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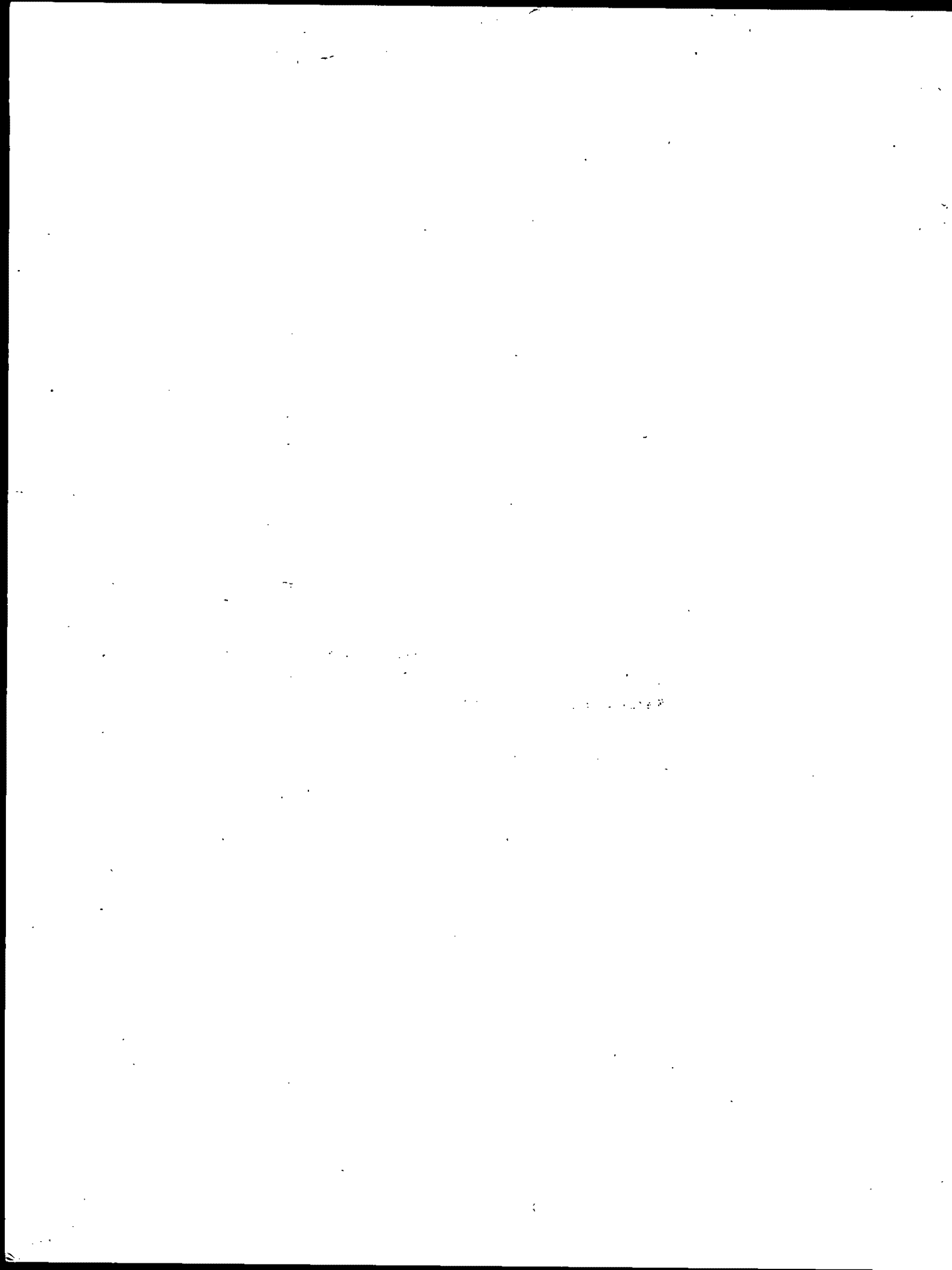
August 1988
EPA 430/09-88-0008



WASTEWATER TECHNICAL ASSISTANCE

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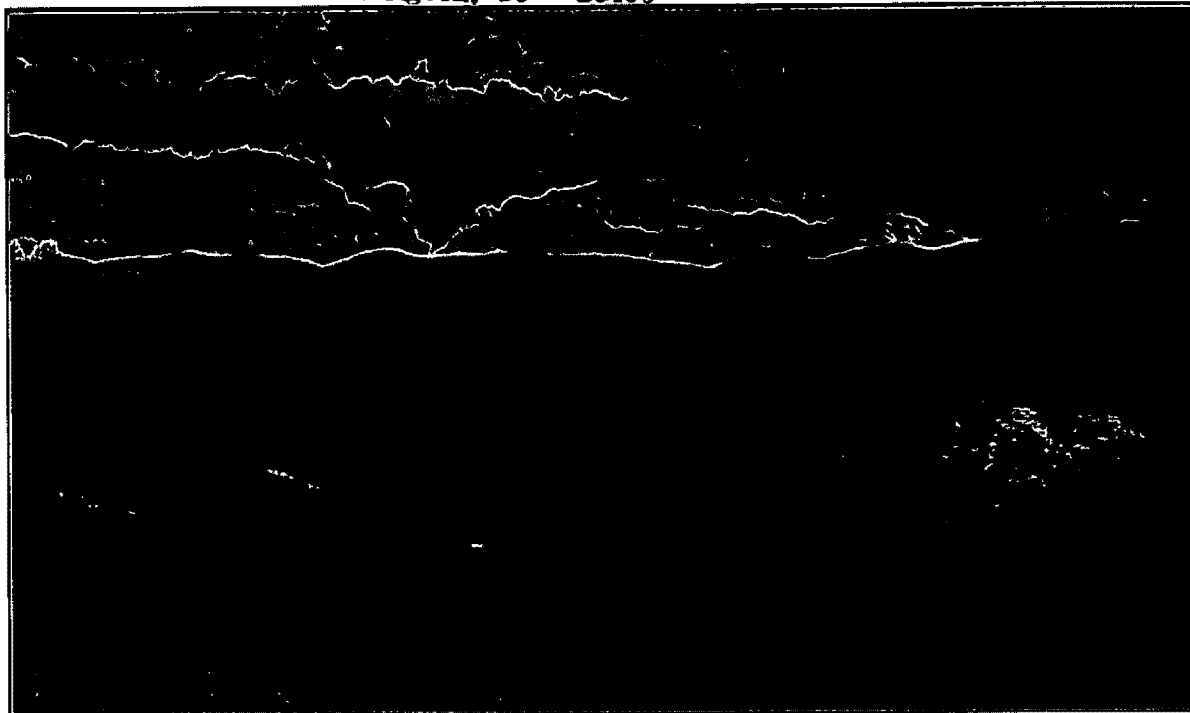
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The University of Tennessee
MUNICIPAL TECHNICAL ADVISORY SERVICE

18-511346

Acknowledgements

This report has been prepared by The University of Tennessee Institute for Public Service (IPS) and Municipal Technical Advisory Service (MTAS) under grant number T901585-01-0 from the United States Environmental Protection Agency (US EPA).

It was made possible through the efforts of these individuals: Ed Archer, MTAS Utility Management Consultant; Deborah Elder, IPS Communications and Publications Specialist; Anne Hawkins, MTAS Information Management Consultant; Andy Jordan, MTAS Senior Public Works Consultant; Alan Major, MTAS Utility Finance Management Consultant; Pierrette Oppegard, Designer; Sharon Rollins, MTAS Utility Management Consultant; Cynthia Tschaepe, Director, Tennessee Department of Health and Environment (TDHE), Division of Construction Grants and Loans; and James E. Word, TDHE Commissioner.

Special thanks to James Bourne, US EPA Office of Municipal Pollution Control, Planning and Analysis Division, who provided direction and guidance for this project.

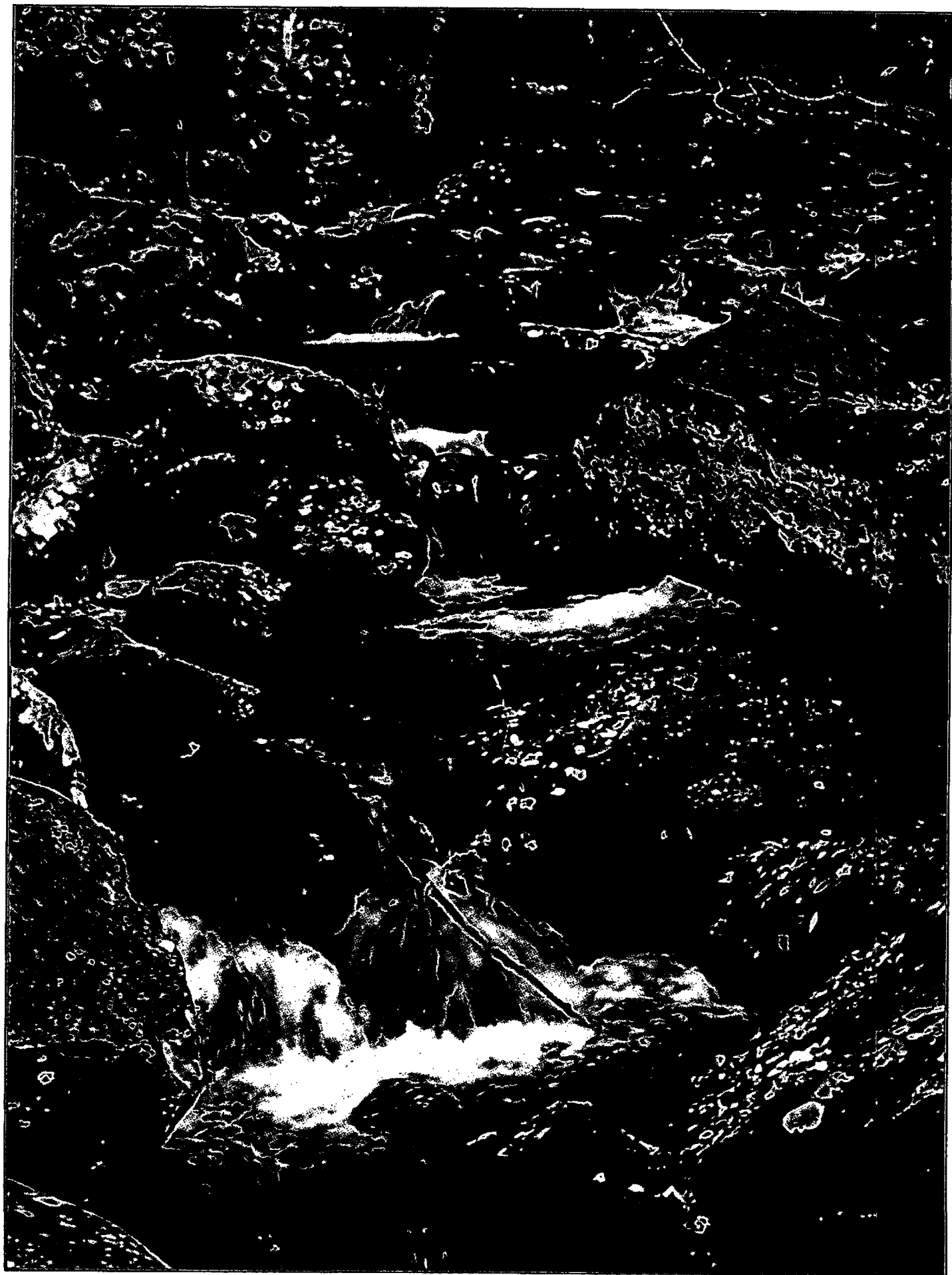
The views, opinions and conclusions contained herein are those solely of the authors and not necessarily those of the Environmental Protection Agency.

WASTEWATER TECHNICAL ASSISTANCE

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FOREWORD

Ecological consciousness has risen in America with the publication of "SILENT SPRING." Reports of fish kills, oil spills, nuclear fallout, PCBs and so on have aroused global awareness of the complexities of environmental problems. The conservation ethic that followed was profoundly stated by Congress in the National Environmental Policy Act of 1969 by employing the words that we (government) should "use all practicable means . . . to create and maintain conditions in which man and nature can exist in productive harmony." This is the charge of the Tennessee Department of Health and Environment (TDHE) through its Bureau of Environment. To that end, we have established the goal to maintain a high quality of life by taking a balanced approach to environmental protection and economic development.

The Bureau of Environment fulfills this mission through financial assistance programs such as the federal and state grants and loans program, through enforcement actions, and through training programs. In 1984, TDHE piloted a technical assistance program to aid municipalities. The Tennessee Wastewater Treatment Works Construction Grant Act of 1984 allowed TDHE to contract with The University of Tennessee's Municipal Technical Advisory Service (UT/MTAS) to provide technical assistance to those cities seeking to obtain grants to improve their wastewater treatment facilities.

This pilot program dramatically emphasized the effectiveness of team work in accomplishing overall water quality protection. First, federal law dictated that all municipal point source discharges meet water quality standards and permit limits by July 1, 1988. Otherwise, those systems were to be placed on a court mandated compliance schedule. Secondly, grant dollars were made available. Although federal allocations to the state have decreased and the federal participation per project has declined significantly since 1982, the Tennessee General Assembly wisely began in 1984 to appropriate state grant dollars annually to supplement federal grants to municipalities for wastewater facility construction. Thirdly, growth needs of cities added pressure to construct wastewater infrastructure. Finally, MTAS utility management and financial consultants provided technical assistance to municipalities in their understanding of the grants program.

The results of the team effort by TDHE and MTAS to provide financial and technical assistance for solving wastewater pollution problems have been overwhelming. Since 1984 when the pilot program began, 91 Tennessee municipalities have been awarded over 100 million dollars. This is just a beginning. Many needs remain for Tennessee cities in wastewater treatment. In addition to wastewater treatment needs, the enormous problems of nonpoint source water pollution, acid rain, solid and hazardous waste disposal, and ground water protection must be addressed.

Air, water, and land are our only natural resources. Tennesseans and thousands of visitors enjoy our clean air, beautiful rivers and lakes, and varied terrain. With increased emphasis on economic growth and industrial expansion, it is vitally important that we all work together to maintain protection for Tennessee's natural resources. Local government faces significant challenges in the areas of air pollution, ground water protection, water supply, solid and hazardous waste management, and financial management. It stands to reason that TDHE and MTAS will have future opportunities to jointly assist local government in discovering solutions to their problems. The success of the wastewater technical assistance program which is detailed in this report portends that comparable results can be accomplished by team work on other environmental issues. I believe in team work. I believe that through the assistance of groups like MTAS, we will continue to have growth and a clean environment.

James E. Word, MPA, Commissioner
Tennessee Department of Health
and Environment



Matching Needs with Capabilities

Water . . . the state's lifeline and the basis of all life. Tennessee is blessed with abundant water resources. The state has 20,000 miles of rivers and streams, 676,000 acres of lakes and reservoirs, and 700,000 acres of wetlands. With good management, Tennessee has adequate supplies of water to allow for growth. Tennessee wants to grow, but in such a way as to protect environmental resources and to avoid future costly cleanup.

How do we protect our resources? That's the question the Select Committee on Clean Water was asked to answer when it was created in 1983.

Tennessee's former Governor, Lamar Alexander, convened the committee. It was composed of the Safe Growth Cabinet, the Tennessee Attorney General, and key state legislators, including Tennessee's current Governor, Ned R. McWherter, who was then Speaker of the House. This committee was charged with the responsibility of making recommendations to the governor and General Assembly for Tennessee's water management needs.

In their recommendations, the Select Committee focused on a major source of pollution in Tennessee's rivers and lakes—improperly treated municipal wastewater. In 1983, over half of the state's 252 municipal sewage treatment plants did not meet discharge requirements. The committee estimated that it would take \$1.8 billion in new construction over the next 20 years to meet wastewater treatment and disposal needs. Meanwhile, federal grants to fund improvements had declined.

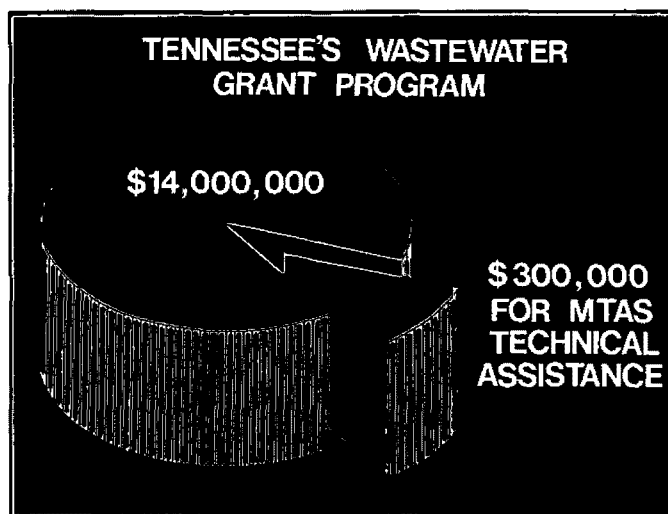
To offset losses from federal cuts, the committee recommended legislation creating the Tennessee Wastewater Treatment Works Construction Grant Act of 1984. This legislation provided for \$14 million in annual appropriation for wastewater facility construction. The act also provided that the Tennessee Department of Health and Environment (TDHE), which administers the grants program, could contract for up to \$300,000 annually with The University of Tennessee's Municipal Technical Advisory Service (MTAS) to assist cities in receiving grants.

Why MTAS?

The Municipal Technical Advisory Service has provided practical, individual solutions to cities' technical problems since 1949. MTAS has a legislative mandate to respond to the technical assistance needs of all Tennessee cities.

Working with TDHE officials, MTAS developed a contract for the following services:

- assistance to cities who are on the state's priority list for wastewater facility grants
- assistance to potential grant recipients in developing and implementing a project management approach
- assistance to grant recipients in financial management, system evaluations, records management, and other management related functions as necessary
- education for local officials in wastewater matters
- assistance to TDHE in areas like policy development, training, and seminar development



How Do MTAS Consultants Interact with Cities on Water Quality Problems?

Consultants act as catalysts to aid the flow of dollars from TDHE to municipalities. There are currently 336 towns and cities in Tennessee. Sixty-five percent of these cities have populations of less than 3,000 and forty percent have populations of less than 1,000. Many of these small municipalities do not have full-time administrative and management staff. MTAS consultants help elected officials stay informed on funding sources and on state requirements affecting the city's sewage treatment facility operations.

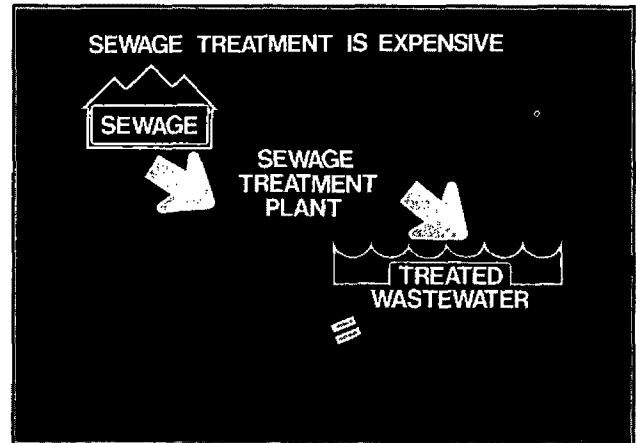
Consultants offer ideas, recommendations, management know-how, and information to help cities become self-sufficient in financing and managing their wastewater treatment facilities. However, one of the most important tasks MTAS performs is aiding communication flow between those involved in cleaning up pollution.

Identifying the Need

There are many steps involved in moving from an overloaded or outdated, poorly performing sewage treatment system to one which meets discharge standards. Paperwork and regulation requirements can be complex when construction is financed through a grant or loan. Building a new sewage treatment plant for small cities can be the single largest undertaking the administration will accomplish.

Getting Started

One of the first steps, selecting professional engineering services, is very important. MTAS does not select the engineer for the city, but will demonstrate how to solicit and evaluate qualification



statements and proposals. Then, MTAS professional staff make recommendations on elements which should be included in an engineering agreement.

The Planning Phase

After the city's consulting engineer has drafted a facilities planning document, MTAS consultants may be requested by the city to provide an objective third party evaluation. Consultants help city officials during the planning process to understand the need for corrective action, identify problems, and evaluate the alternatives.

State law requires that planning documents undergo a peer review process after a facilities planning document has been submitted to TDHE for review. MTAS staff on the peer review board serve along with city officials, state regulators, and consulting engineers to assure communities the best solution to their wastewater problems at the lowest cost.

MTAS field staff also work with various political groups to formalize intermunicipal agreements. Intermunicipal agreements are required when regional solutions to wastewater treatment problems are proposed.

Funding the Project

Solving pollution problems and meeting sewage disposal needs is very expensive. Cities must locate and often combine money from several sources to construct sewage treatment plants. MTAS consultants maintain up-to-date information on sources of grants and loans, application procedures, and contact points within various funding agencies.

Upon request, MTAS will perform comprehensive financial analyses of the city's utility operations,



perform rate assessments, help cities gauge the impact of proposed utility system improvements on sewer bills, and give recommendations on rate adjustments.

The Construction Phase

Once construction begins, MTAS consultants visit city hall frequently to assist in records and financial management. Helping cities prepare for audit checks throughout the project is an important detail during the construction phase. Besides assisting individual cities on specific issues, MTAS sponsors workshops on resolving project conflicts and claims resolution.

After the Project Goes on Line

MTAS staff work one-on-one with city officials in creating effective organizational structures, developing ordinances and policies, and perfecting utility system planning. Professional staff help arrange workshops in enterprise accounting, sewer line rehabilitation, contract operations, budgeting, personnel matters, and general management skills. Consultants research solutions to operational problems, consult with the city's engineer and TDHE staff, and offer recommendations to improve operations.

Besides technical assistance, MTAS distributes information on wastewater issues through: the monthly newsletter Tech Trends, which appears in Tennessee Town and City; the MTAS library's wastewater publications; electronic mail; and technical bulletins and reports.

Communication Link with the State

One of MTAS' roles is to be a communication link between city administrators and TDHE. Consultants bring mayor's questions, comments, and needs to the attention of appropriate state regulatory personnel. These messages often result in new policies and regulations. MTAS consultants provide valuable input to state personnel when representing cities. For example, MTAS consultants recently served on a state-appointed task force. Their work resulted in successful legislation to establish a revolving loan program to finance wastewater facility construction.

MORE ABOUT MTAS

The Municipal Technical Advisory Service is an agency of The University of Tennessee's Institute for Public Service. Created in 1949, MTAS provides technical assistance to cities and towns across the state. MTAS has offices in Jackson, Nashville, and Martin. The central office is on the Knoxville campus of The University of Tennessee. At its creation, MTAS was given the mission of aiding Tennessee

cities in:

- establishing goals, objectives, and policies
- weighing alternative courses of action
- allocating resources to effectively serve its citizens
- conducting research on matters of interest to cities

The Tennessee Municipal League, which supported legislation creating MTAS, is governed by cities, with municipal officials serving as board members. MTAS works in cooperation with the Tennessee Municipal League to provide technical assistance in these areas:

Engineering and Public Works—Consultants provide city officials with information and operational know-how in the areas of refuse collection and disposal, drainage management, street and pavement management, and snow and ice removal.

Environmental Technical Assistance—Environmental consultants give assistance to Tennessee cities and counties in hazardous waste cleanup projects.

Finance and Accounting—Consultants in this specialty area assist city officials in effective management and utilization of available fiscal resources.



Law—MTAS attorneys assist city officials in all areas of municipal law. Services include writing legal opinions, preparing and revising city charters, providing sample ordinances, and updating codes.

Municipal Management—Municipal management consultants are often the city's first point of contact with MTAS. These professionals work one-on-one with city administrative officials in areas including risk management, financial planning, strategic planning, municipal organization, and annexation.

Municipal Technical Advisory Service

Resource and Information Management—The MTAS library is a clearinghouse for information produced by and about cities, providing reference, information transfer, and research services in all aspects of municipal government.

Utility Management Consultants—Utility management consultants assist cities in management and operations of their wastewater treatment facilities. The consultants' backgrounds are in engineering, finance, and management.

MTAS Funding

MTAS' budget for 1988 is approximately \$2.2 million. MTAS is funded from three sources:

- from the cities share of the state sales tax—33%
- from the state through UT—45%
- from state grants—22%

State grant funding to MTAS began in 1984 when TDHE contracted with MTAS to provide utility and financial management assistance to cities. Since then, TDHE has contracted with The University of Tennessee to provide technical assistance to cities and

counties involved in cleanup of hazardous waste sites.

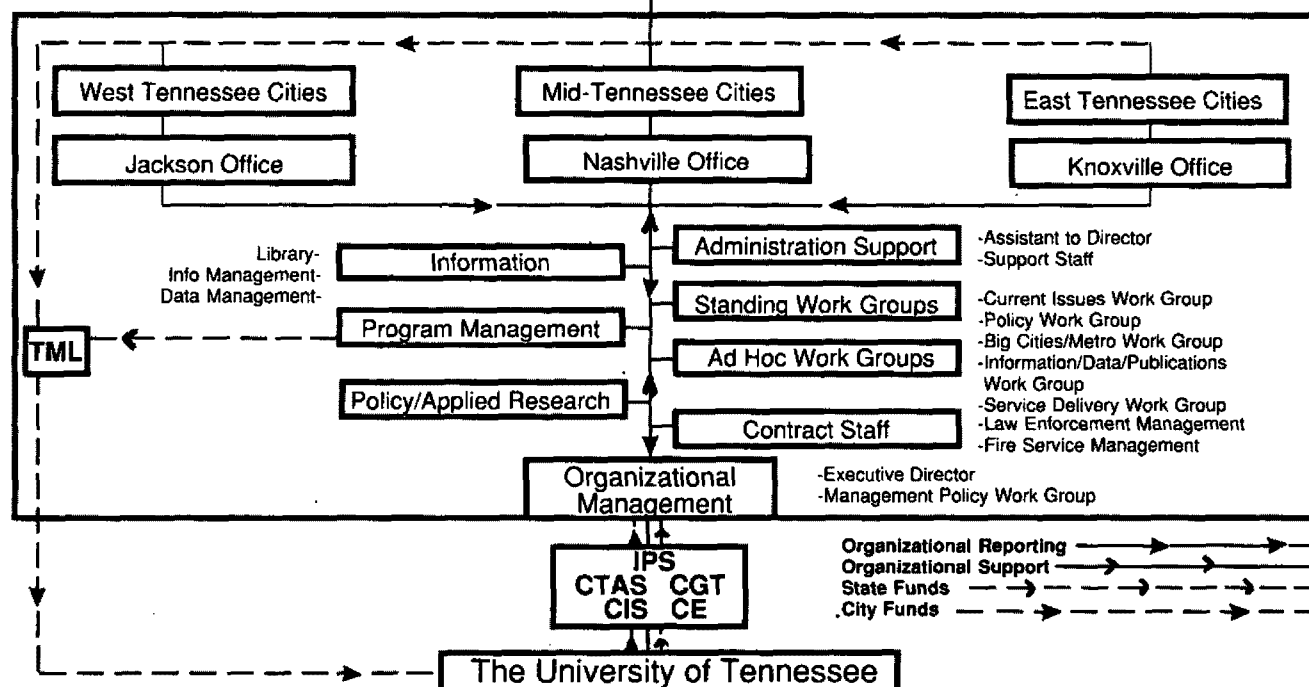
The Institute for Public Service and Statewide Division of Continuing Education

MTAS is one of seven divisions which form The University of Tennessee's Institute for Public Service and Statewide Division of Continuing Education (IPS/CE).

As a federal land grant institution, UT has a three fold mission of instruction, research, and public service. IPS/CE is an outreach organization fulfilling UT's public service mandate through offices in Johnson City, Cookeville, Knoxville, Nashville, Jackson, and Martin. The central office for IPS/CE is on the Knoxville campus of The University of Tennessee.

Other IPS/CE agencies include the Center for Government Training, Center for Industrial Services, County Technical Assistance Service, Center for Educational Video and Photography, Center for Extended Learning, and Radio Services.

MTAS ORGANIZATIONAL CHART



Case Studies

MTAS utility management consultants work on a variety of projects. The following case studies illustrate some of these projects. Projects represented here usually require several hours work and may span a period of months.

Sparta Requests a Water/Sewer Rate Study



Background

In September 1985, Sparta, a thriving middle Tennessee city of 5,000, was awarded a state grant to construct a new wastewater treatment plant and force main. The total construction costs were estimated at \$2.7 million, with the city bearing \$1.4 million. The mayor and town board decided to issue bonds to cover the local share of the proposed improvements.

The Challenge

The consulting engineer anticipated that Sparta should increase rates in order to cover debt service and increased operation and maintenance costs which the project would generate. The engineer asked MTAS to perform a water and sewer rate analysis and propose options for increasing rates.

How MTAS Helped

MTAS worked closely with the City of Sparta's utility manager to obtain water and sewer billing,

rate schedule, audit, and budget information. This information was compiled, and a computerized assessment of the city's current rate picture was generated. From this basic model, several alternative adjustments to the existing rate structure were performed to:

- achieve equity between cost of service and revenue generated
- budget for immediate and future capital expenditures
- plan a strategy for targeting increases in rates

As a result of this work, the city decided to institute a two-step increase. Since several utility districts purchase water from the city, they negotiated with the utility districts to increase rates. Later, the city plans to raise rates for all other users through a uniform percentage increase.

The estimated increase in new revenue to the City of Sparta from MTAS' recommendations was \$34,000 a year. Cost to MTAS for this analysis was \$3,625.

Linden Seeks Improvements for Wastewater Facility

Background

The new administration which came to the City of Linden in 1986 was forced to deal with the city's sewage treatment problems. Linden is currently served by a 300,000 gallon sewage treatment plant which performs very poorly. The plant was built in 1972 and is approaching the end of its design life. The plant is certainly inadequate to serve Linden's future growth.

The Challenge

The new administration found itself facing a commissioner's order to implement expensive sewage system improvements. Because the commissioner's order cited only the collection system problems of inflow/infiltration, the city was



not placed on Tennessee's priority list for federal or state aid. The commissioner's order required that corrections be made to Linden's sewage collection system, but they were not eligible for grants to help defray costs. The mayor asked MTAS for advice on how to proceed.

How MTAS Helped

A MTAS utility management consultant worked intermittently with the city on this issue over a two year period. During that time, services performed for Linden included:

- attendance at city council meetings to help members understand state enforcement correspondence, outline options, and plan how to overcome sewage treatment plant problems
- demonstrations on how to select professional engineering services
- reviews of engineering agreements
- facilitation of meetings between city officials and TDHE officials
- reviews of engineering reports at city council meetings
- research of financing options
- inspection of the sewage treatment plant and formulation of recommendations for improvements
- frequent communication with the mayor and consulting engineer on the status of plant improvements

Because of Linden's willingness to work through the state regulatory system and move ahead with needed improvements, they were placed on the state priority list in October 1987. Thus, Linden became eligible to receive grant funding. Linden was one of the last cities in Tennessee to receive a planning grant to develop a 201 Facilities Plan. The consulting engineer has submitted a 201 Facilities Plan. Hopefully, Linden will be awarded a grant early in FY 1989.

Thus far, MTAS consultants have invested approximately 25 hours in this project for a total cost of \$1,250 to aid Linden in improving its sewage treatment system.

Mountain City Confronts Sewage Problem

Background

Mountain City, a picturesque community of 2,300 located in upper east Tennessee, serves its citizens' sewage treatment needs through an oxidation ditch sewage treatment plant.

The Challenge

The city asked MTAS to help evaluate a solids handling problem at the sewage treatment plant.

Although the plant was fairly new, operators were concerned that a backlog of solids would result in permit violations. Also, the city sought recommendations on ultimate disposal of sewage sludge.

How MTAS Helped

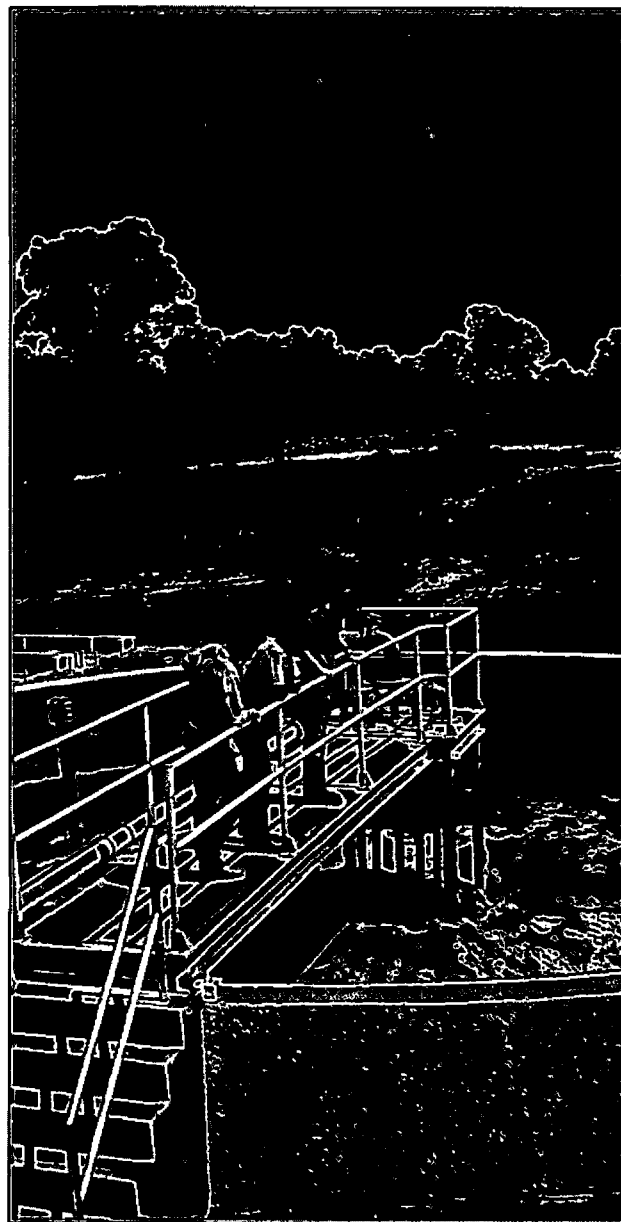
An MTAS utility management consultant visited Mountain City's sewage treatment plant to talk with city officials and sewage system operators. After a study of plant operating records and plant design plans, and discussions with the city's consulting engineer and state regulatory personnel, MTAS made several recommendations to Mountain City on handling of sewage solids.

Included among MTAS recommendations were:

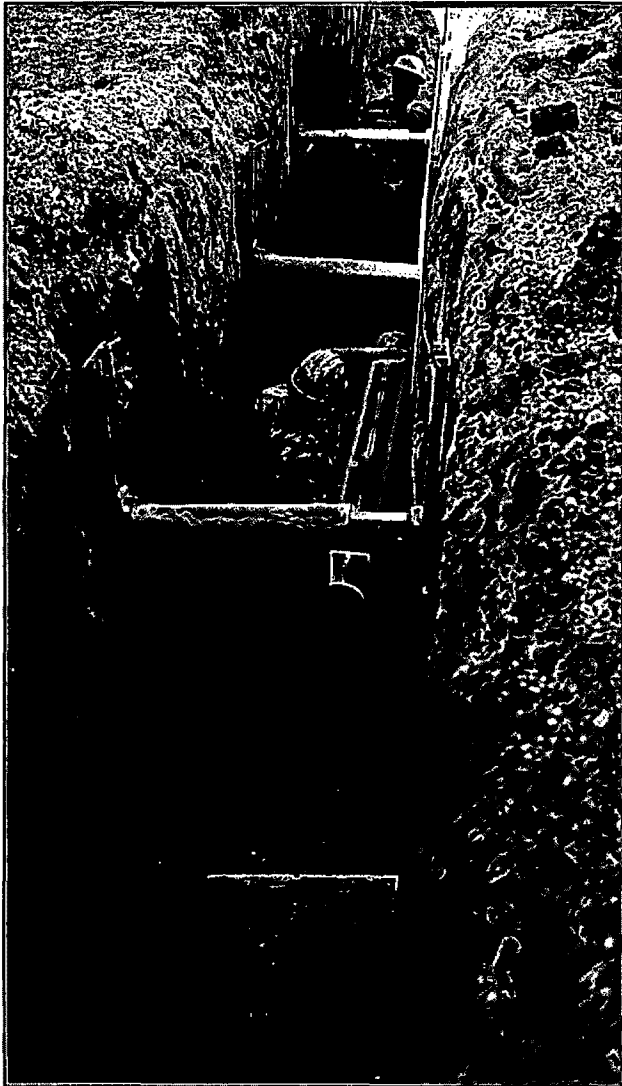
- the city should contract for portable belt dewatering of sewage sludge to immediately reduce the solids inventory prior to winter weather. MTAS helped locate and cost compare this service
- more digester volume would be desirable to increase sludge detention time, provide volatile solids reduction, and to increase stabilization. Since volume was available in an unused basin (part of the old plant components), MTAS recommended the city consider converting it to an aerobic digester/sludge holding tank
- reducing grease would enhance solids concentration and sludge dewatering
- polymer should be added to enhance sludge dewatering
- the depth and characteristics of the sand used on the sand drying beds was questionable and needed evaluation

Regarding the problem of ultimate sludge disposal, the MTAS consultant evaluated four disposal alternatives for cost effectiveness and outlined how to obtain state regulatory approval on the best two options.

Prior to MTAS involvement, Mountain City officials were considering an expenditure of about \$200,000 for a sludge dewatering press. MTAS' evaluation recommended that the city pursue some inexpensive alternatives instead. Potential savings to the city could be as much as \$100,000.



Atwood's Commitment Results in Success



Background

The town of Atwood is located on U.S. Highway 79 approximately six miles northeast of Milan in west Tennessee. The community has shown a steady growth since 1950, and it currently has a population of 1,200. This growth spurred commercial and residential development. The town provided water to those new developments with a city owned and operated water system. However, sewers were not available. On-site septic tank/drainfield systems were installed for each homeowner and commercial development. These on-site systems began to fail shortly after they were installed.

The Challenge

The new mayor and board of aldermen, which were inaugurated in September 1981, faced many problems. The most pressing problems were health risks caused by raw sewage in ditches. This condition was due to an 85% septic tank/drainfield system failure rate. The mayor and aldermen immediately sought funds for construction of a new sewer system. Because of the high septic tank system failure rate, Atwood was placed high on TDHE's priority list for EPA funding.

How MTAS Helped

During application processing by TDHE, Atwood faced another obstacle. TDHE determined that the engineering agreement was not acceptable to EPA because the town had not procured engineering services in accordance with EPA requirements. The mayor and board asked MTAS to guide them in their acquisition of an engineer. With MTAS aid, the mayor appointed a selection committee. After qualifications and proposals were received, MTAS assisted the committee in the review of the contract and in negotiations with the engineer.

The selected engineer began preparation of plans and specifications immediately. Plans and specifications were completed and submitted to TDHE for approval in 1985. While those documents were being processed by TDHE, the town began easement acquisition. Since the project was a small diameter collection system utilizing individual homeowner septic tanks for treatment, easement acquisition was a major undertaking. MTAS worked with town officials and the consulting engineer to develop an acceptable easement acquisition method. MTAS also guided town officials in arranging local share financing for the project.

Bids were taken for the proposed project in July 1986. The bids were higher than project estimates. However, the mayor, board, and citizens of Atwood again pledged their support to the project by applying for and receiving additional funds from EPA. Finally, a contract for construction of a \$1.7 million project was awarded in October 1986. The project is underway and will be finished in 1988. The cost to MTAS for providing technical assistance was \$2,000.

Gibson Meets Challenges in Developing Innovative Process

Background

The Town of Gibson is located between Humboldt and Milan in west Tennessee. The population of 458 has remained relatively stable over the last several years.

Gibson was one of the first towns in west Tennessee to receive EPA funding to upgrade its wastewater treatment system. Local share financing was through a loan from the Tennessee Local Development Authority (TLDA). In 1982, the town began construction of an innovative sewage treatment system. The treatment system consisted of a lagoon and spray irrigation. No discharge to surface water was anticipated.

The Challenge

From 1982 through mid-1987, several problems developed with Gibson's new sewage treatment system. When a new town administration was inaugurated in July 1987, the system status was surveyed. The following deficiencies were noted.

- the spray irrigation system was malfunctioning. Parts of the application site did not have sod coverage. This allowed overland flow with subsequent discharge to a stream
- there were questions about whether the lagoon capacity could accommodate inflow and infiltration flows
- the contract time on the project had been exceeded by the contractor
- the town still owed the contractor \$13,000. The contractor had threatened to sue for the balance and interest
- the town still owed the engineer \$7,700. Since the engineer had not been paid, he had ceased to render services to the town
- Gibson had no funds with which to pay these bills

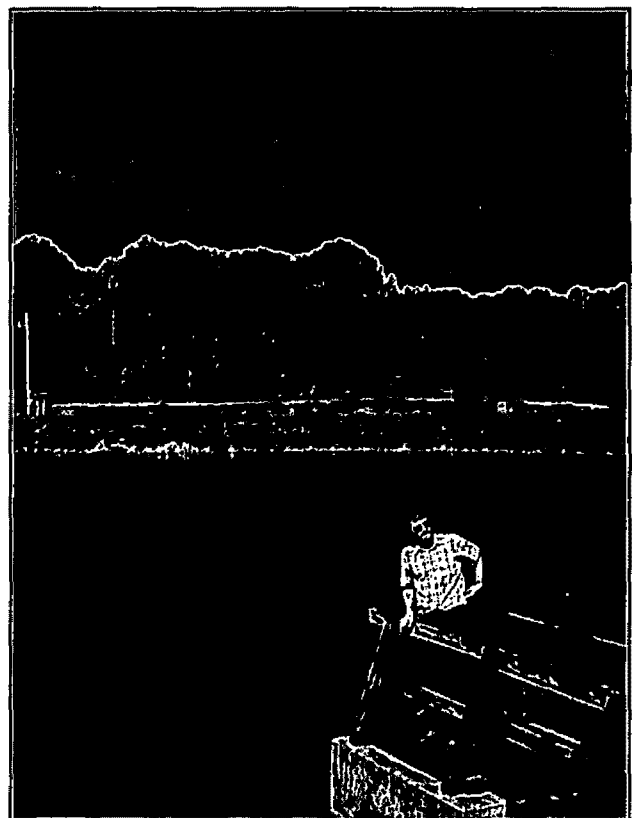
How MTAS Helped

MTAS consulted with the mayor. The mayor took decisive action to eliminate problems associated with the town's sewage treatment system. The

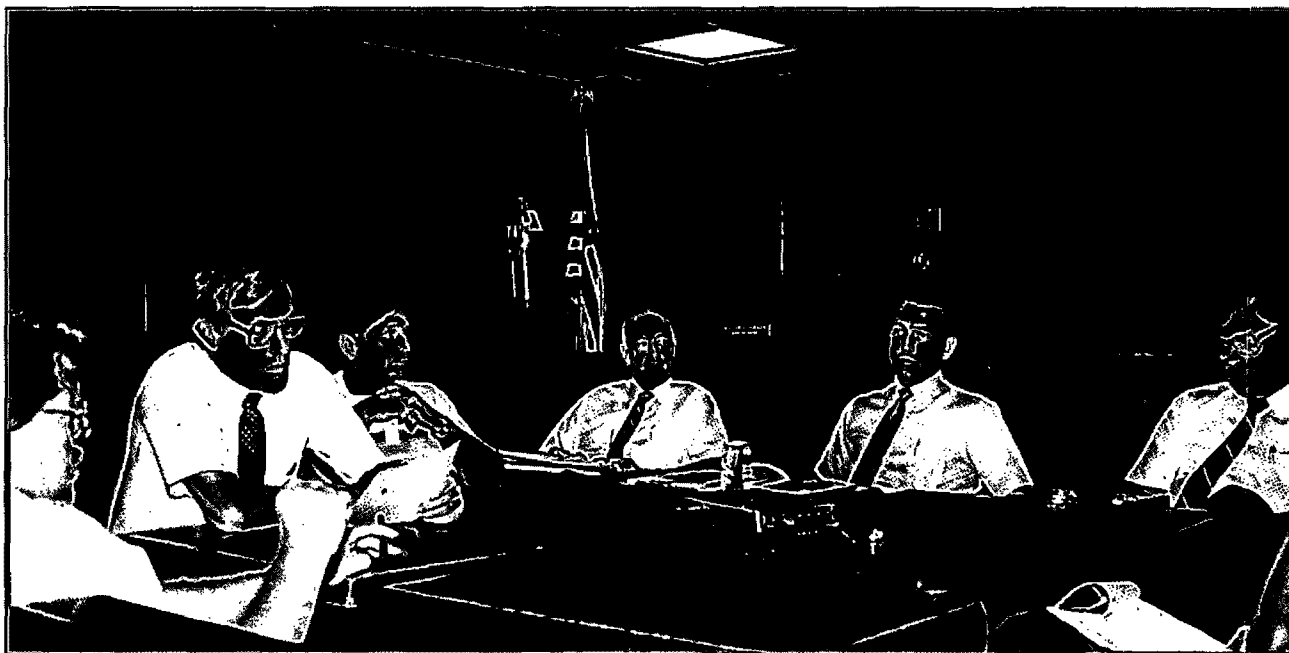
following has been accomplished:

- the mayor is administering the operation of the plant. Improvements have been made to prevent effluent from entering the stream
- a meeting was held with the engineer to discuss the project and to review his fee. An agreement was reached, and the engineer helped to verify the amount owed to the contractor
- the mayor and board have agreed to pay outstanding balances to the engineer and contractor
- the town requested an additional loan from TLDA. TLDA agreed to provide additional funding if the town adopted rates to cover operation and maintenance indebtedness, and depreciation

MTAS is developing a financial assessment of the town's water and sewer operations. The assessment will propose rates to satisfy TLDA's requirements. Cost to MTAS thus far is \$3,800.



Munford Pursues Cost Effective Solution



Background

The City of Munford, which is north of Memphis, is experiencing rapid growth. The existing population is 2,600. The population by 1995 is expected to be 3,900. The 201 facilities plan for the area proposed a dual collection system for Munford and Atoka, a small neighboring town. One treatment plant, to be located at Munford, was planned to serve both municipalities.

The Challenge

The project became stalled because of unresolved issues between the two municipalities and because Munford leaders did not concur with the 201 facilities plan's selected alternative. The city needed a plan to move this sewage treatment project forward.

How MTAS Helped

Munford's mayor requested MTAS help. MTAS recommended that a project management committee be formed by the mayor to address the issues that had stagnated the project. The committee was appointed and became active in December 1985. It consisted of key city officials, the consulting engineer, and MTAS as an ex-officio member.

The committee directed the engineer to re-examine

alternatives for treatment. Specifically, they requested that the alternative for pumping effluent from the city's existing conventional lagoon to a discharge point in the Mississippi River be re-evaluated.

In early 1986, the engineer presented his evaluation to the committee. Based on cost effectiveness, the committee recommended to the mayor and board that the best treatment alternative for the city would be to upgrade their existing lagoon and pump flow from that system to a discharge point in the Mississippi River. The mayor and board accepted the recommendation and authorized the engineer to proceed with plans and specifications.

Next, MTAS worked with the committee to develop an intermunicipal agreement for Munford to present to Atoka. The intermunicipal agreement has been presented to Atoka, and the two municipalities have conducted discussions. However, an agreement has not been finalized.

Disagreements over the route of the force main and the discharge point have brought the project to a halt. The city is now working with the U.S. Army Corp of Engineers and TDHE to resolve these issues.

MTAS has worked 39 hours on this project over the past several months. Total cost to MTAS has been \$1,950. The city will save \$80,000 if the revised selected alternative is implemented.

Elizabethton Overcomes Odds

Background

Elizabethton, the seat of Carter County, is located in upper east Tennessee at the confluence of the Watauga and Doe Rivers. Organized under a modified city manager-council form of government, Elizabethton has a population of more than 12,000. When Elizabethton requested MTAS assistance in 1987, the city was under a commissioner's order for industrial and commercial pretreatment violations. The city was faced with funding \$35,000 in fines for these pretreatment violations. It was also evaluating improvements to its 30-year-old sewer treatment plant.

The Challenge

Looking for both immediate and long term solutions to pretreatment and wastewater issues, the city manager appointed a wastewater task force. The eleven members appointed to this task force represented city staff, city council, legal staff, MTAS, TDHE, area businesses, and the city's consulting engineer. The task force was asked to:

- determine options that the city had in dealing with their commissioner's order
- identify methods of payment for new wastewater construction
- provide recommendations on how the city should proceed

How MTAS Helped

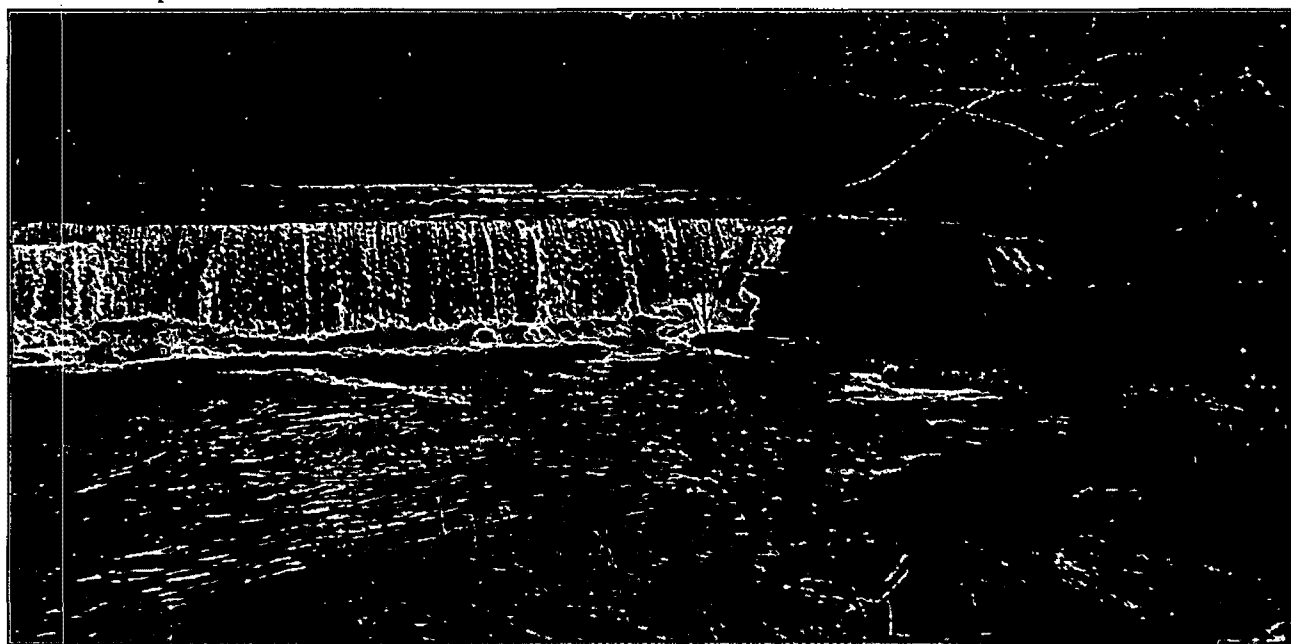
Local legislation was enacted to encourage and enforce pretreatment compliance. MTAS, working with the city's consulting engineer, reviewed planned design and management options to improve the efficiency of the existing sewer treatment plant. Plant improvements were estimated at \$2.3 million.

After solutions to the pretreatment violations were identified, and improvements to the sewer treatment plant were designed, the main issue became—how would Elizabethton pay for these fines and improvements?

MTAS was requested to complete a financial analysis of the city's wastewater system. This analysis included an examination of audited financial statements from 1984 through 1987. By projecting financial statements from 1987 through 1991, the city council was able to make informed budgetary decisions.

Task force recommendations outlined options for: dealing with the commissioner's order; engineering plans for facilities improvements; and financing solutions. Council accepted these recommendations and sought a 10% increase in utility rates. Elizabethton is pursuing a \$1.6 million EPA grant and a \$500,000 Community Development Block Grant.

Cost to MTAS for work completed was \$6,200.



Accomplishments

During the past few years, Tennessee has been very successful in providing quality wastewater treatment service to a growing population. A combination of efforts—enforcement of water quality standards and National Pollution Discharge Elimination Systems (NPDES) permits, the availability of grant and loan dollars, growth pressures, and MTAS' wastewater technical assistance efforts—have all contributed to this success. In many ways, it has been a team effort.

In 1984, when MTAS wastewater technical assistance came on the scene, 87 of the state's 252 publicly owned wastewater treatment plants were not in compliance with their NPDES permits. By 1986, TDHE had issued 23 commissioner's orders to some of those violators; 27 systems had moratoriums preventing further sewer connections. At the end of 1987, 142 systems had commissioner's orders and 16 of those 142 had been put on court mandated compliance schedules (judicial orders) to make improvements and 23 systems still had moratoriums.

Fortunately, during this period, EPA and state grant dollars were available to assist many municipalities seeking to upgrade their treatment systems. In FYs 1985, 1986, and 1987, \$107 million were granted to 91 different municipalities and utility districts to improve wastewater facilities.

As the case studies presented here illustrate, MTAS utility management consultants were key elements in TDHE's grants success story. The success of MTAS' local government technical assistance program can be linked directly to a results oriented emphasis. What has set the UT/MTAS technical assistance experience apart from other types of outreach programs? Observers believe that it is the ability to acquire staff with proven local government field experience and to provide this staff with the technical resources required to produce these results: client trust, professional credibility, and cost effectiveness.

Client Trust

MTAS has developed a unique relationship through the years with Tennessee cities. It is a relationship based on confidentiality, trust, and reliability. This relationship has enabled MTAS to play a critical role in small to medium-sized cities.

Professional Credibility

MTAS consultants have become like staff consultants to Tennessee municipalities. The MTAS

consultant is seen by cities as a credible, neutral third party advisor whose recommendations are based on professional experience.

Cost Effectiveness

MTAS tracks cost effectiveness through a management information system which documents the value added or cost saved to the municipalities for MTAS services rendered.

Table 1 lists municipalities which received federal and state grants for wastewater facility construction in 1985, 1986, and 1987. MTAS utility management consultants provided technical assistance to 93% of those municipalities. The estimated cost savings (or value added) as a result of MTAS involvement was 8.4 million dollars.

In all, MTAS utility management consultants worked in 130 different municipalities in 1985, in 177 in 1986, and in 162 in 1987 on a variety of wastewater problems. In addition, these consultants provided training in sewer system rehabilitation, construction claims and conflicts resolution, financial capability evaluation, enterprise accounting, budget workshops, and general management. This training was open to all Tennessee municipalities.

MTAS utility management consultants provided 16,000 manhours of service and documented a total of 21.7 million dollars in cost savings (or value added) during this three-year period. TDHE's investment for MTAS' services during 1985-87 was \$700,000. The ratio of dollars added or value saved to dollars expended was 32:1.

While it is important to be able to show accomplishments in statistical terms, a significant impact of MTAS' work with cities is often evident in less tangible ways. These less tangible ways include: improved communication between state regulatory officials and municipal officials, improved management at the city's sewage treatment plant, increased environmental awareness, and a willingness of city officials to become involved in finding resolutions to environmental issues.

The future of technical assistance in Tennessee and in the nation is dependent upon this principle: service to, and in the best interest of, the client first, not the state. In Tennessee, as in other states, the interest of local government is not always the same as the state's. Technical assistance efforts funded by state government must be designed to insure that the contractor has a clear understanding of whose interest or authority they represent. This can only be done by clearly written contracts or legislation.

Outlook

Although the MTAS Wastewater Technical Assistance Program has made great strides during its first three and one-half years, many challenges remain. The future for technical assistance or outreach programs is tremendous. There is a demand for objective advice and assistance. With industrial and population growth, cutbacks in federal funding, and the current condition of our infrastructure, local government simply must work smarter. In addition to keeping on track with wastewater technical assistance delivery, MTAS is challenged to provide assistance to municipalities in

other environmental areas. Municipalities must be prepared to address on-site sewage disposal systems in unsewered areas, stormwater discharge, groundwater protection, and solid and hazardous waste disposal.

These environmental problems are complex. They cross political boundaries and require a variety of expertise. MTAS, working in co-operation with local and state government and the resources of The University of Tennessee, can make a positive impact on a better environment for Tennessee.

Tables

FY1985 Grants for Wastewater Facilities

<u>CITY</u>	<u>TYPES OF GRANTS</u>	<u>AMOUNT</u>	<u>\$ADDED OR SAVED</u>
ATOKA	EPA & STATE	\$ 912,569	\$ 70
BETHEL SPRINGS	EPA & STATE	938,726	930
BOLIVAR	STATE	591,093	330
BRENTWOOD	EPA	478,077	1,000,375
BRIGHTON	EPA & STATE	1,943,206	155
BRISTOL	EPA	4,389,963	4,400
CLARKSBURG	STATE	567,640	325
CLEVELAND	EPA	6,655,338	650
COWAN	STATE	1,066,567	250
GALLAWAY	EPA & STATE	295,745	165
CLEASON	EPA & STATE	158,088	570
HENDERSON	STATE	729,801	80
HOHENWALD	STATE	1,508,323	2,770
JELICO	STATE	730,797	1,567,635
LAVERGNE	STATE	2,991,743	4,715
MANCHESTER	STATE	2,995,100	2,000
MASON	EPA & STATE	151,652	145
MOUNT CARMEL	EPA & STATE	2,556,994	348,170
MUNFORD	EPA	498,493	83,785
OBION	EPA	113,867	670
PARSONS	STATE	742,066	270
RIDGELY	EPA & STATE	313,868	320
RIPLEY	EPA & STATE	3,621,070	505
ROGERSVILLE	EPA	516,441	93,485
SARDIS	EPA & STATE	477,992	5,170
SELMER	EPA	1,426,252	1,170
SPARTA	STATE	1,476,015	6,000
TREZEVANT	EPA	274,386	2,28
		<u>539,121,872</u>	<u>\$3,127,390</u>

FY1986 Grants for Wastewater Facilities

<u>CITY</u>	<u>TYPES OF GRANTS</u>	<u>AMOUNT</u>	<u>\$ADDED OR SAVED</u>
ADAMSVILLE	STATE	\$ 312,872	\$ 220
ALAMO	EPA	615,342	725
ARLINGTON	EPA & STATE	458,468	360
BLAINE	EPA	943,637	6,650
BOLIVAR	EPA	43,779	0
BROWNSVILLE	STATE	1,895,978	2,250
BRUCETON	EP	424,900	335
CARYVILLE	EPA & STATE	1,802,181	215
CHAPEL HILL	EPA	1,404,126	575
CHEROKEE-HARTSH	EPA	88,212	0
CLEVELAND	EPA & STATE	366,727	3,531,770
CLIFTON	EPA & STATE	729,326	190
COOKEVILLE	STATE	1,175,681	145
CUMBERLAND U.D.	STATE	2,021,377	0
DECATURVILLE	STATE	758,303	135

FY1986 Grants for Wastewater Facilities ... continued

<u>CITY</u>	<u>TYPES OF GRANTS</u>	<u>AMOUNT</u>	<u>\$ADDED OR SAVED</u>
DUNLAP	STATE	\$ 979,686	\$ 740
EAGLEVILLE	STATE	966,110	325
ERIN	EPA	597,053	160
ERWIN	EPA & STATE	1,655,297	500,735
ETOWAH	EPA	143,121	4,650
FAIRVIEW	EPA	1,346,185	265
FAYETTEVILLE	EPA	1,996,409	935
GLEASON	EPA	22,521	570
GREENFIELD	STATE	361,697	825
HARRIMAN	EPA	1,482,289	495
HENDERSON	STATE	398,073	80
HENNING	STATE	365,856	740
HUMBOLT	STATE	2,512,118	710
JOHNSON CITY	STATE	358,038	2,745
KINGSTON	EPA	1,591,789	11,395
LAFOLLETTE	STATE	4,419,769	315
LAWRENCEBURG	EPA	1,614,337	1,255
LEWISBURG	STATE	631,926	570
LUTTRELL	EPA & STATE	2,655,757	2,240
MARTIN	EPA	22,162	570
MEDINA	EPA	322,833	200
MCKENZIE	STATE	209,306	0
MILAN	STATE	586,295	1,410
MILLERSVILLE	STATE	1,169,220	205
NASHVILLE	EPA	5,448,794	4,225
NEWBERN	EPA & STATE	865,800	3,180
NEW JOHNSONVILLE	EPA	842,006	410
OLIVER SPRINGS	EPA	149,905	610
ONEIDA	STATE	1,245,189	390
PARIS	EPA	408,564	135
PARSONS	EPA	62,865	1,400
PURYEAR	STATE	622,367	3,450
RIPLEY	EPA	175,065	3,850
ROCKWOOD	EPA	192,377	0
RUTHERFORD	STATE	168,979	180
RUTLEDGE	STATE	232,739	177,130
SHARON	STATE	358,935	1,040
SOUTH FULTON	EPA	645,609	580
TENNESSEE RIDGE	EPA	545,357	2,320
TRIMBLE	EPA & STATE	443,209	615
WHITEVILLE	STATE	245,353	680
		<hr/>	<hr/>
		\$51,788,997	\$4,275,680

FY1987 Grants for Wastewater Facilities

<u>CITY</u>	<u>TYPES OF GRANTS</u>	<u>AMOUNT</u>	<u>\$ADDED OR SAVED</u>
BAXTER	EPA	\$ 645,424	\$ 3,200
CARYVILLE	EPA	2,680,662	215
CELINA	EPA	1,060,138	235
COWAN	EPA	104,182	280
DAYTON	EPA	1,108,268	400
DRESDEN	EPA	47,075	5,210
ETOWAH	EPA	896,406	1,130
FAIRVIEW	EPA	1,943,541	665
GREENBRIER	EPA	567,014	825
HUNTSVILLE	EPA	527,134	31,335
MCMINNVILLE	EPA	3,582,819	125
MANCHESTER	EPA	818,668	985
MEDINA	EPA	24,525	245
MIDDLETON	EPA	282,693	3,390
OLD HICKORY U.D.	EPA	1,287,130	0
ONEIDA	EPA	102,760	390
RED BANK	EPA	1,033,466	81,740
SPARTA	EPA	146,638	456,827
SOUTH FULTON	EPA	126,249	423,500
WARTRACE	EPA	642,178	1,750
		<hr/>	<hr/>
		\$17,626,970	\$1,009,247

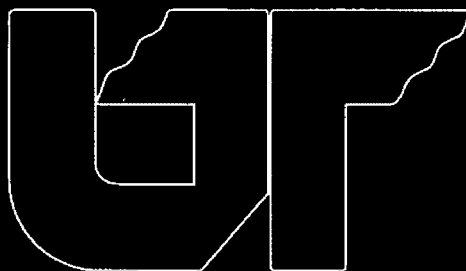
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