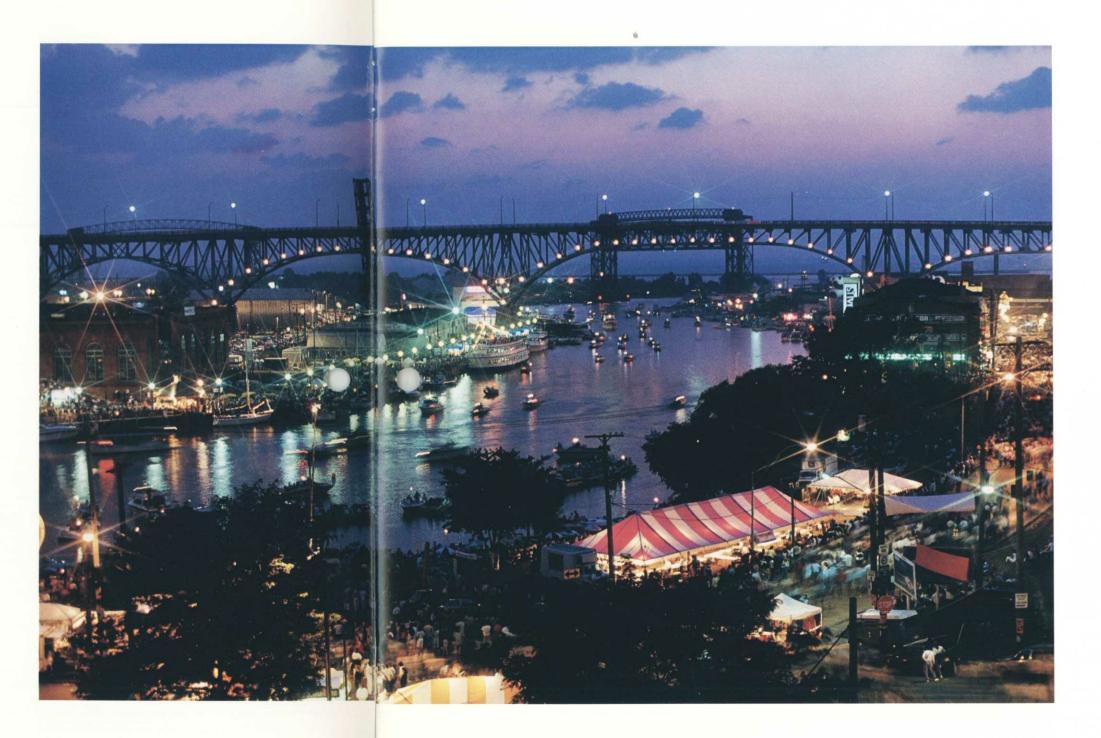


- The Northeast Ohio Regional Sewer District is a public agency governed by the Ohio Revised Code, Chapter 6119.
- ■The District protects water quality by treating wastewater, building interceptors, controlling combined sewer overflows, monitoring industrial waste discharge, and operating associated water pollution control facilities. Wastewater is treated at three main facilities (Southerly, Westerly, and Easterly) and two small municipal plants (Berea and Strongsville "A"). A network of interceptors (large regional sewers) carry wastewater to the treatment plants.
- ■The District serves a population in excess of one million in the City of Cleveland and the following 49 communities:

Beachwood • Bedford • Bedford Heights • Berea • Boston Heights • Bratenahl • Brecksville • Broadview Heights • Brook Park • Brooklyn • Brooklyn Heights • Cleveland Heights • Cuyahoga Heights • East Cleveland • Garfield Heights • Gates Mills • Highland Heights • Highland Hills • Independence • Lakewood • Linndale • Lyndhurst • Macedonia • Maple Heights • Mayfield Heights • Mayfield Village • Middleburg Heights • Newburgh Heights • North Randall • North Royalton • Northfield • Northfield Center • Oakwood • Olmsted Falls • Parma • Parma Heights • Pepper Pike • Richfield • Richmond Heights • Riveredge Township • Sagamore Hills • Seven Hills • Shaker Heights • South Euclid • Strongsville • University Heights • Valley View • Walton Hills • Warrensville Heights





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E Joden

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A message from the President and Director

The Northeast Ohio Regional Sewer District is comprised of talented, skilled and environmentally conscious individuals whose purpose is to protect area waterways. The efforts of these individuals also enable the District to provide quality services to its customers.

The Clean Water Act of 1972 authorized federal funding for wastewater system improvements. Since that time, the District has successfully received \$545 million in federal grants to offset \$845 million in construction costs. By designing improvements and applying for grants in a timely manner, the District consistently attained high priority ranking and receipt of the funding. Prudent operation of these facilities has kept user rate increases at a minimum. In September, the District received the last federal grant it expects because the federal grant program has come to an end. This grant will be used for the Southwest Interceptor. In the past, grants have represented 75 percent of total project costs. Additional improvements must now be made, without federal grants, resulting in increased user rates.

As we move into the 90's, federal regulations are focusing on combined sewer overflow control. The District favors a flexible, situation specific approach. This will allow the District to commit resources where they are most needed. The use of a water body, its habitat and the wide range of pollutants affecting it (such as urban and agricultural run-off) need to be considered when committing public funds.

In 1974, the District began controlling combined sewer overflows. By using the best available technology, the District has positively impacted area waterways. Edgewater Park's improved water quality is one result of this program. To further enhance overflow control the District began improving its system, using the most efficient and economical means available and giving immediate attention to those areas yielding the greatest impact.

In May, the District opened a new facility, the Environmental Maintenance and Services Center, which houses four sections, including a laboratory. Each day, samples from stages throughout the treatment process, industry and area waterways are analyzed to measure water quality improvements. Water quality is also monitored through special projects with groups such as the Ohio Environmental Protection Agency, the local Remedial Action Planning Committee and the Water Pollution Control Federation. Data from these efforts help formulate new environmental standards.

Although our primary function is treating wastewater, we hope this report will help you understand the valuable services we provide.

Improving the System

- A \$13.5 million complex, The Environmental and Maintenance Services Center, opened in May. Outfitted with state-of-the-art technology, the 115,000 square foot building contains offices, garages, and a laboratory. Services include monitoring the environment, analyzing water quality, maintaining sewers and repairing vehicles.
- A new boiler, which provides increased amounts of steam, enabled Southerly Wastewater Treatment Plant to process sludge more effectively.
- Plant odors have been significantly reduced through Southerly's \$3.5 million investment, to date, in advanced odor control systems. Another \$2.5 million in additional research and system improvements are planned in the next three years.
- The grease storage system at Easterly Wastewater Treatment Plant was expanded by installing a 10,000 gallon tank to store grease from the other treatment facilities before incineration. The District will save over \$25,000 a year by no longer hauling grease to landfills.
- Flow was introduced to a section of the 22-mile Heights/Hilltop Interceptor in November and the sixth of twelve contracts was awarded for \$16 million.
- At year end, seven of the ten construction contracts for the 23-mile Southwest Interceptor were completed. Both interceptors will help alleviate environmental overflow, basement flooding and will replace small municipal plants.
- In an effort to minimize stream pollution by alleviating overflows caused by heavy rain, Intercommunity Relief Sewer (ICRS) projects advanced with seven of 47 new intercommunity relief sewers underway. These seven sewers will serve both east and west-side residents.





The District opened a new facility in May, the Environmental Maintenance and Services Center. It is located in Cuyahoga Heights and overlooks the Southerly Wastewater Treatment Plant. At the reception desk, Dianne Jackson greets visitors and directs calls. Engineers Bill Ritz and Spain James (on stairs) and Curtis Nickle (left) were key employees in the building's construction.

A network of programmable controllers, flow level sensors and computer-controlled mechanical gates prevent wastewater from spilling into area waters. Keeping the electrical components of this system in working order is the job of Electronic Maintenance Person Charles Cofield.





Controlling Combined Sewer Overflow

Combined sewers are a growing environmental concern. They were designed to carry both dry weather wastewater and stormwater. Heavy rainfall often causes these sewers to overflow resulting in, a combination of wastewater and stormwater to spill into area waterways.

- The District's goal is to maximize capture of wastewater and reduce overflows. In the early 1970's a Combined Sewer Overflow (CSO) control system was installed. It consists of sensors which measure wastewater levels and computer-controlled mechanical equipment which controls gates and inflatable dams.
- Improvements made to the system included enhancements to the inflatable dams for better control of wastewater storage. A new computer program was written to consolidate rain gauge data and another to calculate flow based on level sensor information. The entire control system was tied into the Computerized Maintenance Management System to improve control of parts and preventive maintenance.
- The District embarked on a two-year project to research and further improve the existing CSO system. The \$4.4 million CSO Facilities Plan will develop control strategies addressing water quality concerns and begin preparing a District-wide Master Plan for CSO control. This effort will identify structural improvements to minimize CSO's and identify future study needs. A public participation program will be a part of this study to assure citizens input.

Treating Wastewater

In order to treat wastewater efficiently and responsibly, process improvements must continually be made.

- To find a more economical way to dewater sludge, a study was initiated at Southerly Wastewater Treatment Plant to evaluate the solids handling process. The study is testing various sludges for thickening and dewatering alternatives, and inspecting solids handling equipment. A report on the findings and suggested improvements will help determine the future of Southerly's solids handling processes.
- Southerly designed and built an effluent filter media make-up system that will save hundreds of man-hours of intensive labor. The system enables personnel to replace granular anthracite which is lost during filter cleaning. Employees now open a valve which continually feeds the filters rather than manually moving equipment to fill each filter. Four tons of anthracite can be fed within an hour.
- Westerly Wastewater Treatment Plant is going through a total redesign. After analyzing different biological process options, the Trickling Filter-Solids Contact design was chosen.
- Westerly switched from city water to process water, saving the District over \$192,000 in less than 9 months. Like Westerly, Strongsville "A" Wastewater Treatment Plant began recycling process water rather than purchasing city water.
- A safer, more economical disinfection system is now used at Easterly Wastewater Treatment Plant. The change from chlorine gas to liquid sodium hypochlorite, a strong bleach, was made because it is safer. Based on a follow up study that showed the same efficiency and safety, Southerly will also begin using sodium hypochlorite.
- Eight plant managers participated in the Ohio Water Pollution Control Association's "Operations Challenge". One of the four-person teams placed first in the Maintenance and Process Control events and finished second overall. The annual olympiad tests wastewater treatment knowledge and plant operating ability.

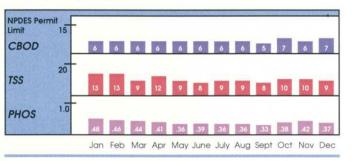




At Southerly, air compressors supply process air to the second stage aeration tanks. Plant Maintenance Mechanic Luther Norman (kneeling) and Operator C2 Bobby Gillespie are assigned to the unit and assure the equipment runs properly.

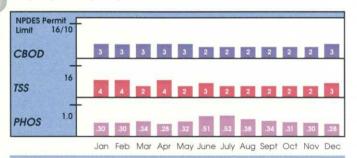
Easterly Wastewater Treatment Plant 14021 Lake Shore Boulevard, Cleveland

Treated 140 MGD of wastewater Pumped 621.2 million gallons of sludge to Southerly Discharges effluent to Lake Erie Employs 68 people



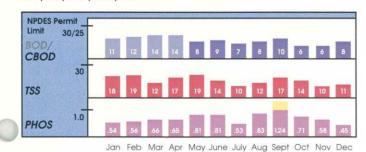
Southerly Wastewater Treatment Plant 6000 Canal Road, Cuyahoga Heights

Treated 134.7 MGD of wastewater Processed 89,064 wet tons of filter cake, incinerated 76,808 wet tons and hauled 12,256 wet tons to the landfill from the Easterly, Strongsville and Berea plants Discharges effluent to the Cuyahoga River Employs 235 people



Strongsville "A" Wastewater Treatment Plant 22707 Sprague Road, Strongsville

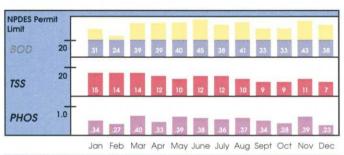
Treated 3.5 MGD of wastewater Discharges effluent to Blodgett Creek (tributary to West Branch of Rocky River) Employs 6 people



Treatment Plant Performance

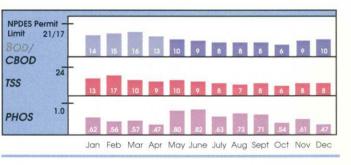
Westerly Wastewater Treatment Plant 5800 West Memorial Shoreway, Cleveland

Treated 35 MGD of wastewater Processed 29,664 wet tons of centrifuge cake, incinerated 28,462 and hauled 1,202 wet tons Discharges effluent to Lake Erie Employs 92 people



Berea Wastewater Treatment Plant 400 Barrett Road, Berea

Treated 3 MGD of wastewater Discharges effluent to East Branch of Rocky River Employs 6 people



NPDES: National Pollutant Discharge Elimination System

BOD: Biochemical Oxygen Demand

CBOD: Carbonaceous Biochemical Oxygen Demand

TSS: Total Suspended Solids

PHOS: Phosphorus

MGD: Million Gallons per Day

7

Analyzing Progress

With state-of-the-art equipment, Analytical Services can detect pollutant concentrations to measure water quality and assure that clean water is returned to the lake and river.

- Samples are collected from treatment plants, industry and area waterways. A wide range of organic and inorganic analyses are performed by skilled scientists on highly technical equipment. In 1990, over 200,000 analyses were performed.
- Analytical Services added four pieces of equipment to remain at the forefront of technology and assure more precise reporting on pollutant levels to the Environmental Protection Agency. The new equipment includes:
 - two gas chromotgraph mass
 Spectrometer (GC-MS) systems to analyze organic pollutants,
 - an Inductively Coupled Plasma (ICP)
 Instrument to detect metals in waste-water samples,
 - a graphite furnace used with an Atomic Absorption Spectrophotometer to detect and analyze minute concentrations of metal.
- In a special project, Analytical Services, Engineering and Southerly worked together to study solids handling efficiency. The project's purpose was finding the most economical way of de-watering sludge.





Laboratory analysis provides indicators on how well the District is treating wastewater and improving area water quality. Wastewater Analyst II Sandra Weeden and Wastewater Analyst I Mark Citriglia analyze wastewater for nitrogen ammonia, total Kjeldahl nitrogen, nitrate and nitrite.

Identifying fish that exist in area waters helps measure improvement in water quality. Fish are momentarily stunned by putting an electric current into the water. They are then netted, examined, weighed, measured, identified and returned to the water. Investigators Catherine Zamborsky, Tim Dobriansky and Tom Zablotny are electrofishing on the Rocky River.





Environmental Monitoring

As part of the District's effort to maintain water quality, environmental monitoring, performed by Water Quality and Industrial Surveillance (WQIS), was expanded to include Lake Erie and the Chagrin River. Monitoring results help develop a database on the ecological status of area waterways. Results from samples have shown improvements in most areas.

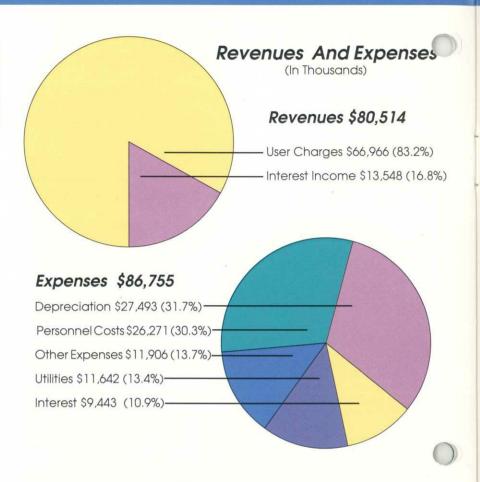
- WQIS collected 3, 147 samples, with the largest number of samples taken from industry, followed by area waterways and combined sewer overflows. These samples were analyzed to detect environmental contaminants. WQIS also performed field measurements for parameters such as dissolved oxygen, conductivity, turbidity, and pH levels.
- Data is also provided for the Remedial Action Plan, a project of the Cuyahoga Coordinating Committee to address pollution concerns in the Cuyahoga River and near-shore Lake Erie. Studies, focusing on fecal coliform sampling and fish tissue collection, were performed. The fish tissue study identified potential risks to human health in the consumption of area fish, while the fecal coliform study measured bacteria levels which could impact recreational water use.
- Two high school biology teachers studied the environment with WQIS employees in a pilot program sponsored by the Cleveland Education Fund and the Cleveland Science Collaborative. The teachers assisted staff biologists and naturalists in the collection, analysis, and interpretation of sample data. The program was designed to help teachers instruct on environmental issues.

Financing the Effort

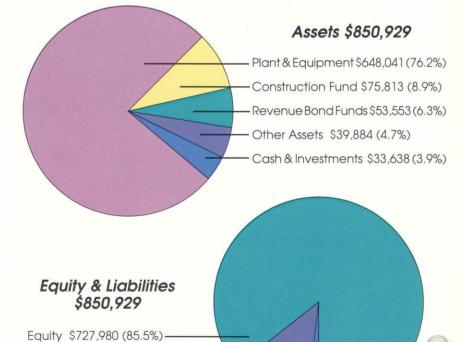
Elimination of the federal construction grant program forced the District to evaluate alternative methods of financing federally required system improvements. A study determined increased user rates were needed to offset the loss of construction grants. Out of concern for fixed income customers, the District proposed a Homestead Sewer Rate. During the past 15 years, federal grants have been funding up to 75 percent of capital costs. A public information process was put into motion to notify customers of the need to increase user rates.

- An increase of \$2.05 per thousand cubic foot (mcf) to \$10.60 for Cleveland customers and a \$2.44 increase to \$13.50 per mcf for suburban customers was effective for use beginning January 1, 1991. The adopted homestead rates offer about a 15 percent savings on the rate increase.
- The District applied for a loan from the State of Ohio Water Pollution Control Loan Fund program. The loan will be used for the \$18 million estimated cost of Hilltop Interceptor Contract G. The first five interceptor construction contracts were grant funded.
- Trying to keep operating expense increases below the inflation rate was achieved between 1989 and 1990 when total operating expenses increased only \$600,000 or just over one percent. The 1989 expense was \$49.6 million while the 1990 expense was \$50.2 million.

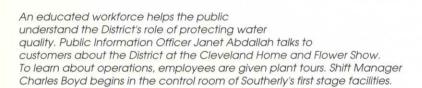
A copy of the detailed financial statement may be obtained by writing to: Director of Finance, Northeast Ohio Regional Sewer District, 3826 Euclid Avenue, Cleveland, Ohio 44115



Financial Position
(In Thousands)



Long Term Debt \$104,557 (12.3%) Other Liabilities \$18,392 (2.2%) –



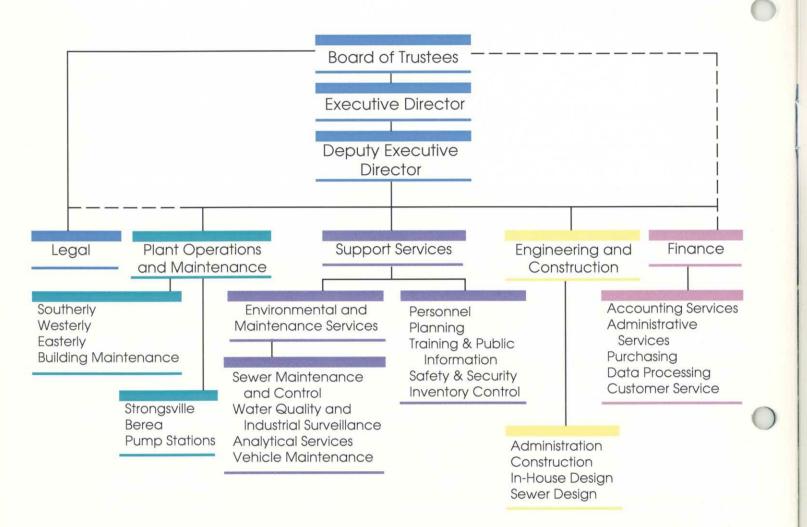




Educating Public and Employees

Participation in community and environmental awareness programs is an important educational tool. Special events serve to educate both the employees and community about the District.

- The Home and Flower Show exhibit contained an eight foot diameter wooden support system called ribs & lagging used to protect workers when tunneling. The display attracted greater attention than in previous years. Over 56 employees helped educate the community during the ten-day show.
- Visitors to Earthfest '90, held at the Metroparks Zoo, learned about wastewater treatment and methods used to monitor water quality and gauge improvements to Lake Erie and area waterways. A costumed character called "Sewerperman" was created to teach children how to keep the environment clean.
- Over 300 people, including community leaders and elected officials, attended the dedication of the Environmental Maintenance and Services Center. The dedication was held during Public Works Week and exhibits were displayed in the Vehicle Maintenance Building by other public agencies.
- "Sewerperman" was brought back during the 1990 Children's Peace Fair at Cuyahoga Community College Western Campus. Children learned about protecting area waterways. Additionally, the District hosted treatment facility tours for schools and educated students about water monitoring efforts.
- The District participated with National Aeronautics and Space Administration Lewis Research Center employees and St. Edwards High School students to track the effluent flow from Easterly and Westerly into Lake Erie. This project used infra-red technology by airplane to see the effluent flow patterns in the lake and determine new sites for water sampling.



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Bobby Gillespie

Robert Gorsica

Robert Guilfoyle

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