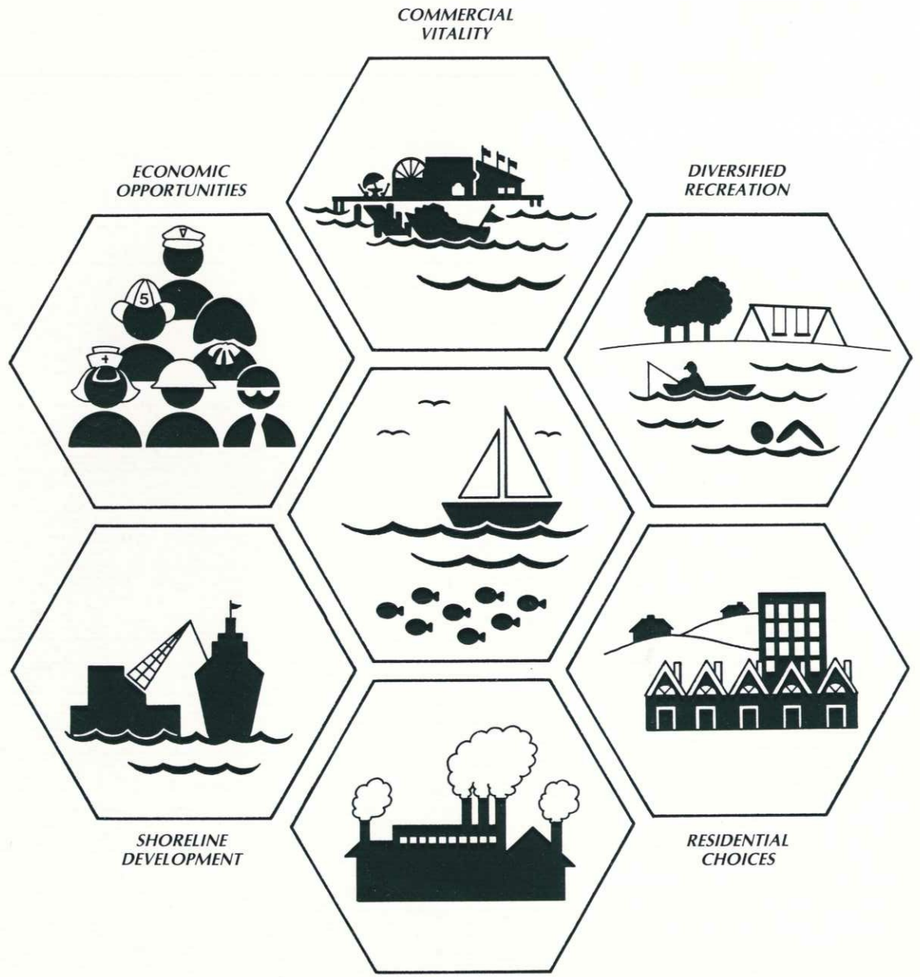
CLEAN WATER ...
CATALYST FOR A DYNAMIC COMMUNITY



1986 ANNUAL REPORT
NORTHEAST OHIO REGIONAL SEWER DISTRICT

About The Northeast Ohio Regional Sewer District

The Northeast Ohio Regional Sewer District (the District) is an independent political subdivision of the State of Ohio. Originally named the Cleveland Regional Sewer District, it was created in 1972 for the purpose of assuming the operation and management of certain wastewater collection, treatment and disposal facilities serving the Cleveland Metropolitan area. Prior to 1972, these facilities were owned by the City of Cleveland.

The District provides wastewater treatment and interceptor sewer facilities to the City of Cleveland and 41 surrounding communities. This service area encompasses 178 square miles and has a population in excess of one million.

The system operated by the District includes three major wastewater treatment plants (Southerly, Westerly and Easterly), two smaller community plants (Berea and Strongsville "A") that will be abandoned when interceptor sewers now being constructed are completed, a network of interceptor sewers (large regional sewers that convey wastewater directly to one of the District's plants), and certain other water pollution control facilities located throughout the service area.

Lois M. Epstein, Editor
1986 Annual Report
Northeast Ohio Regional Sewer District

1986 BOARD OF TRUSTEES

Edward J. Rawlins
Vice President

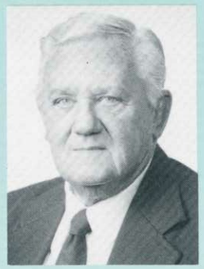
Mr. Rawlins was appointed to the Board by the Cuyahoga County Commissioners in March 1983. He retired in 1983 after 32 years with the City of Cleveland Fire Department.

John Petruska
President

Mayor John Petruska was first appointed to the Board by the Suburban Council of Governments in March 1975. He is mayor of the City of Parma.

Anthony C. Amato
Secretary

First appointed to the Board by the mayor of Cleveland in 1980, Mr. Amato is risk manager of the City of Cleveland and has served in that capacity since 1981.



Lester C. Ehrhardt

Appointed to the Board by the Suburban Council of Governments in February 1984, Mr. Ehrhardt served as mayor of the City of Lyndhurst from 1964 until 1980.

William J. Reidy

Mr. Reidy was appointed to the Board by the mayor of Cleveland in January 1983. He is a general practice partner in the Cleveland office of the certified public accounting firm of Coopers & Lybrand.

Edward H. Richard

Mr. Richard was appointed to the Board in March 1984 by the mayor of Cleveland. He is chief administrative officer of the City of Cleveland.

Ronald D. Sulik

Mayor Sulik was appointed to the Board by the Suburban Council of Governments in January 1985. He is mayor of the Village of Newburgh Heights.

Mayor John Petruska
President

PRESIDENT'S MESSAGE

Among its responsibilities, the Board of Trustees of the Northeast Ohio Regional Sewer District makes policy decisions. We also review and approve or disapprove proposed projects, construction contracts, emergency repairs, and major purchases. These are the types of decisions we are called upon to make during our twice monthly meetings. But among the routine agenda items are some that stand out. As president of the District's Board of Trustees, I would like to use this opportunity to highlight a few of them.

During 1986, the Board was gratified to accept $17.7 million in federal grants for continuing construction of the Heights/Hilltop and Southwest Interceptors. Our pleasure was tempered, however, by the failure of the Clean Water Act to be reauthorized. Our local legislators in Washington, together with area mayors, state representatives, business leaders and District staff all put forth a concerted effort to make our needs known.

Sometimes we make our decisions with reluctance, as was the case when we approved an increase in the sewer rates, effective October 1, 1986. The increase of 70 cents per mcf (1,000 cubic feet) of water used, restored one-half of a reduction of $1.40 per mcf which had become effective in January of 1983. The rate increase was needed to provide sufficient funds to enable the District to meet its projected 1987 operating and maintenance costs.

An additional and new role was undertaken by the District during 1986. As a condition of the federal grants we are receiving for construction of the Southwest and Heights/Hilltop Interceptors, EPA required us to develop, implement and enforce community discharge permits for sanitary sewers.

Community officials were dismayed to learn that they would be required to raise considerable funds to repair and, in some cases, replace their deteriorating sanitary sewers. However, by the end of the year, nearly all the communities had submitted their compliance plans to us.

During the year we welcomed two new members into the District — the Cities of Berea and Brook Park. Wastewater from these communities will be treated by our Southerly Wastewater Treatment Plant when the Southwest Interceptor is completed.

DIRECTOR'S MESSAGE

Inner Harbor: the first phase of a multi-faceted $250 million Cleveland waterfront development project . . . Nautica: a $65 million privately-financed development planned to transform the west side of the lower Cuyahoga River into a year-round entertainment/office/retail marketplace . . . new office buildings and shopping malls . . . huge increases in boat registrations and fishing licenses . . . crowded beaches . . . new condominium complexes . . . trendy restaurants . .

Wishful thinking? Not at all. These developments, occurring right now, signify a kind of metamorphosis of our economy — one that is changing from its dependence on the so-called smokestack industries to a mix with emerging new forms of economic development.

To those of us at the Northeast Ohio Regional Sewer District, these exciting changes are the proof that our work of the past 14 years has been successful.

With 75 percent grant assistance from U.S. EPA, we have invested $689 million to upgrade the water pollution control facilities serving the City of Cleveland and 41 surrounding communities. We have worked with local industries to ensure that they install pretreatment facilities so that dangerous chemicals are not discharged into our sewers and treatment plants.

With the cooperative efforts of communities, individuals, industries, and the state and federal government, we have seen the transformation of the Cuyahoga River from a waterway that in 1972 was declared "dead," to one that is literally teeming with fish. We have seen "unsafe to swim" signs, posted at empty Lake Erie beaches, replaced by crowds of swimmers and sunbathers at the Cleveland Lakefront State Park.

But despite the vast improvement in water quality, there is still substantial work to be completed to maintain and protect the integrity of our waterways.

Due to inadequate sanitary sewer capacity in wet weather, overflows of wastewater from the eastern and southwestern suburbs continue to pollute area streams leading to Lake Erie. We need to complete our interceptors and intercommunity relief sewer program, along with local sewer rehabiliation, to bring this problem under control. The cost — $422 million, for the District. Another $37 million of local monies must also be spent by our communities in this effort.

Another serious problem, yet to be addressed, is the control of discharges from combined sewers — those that carry both wastewater and stormwater. There are 428 combined sewer overflow points in the District's service area. Control of these overflows, we estimate, will cost in the general range of $350 million.

The challenge is great, especially in view of the proposed decrease in federal funds. Our state legislators are now considering ways to help pay for infrastructure projects. We certainly endorse such a program. It would aid both communities and water pollution control agencies.

I believe that our public officials and residents now realize that our abundant fresh water supply constitutes the basis of our hopes for the future, and is, and will continue to be, the catalyst for a dynamic community.

Erwin J. Odeal
Director

USES OF LAKE ERIE WATER

Agriculture - 41 million gallons per day

Power - 9.6 billion gallons per day

Manufacturing - 5.7 billion gallons per day

Domestic - 1.4 billion gallons per day

Mining - 198 million gallons per day

Commercial - 17.6 billion gallons per day

THE TOTAL PICTURE

There is an old Indian legend about a group of blind men and an elephant. When asked to describe the animal, each "saw" it in a different way. One blind man feeling the knee said, "the elephant looks like a tree." Another, upon grasping the swinging tail said, "the elephant is not like a tree at all, it is like a rope." Yet another blind man, losing his balance and falling against the elephant's broad and sturdy side, said that the animal was like a wall.

None of the blind men was able to "see" the whole elephant. Though each of them was partly correct, all of them were wrong.

As the blind men were unable to comprehend the whole elephant, so too it is difficult for the Northeast Ohio Regional Sewer District to be seen as a total entity.

To many of the District's customers, their only contact comes in the form of a quarterly bill.

To residents who live near an interceptor construction site, the District is the organization that builds large sewers and is responsible for the noise, traffic, dust and dirt that always accompanies such a project.

To environmentalists, the District is an agency whose wastewater treatment plants discharge into the area's waterways.

To the mayors and city council members of communities that will be served by the Southwest and Heights/Hilltop Interceptors, the District is the enforcer of the community discharge permit program.

To those who work in or drive through the MidTown Corridor, the District is represented by an attractive and newly-renovated building on Euclid Avenue.

And to people driving along Interstate 77 as it traverses Cuyahoga Heights, the District is represented by a massive complex of buildings — the Southerly Wastewater Treatment Plant — that can be seen from the highway.

Though each of these examples is a small part of the Northeast Ohio Regional Sewer District, none of them represents the whole — or even the most important part of the organization. That part, the nucleus, is composed of the District's 665 employees whose particular skills all contribute to furthering a common goal — the protection of this area's most precious natural resource — its water.

The annual report that follows attempts to provide a more comprehensive picture of the District's responsibilities, accomplishments and problems, with a focus on 1986.

CAPITAL CONSTRUCTION PROJECTS

Heights/Hilltop Interceptor Proceeds On Schedule

In 1860, the City of Cleveland began to build its sewer system. It constructed combined sewers to carry stormwater and wastewater in the same pipe. By 1920, 85 percent of Cleveland's combined sewer system was completed. The remainder was constructed between 1920 and 1960.

Around 1915, some of the eastern suburbs began to build sewers that would carry stormwater and wastewater in separate pipes. However, in order to reach the Easterly Wastewater Treatment Plant, the wastewater from the suburbs still had to enter Cleveland's combined sewers.

This situation presented no problem for many years. But as the population of the eastern suburbs increased, the amount of wastewater became larger than the capacity of the sewers. Incidences of wastewater overflows into creeks and streams, as well as basement flooding, became common, particularly during periods of wet weather.

In the 1960s and 1970s, a number of planning and engineering studies, reports and surveys recommended the construction of an "express" sanitary interceptor sewer.

This large sewer would "intercept" wastewater from 19 eastern suburbs and convey it directly to the Easterly Wastewater Treatment Plant. Not only would the interceptor greatly reduce the incidences of overflows in the suburbs and Cleveland, it would also permit the decommissioning of the home septic systems and a number of small and inadequate wastewater treatment plants in the suburbs.

While the studies all agreed on the basic solution to the problem, there was no money available for construction of such a massive project.

In order to be eligible for federal funds, a design had to be completed. In 1982, the District contracted with an engineering consulting firm to begin the design work for the project known as the Heights/Hilltop Interceptor. But it was not until 1984 that the U.S. EPA approved the project and made funds available to begin construction of the $187 million interceptor.

Construction began in the spring of 1985. The Heights/Hilltop Interceptor, scheduled for completion by May 31, 2000, will serve approximately 252,000 residents.

For design, construction and funding purposes, the 28-mile long interceptor is divided into two major sections — the Heights branch and the Hilltop branch.

However, there is now some doubt as to whether there will be federal funding for the Hilltop section. On July 25, 1986, U.S. EPA announced that it would prepare an Environmental Impact Statement (EIS) for that section. According to EPA, at question is whether potential environmental effects may occur as a result of the project.

In September, the District organized the Hilltop Area Public Advisory Committee (HAPAC) to permit residents and others concerned with the Hilltop area to become informed regarding the EIS issue.

The 35-member committee, composed of public officials, private citizens, and representatives of public interest groups and economic interests, met monthly for the remainder of 1986.

The committee will disband after it has commented on the draft and final EIS. The draft is expected to be published in the summer of 1987.

In October of 1986, the U.S. EPA announced that the District would receive a grant of $8,992,200 to help fund construction of the third contract. Contract 2A, consists of the installation of a 102-inch diameter sewer pipe in a 0.7-mile tunnel, and is scheduled for completion in October 1989.

ECONOMIC OPPORTUNITIES

- *A growing proportion of labor force is employed in sophisticated professional services including law, accounting, medical care, communications and computer science.*
- *Downtown area jobs are predicted to increase from 116,000 to 125,000 by the year 2005.*
- *Greater Cleveland area is the 12th largest consumer market, 8th largest industrial market, and 12th largest retail market in the U.S.*
- *With 334 of 452 Standard Industrial Classifications represented, the Greater Cleveland area has the capability to weather economic downturns.*

Three Sections of Southwest Interceptor Under Construction

In 1926, the City of Cleveland began constructing the Big Creek Interceptor. Construction conditions were very difficult and the workers endured great hardships.

Finally completed in 1939, the Big Creek Interceptor transported wastewater from the southwest suburbs and part of Cleveland directly to the Southerly Wastewater Treatment Plant.

For many years, the interceptor served the area well. But in the 1960s, as the population of the area increased, residents began seeing overflows of untreated wastewater and flooding, especially during heavy rainstorms.

It became increasingly evident to the planners and engineers that the interceptor was no longer adequate to handle all the wastewater flow that was entering it.

Planning studies recommended that a new and larger interceptor should be built to augment the Big Creek Interceptor. But not until many years later did it appear that the project would become a reality.

In 1983, the U.S. Environmental Protection Agency prepared an Environmental Impact Statement. The EIS evaluated the problems and concurred with the studies that a new interceptor should be built.

In 1985, with the promise that 75 percent of the cost would be assumed by the federal government, the Northeast Ohio Regional Sewer District, successor to the Cleveland Regional Sewer District, began construction of the $142 million Southwest Interceptor.

When completed, by June 30, 1994, this facility will be capable of serving approximately 284,000 residents of 15 southwest suburbs and part of the City of Cleveland.

The Main Leg of the Southwest Interceptor will transport much of the wastewater now being carried by the Big Creek Interceptor. The West Leg of the interceptor will permit the decommissioning of four wastewater treatment plants that would not be cost-effective to upgrade to strict EPA standards.

By May of 1986, construction of three contracts of the interceptor was underway. In October, the District was notified that U.S. EPA would provide a grant of $8,710,800 for Contract 4 of the 19-mile long project.

This contract consists of the installation of a 108-inch diameter sewer line. It will be constructed in a tunnel running 1.6 miles along the Interstate 480 right-of-way, between Pearl Road in Cleveland and Summer Lane in Brooklyn. Bids will be opened in March 1987 with completion scheduled for November 1989.

A section of steel truss bridge is lifted by a crane for placement on the concrete piers that will support it. This structure carries the Southwest Interceptor sewer 1,150 feet across the Cuyahoga River and the Cuyahoga River Valley.

Final Connections Made to Cuyahoga Valley Interceptor

The District constructed the Cuyahoga Valley Interceptor (CVI) so that the septic tanks and small wastewater treatment facilities serving Cleveland's southern suburbs and a portion of Summit County could be eliminated.

Wastewater from these areas is now diverted to the interceptor and flows, by gravity, to the Southerly Wastewater Treatment Plant.

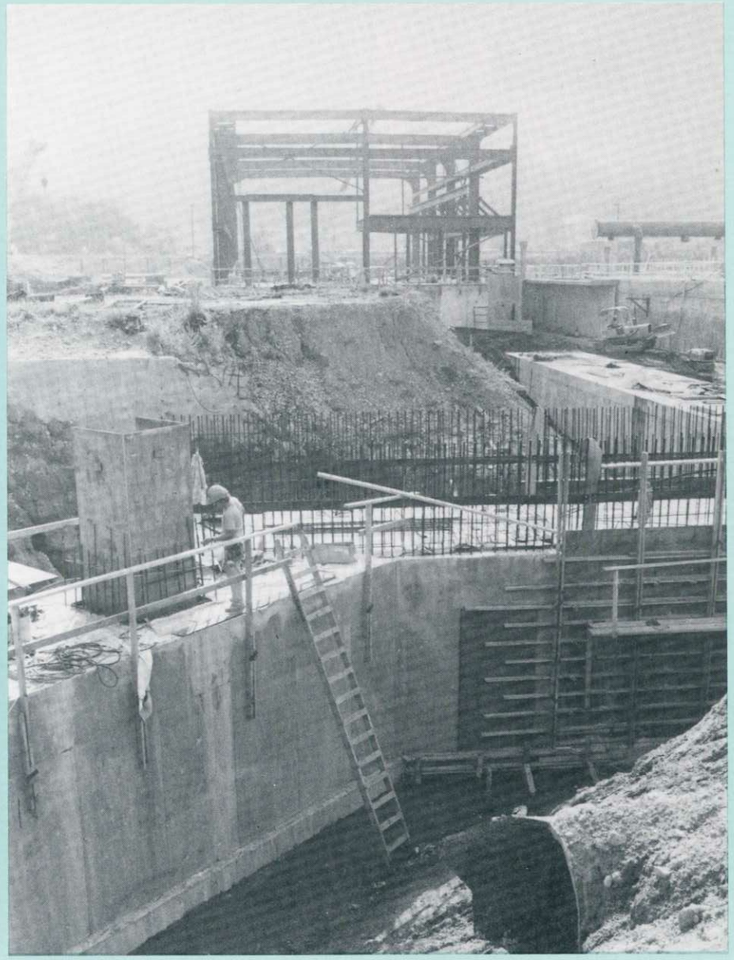
This interceptor consists of a six-mile long main line and 16 miles of trunk lines.

Construction of the $71 million project was essentially completed in 1984. However, a number of communities did not tie into the interceptor until 1985.

In 1986, the following projects brought the District's work to a close: Decommissioning of the Strathmore Subdivision Wastewater Treatment Plant which had served 153 homes in Valley View; completion of a one-mile long segment (Contract E-2), located in Brecksville, which had been delayed due to construction problems; and 879 individual connections to the system.

With the decommissioning of 12 wastewater treatment plants and their diversion to the CVI, the District gained 6,946 new customers. An additional 1,696 customers came into the District when their communities required them to abandon their septic tanks and connect either to the interceptor or to their local sewers.

Other residents will tie-in to the CVI during 1987 and 1988 as a result of the availability and capacity of this interceptor.



In June of 1986, construction was progressing on the compressor building at Southerly, part of Contract 16-1A.

Contractor's Default Delays Southerly Construction

Reconstruction of the Southerly Wastewater Treatment Plant began in 1975, and is now nearing completion.

During 1986, Contract 16-1A moved back on track following the contractor's default. This contract consists of the renovation and expansion of the portion of the plant constructed before 1970. The work is being completed under an EPA construction grant to meet stringent federally-mandated wastewater treatment plant standards.

The $44 million construction project was originally scheduled to be completed by May 1986. However, the contractor defaulted in February 1986. Project responsibility was assumed by the bonding company which hired another contractor to complete the job. It is now anticipated that the work will be completed by the end of 1987.

INDUSTRIAL ADVANTAGES

- *Lake Erie provides a vast inexhaustible freshwater source.*
- *More than 11,000 skills are represented by 800,000-member labor force.*
- *Area provides ready access to intermodal transportation of goods utilizing interstate highway system, Cleveland Hopkins International Airport, rail services and the Cleveland Port, a gateway to the St. Lawrence Seaway and the Atlantic Ocean.*
- *Newly expanded and modernized wastewater treatment plants provide ample capacity to serve all present and future needs.*

Extensive Program Protects Investment

Today, following an enormous investment in water pollution control facilities by the Northeast Ohio Regional Sewer District and area industries, hundreds of thousands of people each summer safely swim at Cleveland area beaches. And sport fishermen attest to the increasing abundance of walleye and other desirable fish now thriving in Lake Erie.

At a cost of $495 million, 75 percent funded by the federal government, the District has totally rebuilt the Southerly and Westerly plants and considerably upgraded the Easterly plant.

But to protect and further improve the water quality of Lake Erie, the Cuyahoga River and other area waterways, these huge and complex wastewater treatment plants must be kept operating at peak performance. To accomplish this requires an extensive and ongoing program of maintenance, reconstruction, rehabilitation and repair.

RECONSTRUCTION, REHABILITATION AND REPAIR

In-House Design Group Completes Four Major Projects

During the year, the District's In-House Design Engineering Group produced four major projects.

At Southerly, an uninterruptable power supply system was designed for the computer that monitors the effluent filters. This project solved a serious problem of frequent surges and dips in the plant's power supply which caused losses of the computer's "memory."

At the Westerly Plant, computers monitor and control the operations of the entire facility. However, the main computer frequently malfunctioned because the room in which it was housed was too dry in winter and too humid in summer. With the design and installation of a humidity control unit, computer malfunctions were significantly reduced.

At Westerly, heaters were expected to keep grease in a liquid state for ease of pumping and removal. However, the immersion heaters installed in the grease collection system did not function efficiently and the heat was not being well dispersed.

The In-House Design Engineering Group, called upon to solve the problem, designed a new heating system utilizing two boilers to generate enough steam to keep the grease in a fluid state.

Installation of the boilers and the necessary piping will be completed during 1987 at a cost of $375,000. Approximately $10,000 was saved by doing the design work in-house.

A final project provided needed space in the central locker and storage building at Westerly. With the design and installation of a mezzanine in the storeroom, 1,000 square feet of storage was added to the building.

In an illustration of the varied uses of the Cuyahoga River, a sightseeing boat, the Goodtime II, and the Sam Laud, a self-unloader vessel carrying iron ore pellets, pass under the Main Avenue Bridge.

Easterly Grease Reactor Is Being Renovated

In April 1986, work began on the renovation and expansion of Easterly's grease reactor unit. This facility is a type of incinerator designed to burn grease and scum removed during the wastewater treatment process.

The $1.3 million District-funded project is due for completion during the summer of 1987.

Refurbishing of Easterly's Final Clarifiers Continues

A project that began late in 1985 involves the refurbishing of 16 final clarifier tanks that are 50 years old.

This $2.3 million District-funded project is expected to be completed during the first quarter of 1987. The work consists of replacing the sludge collecting mechanisms, regrouting the bottom of the tanks, and some minor repairs.

Easterly Outfall Pipes Require Major Repair

Major construction work at Easterly during 1986 was associated with repairs and renovation of existing equipment, some of which is nearly 50 years old.

Early in 1986, it was found that the two outfall pipes, through which wastewater is discharged to Lake Erie following treatment, had been displaced from the wooden trestle structure which supported them. (These nine-foot diameter pipes are 350 feet long.)

When the outfall was originally constructed in the 1930s, earth fill had been placed between and around the pipes. Over the years, the fill had washed away leaving the pipes exposed to the destructive action of the waves and currents.

In April 1986, an underwater contractor was hired to inspect the pipes and the completely submerged trestle structure. A diver found that not only had the pipes been displaced but also that a large hole had been worn in each pipe.

Air hoses and other equipment are checked before a diver enters the cold waters of Lake Erie to determine the extent of damage to Easterly's outfall pipes.

The repair project consisted of pouring concrete fill around the pipes to seal the holes, driving approximately 415 lineal feet of sheet piling alongside the pipes, and filling the areas between the sheet piling walls and the pipes with crushed stone. The crushed stone served to support, seal and reinforce the pipes in lieu of the deteriorating trestles.

A 590-foot shore protection wall was also constructed to protect the existing structures from waves which had been particularly violent due to the unusually high level of Lake Erie. Total cost of this project, which was not eligible for federal grants, was $528,929.

Construction began in September 1986 and was completed in four months.

DIVERSIFIED RECREATION

- *Nearly one million sports fishermen fish on Lake Erie for walleye, white bass, yellow perch, and channel catfish. Lake Erie is now known as the "walleye capital of the world."*
- *Lake Erie offers nearly 10,000 square miles for pleasure boating enthusiasts. There are over 70,000 Ohio-registered boats using Lake Erie.*
- *Facilities of 18,500-acre Metroparks System, which encircles the city, include hiking and biking trails, fishing, golf, bridle trails and stables, ice skating, cross-country skiing, tobogganning and snowmobiling.*
- *Cleveland Lakefront State Parks include Edgewater Park and Euclid Beach with excellent facilities for swimming, sunbathing and picnicing.*

OPERATIONS AND MAINTENANCE

Modifications Improve Southerly's Operations

Throughout 1986, Southerly, largest of the District's three major wastewater treatment plants, operated consistently without any major interruptions.

In fact, Southerly operated so smoothly, that for the first time since the plant was expanded, there were no violations of the effluent limits for BOD, phosphorus or suspended solids.

In another "first," all four incinerators and wasteheat boilers were available for use during 1986. The previous year, extensive repairs were completed to replace the linings of the exhaust gas ductwork of the incinerators.

With the new linings installed and the incinerators operable for 95 percent of the year, the plant was able to incinerate 97 percent of the total sludge cake produced by the vacuum filters.

The consistent operation of the wasteheat boilers created a dramatic savings in fuel costs. The boilers produced 59.2 percent of the total steam required for plant processes and heat, thus saving the District about $726,000.

During the year, some modifications were made to processes and equipment to improve both operations and maintenance procedures.

Several modifications were made to improve the operation of the influent gate for the Cuyahoga Valley Interceptor Lift Station, through which the interceptor flow enters Southerly.

The gate frequently malfunctioned due to excessive vibration, a build-up of silt, and failure of the directional control valves. These problems were complicated by the fact that there was no means for manually reopening the gate during system failures. During 1986, plant staff successfully resolved all of these problems.

Another improvement was the result of a cooperative effort between plant staff and the engineering department. Designs were completed for piping modifications to permit an additional set of high pressure sludge pumps to be connected to the thermal conditioning unit. The pumps, common to the existing five units, will allow plant personnel to perform maintenance without reducing the number of thermal conditioning units needed for sludge conditioning. These modifications will be completed early in 1987.

SOUTHERLY WASTEWATER TREATMENT PLANT
1986 Performance Data Summary
(in milligrams per liter)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Biochemical Oxygen Demand (BOD)	9	8	11	15	9	6	8	10	9	6	18	17
Suspended Solids	3	4	3	4	3	2	5	2	2	2	4	3
Phosphorus	.38	.26	.35	.22	.40	.46	.76	.55	.74	.76	.73	.61

National Pollution Discharge Elimination System (NPDES) Limitations:
BOD — 20 milligrams per liter; Suspended Solids — 12 milligrams per liter; Phosphorus — 1.0 milligrams per liter

Despite Many Projects Easterly Operates Efficiently

The past year was atypical at Easterly due to a combination of reconstruction, rehabilitation, modernization and repair work that continued throughout the year.

Because of the construction of the Heights/Hilltop Interceptor and its connection into the Easterly headworks (the location where wastewater first enters the plant) the amount of grit entering the plant increased by 25 percent, taxing the grit removal equipment for the first several months of the year.

A number of major pieces of equipment were not available for use at one time or another during the year.

One of the four pumps that brings wastewater from the Collinwood Interceptor into the plant was out of service for three months while its 200 horsepower motor was being rebuilt.

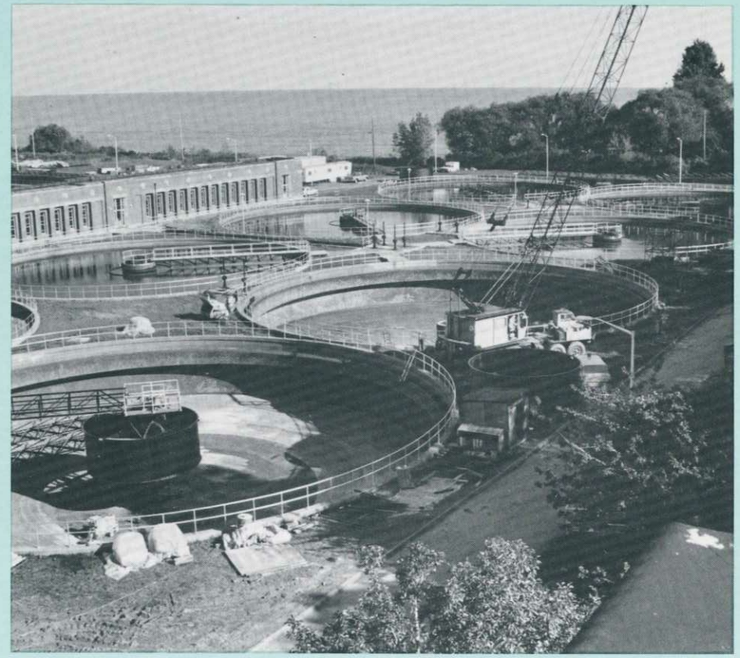
The grease incinerator/reactor was also out of service while it was undergoing rehabilitation.

During the summer months, the primary system operated at 60 percent of capacity due to preventive maintenance procedures requiring replacement of wear shoes, chains, flights and sprockets in the primary settling tanks.

Due to construction necessary to reinforce the walls of the aeration tanks, the secondary system operated with 87 percent of the tanks in service. The final settling tanks operated at 90 percent capacity.

Despite this difficult situation, not only did the plant continue to discharge good quality effluent to Lake Erie, but personnel were able to implement a planned energy-savings program that resulted in a combined savings in electricity and natural gas of $176,605 over the previous year.

In November, Michael A. DaDante, who had been superintendent, Small Stations, was promoted to superintendent of Easterly.



At Easterly, all mechanical equipment in the final clarifier tanks is being replaced.

EASTERLY WASTEWATER TREATMENT PLANT
1986 Performance Data Summary
(in milligrams per liter)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Biochemical Oxygen Demand (BOD)	16	10	13	11	17	25	21	21	23	20	22	22
Suspended Solids	8	8	7	8	10	5	5	5	5	6	7	8
Phosphorus	.33	.26	.26	.26	.30	.18	.23	.29	.21	.28	.28	.34

National Pollution Discharge Elimination System (NPDES) Limitations:
BOD — 20 milligrams per liter; Suspended Solids — 20 milligrams per liter; Phosphorus — 1.0 milligrams per liter

Westerly Undergoes Shakedown Phase

Construction of the Westerly Wastewater Treatment Plant is essentially complete.

The new facility, which uses physical/chemical treatment, replaces an outdated and inadequate primary plant built in 1922. The use of this process was determined prior to the formation of the District. It was chosen because Westerly's small and confined site lends itself to this process which can be housed in multi-level buildings.

Unfortunately, physical/chemical plants throughout the country have experienced start-up and operational difficulties, and Westerly is no exception.

In 1986, processes and equipment were being tested in a shakedown phase. Technical problems were still occurring in some key equipment and processes, and a number of modifications were being made. Until the plant is fully operational, it is being run as a primary treatment plant with solids handling capabilities.

Late in the year, management changes were made at the plant. Alex Balazs, who had been superintendent at Easterly, was named superintendent at Westerly. Prior to the appointment of Balazs, Assistant Chief of Operations Lewis Debevec served as acting superintendent at Westerly. He will continue to spend considerable time at the plant assisting in the solution of technical problems.

A worker checks equipment on the second level of the multi-storied carbon column/pressure filter building at the Westerly Wastewater Treatment Plant.

Also during 1986, the plant was brought up to its full staffing complement with the addition of five new shift supervisors to assist with operational and management duties.

WESTERLY WASTEWATER TREATMENT PLANT
1986 Performance Data Summary
(in milligrams per liter)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Biochemical Oxygen Demand (BOD)	83	53	52	39	31	32	28	31	39	35	42	44
Suspended Solids	35	23	19	12	16	10	15	11	15	15	24	15
Phosphorus	1.06	.57	.61	.28	.34	.55	.40	.64	.66	.45	.57	.45

National Pollution Discharge Elimination System (NPDES) Interim Limitations:
BOD — 85 milligrams per liter; Suspended Solids — 30 milligrams per liter; Phosphorus — 1.0 milligrams per liter

Small SWI Area Plants Must Meet Interim Limits

The West Leg of the Southwest Interceptor will serve portions of Berea, Brook Park, Middleburg Heights and Strongsville when it is completed in 1994.

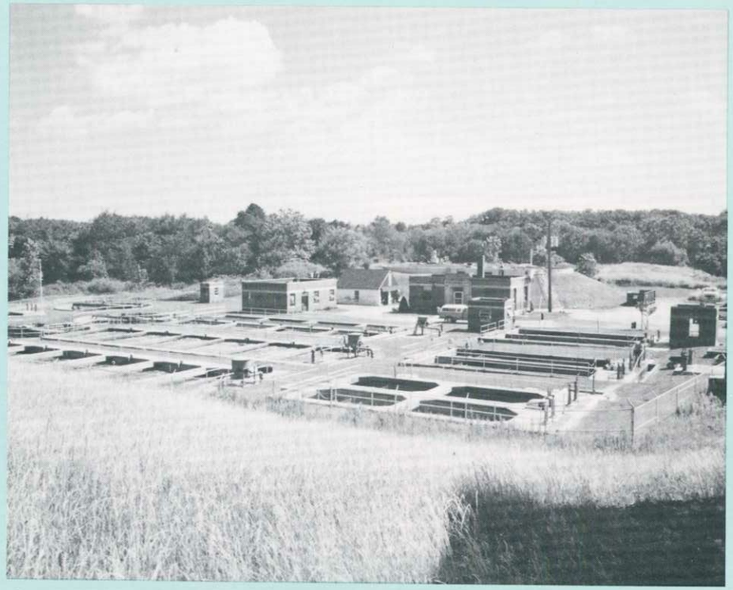
In the meantime, the small wastewater treatment plants serving these communities are required to operate in compliance with Ohio EPA interim effluent limits. Upon completion of the interceptor, these plants will be decommissioned.

In June, the Cities of Brook Park and Berea agreed to become members of the Northeast Ohio Regional Sewer District and to connect to the Southwest Interceptor when it becomes available.

The City of Brook Park has decided to continue to operate its own plant until the interceptor is completed.

However, the City of Berea transferred operation of its plant to the District in October 1986. Shortly thereafter, the District contracted with an engineering consulting firm to analyze the plant and prepare plans and specifications for its modernization to enable it to meet the interim effluent limits.

The upgrading, expected to cost approximately $2 million and to be completed in 18 months, is to be paid for entirely with funds from users within Berea.



The Northeast Ohio Regional Sewer District will modernize and upgrade the Berea Wastewater Treatment Plant shown here shortly after it was transferred to the District.

Another plant scheduled to be decommissioned is Strongsville "A," operated by the District since February of 1978. In 1982, Strongsville "A" users funded a $1 million expansion and upgrading so that this plant would be in compliance with its permit.

Middleburg Heights joined the District in 1985. Like the City of Brook Park, Middleburg Heights will continue to operate its own plant until the interceptor becomes available.

STRONGSVILLE "A" WASTEWATER TREATMENT PLANT
1986 Performance Data Summary
(in milligrams per liter)

	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
Biochemical Oxygen Demand (BOD)	15	14	19	12	10	11	10	11	10	8	19	20
Suspended Solids	16	14	15	9	11	9	9	7	10	8	14	13
Phosphorus	.50	.55	.60	.45	.41	.39	.41	.90	.92	.61	.98	.71

National Pollution Discharge Elimination System (NPDES) Limitations:
BOD — 30 milligrams per liter; Suspended Solids — 30 milligrams per liter; Phosphorus — 1.0 milligrams per liter

1986 OPERATING HIGHLIGHTS

SOUTHERLY WASTEWATER TREATMENT PLANT
Plant Characteristics and 1986 Operating Highlights

LOCATION: 6000 Canal Road, Cuyahoga Heights
TYPE OF PLANT: Primary and Secondary Treatment (Conventional Activated Sludge) with Effluent Filtration and Solids Handling
RESIDENTS SERVED: 605,000
NUMBER OF PERSONNEL: 251
PLANT DESIGN CAPACITY: 175 mgd, dry weather; 400 mgd, peak
TOTAL GALLONS OF WASTEWATER TREATED: 44.4* billion; daily average: 121.8 mgd
TOTAL SLUDGE FILTER CAKE PROCESSED: 72,895** wet tons
TOTAL SLUDGE INCINERATED: 70,446 wet tons
TOTAL SLUDGE HAULED TO LANDFILL: 2,448 wet tons
EFFLUENT DISCHARGE POINT: Cuyahoga River
OPERATING COST: $13,514,726

Includes 584 million gallons of Easterly sludge.
***Includes 7,200 wet tons of Strongsville "A" filter press cake*

EASTERLY WASTEWATER TREATMENT PLANT
Plant Characteristics and 1986 Operating Highlights

LOCATION: 14021 Lakeshore Blvd., Cleveland
TYPE OF PLANT: Primary and Secondary Treatment (activated sludge-step aeration process). Primary and excess activated sludge is pumped 13.2 miles to Southerly Treatment Plant through a 12" force main.
RESIDENTS SERVED: 546,000
NUMBER OF PERSONNEL: 75
PLANT DESIGN CAPACITY: 155 mgd, dry weather; 330 mgd, peak
TOTAL GALLONS OF WASTEWATER TREATED: 44 billion; daily average: 120.5 mgd
TOTAL SLUDGE PUMPED TO SOUTHERLY: 584 million gallons
EFFLUENT DISCHARGE POINT: Lake Erie
OPERATING COST: $3,868,810

WESTERLY WASTEWATER TREATMENT PLANT
Plant Characteristics and 1986 Operating Highlights

LOCATION: 5800 West Memorial Shoreway, Cleveland
TYPE OF PLANT: Primary and Advanced Wastewater Treatment* (Physical/Chemical) and Solids Handling
RESIDENTS SERVED: 215,600
NUMBER OF PERSONNEL: 105
PLANT DESIGN CAPACITY: 50 mgd, dry weather; 100 mgd, peak
TOTAL GALLONS OF WASTEWATER TREATED: 14.1 billion; daily average: 46.9 mgd
TOTAL SLUDGE PROCESSED: 76,205 wet tons
TOTAL SLUDGE INCINERATED: 30,413 wet tons
TOTAL SLUDGE HAULED TO LANDFILL: 45,792 wet tons
EFFLUENT DISCHARGE POINT: Lake Erie
OPERATING COST: $9,221,307

**During the majority of the year, plant was operated as primary treatment with solids handling and disposal while starting up the pressure filter portion of the AWT (Advanced Wastewater Treatment system.)*

STRONGSVILLE "A" WASTEWATER TREATMENT PLANT
Plant Characteristics and 1986 Operating Highlights

LOCATION: 22707 Sprague Road, Strongsville
TYPE OF PLANT: Conventional Activated Sludge and Solids Handling
RESIDENTS SERVED: 19,300
NUMBER OF PERSONNEL: 6
PLANT DESIGN CAPACITY: 2.6 mgd, dry weather; 7.2 mgd, peak
TOTAL GALLONS OF WASTEWATER TREATED: 861.8 million; daily average: 2.38 mgd
TOTAL SLUDGE FILTER CAKE PROCESSED AND HAULED TO SOUTHERLY: 6,913 wet tons
EFFLUENT DISCHARGE POINT: Blodgett Creek, tributary to Rocky River
OPERATING COST: $560,703

SEWER REHABILITATION AND RELIEF SEWER PROGRAMS

As mentioned earlier in this annual report, almost all of the area's suburban sewer systems are separate with wastewater being transported in one pipe and stormwater in another.

Unfortunately, the benefits associated with separate systems have diminished over the years due to deterioration of the pipes and improper connections. In many locations, grout has washed out of the connecting joints. Numerous pipes are cracked and leaking.

In some cases, the gutters and downspouts of homes and businesses have been improperly connected into sanitary sewers rather than storm sewers. When storm sewers and sanitary sewers leak, stormwater, from larger pipes placed above the smaller sanitary lines, is able to enter the sanitary sewers, taxing their capacity. Particularly during rainy weather, the sanitary sewers overflow causing substantial pollution of creeks and streams and, eventually, Lake Erie.

The Heights/Hilltop and Southwest Interceptors, when completed, will provide ample capacity to convey wastewater from the suburbs directly to the wastewater treatment plants, thus eliminating a major source of water pollution. But if the community sewers themselves are deteriorated, the purpose of the interceptor is defeated.

To address this problem, according to the terms of the federal grants, the District is required to develop, implement and enforce an intercommunity and community relief sewer and rehabilitation program.

Individual communities are responsible for repairing deteriorated sewers and building new ones where needed within their own boundaries. Implementation of these projects is required by a permit program.

During 1986, the District's Board of Trustees adopted 39 individual Community Discharge Permits — one for each member community that has separate sanitary sewers.

The permit program requires each community to comply with certain basic requirements.

A sewer system evaluation survey previously determined specific sanitary sewer problems in 16 priority cities within the area to be served by the Heights/Hilltop and Southwest Interceptors. These communities must comply with additional requirements.

No federal funds are available for the estimated $39.6 million of local work which will be initiated in 1987 and must be completed by 1999.

The District's 1986 permit program activities culminated in December with the submittal of a master community project schedule to Ohio EPA. This document consists of a compilation of technical program recommendations on a community-by-community basis.

The successful implementation of the permit program is a reflection of the constructive attitude and cooperative spirit demonstrated by all of the communities involved.

While the work required by the permit program is the responsibility of individual communities, the Intercommunity Relief Sewer Program is the responsibility of the District.

Intercommunity relief sewers are new sewers that will serve more than one community. Their purpose is to add capacity in areas where the sewers are overtaxed.

The District is responsible for constructing more than 50 of these sewers by the year 2000. These sewers, estimated to cost $82 million, are not eligible for federal funding.

During 1986 the District initiated the program by beginning design work for a four-mile long sewer to be tunneled under Pearl Road.

This is the largest and most expensive individual project in the intercommunity program, and is expected to cost approximately $20 million.

The Pearl Road sewer will have the capacity to transport 100 million gallons of wastewater per day directly to the Southwest Interceptor from the cities of Middleburg Heights, Parma Heights and Parma.

COMMERCIAL VITALITY

- *Construction is underway on the west bank of the Cuyahoga River for Nautica — a $65 million privately-financed entertainment/retail complex.*
- *Downtown Cleveland is enjoying a billion dollar construction boom.*
- *Multi-million dollar restoration of three 1920s-era movie houses in downtown Cleveland provides performing arts center for resident ballet, opera and theatre companies and superb facilities for touring shows and concerts.*
- *Tower City Center, a $228 million hotel, retail and residential complex, will also be the home of the Rock and Roll Hall of Fame.*

RESIDENTIAL CHOICES

- *A wide variety of single family homes and apartments are available at affordable prices throughout the suburban areas and the City of Cleveland.*
- *Ohio City, an historic neighborhood adjacent to downtown Cleveland, has been revitalized.*
- *Newly-constructed condominiums have been built overlooking the Cuyahoga River, within walking distance of downtown Cleveland.*
- *The highest demand in decades now exists for downtown housing.*

HELPING TO ENSURE PUBLIC HEALTH AND SAFETY

Industrial Waste Section Assists In Emergencies

Product spills at industrial sites ... leaking underground gasoline storage tanks at service stations ... chemicals or fumes escaping from a truck following an accident ... reports of strange and noxious odors.

These all too frequent occurrences have the potential to cause serious damage to people and animals, to the environment, to sewer systems and to wastewater treatment plants.

During 1986, these were some of the problems that the District's Industrial Waste Section was called upon to investigate and help solve as part of its emergency response program.

Requests for assistance came from fire and police departments, Ohio EPA, companies and individuals.

The Industrial Waste Section is also responsible for enforcing the District's Sewer Use Code which requires companies to control and/or pretreat their discharges containing acids, cyanides, oil and heavy metals.

It also enforces the federal rules regulating the types and amounts of industrial wastewater permitted to be discharged into the public sewer system.

While 1986 was the first full year that the District's EPA-approved pretreatment program was in effect and administered, the District actually began implementing the federal pretreatment requirements in 1984 when the first of the standards became effective.

Since these regulations have been implemented, local area companies have responded in a positive manner. Electroplaters, representing the industry most affected by the regulations, have invested nearly $10 million dollars in pollution control systems. In 1986, alone, 18 electroplaters invested a total of approximately $1.1 million in pretreatment equipment.

During 1986, Industrial Waste investigators inspected 250 companies and collected 786 discharge samples.

Sewer Control Staff Perform Varied Duties

Employees of the District's Sewer Control Systems also help to guard the public health. Their responsibilities include inspecting and maintaining the interceptor sewers, operating the Combined Sewer Overflow Control System, and coordinating and supervising emergency sewer repairs. They also survey and map the District's facilities to determine the exact location of sewers for repair and maintenance procedures.

During the year, eight emergency repairs were made and a total of 8,398 overflows were inspected. A digitized mapping of the Cuyahoga Valley Interceptor was completed and over 40 connections to this interceptor were inspected and approved.

In June, the EPA conducted the first Ohio licensing examination for wastewater collection workers — the category of personnel in Sewer Control Systems. Four employees received their certification under this new licensing procedure that measures their level of expertise.

Central Laboratory Analyzes Discharges

The District's Central Laboratory serves to provide valid and reliable data to ensure that the wastewater treatment plants meet their NPDES permit requirements. It also analyzes the industrial discharge samples collected by the Industrial Waste investigators.

During 1986, the laboratory performed nearly 150,000 analyses.

In May and June, specialized samples were collected from the District's wastewater treatment plants. Analyses made for 110 priority organic pollutants such as solvents, PCBs and pesticides, indicated that two of the District's treatment plants were completely free of these materials. Traces of industrial solvents were detected at two other treatment plants, but amounts were well within safe limits.

To increase the laboratory's capabilities, a Total Organic Carbon (TOC) Analyzer was purchased in 1986. This automated system enables a technician to determine the oxygen needed to chemically change organic carbon to carbon dioxide gas.

A new test performed by the laboratory helped to improve operations at the Strongsville "A" Plant. During 1986, plant personnel began to use permanganate pellets for odor control. The pellets were analyzed to determine the rate at which the potassium permanganate is depleted, enabling plant personnel to determine when the pellets should be replaced.

COMMUNICATING WITH THE PUBLIC

Because of its varied responsibilities, the Northeast Ohio Regional Sewer District reaches out and interacts with the public in a number of different ways.

On a one-to-one basis, the District's Customer Service staff answers billing questions, mainly over the phone, but occasionally in person. During 1986, Customer Service representatives responded, either verbally or in writing, to 22,026 billing inquiries.

The District's Industrial Waste Section responded to numerous phone calls that ran the gamut from odor complaints to tips from civic-minded citizens reporting suspicious dumping of unknown materials into sewers or waterways.

As part of its ongoing public information program, in February, the District was a participant in the Cleveland Home and Flower Show which attracted several hundred thousand people over a ten-day period. The District's exhibit consisted of a display, a video presentation and a model illustrating the wastewater treatment process. Staff volunteers from all of the District's departments were available to talk with the public and to distribute a variety of literature.

On October 25, in conjunction with Ohio Water Quality Awareness Week, the District conducted public tours of the Easterly Wastewater Treatment Plant.

Another significant way the District communicates with the public is through printed information. The District publishes an annual report and a quarterly newsletter. Other publications include a general brochure describing the District's facilities and responsibilities, fact sheets, reprints of newspaper and magazine articles about the District, and brochures describing the processes in use at the wastewater treatment plants.

Tours of the Easterly Wastewater Treatment Plant were given as part of the District's observance of Ohio Water Quality Awareness Week. Herman Bishop, assistant superintendent of Easterly, (leaning forward) explains how the control panel monitors the plant's processes.

SHORELINE DEVELOPMENT

- *Construction began in the summer of 1986 for the widening and deepening of the east entrance to the Cleveland Harbor. When completed, a new generation of freighters and large ore boats will be able to enter the harbor.*
- *Major elements of the planned Inner Harbor project include a maritime museum, aquarium, market place and winter garden.*
- *The Flats area, a combination industrial/warehouse district along the Cuyahoga River, is being transformed into a bustling and exciting area of shops, restaurants and night spots.*

BALANCE SHEET

NORTHEAST OHIO REGIONAL SEWER DISTRICT
3826 Euclid Avenue, Cleveland, Ohio 44115
December 31, 1986 and 1985
(In thousands of dollars)

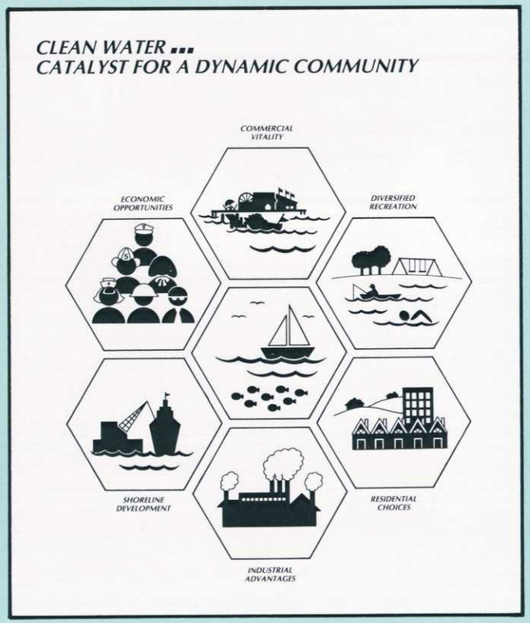
	1986	1985
ASSETS		
Property, Plant and Equipment:		
Sewage Treatment Plants	$ 489,390	$ 429,737
Interceptor Sewer Lines	129,693	118,683
	619,083	548,420
Less - Accumulated Depreciation	(113,862)	(92,800)
	505,221	455,620
Land	2,884	2,824
Construction in Progress	76,296	113,252
Net Property, Plant & Equipment	584,401	571,696
Unamortized Bond Issue Costs & Discount	2,923	3,218
Construction Fund	108,704	95,460
Revenue Bond Debt Service Fund	13,402	8,370
Revenue Bond Debt Service Reserve Fund	15,573	15,573
Deposits for Deferred Compensation Benefits	1,274	939
Current Assets:		
Cash & Short Term Investments	18,081	22,648
Billed & Unbilled Sewage Service Fees Receivable	29,254	29,155
Grants Receivable	8,524	13,123
Inventory of Supplies	2,962	2,605
Total Current Assets	58,821	67,531
Total Assets	$ 785,098	$ 762,787
EQUITY AND LIABILITY		
Equity:		
Retained Earnings	$ 265,093	$ 247,767
Contribution in Aid of Construction	393,814	387,273
Total Equity	658,907	635,040
Long-Term Liabilities:		
Long-Term Debt	105,342	106,220
Deferred Compensation Liability	1,274	939
Total Long-Term Liabilities	106,616	107,159
Current Liabilities:		
Accounts Payable	3,062	3,150
Construction Contracts Payable	9,390	8,965
Accrued Liabilities	4,476	5,554
Long-Term Debt Due Within One Year	2,647	2,919
Total Current Liabilities	19,575	20,588
Total Equity and Liabilities	$ 785,098	$ 762,787

A copy of the detailed financial statement may be obtained by writing to: Comptroller, Northeast Ohio Regional Sewer District, 3826 Euclid Avenue, Cleveland, Ohio 44115.

SENIOR STAFF

Senior staff of the Northeast Ohio Regional District are: (left to right) David A. DeMarco, comptroller; Charles J. Vasulka, chief engineer; Erwin J. Odeal, director; William B. Schatz, general counsel; Dale F. Patrick, chief of operations; and Kenneth A. Pew, chief of support services.

CLEAN WATER ...
CATALYST FOR A DYNAMIC COMMUNITY



NORTHEAST OHIO
REGIONAL
SEWER DISTRICT

3826 EUCLID AVENUE
CLEVELAND, OHIO 44115