to 2 feet in diameter. The mounds shelter 50,000 to 250,000 ants each. In heavily infested regions there may be as many as 200 mounds per acre.

The mounds interfere with normal farming operations, such as mowing and harvesting, and discourage farm laborers from working in infested fields.

The fire ant is harmful to wildlife and livestock in many states. Poultry houses are sometimes plagued by the fire ants. During periods of large amounts of rainfall, the ants thrive.

Various pesticides have been used to control these ants, but concern has been raised about the long term effects of these chemicals.

Mirex was introduced in 1961 to combat the fire ant problem, and after 1961 was applied under the sponsorship of the UDSA-State fire ant programs in all or parts of Texas, Florida, Arkansas, Alabama, Mississippi, Louisiana, Georgia, North and South Carolina. In 1969 the MRAK report recommended termination of the use of *Mirex* on the basis of substantial evidence developed under the auspices of the National Cancer Institute that *Mirex* is a potential carcinogen. During EPA's review and subsequent hearings on *Mirex* from 1973 to 1976, all *Mirex* registrations were transferred to the Mis-

issippi Authority for the Control of Fire Ants. On August 31, 1976, the Mississippi Authority proposed a plan providing for the phaseout of *Mirex*. On October 21, 1976, the Administrator of EPA accepted the Mississippi Plan.

In addition to the cancer risk of *Mirex*, studies showed *Mirex* residues in the tissues of persons in states where *Mirex* was used heavily; studies have demonstrated that *Mirex* crosses the placental barrier and has been found in human milk of nursing mothers; and it appears that *Mirex* remains in the environment and bioaccumulates in the food chain.

Ferriamicide, developed by the State of Mississippi, contains the active ingredient *Mirex* and a small proportion of amine and metal salt which causes *Ferriamicide* to degrade much faster than *Mirex*. *Ferriamicide* is designed to be applied on a corncob grit carrier with a soybean oil attractant. Emergency exemptions for *Ferriamicide* use in 1978 and 1979 were blocked on procedural grounds by a court challenge and because of the need to evaluate new data.

Amdro is a new pesticide designed to control fire ants. It has been used in large scale field tests by its manufacturer, American Cyanamid Company, USDA, the Animal and Plant Health Inspection Service, the Texas Department of Agriculture, Texas A & M University, and several other southern universities. *Amdro* is registered for use on range lands. The registrant has petitioned the Agency to establish residues for crop use of *Amdro*.

Other new materials are also being developed for control of the fire ant. □



This drawing illustrates how a fire ant bites and stings a human.

Giant Geese Survive Another Winter

The largest flock of giant Canada geese in the country has survived another frigid winter in Rochester, Minn., and with the exception of a small number of cripples, recently flew to the lake country in central Canada to nest.

An estimated 11,000 of these biggest of the Canada goose subspecies were congregated on Rochester's Silver Lake in mid-winter when thermometers showed readings 32 degrees below Fahrenheit and the wind chill factor dropped the temperatures to as much as 100 degrees below zero.

A critical factor in the survival of these geese during such weather extremes is the discharge of heated water into the lake from the city-owned power plant. This hot water, which under other conditions and in other climates could be a destructive pollutant, keeps portions of the lake ice-free all winter.

The large size of this subspecies of Canada goose also enables them to survive cold conditions which the many other smaller subspecies of Canada geese would find intolerable.

Biologists had long assumed that the giant species of this goose had become extinct in the 1920's, but in 1962 some scientists who were banding and weighing geese at Silver Lake were startled by the heavy weight of some of these birds. They later confirmed that these animals were members of the giant subspecies.

These large geese normally weigh 12 to 14 pounds compared to an eight-pound average for western Canadas, for example.

Wildlife officials believe that the resurgence of the giant Canadas at Silver Lake began with one private flock started by Dr. Charles Mayo of the famed family which launched the Mayo Clinic.

These captive geese attracted wild birds

and soon large flocks began using lakes in the Rochester area. The growth of the geese at Silver Lake was aided when a former patient at Mayo Clinic who had enjoyed watching the birds left funds in his will for the purchase in 1947 of 12 large Canadas from Nebraska. These birds placed on the lake with pinioned wings helped decoy wild geese to the location.

However, the geese did not begin to overwinter in large numbers until 1948 when the lake began to serve as a discharge point for heated water from the new city power plant.

Once the geese were identified as members of the giant subspecies, State, Federal and Canadian officials entered into a cooperative agreement to protect the relatively rare subspecies.

The giant Canada is similar in appearance to other Canada goose subspecies except

Giant Canada geese emerge from the early morning mists of Silver Lake in Rochester, Minn. In the background is the municipal power plant which discharges heated waste water into the lake. This hot water keeps the lake at least partly ice-free for the geese during the winter.





that it is larger. It has the same distinctive black stocking heads and necks and white cheek patches.

Early each winter morning in Rochester most of the geese fly off in long undulating line formations to feed in nearby fields on waste corn, soybeans, and small grains.

When the flocks return to Rochester later in the day, downtown shoppers pause to watch the birds as they swoop out of a winter sky twisting and rolling to avoid trees and buildings.

Patients in the taller Mayo Clinic buildings forget their health problems at least momentarily when these huge birds pass by their windows. As the geese settle back into the lake, they gabble furiously.

A public opinion survey a few years ago in Rochester revealed that about 75 percent of the city's residents watch or feed the geese and that about the same percentage feel the flock is beneficial to their city.

Merchants near the lake who sell shelled corn in bags for feeding the geese have sold more than two tons of corn during one winter month. The sales of photographic and hunting supply outlets also rise sharply when the geese are in town.

Although the geese have been protected by establishment of a 66.5 mile square refuge which includes the City of Rochester, hunters hide in the fields on the fringes of the refuge. Biologists contend that hunting may be necessary to control the increasingly large flock from reaching nuisance levels.

Already some cities such as Toronto, Canada, have been shipping their surplus Canada geese to other areas because when these birds become too numerous they eat ornamental vegetation, destroy lawns, and despoil park property with their wastes.

Yet most people seem to welcome the Canada geese and many feel as conservationist-author Aldo Leopold once wrote:

"One swallow does not make a summer, but one skein of geese, cleaving the murk of a March thaw, is the spring." □



Some Drinking Water Filters Found Effective



New tests performed for EPA have shown that a number of home drinking water filters are highly effective in removing possibly harmful "halogenated organic" chemicals from ground water used for drinking.

The tests demonstrated that the effectiveness of the 10 activated carbon filters in reducing organic compounds ranged from 76 to 99 percent during the filter's claimed lifetimes.

The organic compounds involved in these tests included the solvents trichloroethylene and tetrachloroethylene, serious contaminants of a small portion of the nation's ground water supplies.

The tests are the third in a series begun in 1978 for EPA by the Gulf South Research Institute of New Orleans. Twenty other activated carbon water filters were studied earlier by this firm.

The 10 filters most recently examined included a pour-through model, faucet-mounted units, a stationary model placed below a sink to filter all the water coming through the faucet, and several line-bypass models which also are mounted below a sink but attached to a separate faucet. The useful life of these filters varies as does their cost: from about \$10 for the pour-through device to several hundred dollars for the line-bypass units.

EPA, which is charged with ensuring drinking water safety under a 1974 law, does not certify or approve home water filters. However, the agency had the filters studied

both for its own information and as a consumer service. Many of the filters were tested beyond their manufacturers' claims, which in most cases were limited to improve taste or odor removal.

Other findings from the studies were:

- The performance of activated carbon filters on the drinking water from four cities was similar to their performance in a laboratory.
- Non-pathogenic bacteria do accumulate on the carbon filtering material and do increase in drinking water, but no conclusions can be drawn as to the health significance of these facts at this time.
- More exotic filters, including a reverse osmosis/granular carbon device and a filter using ozone gas and carbon, removed between 70 and 99 percent of halogenated organics from drinking water.

A fact sheet on the third phase filter studies is available from EPA's Public Inquiries Center (PM-215), 401 M St., S.W., Washington, D.C. 20460, phone 202/755-0707. □

Opposite: Canoeers, dressed as early French explorers, retrace an historical expedition on the Wisconsin River.

Back Cover: Early morning ice glaze melts in spring sun on Bull Run, a stream near Washington, D.C., stained with blood during the Civil War.



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