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Daniel Lukis Inake Operator

Ben Lagman Construction Coordinator

Lisa Murray Sampling Associate

Edward Arcese Aqueduct Maintenance Foreman

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Barbara Rich Sampling Associate

Frank Kotce Sampling Associate

J.Dennis Rankin Assistant Chief

David Smith Water Storage Foreman

Frank Sears Chief Maintenance Mechanic

Millie Bedard Administrative Assistant

Desmond Vickers Capital Improvement Project Analyst

Paul Crocco Sewage Inspector

Jaime Santiago Laborer

Yvonne VanOssenbruggen-Hart Assistant Contract Manager

Scott Tamagna Sewer Maintenance Foreman

David Frost Hason

James Arsenault Assistant Bacteriologist

Kevin O'Rourke Sewage Treatment Plant Attendant

Ana Soto Executive Secretary

Michael Caples Carpenter

Mark Jackson Laborer

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MASSACHUSETTS WATER RESOURCES AUTHORITY
 1991 ANNUAL REPORT



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Colin Reid Machinist Foreman

Patrick Adesanya Junior Civil Engineer

Richard Byrne Senior Construction Inspector

Debbie Palmer Deputy Accounts Payable Manager

Richard Burns Tidegate Inspector

Christine Morris Senior Engineering Aide

AT THE MWRA,

we are committed to doing everything possible to make service an integral part of our work. The MWRA employees pictured throughout this report are part of a 1,734-member team dedicated to providing 2.5 million people with excellent water and sewer service, 24 hours a day, 365 days a year.



As the MWRA enters its seventh year of providing water and sewer services to the Boston region, it is worth reaffirming the wisdom of the decision made back in 1985 to give the Authority a substantial measure of independence.

The existing water and sewer systems, excellent though they had once been, were in considerable disrepair by 1985. Responsibility for the systems was vested in the MDC, a state agency consistently denied the funding to do an effective job. The MDC was a victim of the political reality that there is little support to be won by promising to modernize underground infrastructure—even less to be won by authorizing funding to actually pay for such work.

With the creation of MWRA, responsibility for the region's water and sewer systems was transferred out of the world of short-term political expediency. An independent agency with the mandate to fund its operations via rates charged to the communities it serves, the MWRA was given the power and the means to accomplish its mission.

Such independence was essential in light of the court suits of the early 1980s regarding the pollution of Boston Harbor. Meeting the challenge posed by the subsequent court-ordered schedule to end the pollution of the harbor has required the Authority's Board of Directors and staff to make tough and politically unpopular decisions that were not, and could not, be made under the previous organizational structure.

Today, the label of "dirtiest in America" can no longer be applied to Boston's harbor. Nineteen ninety-one was the last year that sewage sludge was dumped into the harbor. The completion of the Authority's fertilizer facility in Quincy means that sludge, the solid

material that settles out during sewage treatment, is now being turned into a useful agricultural product.

As you can see from this annual report, other parts of the multi-billion dollar harbor project are firmly on track. Moreover, in the past year there has been an amazing amount of maintenance and repair on the existing water and sewer systems. The MWRA is much more, however, than an engineering and construction operation: it is a customer-oriented agency committed to providing first-rate service to our communities and the people who live in them.

I am particularly proud of the results of the annual survey of user communities done by the Advisory Board—the organization that represents those communities' interests to the MWRA. This year's survey shows once again that our communities rate us between "Good" and "Excellent" on criteria such as provision of information to the public and to local officials, responsiveness to problems and emergencies, and coordination with communities on construction projects.

As I prepare to leave the MWRA and move on to new challenges, I am confident that the organization is now firmly in place to complete the Authority's mission. I would like to offer my personal thanks to the Board of Directors, the Authority's employees and local officials for their hard work, dedication, and encouragement. It has been a privilege to have been a part of all that we have accomplished together.

Paul F. Levy
Executive Director



AN OVERVIEW: Over 2 million people and 5,500 industries in 61 Greater Boston area communities depend on the MWRA for water and/or sewer services — services that help make modern life possible. We deliver high-quality, fresh water from the Quabbin and Wachusett reservoirs in the western and central portions of Massachusetts, using over 400 miles of tunnels, aqueducts and large pipes. Cities and towns then distribute this water to homes and industries in the Boston region through approximately 6,000 miles

of smaller, community-owned pipes. Our sewer service complements our fresh water system.

Using more than 5,000 miles of local sewers and 230 miles of larger MWRA interceptor pipes, we take away the dirty water and other waste material that is put into the sewers.

We then treat it at either the Deer or Nut Island plants, before disposing of it into Boston Harbor. The way that we dispose of wastewater is changing rapidly, as the

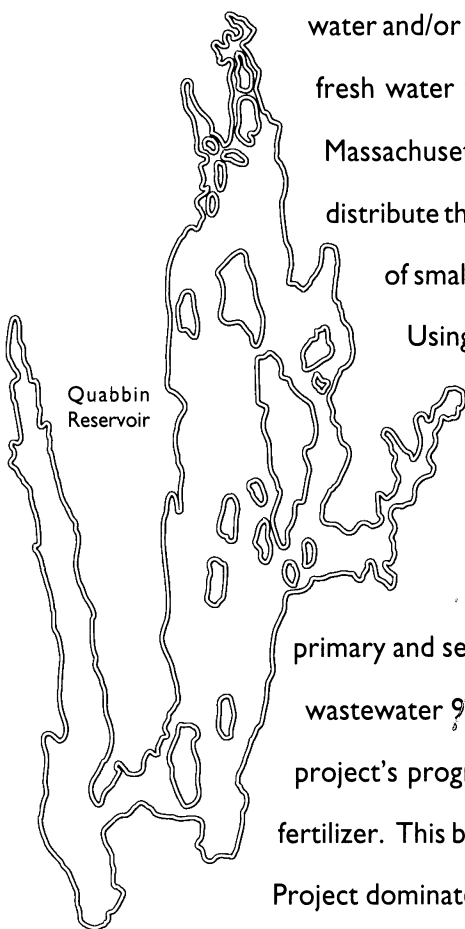
Boston Harbor Project forges ahead. This multi-billion-dollar project includes a new

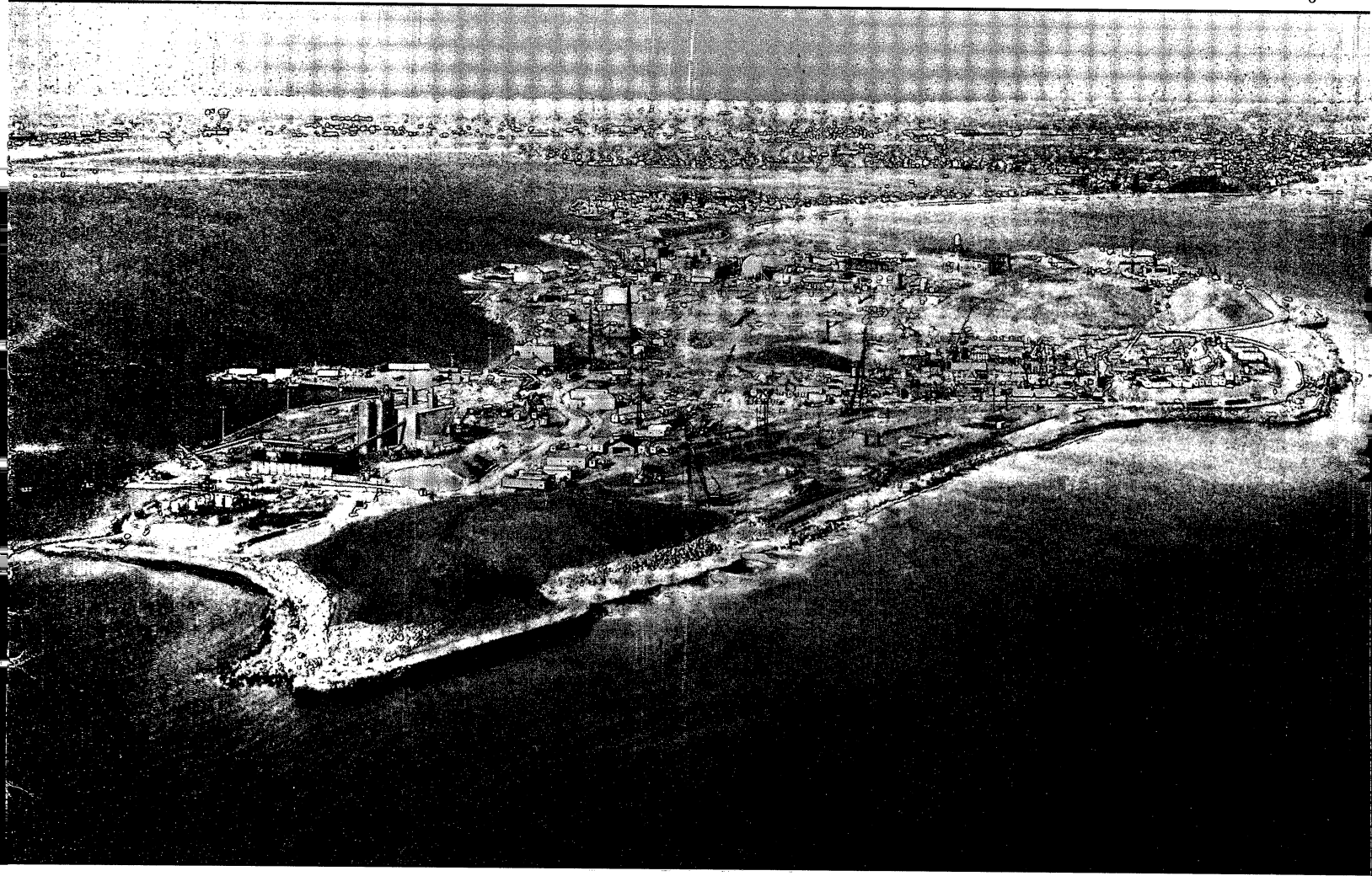
primary and secondary treatment plant on Deer Island and an outfall tunnel that will take the treated wastewater 9.5 miles out into the deep waters of Massachusetts Bay. The most tangible sign of the

project's progress is the recent completion of the pelletizing facility to turn the sewage sludge into fertilizer. This brings to an end years of dumping sludge into the harbor. Yet even as the Boston Harbor

Project dominates the headlines, the basic, vital services provided by the MWRA are being dramatically

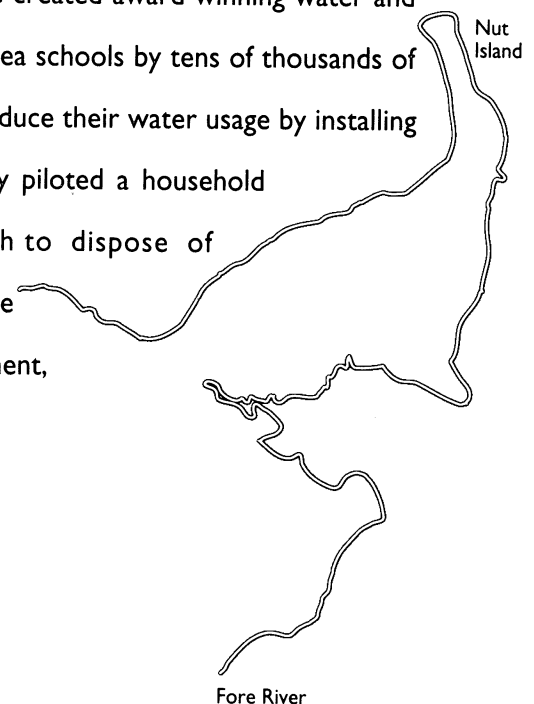
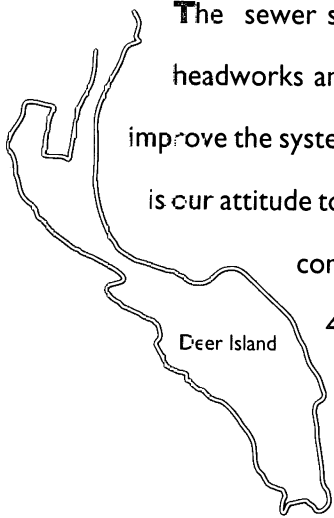
improved. The water system, a triumph of design but suffering from years of neglect before the establishment of the MWRA, is now operating efficiently. Demand management, conservation programs, and leak detection and repairs have been so effective that, for the first time in decades, MWRA communities are using less than the "safe yield" of 300 million gallons per day.

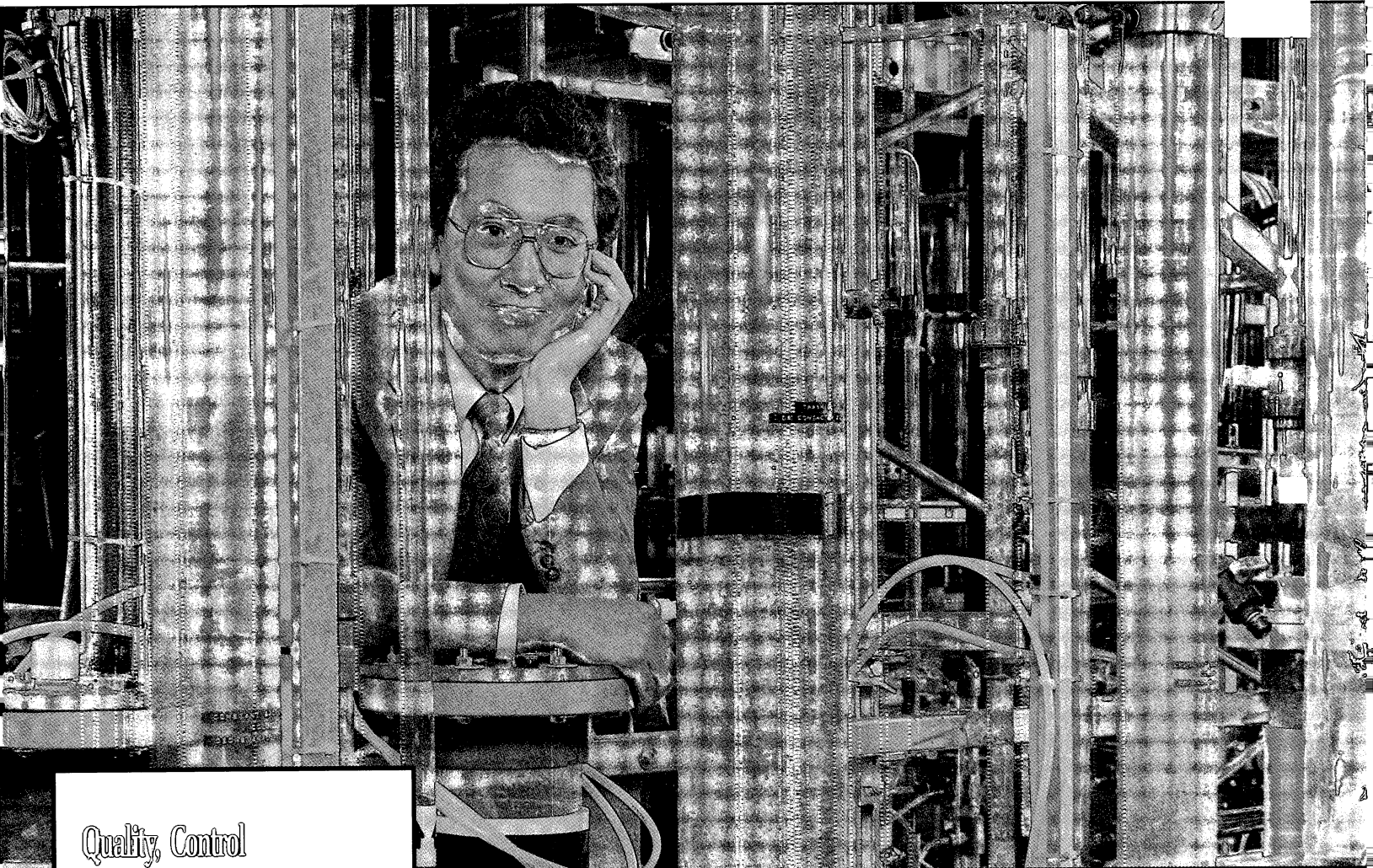




The sewer system is already benefiting from a thorough overhaul of our interceptor pipes, modernization of headworks and pumping stations, and improvements to the existing treatment plants. More has been done to improve the system in the last few years than in the previous two decades. **A**nd unifying the entire MWRA operation is our attitude toward service—toward meeting the needs of our member communities. We take very seriously our commitment to talk with our communities and to listen to their concerns. Last year alone we hosted 442 public meetings, exchanging information with over 12,000 citizens. **I**t is this attitude toward service that leads us to go beyond the day-to-day management of water and sewer systems and to develop innovative community-based programs. We created award-winning water and sewer education curricula that are now studied in area schools by tens of thousands of students. We run a domestic device retrofit program, which helps households reduce their water usage by installing fixtures such as low-flow shower heads and faucet aerators. And we recently piloted a household hazardous waste collection program, which gave people a safe and secure site at which to dispose of chemicals, solvents and other potentially dangerous substances that might otherwise have ended up in the sewers. **A**t the MWRA, we provide more than the management, engineering, and construction skills needed to run the water and sewer systems.

We provide service.





Quality, Control

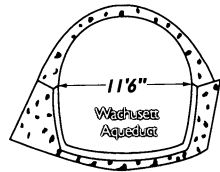
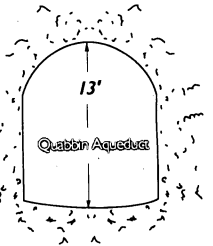
In 1986, new amendments toughened the federal Safe Drinking Water Act. Shortly thereafter, Water Quality and Facilities Manager Jae Kim went to work.

His job: to plan the MWRA's compliance with the strict new water quality regulations. His overriding goal: to control costs for our ratepayers.

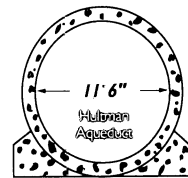
For four years, Jae and his staff studied the water system. "We built a very flexible pilot plant to look at every applicable method of filtration," says Jae. The pilot study is to show that the MWRA's high quality source water can be treated to meet new regulations with a less elaborate filtration plant.

And a less elaborate plant means greater savings when it comes time to build.

WATER SYSTEM: BACK TO THE SOURCE Nearly 2.5 million people receive water from the Quabbin and Wachusett reservoirs. Water is transferred from the Quabbin, 65 miles west of Boston, to the Wachusett via the 25-mile-long Quabbin Aqueduct.

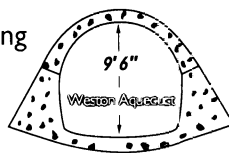


From the Wachusett, water is conveyed to the MWRA communities via a gravity-based system of aqueducts, smaller reservoirs and local pipes. Quabbin is the jewel of the MWRA's water operation: covering more than 39 square miles, it holds over 400 billion gallons when full and is the largest single-purpose reservoir in the United States. The Quabbin has served our region well, and will continue to do so.

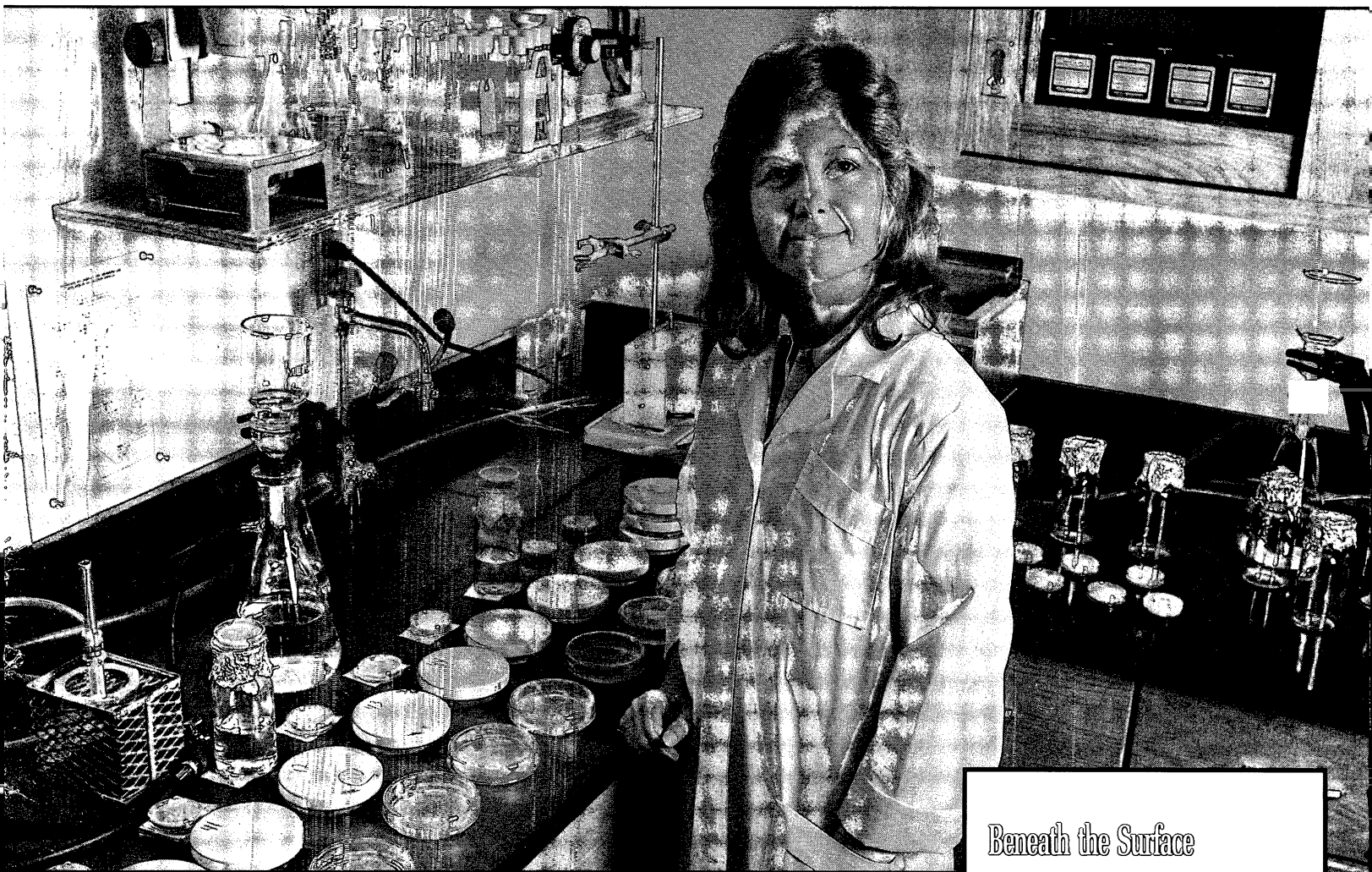


But not without help. Encroaching development on watershed areas (particularly around the Wachusett), increasing water demand and historic neglect of the system's infrastructure have mandated a much more aggressive and innovative water-management approach.

KEEPING PURE WATER PURE Protection of the MWRA water supply is being taken to a new level following changes mandated by the federal Safe Drinking Water Act. The



MWRA, in conjunction with the Metropolitan



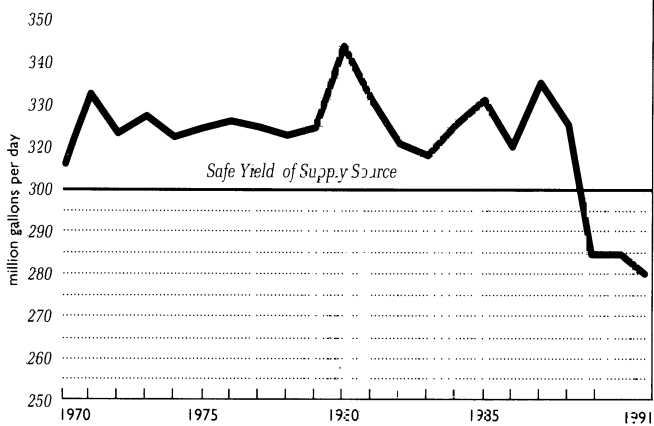
Beneath the Surface

"When I look at one of our reservoirs, I don't notice what's happening on the surface," says Aquatic Biologist Mary Bezek. "I'm concerned with what's going on beneath it."

One of her concerns is algae. "Normal amounts are fine...actually beneficial," she says, "but growth must be controlled or it can disrupt water quality." Mary's training—and a knack for looking beneath the surface—help the MWRA treat algae blooms before they develop into problems.

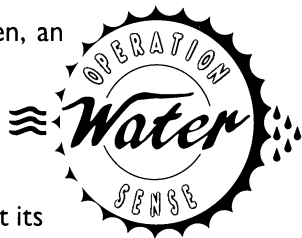
"The water quality in our system is outstanding," says Mary. "It's more reliable than bottled water because it is tightly regulated and tested. I'm just thrilled to help keep it that way."

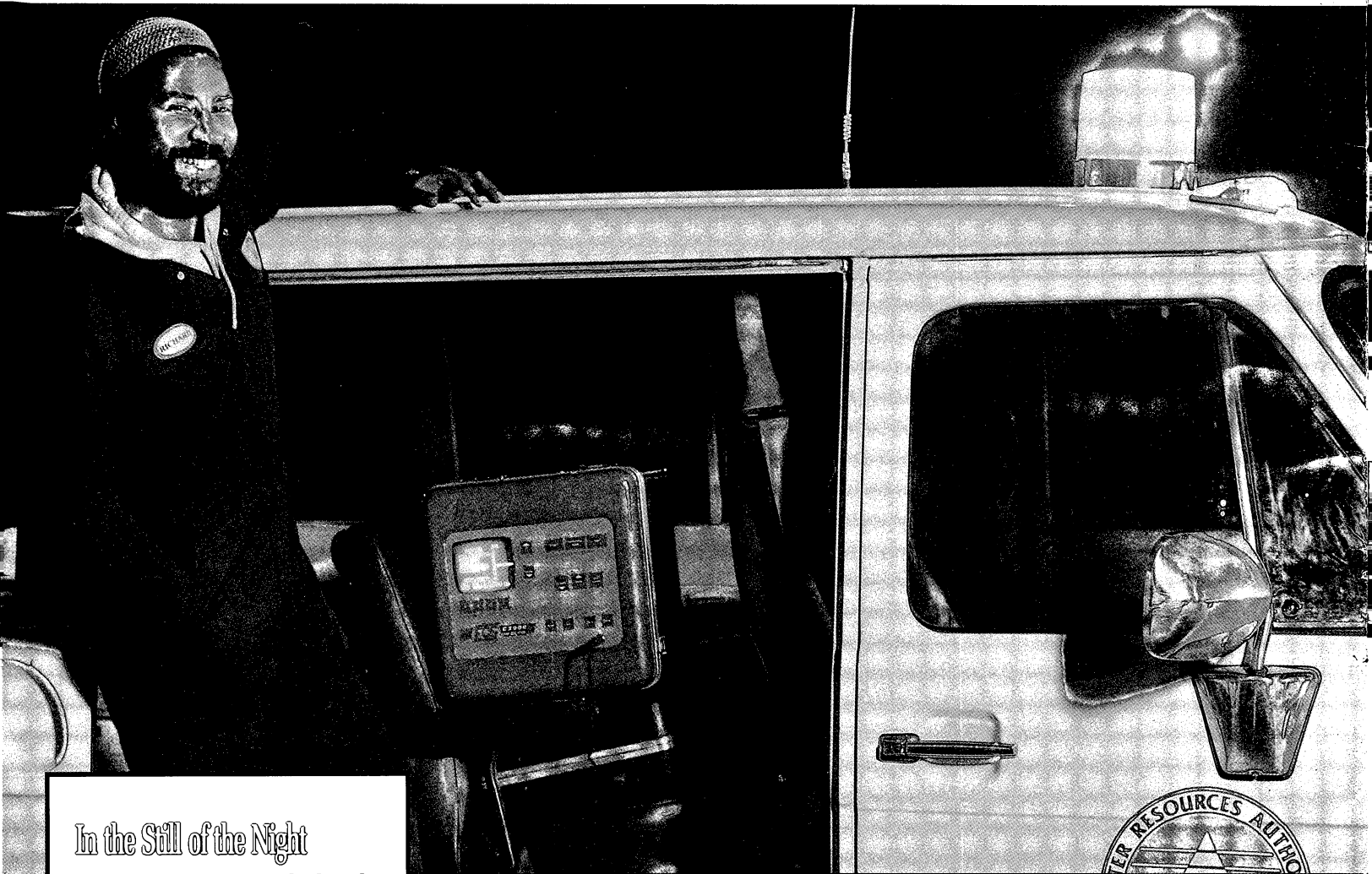
MWRA YEARLY AVERAGE WATER USE



District Commission, has drafted a watershed protection plan to control activities which might harm the water supply. A pilot treatment facility is helping us determine the most effective way to filter, disinfect and add corrosion control to the water supply

in the future, and we are exploring how to cover certain reservoirs to avoid possible contamination. These are the sort of changes that will help ensure reliable water quality for generations to come. **CONSERVATION AND LEAK DETECTION** In 1987, as pressure mounted to augment the metropolitan water supply because of increased demand, the MWRA took a bold stand in favor of conservation. Since then, an aggressive leak detection and repair program and a far-reaching water conservation campaign have cut system-wide demand by more than 50 million gallons per day (mgd). Water demand is at its





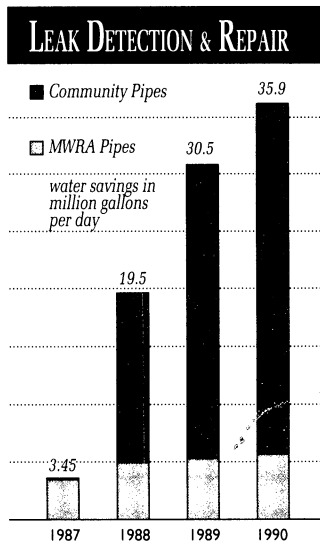
In the Still of the Night

Long after most people hit the sack, Senior Field Service Technician Richard Matra hits the street. During the quiet of the night, his electronic listening equipment can best detect the delicate hiss of leaking pipes.

Richard and the inspection team have been successful in isolating hundreds of leaks, many wasting upward of 25 gallons per minute. In fact, groups like the MDC, the MBTA, and area hospitals often seek MWRA help in pinpointing unexplained water losses. "We get thank-you letters all the time from communities we've helped."

"The most satisfying part of this job has been watching the system improve so quickly," says Richard. "It's also satisfying to have earned the communities' confidence. They know we can solve their problems."

lowest point in more than 20 years and is now at a level well below the system's "safe yield" of 300 mgd. This conservation effort represents one of the MWRA's most important successes, and it has silenced the call for costly, environmentally disruptive expansions to the water supply. **MODERNIZING THE SYSTEM** Not since the construction of the



Quabbin Reservoir has the metropolitan water system undergone such rapid improvement. The MWRA replaced hundreds of rusted valves, some of which were installed when Abraham Lincoln was president. We finished design for a computerized operations control center which takes advantage of the latest water management technology. Remote electronic sensors and micro-computers will feed a continuous stream of data to a central computer, keeping track of reservoir levels, flow rates and water usage throughout the system. The automated system will help cut labor costs, increase overall efficiency and speed up response time to emergencies. We completed a water distribution model that helps us set major priorities for the repair or replacement of sections of the water



Tapping Young Minds

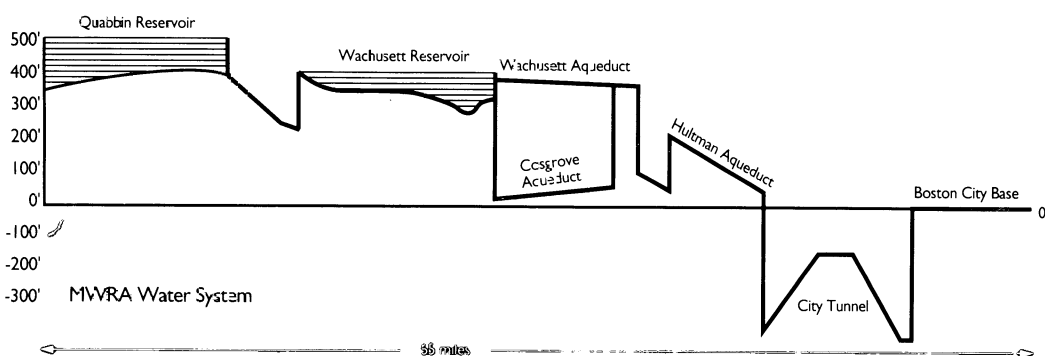
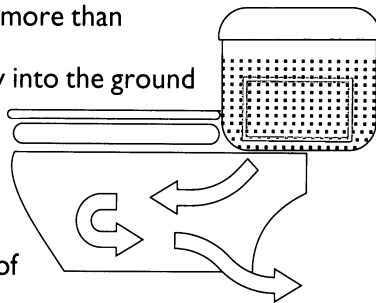
With nothing more than cardboard tubes, straws and the imagination of students, School Program Coordinator Teresa Quinton can recreate Boston's entire water infrastructure.

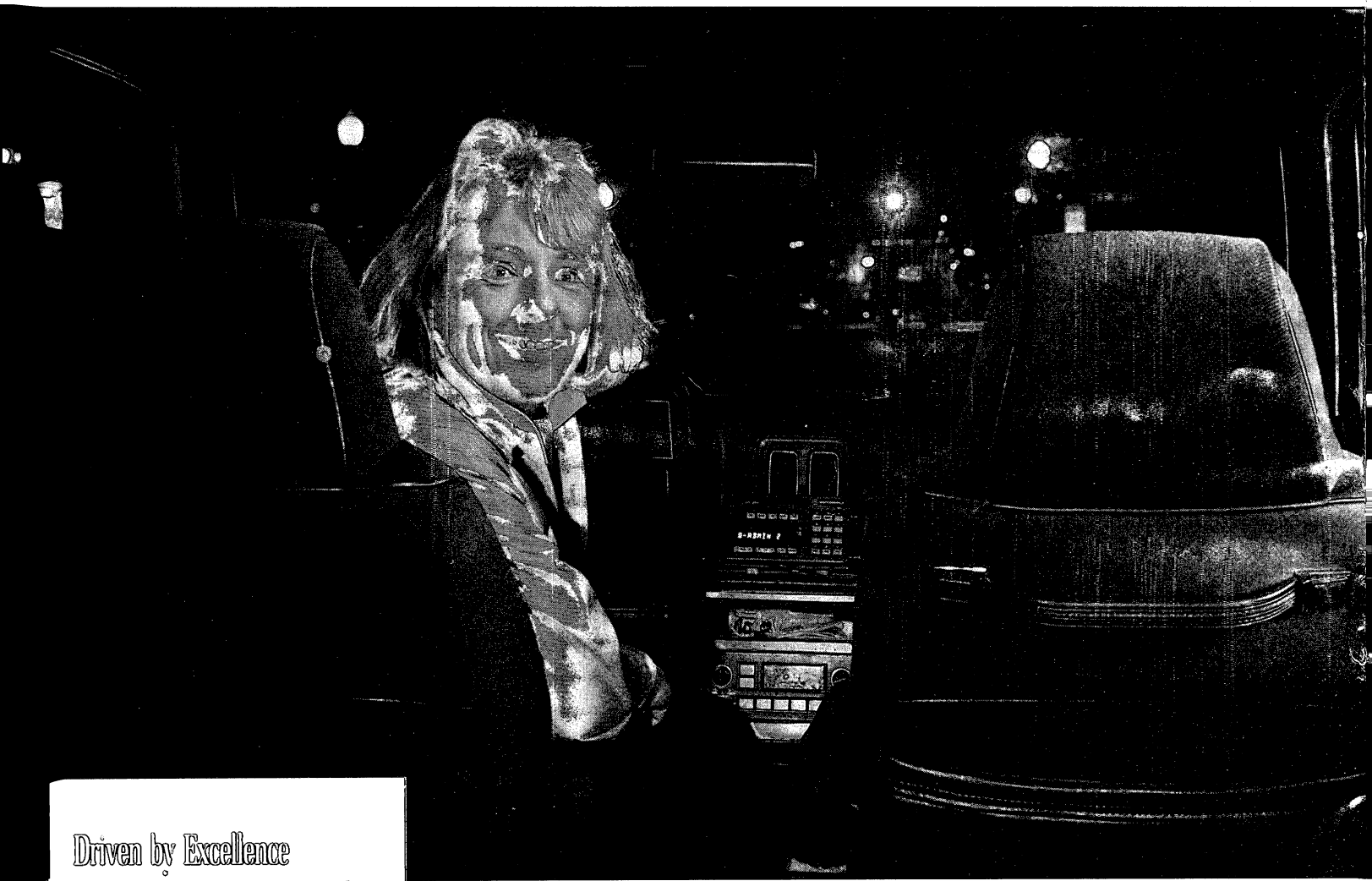
She's done it hundreds of times in schools throughout our service area, showing students where water comes from, where it goes and why it must be used carefully.

Teresa, an elementary school teacher who is pursuing her master's degree in education, helped develop the MWRA's award-winning school program. "Our activities give students a broader understanding of how their actions can affect the world at large."

Teaching children respect for their environment is a long-term approach to water management. It is exactly the approach the region needs.

system over the next 20 years. There are scores of modernization projects currently under way—from installing more accurate meters to restoring hydroelectric generating capacity. **REDUNDANCY IS IMPORTANT** Every day, more than 300,000 gallons of pure, drinkable water flow needlessly into the ground through at least 15 leaks in the Hultman Aqueduct. The Hultman carries 85 percent of the water between the Wachusett Reservoir and Greater Boston, but the lack of a back-up system means that it cannot be removed from service to make repairs. The MWRA has begun design of the \$280 million Sudbury Aqueduct Project, a crucial backup system to provide redundancy for the Hultman. The new, deep rock tunnel aqueduct will allow sections of the Hultman to be closed for repair for the first time in over 50 years. Having a backup aqueduct will help ensure uninterrupted water service for hundreds of thousands of households in dozens of communities.





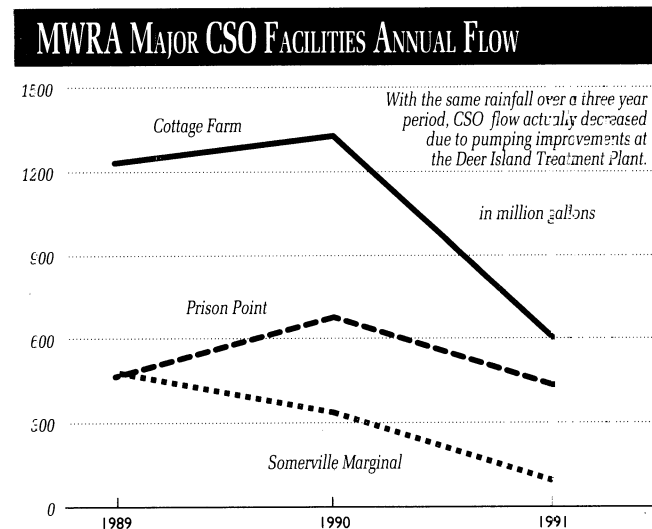
Driven by Excellence

As Hurricane Bob began pounding New England, it knocked out power at two critical sewage pumping stations. Instantly, sewage began backing up. The call went out to MWRA electrician Linda Dimes and her coworkers on the Pumping Maintenance crew.

During the height of the storm, they lugged an emergency generator to the first site, brought the pumps back on line, and then braved their way to the second station. They worked throughout the blustery night, in the rain, fighting against a rising tide of sewage.

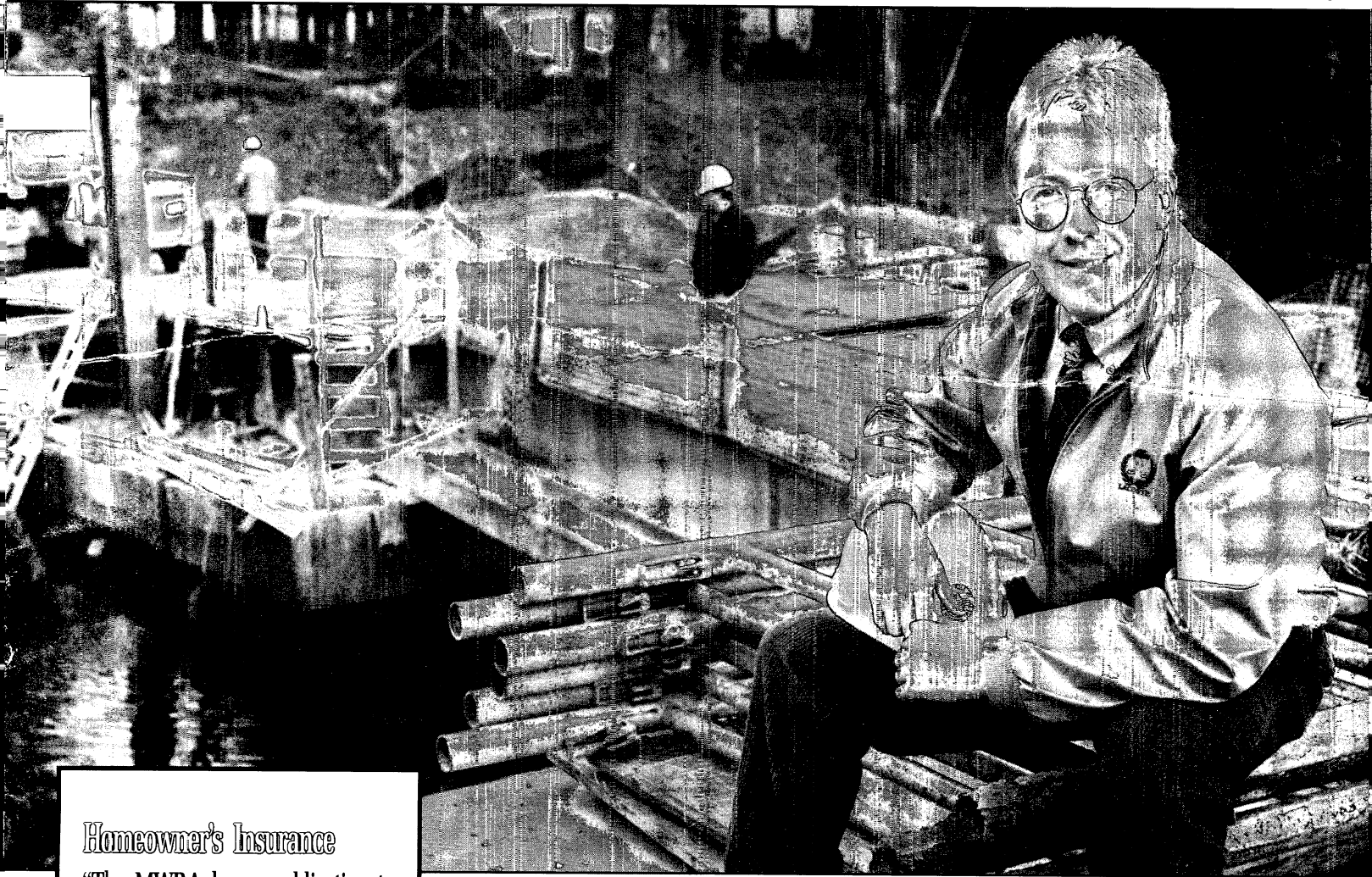
"No matter how uncomfortable, dangerous, or difficult a repair may be, it not only gets done quickly, it gets done right," says Linda. By morning, everything was working—just in time to start the regular shift of inspection, maintenance and routine repairs.

SEWER SYSTEM: ENTERING THE 21ST CENTURY Just a few years ago, a federal study rated Boston Harbor the dirtiest in the nation. One of the major causes was the region's sewer system, which was releasing billions of gallons of raw or poorly treated sewage into the harbor and into nearby rivers and wetlands. Today, thanks to major repairs and upgrades, harbor monitoring shows that Boston Harbor no longer tops the list. The



existing treatment plants on Deer and Nut islands are functioning at or near their designed levels of capacity for the first time in their history. Faulty tidegates and connections in sewer lines have been repaired and new screening and disinfection facilities have come on-

line, dramatically reducing the amount of pollution entering the harbor. **T**hese improve-



Homeowner's Insurance

"The MWRA has an obligation to address public health and environmental issues as it carries out its projects," says Tora Lindberg, "but it also has an obligation to the people whose lives are disrupted by construction."

As a Community Relations Coordinator, Tom works with residents in impacted communities to make sure every possible local concern is taken into account during construction.

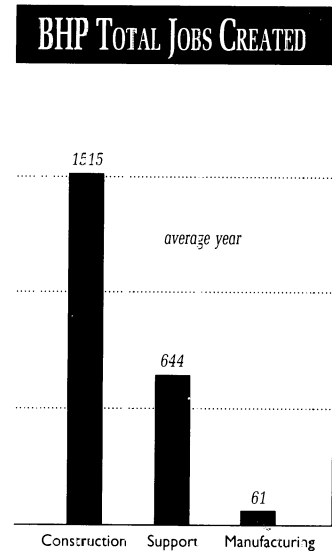
"We've asked contractors to transplant, replace or work around certain trees, even to re-landscape according to homeowner specifications. We've also had them adopt protective measures for children, elderly residents and pets, as well as restrict truck traffic on certain streets."

"Basically," says Tom, "my job is to make sure that the inconveniences caused by construction don't outweigh the environmental benefits."

ments are part of a program to address the aging system's most pressing repair needs even while the long-term solution—the new primary and secondary plant and the 9.5-mile

effluent cutfall tunnel—is under construction. Work on the new plant and outfall tunnel, which together with the pelletizing plant form the court-ordered Boston Harbor Project, is proceeding ahead of schedule and under budget.

MODERNIZING THE SEWER COLLECTION SYSTEM Large segments of the existing wastewater collection system were constructed between 1890 and 1930 and are severely deteriorated. Several pumping facilities have become inefficient and even inoperable. **D**uring the last year, work



continued on the modernization of the southern section of the sewer system, with major projects in 13 communities. More than 25 miles of new interceptor collection pipe, some of it over 60 inches in diameter, are now being designed or constructed, and 10 pump stations are being built or rehabilitated. This will prevent raw sewage from leaking into



A Stickler for Details

"I'm a ratepayer too, and I only want to pay for a solid, working treatment plant on Deer Island," says Melissa Werts, staff engineer for the CADD (computer aided drafting and design) system.

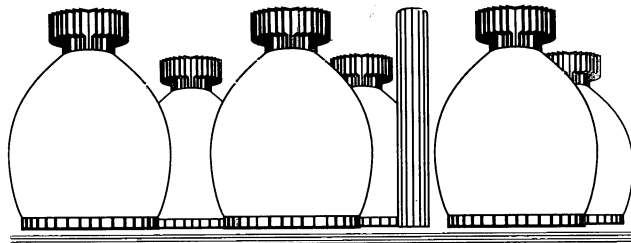
The system eliminates waste and helps guarantee that the new treatment plant is well-built. "CADD enables us to see design flaws that wouldn't be otherwise apparent until construction" Melissa says. "We also use it to monitor design quality, consistency and compliance with MWRA standards."

The attention to detail will reap rewards long after construction is completed. "Access to detailed, computerized records means more efficient operation and maintenance at the new plant," she says, "and that helps control costs for future ratepayers."

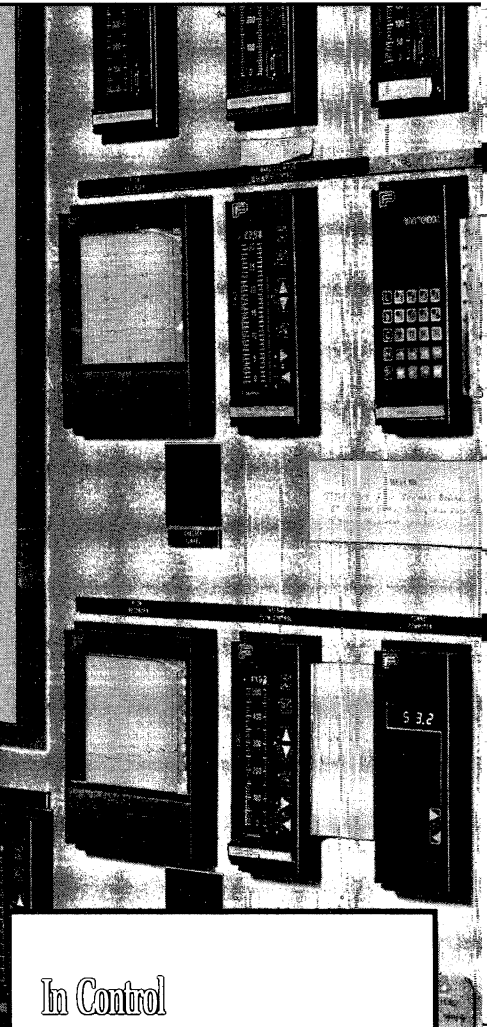
local wetlands and rivers. In the northern section of the system, a new pump station in East Boston and an upgraded screening facility in Winthrop provide expanded capacity. This helps decrease raw sewage seepage into nearby rivers and into Alewife Brook.

COMBATING COMBINED SEWER OVERFLOWS Over the last year, the MWRA has made great strides addressing the problem of combined sewer overflows, known as CSOs. During periods of heavy rainfall, several older portions of the sewer system that combine storm run-off with sewage become overburdened; consequently, some sewage spills out into the inner harbor untreated. The MWRA is still in the process of developing a system-wide solution to the CSO problem, but in this last year it opened a fifth and sixth treatment facility to screen and disinfect discharge from CSOs near key recreational points on Boston Harbor.

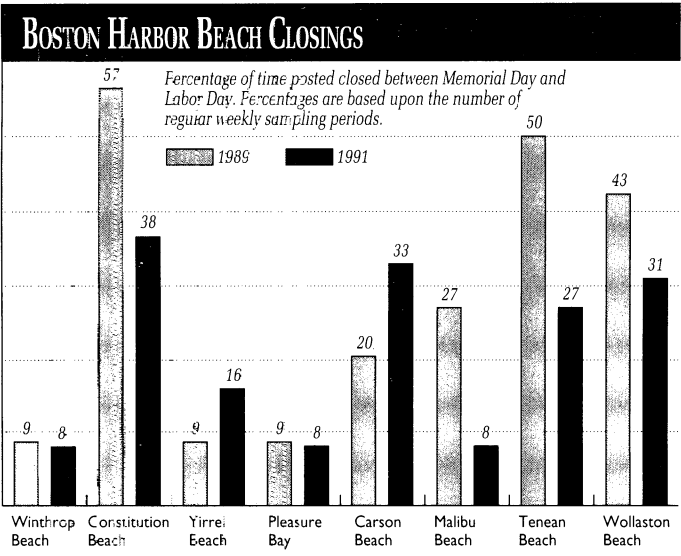
SAFE SWIMMING AT LOCAL BEACHES The MWRA also worked with the Boston Water and Sewer Commission and Metropolitan District Commission to facilitate inspection and repair of pipes



Egg-Shaped Sludge Digesters



and tidegates, and to institute routine monitoring of water quality. This work, together with the CSO treatment facilities, contributed greatly to the reduction of local beach closings. Beaches that had to be closed to swimmers did not remain so for as



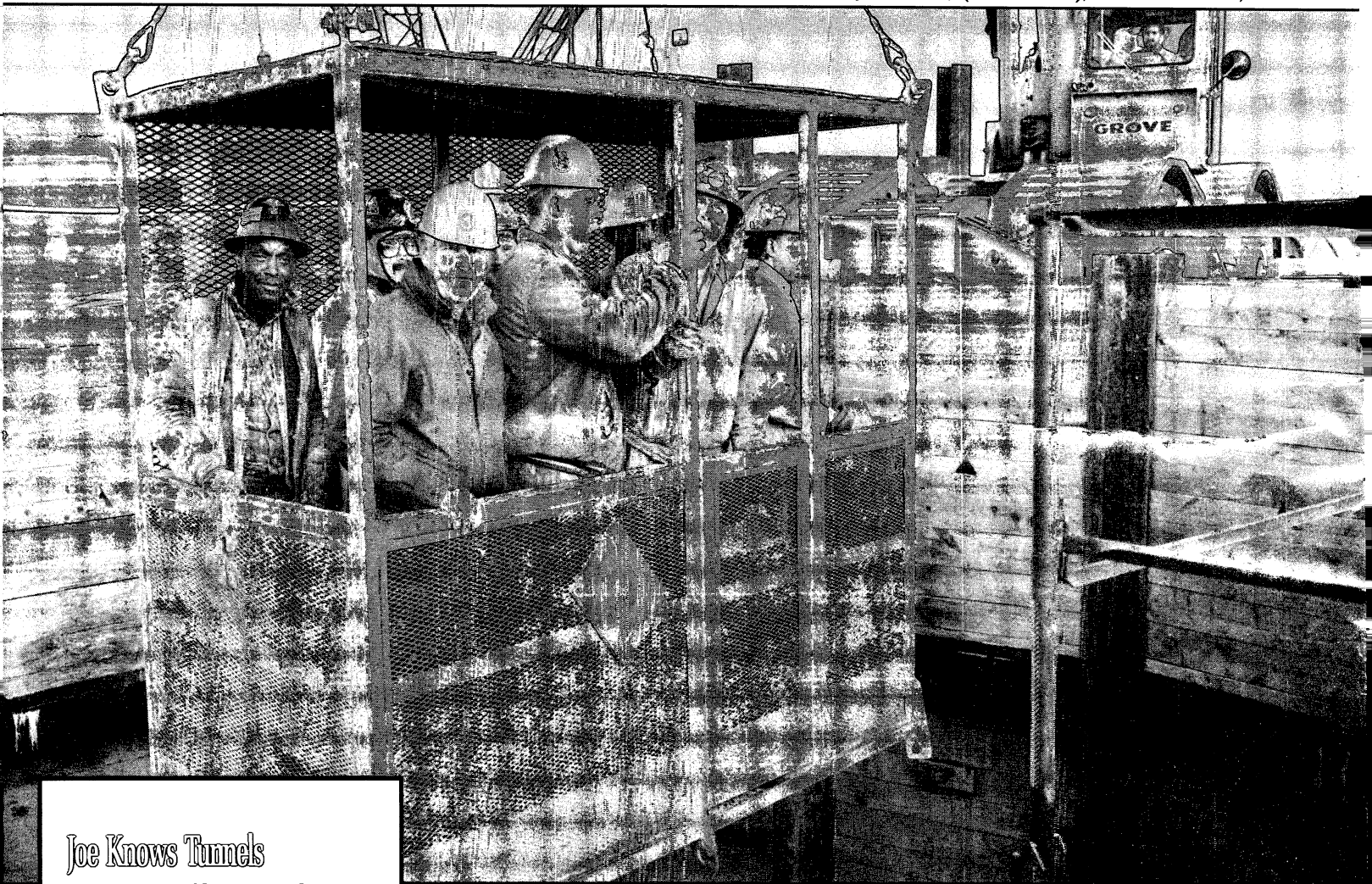
long as they had in previous summers. **CONTROLLING TOXINS** Controlling toxins was another MWRA success story in 1991. Keeping toxic chemicals out of the sewer system is a priority because it is so difficult to dispose of residuals with high concentrations of either organics or metals. As a result of aggressive inspection, monitoring, and undercover surveillance of local industries, the MWRA issued more than 100 Enforcement

In Control

Thirty-five years ago, Bob De Rossier began his career at the old Deer Island steam pumping station. He and his family lived on the island in a house set aside for pump station employees. "It was a great place to live," says Bob, "with beautiful hills, beaches for my kids to play on and incredible flounder fishing."

The De Rossiers no longer live on Deer Island, but Bob still works there. He is a Senior Operator in the treatment plant's Graphic Control room—the 24 hour a day, 365 day a year nerve center of the sewerage system. When Bob's in control, the system is in experienced hands.

"Because I think of it as home," says Bob, "I take particular pride in Deer Island and the role it is playing in revitalizing Boston Harbor."



Joe Knows Tunnels

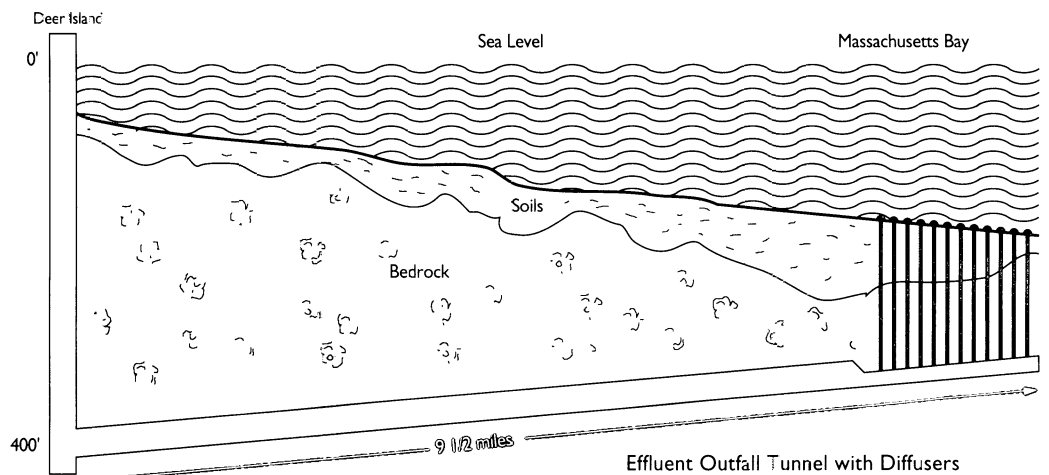
"No two tunnel boring machines are the same," says MWRA Senior Construction Manager Joe Griffith, "They're like ships, each with its own idiosyncrasies and personality." And with 25 years of tunneling experience—Joe knows.

Joe's career began with the earliest Tunnel Boring Machines (TBMs)—huge rock and earth eating machines that have since revolutionized the tunneling business.

Today, Joe manages the Boston Harbor Project's three state-of-the-art TBMs. "This will be the largest tunnel of its kind in history," says Joe, referring to construction of the 9.5-mile, 24.5-foot diameter effluent outfall tunnel. When completed in 1996, it will be as big around as the Callahan Tunnel and nine times longer. The project keeps Joe where he likes to be—on the cutting edge of the industry.

Orders last year, as well as assessing more than \$600,000 in penalties to 18 sewer users who violated pollution regulations. The Authority also initiated a program to help companies institute pretreatment and source reduction measures. Recent estimates of the toxics loadings at the treatment plants suggest that over the last five years several key toxins, including chromium, cadmium, and silver are down by at least 50 percent.

BUILDING THE FUTURE: THE BOSTON HARBOR PROJECT On Deer Island, years of planning and preparatory work began to take concrete form in 1991. Foundations are being laid for new clarifier tanks, signaling the start of construction on the actual components of the new treatment facility. By 1995, this work will provide the next great boost to the environment: a new primary treatment plant and an enormous 9.5-mile outfall tunnel with 55 diffusers will discharge a cleaner effluent into the deeper waters of



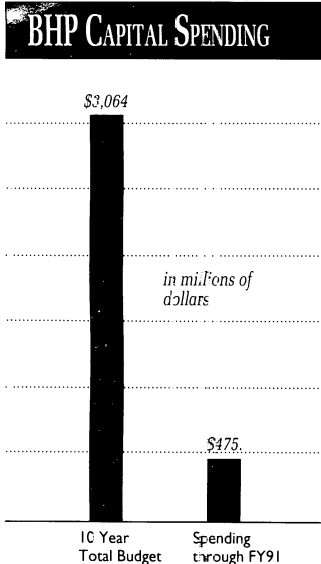


Tackling Toxins

"Just because something is on the supermarket shelf doesn't mean it's safe," says Denise Breiteneicher of the Toxic Reduction and Control department. "The average American home contains 15 pounds of hazardous waste, hidden in products like bug spray, motor oil, batteries and paints." These household hazardous wastes are often released into the region's sewers—and ultimately pollute Boston Harbor.

Denise is working to stop that. With grant money from the EPA, she is managing two innovative pilot programs that provide several communities with safe disposal options for household hazardous waste and used motor oil.

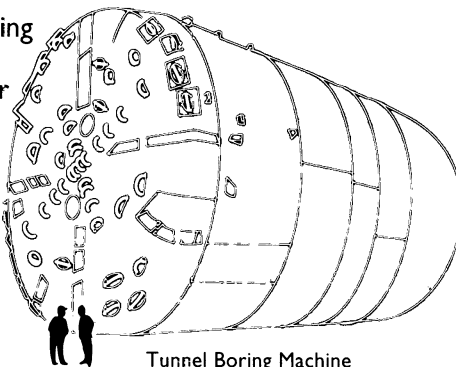
Proper disposal is important, but education, says Denise, is the key. "If our customers don't spend money on hazardous products, then we won't have to spend money cleaning them up."



Massachusetts Bay. In 1996, the first sections of the new secondary treatment plant will come on line, resulting in an even cleaner effluent. By 1999, and possibly much sooner, discharges from the metropolitan system will meet federal and state regulations for the first time in nearly 30 years.

But the most dramatic Harbor Project achievement of 1991 occurred off-island, across the harbor in the city of Quincy. The completion of a sludge pelletizing facility at the Fore River Staging Area means the end of sludge dumping in

Boston Harbor. Instead of polluting the harbor, each day 400,000 gallons of liquid sludge—about 60 dry tons—will be processed into pellets suitable for use as a soil enhancer or fertilizer. As a result, scientists expect to see healthier fish in the harbor, a richer diversity of bottom-dwelling creatures and cleaner-looking water. And sludge, the bane of the harbor for decades, will become a useful product that can be marketed for horticultural and agricultural use.



Tunnel Boring Machine



High Ratings

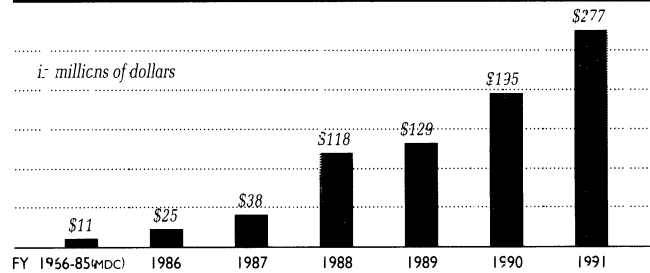
As Manager of Debt and Investments, Dennis Williams makes sure the MWRA invests its money wisely. And in 1991, that was a \$1 billion job. "It's vital that we carefully manage our capital financing program to maintain a high credit rating. This will translate into lower interest rates, saving hundreds of millions of dollars for MWRA ratepayers."

Casey Bekaert, Manager of Investor Relations, isn't satisfied with simply offering financial information to investors. She works hard to build long-term relationships.

"I want the institutions and people who buy our bonds to have confidence in the MWRA and the job it must accomplish. So we go beyond the level of basic disclosure; we offer site tours, produce quarterly newsletters and deliver answers to questions at all hours."

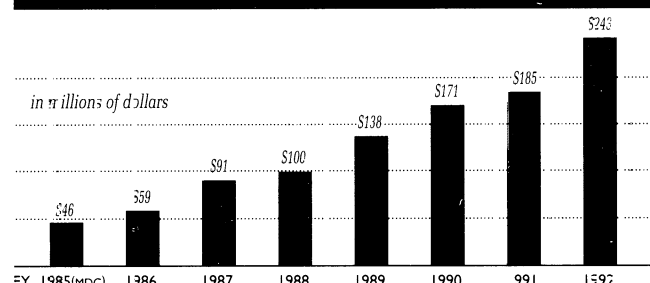
THE FINANCIAL CHALLENGE Equal to the challenge of siting, designing and building massive new wastewater treatment facilities is the challenge of paying for them. In FY91, for the sixth consecutive year the MWRA collected 100 percent of rate revenue from member communities. A highly successful \$836 million bond issuance in FY90 kept us

CAPITAL SPENDING FY 1966-1991



from having to borrow additional funds in FY91. However, rapid acceleration of construction work caused capital spending to increase dramatically. It now exceeds one million dollars per day. More than 500 contracts and contract changes were signed in FY91, totaling almost one billion dollars. **BUDGETING FOR THE FUTURE** Our FY92 Current Expense Budget (CEB) and FY92-94 Capital Improvement Plan (CIP) were reviewed by the MWRA

REVENUES FROM WATER & SEWER CHARGES



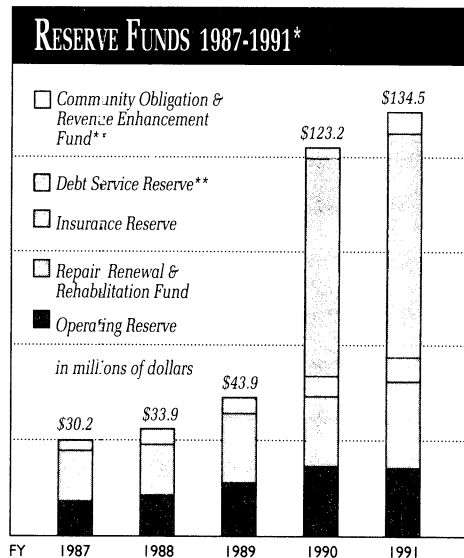
Advisory Board and then adopted by the MWRA Board of Directors. The FY92 CEB totals \$272.9 million, which is a 27 percent increase over the FY91 budget and requires a 31.3



percent increase in rate revenue. Most of the increase is the result of debt service and the operating cost of the new sludge processing facility. The FY92-94 CIP totals \$2.2 billion, 80 percent of which is devoted to court-ordered projects. The 10-year CIP is comprised of 61 projects requiring \$5.3 billion in expenditures.

MWRA Bonds The MWRA will continue to finance the Boston Harbor Project by issuing bonds. That means that debt service—the cost of borrowing money—will play a significant role

in the overall cost of the project. A fraction of an interest point one way or another can translate into millions of dollars to our ratepayers. With this in mind, the MWRA has developed the Investor Relations Program to help maintain a proactive relationship with the financial community. The program provides a reliable flow of information about the MWRA, including quarterly financial reports, facilities tours, investor forums and a 24-hour response time to all inquiries. By increasing confidence in MWRA bonds, the program helps keep borrowing costs as low as possible. In 1991, the program received the Industry Contribution Award from the National Federation of Municipal Analysts for “voluntarily setting a standard of continuing market disclosure.”



* Does not include Rate Stabilization Fund

** Prior to the issuance of its first series of general revenue bonds on February 15, 1990 under its General Bond Resolution, the Authority was not required to maintain a Debt Service Reserve Fund or a Community Obligation and Revenue Enhancement Fund.

Building Successes

Development Manager Maggie Debbie, who oversees MWRA real estate transactions, has an eye for good deals. So she took a long, hard look when a group of shipbuilders—formerly employed by General Dynamics in Quincy—asked the MWRA to consider the idea of returning shipbuilding to a portion of the shipyard now owned by the MWRA.

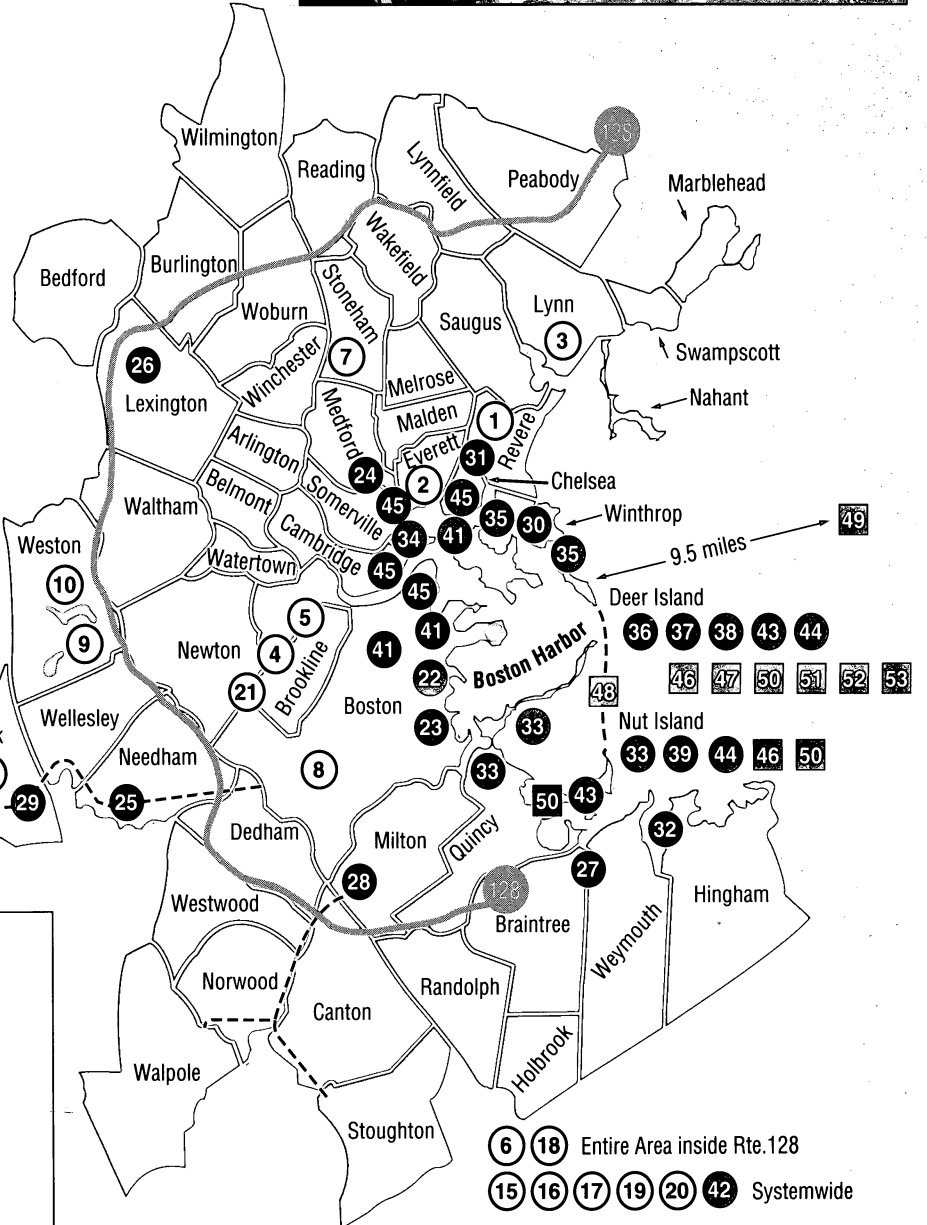
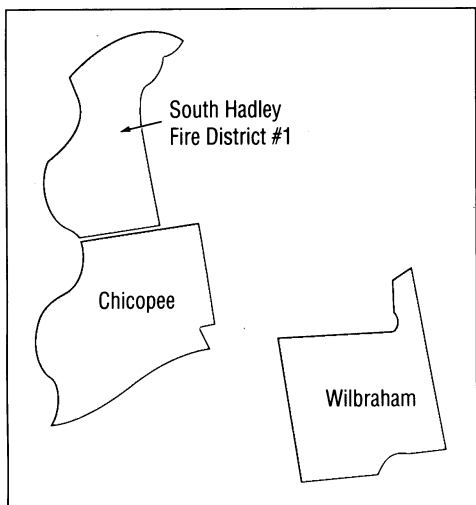
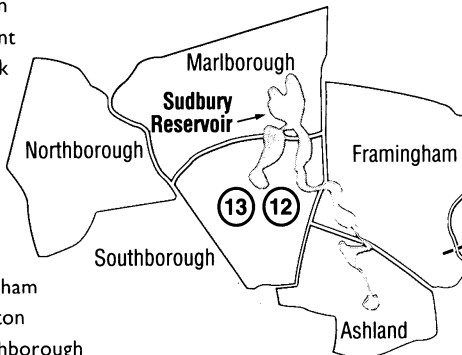
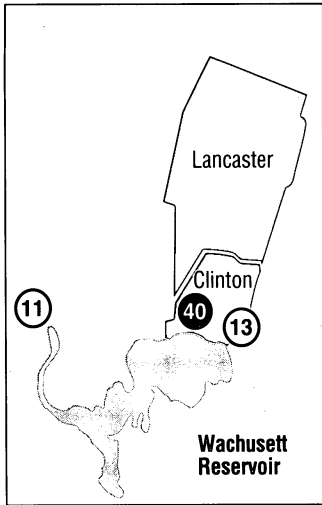
Despite many arduous twists and turns, she, the shipbuilders and other interested parties stuck with the idea, turning it into reality. A temporary agreement was signed, enabling the shipbuilders to win a contract to rehabilitate ships returning from the Persian Gulf war.

“It’s a win/win deal for everyone,” says Maggie. “Quincy and Braintree get jobs and tax revenues and our ratepayers get a return on the cost of purchasing the shipyard.”

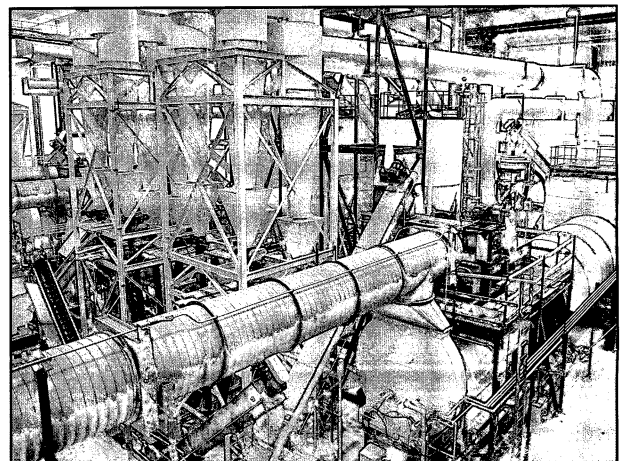
MWRA SYSTEM AND MAJOR CAPITAL PROJECTS

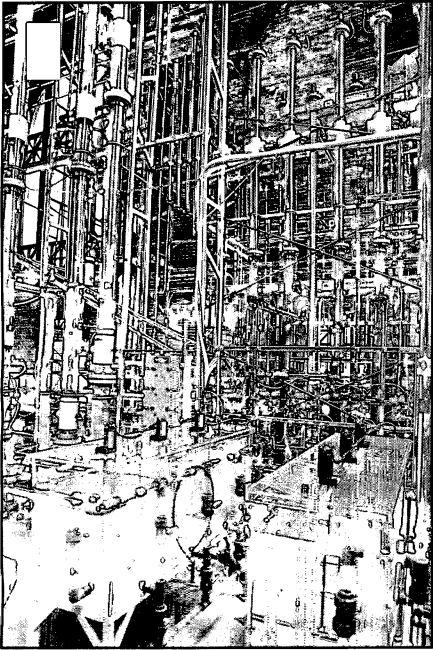
- Arlington
- Ashland
- Bedford
- Belmont
- Boston
- Braintree
- Brookline
- Burlington
- Cambridge
- Canton
- Chelsea
- Chicopee
- Clinton
- Dedham
- Everett
- Framingham
- Hingham
- Holbrook
- Lancaster
- Leominster
- Lexington
- Lynn
- Lynnfield Water District
- Malden
- Marblehead
- Marlborough
- Medford
- Melrose
- Milton
- Nahant
- Natick
- Needham
- Newton
- Northborough
- Norwood
- Peabody
- Quincy
- Randolph
- Reading
- Revere
- Saugus
- Somerville
- Southborough
- South Hadley Fire District #1
- Stoneham
- Stoughton
- Swampscott
- Wakefield
- Walpole
- Waltham
- Watertown
- Wellesley
- Weston
- Westwood
- Weymouth
- Wilbraham
- Wilmington
- Winchester
- Winthrop
- Woburn
- Worcester

11 THE OAKDALE HYDROELECTRIC POWER STATION, closed by a lightning related fire a few years ago, has been rebuilt and is again a reliable, clean, energy-efficient provider of electricity. During peak production, the facility produces nearly three megawatts of electricity—enough to meet the needs of about 6,000 homes. The energy is sold to the New England Power Company. Profits are used to offset the cost of operating the water system.

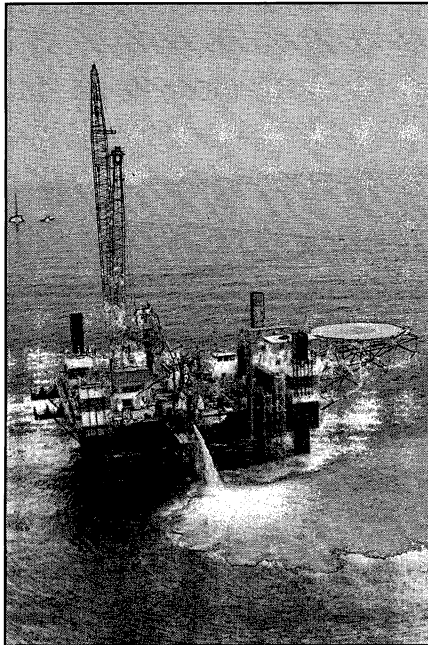


43 AT THE FORE RIVER STAGING AREA in Quincy, sludge barged in from the Deer and Nut Island treatment plants is dewatered and heat-dried into fertilizer pellets. The new facility includes a sealed building where air pressure is kept lower than outside to prevent odorous gasses from escaping. Some gasses are used to heat cylindrical burners; others are destroyed in a special 1,500 degree furnace before being emitted from an 213-foot-high stack. The pelletizing plant has been recognized by Commonwealth Electric for its energy-efficient design.





19 **AT THE FOOT** of the Wachusett Dam, a pilot water filtration plant is being used to determine the most cost-effective method of compliance with new federal drinking water regulations. The pilot plant filters 72,000 gallons per day. When the actual filtration facility is designed and built, it will have the capacity to process 500 million gallons per day.

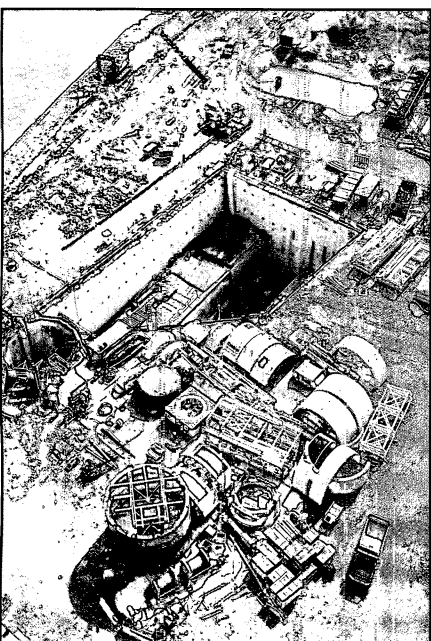


49 **NINE MILES OUT** into Massachusetts Bay, a drilling platform supports the underwater construction of 55 diffusers. These diffusers will run the length of the last 1.25 miles of outfall pipe now under construction, helping to thoroughly disperse the effluent from the new treatment plant.

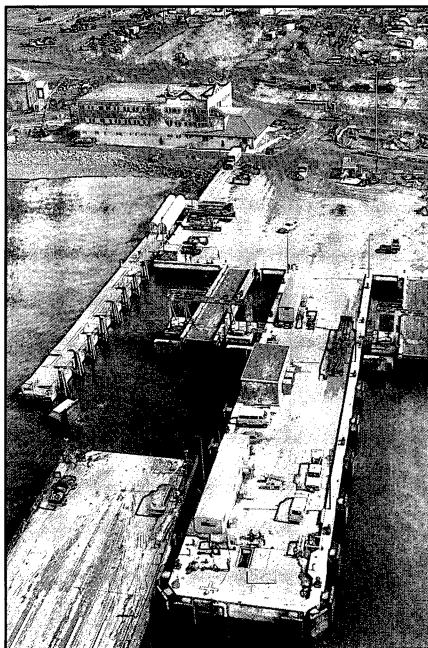
LEGEND

- Water Service Community
- Sewer Service Community
- Water & Sewer Service Community
- 1** Water System Project
- 2** Sewer System Project
- 3** Boston Harbor Project

Numbers refer to major Capital Projects on pages 18 & 19



48 **AT THE MOUTH** of a 400-foot deep shaft on Deer Island, a tunnel boring machine (TBM) lies in sections. The TBM has since been assembled in a chamber at the shaft's base and begun a four-year, 9.5 mile journey through the solid bedrock below Boston Harbor. Tunnel workers, known as sandhogs, will work in three shifts around the clock to keep the project on track. Their job has been described as "dark, damp, dirty and dangerous."



50 **A NEW PIER** on Deer Island supports a massive construction effort. At the peak of construction activity, the pier will receive as many as 1,200 workers and 100 trucks daily. Barges can also use the pier to off-load construction material or remove excess earth and rock from the island. The pier has spared the community of Winthrop—which is connected to Deer Island by a narrow residential road—from a decade of disruptive truck traffic.

MWRA MAJOR CAPITAL PROJECTS

	1984	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total Cost	
WATER SYSTEM	NORTHERN HIGH SERVICE PIPELINE-REVERE/MALDEN (1) Began construction on improvements to ensure sufficient water pressure.																	(Millions) \$22.4
	NORTHERN LOW SERVICE PIPELINE REPLACEMENT (2) Continued design of repairs for badly corroded pipelines in Medford and Chelsea.																	\$5.3
	NORTHERN HIGH SERVICE PIPELINE-LYNN (3) Continued construction to upgrade service by replacing old, undersized pipes and valves.																	\$15.1
	HEATH HILL /ROUTE 9 PIPELINE (4) Continued design to replace old, corroded pipeline.																	\$6.9
	BOSTON LOW SERVICE PIPE AND VALVE REHABILITATION (5) Continued design of rehab of pipes serving downtown Boston and surrounding areas.																	\$11.3
	SYSTEMWIDE BLOW-OFF VALVE REPLACEMENT (6) Continued design to reconfigure blowoff valves to maintain water quality and eliminate cross connections.																	\$8.3
	SPOT POND PUMP STATION (7) Began second phase design of rehab of 1905 pump station, which serves Woburn, Stoneham, Winchester, Wakefield and Melrose.																	\$40.1
	SOUTHERN SERVICE IMPROVEMENTS (8) Continued construction on rehab of Newton Street pump station.																	\$14.0
	NORUMBEGA CHLORINATION FACILITY (9) Completed construction of chemical feed facility to disinfect up to 460 million gallons of water per day.																	\$1.5
	WESTON RESERVOIR CHLORINATION (10) Began construction of rehab of chlorination facility.																	\$2.5
	OAKDALE POWER STATION GENERATOR (11) Completed the repair of the hydroelectric generator which controls reservoir elevation.																	\$9
	HULTMAN/WESTON AQUEDUCT TRANSFER (12) Completed construction of aqueduct modifications. Continued pipeline replacement and meter improvements.																	\$5.6
	SLUICE GATE REHABILITATION (13) Began construction to replace inoperable sluice gates at reservoir intakes.																	\$5.0
	AQUEDUCT SYSTEM IMPROVEMENTS (14) Continued design for construction of a tunnel to provide a back-up for Hultman Aqueduct.																	\$299.0
	CENTRAL MONITORING SYSTEM (15) Continued design of remote monitoring network to provide current data and immediate control of flow and pressure.																	\$18.4
	LEAK DETECTION (16) Completed examination of member communities' pipes to help identify needed repairs.																	\$2.1
	LOCAL SOURCES OF SUPPLY (17) Continued to identify alternate local water supplies.																	\$9.1
	WATER METER MODERNIZATION (18) Continued rehabilitation of 139 meters which will provide accurate information on each community's water use.																	\$12.9
SAFE DRINKING WATER ACT COMPLIANCE PROGRAM (19) Continued planning for construction of water storage, disinfection and treatment facilities to comply with federal law.																	\$656.2	
DOMESTIC DEVICE RETROFIT PROGRAM (20) Continued to install free water saving devices throughout the service area.																	\$13.6	
CHESTNUT HILL PUMP STATION REHAB (21) Continued the design of a building rehab that will house a lab testing facility.																	\$16.2	
SEWER SYSTEM	FOX POINT CSO (22) Completed construction of facility to treat wet weather sewage overflow into Dorchester Bay.																	\$4.2
	COMMERCIAL POINT CSO (23) Completed construction of facility in Dorchester to treat combined sewer system overflows.																	\$7.1
	SOMERVILLE MARGINAL CSO (24) Completed improvements to provide treatment to combined sewer system overflows before discharge into Mystic River.																	\$1.7
	WELLESLEY EXTENSION SEWER REPLACEMENT (25) Continued construction of 7.5 miles of pipeline to increase system capacity and prevent pollution of Charles River.																	\$71.2
	MILLBROOK VALLEY INTERCEPTOR (26) Completed relief sewers to increase system capacity.																	\$6.2

Number refers to position on map on page 16.

● Planning/Design ➤ Construction ■ Completion

		1984	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	Total Cost
SEWER SYSTEM	BRAINTREE/WEYMOUTH (27) Continued planning for new relief facilities and pump station to serve South Shore communities.	●	●	●	●	●	●	●	●	●	●	●	▶	▶	▶	▶		(Millions) \$86.3
	NEW NEPONSET VALLEY (28) Continued design of a major pump station and relief sewers to increase system capacity.	●	●	●	●	●	●	●	●	●	▶	▶						\$41.2
	FRAMINGHAM EXTENSION RELIEF SYSTEM (29) Continued design of 22 million gallons-per-day pump station and rehab of Framingham Extension Sewer.	●	●	●	●	●	●	●	●	●	▶	▶	▶					\$45.6
	BELLE ISLE SIPHON (30) Completed rehab of siphon carrying sewage under Belle Isle marsh in Winthrop to eliminate leakage.	●	●	●	●	▶	■											\$2.0
	SLADE SIPHON (31) Completed rehab of siphon to convey sewage to Deer Island and prevent pollution of Chelsea Creek.	●	●	●	▶	■												\$.8
	HINGHAM PUMP STATION (32) Began construction for rehab of pump station to prevent overflows into Back River.	●	●	●	●	●	●	●	▶	▶								\$3.0
	QUINCY PUMP FACILITIES (33) Began construction for short and long-term improvements to three pump stations.				●	●	●	●	▶	▶	▶	▶	▶	▶	▶	▶	▶	\$17.1
	CHARLESTOWN PUMP STATION (34) Continued construction of 93 million gallons-per-day pump station to replace 1895 facility.	●	●	●	●	●	●	▶	▶	▶								\$36.5
	EAST BOSTON PUMP FACILITIES (35) Continued construction to replace 1898 East Boston Pump Station, Chelsea Screenhouse and Winthrop Terminal.	●	●	▶	▶	▶	▶	▶	▶	▶								\$46.1
	DEER ISLAND PUMP AND POWER STATION (36) Completed final rehab phase of sewage pumping and generation facilities.	●	●	▶	▶	▶	▶	■										\$33.2
	DEER ISLAND SEDIMENTATION (37) Completed improvements to sedimentation tanks to ensure effective sewage treatment until opening of new plant in 1995.		●	●	▶	▶	■											\$19.7
	DEER ISLAND IMMEDIATE UPGRADE (38) Continued improvements to existing plant to ensure uninterrupted service until new facility is completed.		●	▶	▶	▶	▶	▶	▶	▶								\$11.8
	NUT ISLAND INTERMEDIATE UPGRADE (39) Continued improvements to ensure uninterrupted service until new Deer Island facility is completed.				●	●	▶	▶	▶	▶								\$1.7
	CLINTON TREATMENT PLANT (40) Continued construction to upgrade sewage treatment plant to improve water quality of discharges into the Nashua River.	●	●	●	●	●	▶	▶	▶	▶								\$36.6
	REMOTE HEADWORKS (41) Completed improvements at three facilities that screen out larger debris before flow reaches Deer Island plant.		●	●	▶	▶	■											\$25.4
	SEWER SYSTEM METERING (42) Continued construction of metering system to measure flow of sewage from member communities.				●	●	▶	▶	▶	▶	▶							\$7.1
	RESIDUALS MANAGEMENT FACILITIES (43) Continued construction of facilities to process and dispose of wastewater treatment plant sludge.		●	●	●	●	●	▶	▶	▶	▶	▶	▶					\$173.6
	INTERIM SCUM DISPOSAL (44) Completed construction of facilities at Deer and Nut Islands to stop discharge of scum into Boston Harbor.		●	●	▶	▶	■											\$4.5
	COMBINED SEWER OVERFLOWS (45) Continued CSO planning. Completed initial facilities plan. Began procurement of Master Planning and final Facilities Planning Contract.					●	●	●	●	●	●	●	●	▶	▶	▶	▶	\$1,270.0
PRIMARY TREATMENT PLANT (46) Continued construction of primary plant on Deer Island to improve treatment and increase capacity.		●	●	●	●	●	▶	▶	▶	▶	▶	▶					\$626.5	
DEER ISLAND SECONDARY PLANT (47) Continued design of plant that will increase the level of treatment to meet federal standards.		●	●	●	●	●	●	●	●	▶	▶	▶	▶	▶	▶	▶	\$743.4	
INTER ISLAND TUNNEL AND SHAFT (48) Began construction of tunnel to carry sewage from Nut Island to Deer Island for treatment.		●	●	●	●	●	●	▶	▶	▶	▶	▶					\$85.2	
EFFLUENT OUTFALL TUNNEL (49) Continued construction of outfall tunnel and diffusers to carry and disperse treated sewage nine miles out into Massachusetts Bay.		●	●	●	●	●	▶	▶	▶	▶	▶	▶					\$358.6	
WATER TRANSPORTATION FACILITIES (50) Continued transportation of construction materials and personnel to Deer Island.		●	●	●	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	\$265.4	
SITE FACILITIES (51) Continued construction of site support facilities on Deer Island.				●	●	●	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	\$312.7	
PERMANENT UTILITIES (52) Continued construction of switchgear and yard utilities.				●	●	●	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	\$187.3	
ON ISLAND RESIDUAL FACILITIES (53) Began construction of primary egg-shaped digesters and sludge thickeners.				●	●	●	●	●	▶	▶	▶	▶	▶	▶	▶	▶	\$487.1	

BOSTON HARBOR PROJECT



Providing Direction

The eleven-member MWRA Board of Directors, chaired by the Massachusetts Secretary of Environmental Affairs, sets policy and discusses and approves programs and procurements that carry out the mission of the MWRA.

In addition to the Secretary, four members are appointed by the Governor. Of these four members, the communities of Quincy and Winthrop recommend one each. Three members are appointed by the Mayor of Boston and three by the MWRA Advisory Board. Shown here, left to right, front row: Samuel G. Mygatt, Susan F. Tierney-Chairman, Joseph A. MacRitchie, Patricia A. Crutchfield; back row: Lorraine M. Downey, John J. Carroll, Thomas E. Reilly, Jr., Robert J. Ciolek, Charles Lyons. Not shown: Norman P. Jacques, Walter J. Ryan, Jr.

INDEPENDENT BUT ACCOUNTABLE The MWRA has a considerable measure of independence — independence that is crucial if it is to accomplish its mission. However, the Authority maintains public accountability through its governing Board of Directors and its Advisory Board. The Board of Directors has established and maintains strong financial and managerial controls. The Advisory Board, created by the Enabling Act that established the MWRA, includes the chief executive official from 60 communities that receive water and sewer services from the MWRA, an appointee from the Massachusetts Area Planning Council, and six gubernatorial appointees from across the state. Providing a vital link between the MWRA and its member communities, the Advisory Board scrutinizes MWRA capital and operating budgets and makes recommendations on them to the MWRA Board of Directors.

REPORT OF INDEPENDENT ACCOUNTANTS

To the Board of Directors of the Massachusetts Water Resources Authority:

We have audited the accompanying balance sheet of the Massachusetts Water Resources Authority as of June 30, 1991 and the related statements of operations and changes in retained earnings, changes in fund equity and cash flows for the year then ended. These financial statements are the responsibility of the Authority's management. Our responsibility is to express an opinion on these financial statements based on our audit. Condensed totals for the year ended June 30, 1990 are presented for comparative purposes only.

We conducted our audit in accordance with generally accepted auditing standards and government auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements referred to below present fairly, in all material respects, the financial position of the Massachusetts Water Resources Authority as of June 30, 1991 and the results of its operations and its cash flows for the year then ended in conformity with generally accepted accounting principles.

Our audit was conducted for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplemental schedule of funds and accounts established by the General Revenue Bond Resolution for the year ended June 30, 1991 and for the period from February 15, 1990 through June 30, 1990 is presented for purposes of additional analysis and is not a required part of the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated, in all material respects, in relation to the basic financial statements taken as a whole.



Boston, Massachusetts
September 6, 1991

BALANCE SHEETS

June 30, 1991 and 1990 (in thousands)

ASSETS			1991	1990
	Sewer	Water	Total	Total
Current assets:				
Cash and cash equivalents (Notes B, D and E)	\$ 34,558	\$ 16,938	\$ 51,496	\$ 31,406
Short-term investments (Note D)	1,200	1,200	2,400	12,798
Accounts receivable	32	342	374	899
Materials and supplies	5,263	1,198	6,461	7,369
Total current assets	<u>41,053</u>	<u>19,678</u>	<u>60,731</u>	<u>52,472</u>
Restricted assets:				
Cash and cash equivalents and short-term investments (Notes B, D and E)	265,956	56,860	322,816	538,449
Interest receivable	709	282	991	1,292
Grants receivable:				
Billed	14,346		14,346	26,487
Unbilled	17,574		17,574	18,486
Total restricted assets	<u>298,585</u>	<u>57,142</u>	<u>355,727</u>	<u>584,714</u>
Property, plant and equipment (Notes B and G):				
Property, plant and equipment	973,913	1,670,242	2,644,155	2,522,959
Less accumulated depreciation	(158,817)	(154,419)	(313,236)	(239,525)
	815,096	1,515,823	2,330,919	2,283,434
Construction in progress (Note K)	540,285	26,636	566,921	383,776
Total property, plant and equipment	<u>1,355,381</u>	<u>1,542,459</u>	<u>2,897,840</u>	<u>2,667,210</u>
Other assets	1,863	655	2,518	2,612
Total assets	<u>\$1,696,882</u>	<u>\$1,619,934</u>	<u>\$3,316,816</u>	<u>\$3,307,008</u>
LIABILITIES			1991	1990
	Sewer	Water	Total	Total
Current liabilities:				
Accounts payable and accrued expenses	\$ 8,419	\$ 4,130	\$ 12,549	\$ 17,945
Total current liabilities	<u>8,419</u>	<u>4,130</u>	<u>12,549</u>	<u>17,945</u>
Payable from restricted assets:				
Accounts payable for construction	49,721	3,623	53,344	31,515
Retainage on construction in progress	14,831	1,098	15,929	10,276
Accrued interest on bonds payable	12,948	1,898	14,846	30,166
Current portion of long-term debt (Note E)	13,504	3,975	17,479	9,848
Reserves (Notes B, C and D)	36,840	21,571	58,411	44,538
Deferred credits (Notes B and C)	43,171	15,934	59,105	54,169
Total payable from restricted assets	<u>171,015</u>	<u>48,099</u>	<u>219,114</u>	<u>180,512</u>
Commitments and contingencies (Notes K and L)				
Long-term debt, less current portion (Notes E and L)	725,040	127,549	852,589	867,136
Total liabilities	<u>904,474</u>	<u>179,778</u>	<u>1,084,252</u>	<u>1,065,593</u>
FUND EQUITY				
Contributed capital (Notes B and L)	792,408	1,440,156	2,232,564	2,241,415
Total liabilities and fund equity	<u>\$1,696,882</u>	<u>\$1,619,934</u>	<u>\$3,316,816</u>	<u>\$3,307,008</u>

The accompanying notes are an integral part of the financial statements.

STATEMENTS OF OPERATIONS AND CHANGES IN RETAINED EARNINGS

For the years ended June 30, 1991 and 1990 (in thousands)

	Sewer	Water	1991 Total	1990 Total
Operating revenues (Note E):				
Customer services	\$134,726	\$51,902	\$186,628	\$173,923
Other	1,727	72	1,799	1,049
	<u>136,453</u>	<u>51,974</u>	<u>188,427</u>	<u>174,972</u>
Operating expenses:				
Operations	40,427	22,400	62,828	59,449
Maintenance	5,892	1,507	7,398	4,869
Payments in lieu of taxes (Notes I)		1,986	1,986	1,519
Engineering and general and administrative	35,463	11,936	47,399	42,157
	<u>81,782</u>	<u>37,829</u>	<u>119,611</u>	<u>107,994</u>
Income from operations before depreciation	54,671	14,145	68,816	66,978
Depreciation (Note B)	45,678	28,083	73,761	59,906
Operating income (loss)	8,993	(13,938)	(4,945)	7,072
Regulatory accounting provisions (Notes B, C and D):				
Reserves recovered through rates	(9,982)	(3,891)	(13,873)	(3,547)
Change in deferred credits	(3,223)	(1,713)	(4,936)	(29,906)
Nonoperating income and expenses:				
Interest income	31,720	6,099	37,819	38,997
Interest expense (Note F)	(57,063)	(9,507)	(66,570)	(55,398)
Net loss	(29,555)	(22,950)	(52,505)	(42,782)
Plus depreciation on property, plant and equipment funded by capital contributions (Note B)	29,555	22,950	52,505	42,782
Change in retained earnings	—	—	—	—

STATEMENTS OF CHANGES IN FUND EQUITY

For the years ended June 30, 1991 and 1990 (in thousands)

	Sewer	Water	Total
Fund equity as of June 30, 1989	\$719,303	\$1,486,263	\$2,205,566
Grants in aid of construction (Note B)	78,631		78,631
Less depreciation on property, plant and equipment funded by capital contributions (Note B)	<u>(19,625)</u>	<u>(23,157)</u>	<u>(42,782)</u>
Fund equity as of June 30, 1990	778,309	1,463,106	2,241,415
Grants in aid of construction (Note B)	43,654		43,654
Less depreciation on property, plant and equipment funded by capital contributions (Note B)	<u>(29,555)</u>	<u>(22,950)</u>	<u>(52,505)</u>
Fund equity as of June 30, 1991 (Note L)	<u>\$792,408</u>	<u>\$1,440,156</u>	<u>\$2,232,564</u>

The accompanying notes are an integral part of the financial statements.

STATEMENTS OF CASH FLOWS

For the years ended June 30, 1991 and 1990 (in thousands)

	1991	1990
Cash flows from operating activities:		
Cash received from customers	\$187,153	\$173,450
Cash paid to suppliers for goods and services	(65,610)	(48,530)
Cash paid to employees for services	(58,489)	(53,461)
Other operating revenue	1,799	1,686
	<u>64,853</u>	<u>73,145</u>
Cash flows from financing activities:		
Proceeds from sale of revenue bonds		788,999
Capital grants for construction	56,707	73,954
Repayment of debt	(9,847)	(613,365)
Interest paid on debt	(78,959)	(34,989)
Plant expenditures	(276,909)	(194,935)
	<u>(309,008)</u>	<u>19,664</u>
Cash flows from investing activities:		
Purchases of short-term investments	(110,569)	(375,797)
Sales and maturities of short-term investments	340,871	90,021
Decrease (increase) in restricted cash and equivalents, net	(13,107)	163,912
Interest received	47,050	39,378
Other		(1,704)
	<u>264,245</u>	<u>(84,190)</u>
Net increase in cash and equivalents	20,090	8,619
Cash and equivalents at beginning of year	31,406	22,787
Cash and equivalents at end of year	<u>\$ 51,496</u>	<u>\$ 31,406</u>
Reconciliation of operating income to cash flows from operating activities:		
Operating income (loss)	\$(4,945)	\$ 7,072
Adjustments to reconcile operating income to cash flows:		
Depreciation	73,761	59,906
Decrease in accounts receivable	525	164
Decrease (increase) in materials and supplies	908	(553)
Increase in other assets		(908)
(Decrease) increase in accounts payable	(5,396)	7,464
Cash flows from operating activities	<u>\$64,853</u>	<u>\$73,145</u>

The accompanying notes are an integral part of the financial statements.

NOTES TO FINANCIAL STATEMENTS

A. Organization:

The Massachusetts Water Resources Authority (the "Authority") was established in January 1985 pursuant to Chapter 372 (the "Enabling Act") of the Act of 1984 of The Commonwealth of Massachusetts (the "Commonwealth"). The Authority, a successor agency to certain functions of the Metropolitan District Commission (the "MDC"), is a public instrumentality and, effective July 1, 1985, provides water supply services and sewage collection, treatment and disposal services to areas of the Commonwealth.

B. Accounting Policies:

The accounting policies of the Authority conform to generally accepted accounting principles as applicable to government enterprises. The following is a summary of significant accounting policies:

1. Basis of Presentation

The Authority is required by the Enabling Act to establish user rates for its water and sewer services which provide sufficient funds to recover the costs of operations (excluding depreciation), debt service, maintenance, replacements and improvements to its facilities, and appropriate reserves. Accordingly, the Authority's financial statements are reported on the accrual basis of accounting as specified by the Government Accounting Standards Board's requirements for an enterprise fund.

In order to comply with the internal and external limitations and legal restrictions placed upon the use of available resources, the Authority employs principles of fund accounting which require that resources be classified into various funds that are in accordance with specific activities or objectives.

In addition, the Authority has adopted the provisions of the Financial Accounting Standards Board's Statement No. 71, "Accounting for the Effects of Certain Types of Regulation," to provide a better matching of revenues and expenses. The effect of this policy has been to defer certain costs, which will be recovered through future revenues in accordance with the Authority's rate model, and to record deferred credits for certain reserves required to be collected through rates and for the current recovery of costs expected to be incurred in the future. The effects of the Authority's accounting policies under Statement No. 71 are discussed further in Note C.

2. Property, Plant and Equipment

Property, plant and equipment consists principally of plant and pipelines in the Authority's sewerage and waterworks systems.

Property, plant and equipment transferred to the Authority on July 1, 1985 was recorded at its estimated fair market value of \$2,331,465,000 (including certain construction projects which were in progress as of July 1, 1985) based upon an appraisal performed by valuation specialists. Property, plant and equipment acquired or constructed since July 1, 1985 is stated at historical cost, and includes the expenditure of capital grants in aid of construction.

Betterments and major renewals are capitalized and included in property, plant and equipment accounts, while expenditures for maintenance and repairs are charged to expense when incurred. The cost of depreciable assets and related accumulated depreciation are eliminated from the accounts when they are retired or otherwise disposed.

Pursuant to the Enabling Act, ownership of the real property of the MDC sewer and waterworks systems was not transferred from the Commonwealth to the Authority; however, the Authority has the right to use, improve, maintain and manage that property. In addition, ownership of the real and personal property of the watershed system remains with the Commonwealth; however, the Authority has the right to utilize the water therefrom for water supply purposes (see Note L).

3. Depreciation

The Authority provides for depreciation by use of the straight-line method. Depreciation is intended to distribute the cost of depreciable properties, including those financed by capital grants in aid of construction, over the following estimated average useful lives:

	Years
Plant and equipment, water and sewerage system	5-100
Motor vehicles and equipment	5
Furniture and fixtures	7
Leasehold improvements	3-5

4. Revenue Recognition

The Authority recognizes revenue as amounts become collectible from its customers for water and sewer services provided. The majority of the Authority's billings to cities and towns are subject to, in the event of nonpayment, the local aid intercept allowed by the Enabling Act.

5. Contributed Capital

Nonrefundable contributions of capital (including the initial capital contribution discussed in Note B.2.) or grants from governmental agencies and others for construction purposes are included in contributed capital. Depreciation expense on property, plant and equipment funded by capital contributions and grants is charged to contributed capital.

6. Materials and Supplies

Materials and supplies are valued at cost using the first-in, first-out (FIFO) inventory flow method. Materials and supplies inventory transferred to the Authority on July 1, 1985 were recorded at the fair market value as determined by an independent appraisal.

7. Cash and Equivalents

The Authority's policy is to treat investments with an original maturity date of three months or less as cash equivalents. Restricted cash and equivalents are combined with investments on the balance sheets, and shown separately on the statements of cash flows as investing activity.

C. Deferred Credits:

The Authority is required to establish rates for its services sufficient to recover the costs of operations (excluding depreciation), debt service, maintenance, replacements and improvements to its systems and appropriate reserves. While the Authority is authorized to recover all such costs through rates charged to its users, not all costs are recovered at the same time as they are incurred under generally accepted accounting principles. In accordance with Financial Accounting Standards Board Statement No. 71, the Authority has deferred certain revenues and costs which will be recognized as income or recovered through future rates as appropriate.

Netted within deferred credits are operating expenses amounting to \$11,345,000 and \$13,730,000 at June 30, 1991 and 1990, respectively, incurred by the sewer division in the fiscal year ended June 30, 1985, prior to the Authority obtaining full authority and responsibility for operations. These costs were charged to the Authority under the Enabling Act, and are deferred pending recovery through rates. The balance of the deferred credits results primarily from differences between budgeted and actual revenues and expenses, including depreciation on property, plant and equipment not financed by grants or capital contributions, which is recovered through rates as debt service. The interest income on borrowed funds is used to reduce debt service for acquisition of fixed assets, and is recognized as a credit in the statement of operations in conjunction with the depreciation of associated fixed assets. The amount reflected in recovery for rate stabilization represents the amount determined by the Board of Directors to be utilized in a subsequent year to reduce customer billings.

A detail of the activity in this account for the fiscal years 1991 and 1990 is as follows (in thousands):

	Sewer	Water	Total
Balance, June 30, 1989	\$(14,619)	\$ (9,644)	\$(24,263)
Depreciation of property, plant and equipment not financed by grants or capital contributions	13,964	3,159	17,123
Amortization of 1985 operating costs	(1,923)		(1,923)
Recovery of debt service in excess of interest expense	(5,238)	(6,380)	(11,618)
Recovery for rate stabilization	(6,750)	(708)	(7,458)
Interest income on borrowed funds and other	(25,382)	(648)	(26,030)
Balance, June 30, 1990	(39,948)	(14,221)	(54,169)
Depreciation of property, plant and equipment not financed by grants or capital contributions	16,123	5,133	21,256
Amortization of 1985 operating costs	(2,385)		(2,385)
Recovery of debt service in excess of interest expense	(8,398)	(3,663)	(12,061)
Rate stabilization:			
Current year recovery	(73)	(1,264)	(1,337)
Current year usage	7,480		7,480
Interest income on borrowed funds and other	(15,970)	(1,919)	(17,889)
Balance, June 30, 1991	\$(43,171)	\$(15,934)	\$(59,105)

The balance in the rate stabilization reserve, which is included in the deferred credits, was approximately \$9,751,000 and \$15,894,000 at June 30, 1991 and 1990, respectively.

D. Operating Reserves and Restricted Assets:

Certain accounts and funds are required to be maintained and are pledged as collateral under the Authority's general and supplemental bond resolutions. These accounts and funds must be expended in accordance with the provisions of the resolutions. Funds established and available for working capital (current assets) and other purposes (restricted assets) were as follows (in thousands):

Fund Description	Sewer	Water	1991	1990
			Total	Total
Current assets:				
Operating	\$ 21,581	\$ 10,731	\$ 32,312	\$ 22,104
Operating reserve	14,159	7,401	21,560	22,064
General	18	6	24	36
	<u>\$ 35,758</u>	<u>\$ 18,138</u>	<u>\$ 53,896</u>	<u>\$ 44,204</u>
Restricted assets:				
Construction	72,375	22,419	94,794	260,360
Project	59,648		59,648	99,476
Debt service reserve	62,164	8,880	71,044	69,227
Debt service	21,514	3,073	24,587	33,156
Revenue	12,714	8,016	20,730	33,371
Combined restricted reserves	30,899	13,556	44,455	37,014
Community obligation and revenue enhancement	6,019	860	6,879	3,302
Rebate	314	49	363	2,218
Other	309	7	316	325
	<u>\$265,956</u>	<u>\$56,860</u>	<u>\$322,816</u>	<u>\$538,449</u>

At June 30, 1991, the combined restricted reserves include \$27,334,000 renewal and replacement, \$7,728,000 insurance, and \$9,393,000 rate stabilization reserves.

The Authority is authorized by its Enabling Act to invest in obligations of the U.S. Treasury, its agencies and instrumentalities, in bonds or notes of public agencies or municipalities, in bank time deposits, and in repurchase agreements. These investments are recorded at amortized cost, which approximates market, and earn interest and dividends at prevailing rates.

The funds consist of the following cash and short-term investments (in thousands):

	Carrying Value	
	Current	Restricted
Money market accounts	\$51,472	\$223,989
Deposits	24	304
Certificates of deposit	2,400	
U.S. Government securities		30,000
Guaranteed income contracts		68,523
	<u>\$53,896</u>	<u>\$322,816</u>

Deposits are covered by Federal Depository Insurance Corporation (FDIC) for approximately \$300,000.

U.S. Government securities are guaranteed by the U.S. Government. Except for the operating and deposit accounts in current assets, all cash and short-term investments are held on behalf of the Authority by the Authority's trustee.

Reserves funded through operations related to the establishment of the above accounts and funds were as follows (in thousands):

Reserve	Sewer	Water	1991	1990
			Total	Total
Renewal and replacement	\$12,334	\$ 9,000	\$21,334	\$15,667
Insurance reserve	3,864	3,864	7,728	6,363
Operating reserve	14,621	7,847	22,468	22,508
Community obligation and revenue enhancement reserve	6,021	860	6,881	—
	<u>\$36,840</u>	<u>\$21,571</u>	<u>\$58,411</u>	<u>\$44,538</u>

The above amounts do not include \$6,000,000 of reserves received through grant receipts transferred from the Commonwealth.

E. Notes Payable and Long-Term Debt:

Long-term debt at June 30, 1991 consisted of the following (in thousands):

General Revenue Bonds, 1990 Series A, 6 1/5% to 7 5/8%, due 1992 to 2020	\$834,609
Principal reimbursable to the Commonwealth	79,656
	<u>914,265</u>
Less unamortized issuance and discount costs	(44,197)
Less current portion payable from restricted assets	(17,479)
Long-term debt, net	<u>\$852,589</u>

The general and supplemental bond resolutions contain various requirements relating to the Authority and also require certain funds and accounts to be established and maintained (Notes C and D), the expenditures of which are restricted to various operating, debt service, capital expenditure, and repair and replacement purposes. The Authority is required to establish water and sewer rates and charges at a level sufficient to provide, among other things, primary and supplemental debt service coverage ratios of 120% and 10%, respectively. For the year ended June 30, 1991, the Authority had primary and supplemental debt service coverage ratios of 135% and 10%, respectively.

As of July 1, 1985, the Authority assumed responsibility to repay the Commonwealth for all principal and interest payments related to \$141,703,000 of debt issued by the Commonwealth in connection with the MDC sewer and waterworks prior to July 1, 1985. The Commonwealth's debt consists of approximately 140 different debt instruments with varying interest rates and maturity dates, and the Authority's share of principal payable amounted to approximately \$79,656,000 and \$87,119,000 at June 30, 1991 and 1990, respectively. As further discussed in Note L, legislation, forgiving the foregoing obligation in exchange for the payment of \$120,000,000 to the Commonwealth for other common obligations, was enacted on July 10, 1991, and is being contested through litigation by the Authority's Advisory Board, certain member communities, and certain individuals, as ratepayers and members of the Advisory Board Executive Committee.

On February 15, 1990, the Authority sold general revenue bonds in the aggregate principal amount of \$836,312,000. The bonds mature in varying amounts as follows: serial bonds from 1991 to 2005 (\$225,405,000); capital appreciation bonds in 2006 (\$7,932,000); and term bonds in various maturities from 2009 to 2020 (\$602,975,000). Commencing in April 2000, the Authority may redeem any bonds due thereafter (except the capital appreciation bonds) at redemption prices ranging from 100% to 102% of the principal amount. Interest is payable semiannually on April 1 and October 1, except on capital appreciation bonds on which interest is payable upon maturity. The bonds are collateralized by a lien and pledge on substantially all of the Authority's cash and revenues, except the operating fund. The discount on and the cost of issuing the bonds, aggregating \$47,313,000, are being amortized over the life of the bonds.

The amounts of long-term debt payable in the fiscal years ended June 30, 1992, 1993, 1994, 1995 and 1996 are approximately \$17,480,000, \$18,068,000, \$18,336,000, \$18,819,000, and \$19,279,000, respectively.

The Authority has entered into interest rate swap agreements to reduce the impact of changes in interest rates on its long-term debt. One interest rate swap entered into matures in October 2000, for which the notional amount is \$90,000,000. The Authority has also entered into a future interest rate swap, effective in 1994 and maturing in August 2000, for which the notional amount is \$78,000,000. Under both of the aforementioned interest rate swaps, the Authority pays variable interest rates, based on Kinney Information Services Index, and receives interest at a fixed rate of 7.56%. The differential to be paid or received is recognized currently as interest rates change and the cost of the agreements is recognized over the life of the agreements. On February 1, 1991, the Authority amended the existing interest rate swap and will pay interest at a fixed rate of 5.86% through July 31, 1993.

F. Capitalized Interest:

During fiscal 1991 and 1990, none of the Authority's interest expense was capitalized, in accordance with its current policy of recovering such costs through rates as incurred.

G. Property, Plant and Equipment:

Property, plant and equipment consisted of the following at June 30, 1991 (in thousands):

Land	\$ 167
Plant and equipment, water and sewerage system	2,605,380
Motor vehicles and equipment	7,929
Furniture and fixtures	28,716
Leasehold improvements	1,963
	<u>2,644,155</u>
Less accumulated depreciation	(313,236)
Net property, plant and equipment	<u>\$2,330,919</u>

H. Leases

The Authority leases office space in Boston and other property under long-term operating leases. Future minimum rental payments required under operating leases having initial or remaining noncancelable lease terms in excess of one year are as follows (in thousands):

Year Ending June 30

1992	\$ 10,035
1993	9,916
1994	10,192
1995	10,206
1996	10,181
Thereafter	118,509
	<u>\$169,039</u>

Rental expense was approximately \$9,843,000 and \$3,926,000 in fiscal years 1991 and 1990, respectively.

The Authority has the option to extend the lease agreements on the Boston offices for a subsequent five-year period at costs ranging from the current market rent at the extension date to an 18% increase.

In fiscal year 1991, the Authority entered into a 25-year agreement to lease facilities and a submarine transmission cable to provide electrical power to the Authority's Deer Island location. The future minimum rental payments under this operating lease, included in the above amounts, aggregate \$117,860,000.

I. Payments in Lieu of Taxes:

The Enabling Act authorizes and directs the Authority to pay to the MDC Division of Watershed Management an amount for payment to each city or town in which land of the Quabbin watershed and Ware River watershed is located. Each such payment is equal to the amount which the respective city or town would receive in property taxes, based upon the fair value of such land if such land were not tax-exempt.

J. Retirement Benefits:

All MDC personnel who became employees of the Authority on July 1, 1985, and were members of the State Employees Retirement System, retained their membership in that system. The Authority is not liable for retirement allowances paid to or on account of these employees. Funding of the pension liability of the State Employees Retirement System is the obligation of the Commonwealth and is on a "pay as you go" method. Employees covered by this plan become 100% vested after 10 years of service. The Authority's covered payroll for members of this plan for the year ended June 30, 1991 was \$22,824,000. Total payroll for all Authority employees was \$59,736,000 for the year ended June 30, 1991.

The Enabling Act provided for the establishment of the "Massachusetts Water Resources Authority Employees' Retirement System" (the "Plan"), a contributory retirement system that is separate from the State Employees Retirement System. The Plan is a defined benefit pension plan covering those employees not employed by the MDC prior to July 1, 1985. Total contributions to the Plan were \$3,320,000 and \$3,171,000 for the years ended June 30, 1991 and 1990, respectively. All of the contributions were made by employees covered by the Plan which are based upon a percentage of employee base pay (5% for employees hired before December 31, 1974, 7% for employees hired between January 1, 1975 and December 31, 1983, and 8% for employees hired after December 31, 1983). Additionally, certain employees earning in excess of \$30,000 contribute an extra 2% of their salary effective January 1, 1989. The Authority is required to contribute only if participant contributions are inadequate to fund the annual pension expense actuarially determined. Since the Plan is deemed by management to be adequately funded at June 30, 1991, the Authority's contribution of \$908,000 in fiscal 1990 is reflected as a prepayment. Employees receive full payment of contributions upon withdrawal from the Plan and 50% of interest earned for employees with 5 to 9 years of service or 100% of interest earned if 10 or more years of service (employees with less than 5 years of service do not receive earned interest).

The actuarial cost method utilized to determine contributions to the Plan for the year ended December 31, 1988 is the Individual Entry Age Normal Actuarial Cost Method.

The significant actuarial assumptions underlying the actuarial computations for the plan year ended December 31, 1988 are as follows:

Assumed rate of return on investments	8% per annum compounded annually																
Nondisabled life mortality basis	1984 Unisex Pension Mortality Table with ages set back three years																
Employee turnover basis	Based on experience of employees of the Commonwealth																
Salary escalation	6% per annum																
Cost of living increase	None																
Retirement	Rates vary by age as follows:																
	<table border="1"> <thead> <tr> <th>Age</th> <th>Rate</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>N/A</td> </tr> <tr> <td>55</td> <td>0.10</td> </tr> <tr> <td>60</td> <td>0.05</td> </tr> <tr> <td>62</td> <td>0.25</td> </tr> <tr> <td>65</td> <td>0.10</td> </tr> <tr> <td>66</td> <td>0.10</td> </tr> <tr> <td>67</td> <td>1.00</td> </tr> </tbody> </table>	Age	Rate	50	N/A	55	0.10	60	0.05	62	0.25	65	0.10	66	0.10	67	1.00
Age	Rate																
50	N/A																
55	0.10																
60	0.05																
62	0.25																
65	0.10																
66	0.10																
67	1.00																

At January 1, 1989, the date of the most recent available actuary valuation, the pension benefit obligation was fully funded, determined as follows:

Pension benefit obligation:

Retirees and beneficiaries currently receiving benefits and terminated employees entitled to benefits but not yet receiving them	\$ 6,000
Current employees:	
Employee-financed	3,211,000
Employer-financed vested	—
Employer-financed nonvested	—
Total pension benefit obligation	3,217,000
Net assets available for benefits	3,451,000
Unfunded pension benefit obligation	—

The amount shown as "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee services to date. The measure is the actuarial present value of credited projected benefits and is intended to help assess the Plan's funding status on a going-concern basis, assess progress made in accumulating sufficient assets to pay benefits when due, and make comparisons among other public employees retirement systems plans. The measure is independent of the actuarial funding method used to determine contributions to the Plan.

The Plan's funding policy provides for periodic employer contributions at actuarially determined rates that, expressed as percentages of annual covered payroll, are sufficient to accumulate sufficient assets to pay benefits when due and fund operating costs of the Plan. Employer contributions are determined using the Entry Age Normal Actuarial Cost method. The Plan also amortizes the unfunded liability over a period of 40 years assuming a 4 1/2% increase in payments by each employee. The actuarially determined employer contribution was \$0 at January 1, 1989, the last date of such determination.

The Authority's covered payroll for members of the Plan for the year ended June 30, 1991 was \$36,912,000. 10-year historical information for the Plan is not currently available.

The Authority's policy is to provide certain health care and life insurance benefits for retired employees. Substantially all of the Authority's employees may become eligible for those benefits if they reach normal retirement age while working for the Authority. Those and similar benefits for active employees are provided through an insurance company whose premiums are based on the benefits paid during the year. Premiums for retired employees were immaterial in fiscal 1991.

K. Commitments and Contingencies:

A major capital improvement program is currently in progress. As part of this program, the Authority has entered into a number of contracts for the design and construction of facilities. Commitments under these contracts aggregated approximately \$895,038,000 at June 30, 1991.

Due to various state and federal lawsuits, the Authority is required, by a decision of a federal district court, to comply with a detailed schedule of actions to achieve and maintain compliance with the requirements of the Clean Water Act. The schedule establishes, among other things, a time table of target dates for the completion of certain steps, including the construction of new primary treatment facilities commencing December 1990 and finishing by July 1995, and the construction of secondary treatment facilities during 1995 to be completed during 1999. Other matters are still outstanding. Management believes that the Authority is in substantial compliance with the schedule requirements.

On February 27, 1987, the Authority accepted responsibility and legal liability for undertaking measures to control discharges from combined sewer overflows ("CSOs") into Boston Harbor and adjacent waters. The Authority did not accept any liability for any failure by anyone to undertake any such measures prior to that date. On August 20, 1987, the federal district court entered an order for the First Combined Sewer Overflow Schedule, which provides in some detail for implementation of short-term controls for CSO discharges and planning for long-term controls. To date, the Authority is in substantial compliance with this schedule. In fiscal 1991, the Authority's recommended plan for the long-term control options, aggregating \$1.2 billion, was approved by the federal district court and regulatory agencies.

The Authority's operating and construction plans are designed to comply with the federal district court's schedule of actions. The Authority anticipates capital expenditures of approximately \$6 billion from fiscal 1990 to 1999, including those projects required to comply with the federal district court's schedule. These capital expenditures have been forecasted based upon certain preliminary assumptions and estimates, which may change significantly as design and construction of the necessary facilities proceed. Funding is expected to come from various federal and state grants, as available and approved, and from the Authority's debt proceeds. As of September 1, 1991, the federal government has authorized \$100 million in grants to the Authority for the cleanup of Boston Harbor of which \$80 million has been appropriated as of that date. From 1988 to 1991, the Commonwealth was authorized to receive approximately \$83 million annually of federal funds for loans and currently will receive \$92 million, \$38 million, and \$19 million for 1992, 1993 and 1994, respectively, from which the Authority and other entities may request funding for eligible projects. In fiscal year 1991, Congress did not authorize the full amount, and as a result, the Commonwealth had \$64 million available for that year.

As a result of a finding of liability for a Clean Water Act violation by the MDC's sewerage operations, a substantial part of the Authority's construction programs have become or may become subject to court supervision. In addition, the court has reserved the right to order further remedial action and assess penalties. The Authority cannot predict whether penalties will be requested by litigants or assessed by the courts in the future. No penalties have been assessed to date.

The Authority is also a defendant, or may be derivatively a defendant, in several legal actions arising out of the operations of the water and sewer systems. It is the opinion of management that no material adverse assessments will result from these actions.

L. Subsequent Event:

On July 10, 1991, legislation, relating to the Fiscal 1992 Budget of the Commonwealth, was enacted, and provided, among other things, that the Authority shall pay the Commonwealth, on or before September 30, 1991, an amount of \$120,000,000 in consideration for costs borne by the Commonwealth on behalf of the Authority and its predecessor agency, the MDC, including, but not limited to, the payment of interest and principal on debt issued and charged to the MDC (see Note E). The legislation also establishes a fee to be determined annually, and not to exceed \$.00015 per gallon, that will be billed to and paid by the Authority on a monthly basis for water delivered from the watershed lands to the Authority. This per-gallon fee may exceed \$16,000,000 annually.

Prior legislation, enacted during fiscal 1991, required the Authority to pay \$1,300,000 to the Commonwealth as savings that would have occurred had the Authority's employees been furloughed under the furlough program adopted for the Commonwealth's employees.

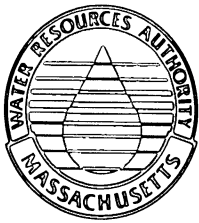
On August 22, 1991, litigation was initiated by the Authority's Advisory Board (an oversight organization representing the Authority's member communities, and established under the Authority's Enabling Act), certain member communities and certain individuals, as ratepayers and members of the Advisory Board Executive Committee, against the Commonwealth, certain individuals as officers of the Commonwealth or officials of the MDC, and the Authority. This action requests a declaratory judgement and injunctive relief from, among other things, the aforementioned payments.

Presently, the Authority cannot predict the final disposition of this litigation, however, it is the opinion of management that it will not have a material impact on the financial condition of the Authority.

SUPPLEMENTAL SCHEDULE OF FUNDS AND ACCOUNTS ESTABLISHED BY THE GENERAL REVENUE BOND RESOLUTION

For the year ended June 30, 1991 and for the period from February 15, 1990 through June 30, 1990

	Construction	Revenue	Debt Service	Combined Reserves	Total
Balance at February 15, 1990	\$115,144	\$15,927	\$29,303	\$36,467	\$196,841
Proceeds from sale of revenue bonds	260,920		528,079		788,999
Cash received from customers		96,241			96,241
Interest income	10,422	962	9,467	733	21,584
Grant receipts	47,793				47,793
Other receipts	2,440		4,908		7,348
Construction payments	(78,348)				(78,348)
Debt service payments:					
Commonwealth obligations			(22,316)		(22,316)
Other			(474,825)		(474,825)
Other Commonwealth payments		(123)			(123)
Cost of issuance payments	(2,280)				(2,280)
Arbitrage spend-down penalty			(2,542)		(2,542)
Other payments		(1,712)			(1,712)
Interfund transfers	3,756	(39,399)	35,829	(186)	—
Transfers to operating account		(38,211)			(38,211)
Balance at June 30, 1990	359,847	33,685	107,903	37,014	538,449
Cash received from customers		188,952			188,952
Interest income	21,859	3,625	7,830	2,740	36,054
Grant receipts	56,707				56,707
Construction payments	(276,909)				(276,909)
Debt service payments:					
Commonwealth obligations			(11,919)		(11,919)
Other			(73,726)		(73,726)
Other Commonwealth payments		(7,338)			(7,338)
Cost of issuance payments	(88)				(88)
Arbitrage spend-down penalties			(3,098)		(3,098)
Interfund transfers	(6,962)	(73,622)	75,883	4,701	—
Transfers to operating account		(124,268)			(124,268)
Balance at June 30, 1991	<u>\$154,454</u>	<u>\$21,034</u>	<u>\$102,873</u>	<u>\$44,455</u>	<u>\$322,816</u>



MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Telephone: (617) 242-6000
Facsimile: (617) 241-6070

Dear Friend:

I am pleased to provide you with the Massachusetts Water Resources Authority's 1991 Annual Report.

1991 was an exciting year for the MWRA. It marked the historic end of sludge dumping in Boston Harbor. Sludge is now being processed into useful agricultural fertilizer pellets. The number of Boston Harbor beach closings was substantially reduced because of combined sewer overflow treatment facility upgrades and sewer pipe repairs. And for the second year in a row, average water use in 1991 stayed well below the "safe yield" of 300 million gallons per day.

As you review this report, you will notice immediately the strength behind the MWRA's operation: its employees. The MWRA is committed to providing 61 communities—over 2.5 million people—with the most reliable, cost effective water and sewer services possible. And that commitment begins with individuals who perform their jobs exceptionally well everyday. The tangible progress that the MWRA has enjoyed over the last six years has a lot to do with a team of over 1700 employees who still focus on integrity, ability and quality.

As I depart from the MWRA, I am proud of the opportunity that I have had to serve with so many able and committed workers. 1991 was a banner year. In the years to come, I know that the MWRA will continue to uphold a tradition of excellence and quality.

Sincerely,

Paul F. Levy
Executive Director

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