NBP-91-72

Financing Volume II: Beneficiary-Based Financing for Local Enforcement of Soil Erosion, Sedimentation Control, and Stormwater Management Regulation; The Stormwater Management Utility: A Guide to Planning for the Narrow River Watershed, RI; and An Examination of the Financing of Improved Wastewater Treatment in Cranston, Warwick and West Warwick, RI 116 pp

Apogee Research

Narragansett Bay Estuary Program

FINANCING VOLUME II

Prepared by:

Apogee Research
Bethesda, Maryland
January, 1990

- Beneficiary-Based Financing for Local Enforcement of Soil Erosion, Sedimentation Control, and Stormwater Management Regulations

- The Stormwater Management Utility: A Guide to Planning for the Narrow River Watershed, Rhode Island

- An Examination of the Financing of Improved Wastewater Treatment in Cranston, Warwick, and West Warwick, Rhode Island

#NBP-91-72

FOREWORD

The United States Congress created the National Estuary Program in 1984, citing its concern for the "health and ecological integrity" of the nation's estuaries and estuarine resources. Narragansett Bay was selected for inclusion in the National Estuary Program in 1984 , and the Narragansett Bay Project (NBP) was established in 1985. Narragansett Bay was designated an "estuary of national significance" in 1988. Under the joint sponsorship of the U.S. Environmental Protection Agency and the Rhode Island Department of Environmental Management, the NBP's mandate is to direct a program of research and planning focussed on managing Narragansett Bay and its resources for future generations.

The NBP will develop a draft Comprehensive Conservation and Management Plan (CCMP) by December, 1991, which will recommend actions to improve and protect the Bay and its natural resources.

The NBP has established the following seven priority issues for Narragansett Bay:

- management of fisheries
- nutrients and potential for eutrophication
- impacts of toxic contaminants
- health and abundance of living resources
- health risk to consumers of contaminated seafood
- land-based impacts on water quality
- recreational uses

The NBP is taking an ecosystem/watershed approach to address these problems and has funded research that will help to improve our understanding of various aspects of these priority problems. The Project is also working to expand and coordinate existing programs among federal, state and local agencies, as well as with academic researchers, in order to apply research findings to the practical needs of managing the Bay and improving the environmental quality of its watershed.

This report represents the results of investigations funded by the United States Environmental Protection Agency under Contract # 68-03-3514; Sub-Contract # 3514-05 with Apogee Research. **These results are preliminary and are presented to the reader in their draft format. This report has not undergone the Agency's and the NBP's peer and administrative review. The results and conclusions contained herein are those of the author(s), and do not necessarily represent the views or recommendations of the NBP. The interested reader is encouraged to investigate additional sources of information and should not necessarily consider these investigations comprehensive syntheses of the existing data on the subjects.** Apogee Research performed five (5) investigations, which are available through the Narragansett Bay Project in two volumes: NBP-91-71 and NBP-91-72.

BENEFICIARY-BASED FINANCING FOR LOCAL ENFORCEMENT OF SOIL EROSION, SEDIMENTATION CONTROL, AND STORMWATER MANAGEMENT REGULATIONS

TABLE OF CONTENTS

INTRODUCTION: BENEFICIARY-BASED FINANCING FOR SOIL EROSION, SEDIMENTATION CONTROL, AND STORMWATER MANAGEMENT REGULATION

Regulatory controls associated with stormwater management and soil erosion may, for funding purposes, be divided into two categories: those involving publicly-owned projects, such as highways or public buildings, and those involving private development, such as residential subdivisions. For equity reasons, the financing sources for these two classes of controls ought to be different. With publicly-owned projects, the assumption may be made that all taxpayers jointly demand and benefit from these projects, and thus should be called on to support their associated environmental controls. It is therefore appropriate for local governments to draw on public resources when developing comprehensive plans and budgets to fund these activities.

Stormwater management and soil erosion controls associated with private development also require proper public oversight to ensure their compliance with sound environmental management practices. However, these are not publicly created needs but are the result of private initiatives, such as the decision to develop a piece of land. Therefore, oversight and enforcement duties associated with these projects are more equitably financed by those specifically requiring this service (i.e. the developer), rather than shifted onto all taxpayers through general revenue funding, which provides most of the budget resources for regulatory efforts. As has been seen in a number of places around the nation, beneficiary-based financing of this sort can be achieved by directly charging developers for government services provided, including permitting, site review, and inspections.

This report is intended for use by local government officials in Rhode Island facing decisions about how to finance programs to administer and enforce soil erosion, sedimentation control, and stormwater management activities vital to protecting water quality in the Narragansett Bay and its tributaries. It examines how stormwater management and soil erosion control activities associated with private development in Rhode Island are currently financed at the state and local levels, and outlines a series financing options for use by local governments to fund sound comprehensive management programs. In conclusion, case studies of local-level beneficiary-based financing for stormwater management and soil erosion control are presented.

THE STATE ROLE IN FINANCING SOIL EROSION CONTROL AND STORMWATER MANAGEMENT IN RHODE ISLAND

In Rhode Island, the state role in financing the development and enforcement of stormwater management and soil erosion controls has been chiefly in three areas: (1) the development of a non-point source management program; (2) regulatory oversight for a range of permits for related activities[1], and (3) limited financial support of the state's three Conservation Districts. In addition, the General Assembly has provided legislative support for soil erosion and sedimentation control by passing enabling legislation allowing local governments to adopt ordinances governing activities having soil erosion and sedimentation impacts, and supplying a model ordinance to facilitate the drafting process.[2]

The Office of Environmental Coordination (OEC) of the State Department of Environmental Management (DEM) is responsible for preparation of the state's Nonpoint Source Management Program and for coordinating continued nonpoint source activities. In conjunction with a thorough research effort to analyze nonpoint source pollution in Rhode Island and develop effective controls, the OEC has produced two comprehensive reports:

- An Assessment of Nonpoint Sources of Pollution to Rhode Island's Waters

  This report catalogues and assesses nonpoint sources of pollution and their danger to high quality waters in Rhode Island. It identifies stormwater runoff and eroded sediments as important contributors to habitat loss and closure of shellfishing areas in the Narragansett Bay. Furthermore, it predicts that stormwater runoff and soil erosion are likely to increase steadily in the 1990's. In the Bay Basin alone, 400,000 tons of soil per year are currently lost by erosion related to agriculture, and an additional 178,000 tons eroded annually can be attributed to urbanization, principally stemming from construction activity; and

- Governance of Non-Point Source Inputs to Narragansett Bay: A Plan for Coordinated Action

  The Plan for Coordinated Action recommends management practices, control measures, and implementation programs to address the pollution sources identified

---

[1] For example, the state requires Wetlands Permits for review of proposed development in wetland areas, and Coastal Resources Management Council review of proposed alteration to certain classes of land.

[2] To date, fourteen Rhode Island municipalities have adopted these ordinances and another fourteen are in the process of doing so.

in the Assessment Report. The study concludes that preventive and restorative action is necessary by state and local governments to stop further deterioration of the Bay. It provides detailed recommendations for a comprehensive watershed-based management strategy.

Other state-sponsored activities associated with soil erosion and sedimentation control are handled through Rhode Island's three Conservation Districts. Conservation Districts are established by state law and given extensive responsibilities (although no regulatory or enforcement authority) for all types of natural resources within the state. Among their primary responsibilities, these Districts provide technical assistance to landowners, predominantly farmers, regarding conservation issues such as soil erosion and sedimentation control. In addition, they provide an important service to local governments and state agencies by performing site plan reviews for proposed and existing development which focus on soil erosion and sediment control. Although relying on the state for their charters, Rhode Island's Conservation Districts receive negligible state funding and instead draw most of their financial support from seedling sales and from annual federal grants through the U.S. Department of Agriculture. They receive only scant and sporadic funding from the local governments for whom they perform site plan reviews.

OVERVIEW OF LOCAL STORMWATER MANAGEMENT AND SOIL EROSION CONTROLS: HOW THEY ARE FINANCED

Through their responsibilities for land use planning, zoning, and issuing building permits, Rhode Island's local governments hold primary responsibility for stormwater management, soil erosion, and sedimentation control associated with private development. However, local government effectiveness in protecting against harmful development is inconsistent and can vary substantially among localities because each operates under a different set of policies. Coordinated plans among local governments for stormwater or sedimentation control are rare.

With regard to stormwater management, most municipalities do not establish separate program budgets. Capital budgets for stormwater infrastructure are usually included among those for the Highway Department and Water Supply functions. Large-scale capital projects, such as the end-of pipe pre-discharge treatment system currently under construction in Newport, are usually financed with general obligation bonds. Limited money has also been available through the Clean Water Act's Marine Combined Sewer Overflow Program. Newport received $4.6 million in 1988 for the above-mentioned treatment system in conjunction with that program.

The most important mechanisms used for stormwater management and soil erosion control at the local level are zoning ordinances and the issuance of building permits, which allow oversight of proposed site plans and associated control technologies. Both of these activities are typically financed through the municipality's general tax revenues. Newport, Rhode Island, is an exception, dedicating a portion of its water use charges to fund stormwater management and soil erosion control, including inspections and permit review.

Some Rhode Island municipalities have implemented special purpose districts for related purposes, including coastal protection, flood hazard management, aquifer protection, and drainage control. Others, like Narragansett, have adopted a system of "overlay zoning" for sensitive areas that superimposes a groundwater protection zone over the pre-existing zone. Land use restrictions associated with the overlay district have priority over the underlying zone restrictions. In the case of overlay zoning, planning and zoning officials must issue special exceptions in order to allow development within the area. In Narragansett, developers are not charged for the effort required for this service, which can include substantial staff resources.

In fulfillment of the requirements for obtaining a building permit, site plans are required for all proposed development which include features for soil erosion and sedimentation control (during construction) as well as stormwater management (post construction). Typically, local building inspectors determine the adequacy of these plans. For the most part, review fees are charged to private developers for this service, but they are usually minimal, barely recouping any of the costs of staff resources involved in the evaluation. (The proceeds from these fees may even flow directly into the general fund rather than back into departmental resources.) Thus, private development may command public resources to finance the services that it necessitates.

Even more importantly, most building inspectors or others responsible for site plan reviews lack special training in stormwater management, soil erosion, and sedimentation control technologies which is essential to proper oversight. Consequently, many of the municipalities that have passed stormwater or soil erosion ordinances have a "memo of understanding" on file with the regional Conservation District for the review of site plans with regard to soil erosion control and stormwater management. Although they review site plans for adequate controls, Conservation Districts have no regulatory or enforcement authority, operating on an advisory status only. Nor do local governments seem to be filling this role. Following an initial determination of compliance with applicable ordinances, local governments frequently do not inspect sites either during or after construction to proper compliance with the site plan or proper maintenance of stormwater control facilities.

ISSUES RAISED

1. Nonpoint source pollution is a large and growing problem for the Narragansett Bay, much of it due to potent stormwater runoff, soil erosion, and sedimentation.

2. The Rhode Island Department of Environmental Management has studied the problem of nonpoint source pollutants in general, and sedimentation and stormwater management in particular. In addition, they have issued recommendations about management changes that could be made to reduce non-point source pollution in the bay.

3. Some local governments in Rhode Island have responded to these concerns by enacting ordinances and instituting policies to improve stormwater management and soil erosion/sedimentation control. However, inadequate funding, lack of specific training or technical assistance, and poor coordination of activities among watershed municipalities have resulted in inconsistent and often poorly enforced measures to combat these sources of nonpoint source pollution to the Narragansett Bay.

4. To remedy this situation, it is useful to look at sources of funding and organizational structures successful in helping other states strengthen local efforts to improve stormwater management and soil erosion/sedimentation control. This report now turns to financing and organizational options employed elsewhere and their applicability to the problems faced in Rhode Island.

LOCAL FINANCING OPTIONS FOR SEDIMENTATION CONTROL AND STORMWATER MANAGEMENT

When determining the precise mix of revenue sources for local soil erosion, sedimentation control, and stormwater management regulatory programs, the following factors ought to be considered:

- **Does the polluter pay?** Ideally, those whose actions necessitate public oversight or remedy should pay for such in proportion to the need generated by their actions.

- **Can sufficient revenues be generated from the funding source to fully support the program in question?** It is important as well that the funding base is relatively stable in order to allow longer-term budgetary decisions to be made on the basis of projected revenues.

- **Do local governments have adequate legal authority?** Municipalities may need special enabling legislation allowing them to delegate responsibility for example, for stormwater management, to a separate utility. Or to institute a rate system? Or to create regional authorities?

- **Are administrative costs reasonable, or could the service be provided more cheaply in another way?** Program efficiency must be adequately addressed to ensure longevity in the current era of fiscal conservatism and budgetary shortfalls.

At present, most local stormwater management, soil erosion, and sedimentation control activities may be financed through the following sources, either singly or in combination:

1. General Fund financing by means of line items in local budgets.

2. Stormwater management charges administered through a utility or special district.

3. Building permit fees, inspection fees, and other user fees administered through regulatory programs.

It is useful to examine these options with reference to the criteria discussed above and to Rhode Island's situation in particular.

1. General Fund Financing

In Rhode Island, general fund financing is the most common source of funds for stormwater management and soil erosion control activities, both for construction and operation of public facilities and for regulation of private development. Often, capital requirements for these functions may not appear as distinct budget line items but are included instead in highway or sewage budgets. Because they compete for limited funds with other more politically visible projects within these departments (e.g., roads), these activities are often not high priorities for local governments in Rhode Island. The largest source of general fund revenues is the local property tax. Thus, any programs financed with general revenues can be said to be shifted onto the entire body of taxpayers rather than borne by program beneficiaries, unless the entire tax base can be said to benefit equally from the program.

An important limitation of general fund financing is the fact that without specific budgets or departments solely responsible for stormwater management, soil erosion, or sedimentation control, these functions are unlikely to fare well in the competition for limited budget resources. Thus, the general fund may be considered an unstable revenue source as funding levels can change with political priorities. General fund financing can also make it difficult to issue bonds for large capital needs because they are not linked to a specific revenue source.

2. Stormwater Management Charges Administered Through A Utility

Storm and surface water management in Rhode Island have traditionally been funded by general revenues from property taxes. In the past, these have not been viewed as high priorities relative to other local programs and there was little incentive to attempt to raise additional money for stormwater management programs. In recent years, particularly with the forthcoming federal stormwater control regulations, municipal governments have sought to design and finance expanded programs.

Many states have created stormwater utilities to coordinate an expanded program and raise

revenues for stormwater management. Stormwater utility charges, or user charges, are introduced for property-owners based on estimated runoff from their land. Utility rates provide a stable, secure source of funds and are often considered to be more equitable, as user charges can be structured so that the polluter pays more. The charges generally are added to water bills. Developers continue to finance some portion of the utility's activities and special districts often provide funds for stormwater management.

Utilities can exist within prevailing local government structures or as separately created public utility districts. Special districts are separate municipal corporations that operate independently of city and county governments. They can be organized on a regional watershed basis, thereby encompassing all potential sources of pollution to the Narragansett Bay and its tributaries.

While the utility option has not yet been tried in Rhode Island,[3] there are several potential advantages to this approach to financing stormwater management. When properly designed and implemented, stormwater utilities or special districts can satisfy the criteria outlined above. However, the authority granted a utility or special district will determine, in part, its effectiveness. For example, the authority must include the right to perform periodic inspections of private facilities and to effectively enforce performance standards. Omission of this authority would seriously weaken the regulatory effort.

A stormwater utility's ability to generate adequate revenues from its customer base is a function of the size of its jurisdiction, the extent of parcel development, and the rate system chosen. The ability to collect rates across a large area through a regional authority is particularly desirable for rural, sparsely populated areas. Utilities and special districts are generally considered to provide stable sources of revenue as the amount collected through user charges tends to fluctuate very little and rarely drops when it does change. In accordance with the "polluter pays" principle, stormwater utility charges are generally based on the total amount or percentage of impervious area on individual properties and are frequently calculated in terms of single family equivalents, units that equate parcel runoff to the average amount of runoff from a single family residential parcel.

Administrative costs of stormwater utility charges can be very small if billing is done jointly with normal water and sewer charges. The cost of establishing the rate system can be minimized by developing averages of impervious land through sampling and limited surveys rather than actually evaluating each parcel of land. The amount of impervious area per parcel, for the purposes of estimating runoff, generally is correlated with land use. However, to the extent that individual parcel differences in impervious area are masked through the application of average runoff coefficients, the polluter pays principle is compromised. In some cases, utilities will choose to minimize initial start-up costs by relying for the first several years on

---

[3]Such an approach is currently being jointly considered by three municipalities in the Narrow River watershed, Narragansett, North Kingstown, and South Kingstown.

average impervious area measures, phasing in actual per parcel impervious measures after utility revenue streams are in place and established.

One survey of utilities estimated that the costs of establishing utilities ranged from $500 (Roseville, 1984) to $785,000 (Cincinnati, 1984).[4] This translates into $.05 per account in Roseville and $7.82 per account in Cincinnati. Roseville's costs were negligible because the utility was established by city employees and did not require many changes in existing operations. However, their cost calculations did not include staff time -- an estimated 400 hours. Although the survey did not identify specific reasons for differing costs it suggested that a major factor was the costs of developing the billing system, particularly the approach taken to estimating the amount of impervious area per parcel.

3. Permit And Other User Fees Administered Through Regulatory Programs

In conjunction with the "polluter pays" criterion, building permit, inspection, and other user fees should be used to pay for the government services provided in conjunction with site review, permitting, inspection, and enforcement for stormwater management, soil erosion, and sedimentation control. State programs are often financed by fees for services provided, licenses, and other charges linked to development or agriculture, both of which are important contributors to the stormwater and soil erosion problems. At the local level, however, fee structures are weak. Currently, local governments in Rhode Island assess minimal fees in conjunction with site plan review and permitting. The fees that are assessed are not sufficient to cover administrative costs and are often deposited into the general fund rather than used to finance permitting activities. Fines and penalties are not currently a source of revenue. Nor do municipalities have formal enforcement programs beyond requiring developers to post bonds as a condition of acquiring a building permit. None of the local governments surveyed for this report perform inspections of private stormwater facilities after the initial determination of compliance with permit conditions.

The level of revenues generated from fees can be substantial if they are set to cover the costs of particular activities such as site review and permitting. They are most successful as a source of revenue in growing areas. Other activities are more appropriately financed through charges on existing development. For example, ongoing operation and maintenance of public stormwater facilities, general planning, and large capital investments in facilities are for the benefit of existing as well as new users in the larger community.

---

[4]Greg Lindsey, "A Survey of Stormwater Utilities", prepared for the Stormwater Management Administration of the Maryland Department of the Environment, March 1988.

CASE STUDIES

CASE STUDY 1: EXPANDED ROLE FOR CONSERVATION DISTRICTS IN SOIL EROSION AND SEDIMENTATION CONTROL

Location: Hunterdon County, New Jersey

In 1975, the State of New Jersey passed the Soil Erosion Act which established minimum standards for soil erosion and sedimentation control and required, among other things, that an acceptable sediment control plan be in place prior to the start of any construction activity disturbing over 5,000 square feet of soil.[5] The law specified as well that no state funds were to be provided to fulfill this requirement, but that user fees instead were to provide full funding. The responsibility for overseeing this law was placed with the state's 16 Conservation Districts, quasi-state organizations charged with a variety of resource conservation responsibilities.

Conservation District services under the Urban Soil Erosion Control Program are divided into (1) Review and Certification Procedures and (2) Site Inspections. During the Review and Certification phase, specially trained District employees review site plans for adequacy of stormwater management, sediment, and erosion control techniques. Technical advice is provided when needed to bring substandard plans to acceptable levels. Upon being found satisfactory, staff meets with the District Board of Supervisors to recommend issuance of a Certificate of Compliance, receipt of which is in turn a prerequisite to issuance of a construction permit. Once construction has begun, District staff make periodic site inspections as necessary both to ensure compliance with interim erosion control techniques required during construction and to make sure that the long-term erosion and sediment control techniques included in the site plan are correctly implemented.

New Jersey's Conservation Districts have been endowed with significant powers to enforce the erosion control statutes they administer. Two remedies are chiefly used for noncompliance:

- **Stop Work orders.** Conservation Districts have the authority to issue stop work

---

[5]The State of Rhode Island has passed enabling legislation allowing local governments to develop and adopt soil erosion and sediment control ordinances, and has even supplied a blueprint to facilitate the drafting process. These ordinances typically specify design and performance standards for stormwater management, soil erosion, and sediment control both during and after (long-term) construction. At present, fourteen Rhode Island cities and towns have adopted soil erosion ordinances, another fourteen are planning them, and three do not plan any but include soil erosion and sediment control provisions in their zoning and subdivision codes.

orders when needed, although this is not a preferred route because of the possibility of resulting legal entanglements. Generally this is done only for off-site erosion control problems occurring during construction, and usually the threat of District action is enough to secure compliance.

- **Withholding Certificates of Compliance.** By law, completed construction in New Jersey must receive a Certificate of Compliance from the applicable Conservation District before a Certificate of Occupancy may be obtained. Conservation Districts will not issue these until a final inspection has confirmed that stormwater, soil erosion, and sediment control procedures included in the site plan have been correctly implemented.

The Soil Erosion Act of 1975 specified that these activities must receive all their financial support from user fees and none from State sources. This has resulted in the careful development of a fee structure based on several factors, including:

- the size of the area of disturbance;
- the category of construction (e.g., single family subdivision, townhouse, land grading only, etc.); and
- the expected duration of construction activity.

Fees charged to developers for District services have ranged from $125 for a single family home to $11,000 for a subdivision. Fees for the same service can vary among Districts in response to the local costs of doing business. The idea is to set fees for each job which reflect the amount of District resources required to comply with state law.

Proper financial management is controlled by a system of accounts which ensures that application fees collected for individual jobs are adequate (i.e., including all reviews and inspections required throughout the project's duration). This requires careful planning, as some projects have lasted as long as eight years, and fees, once established, cannot be readjusted if shown to be too low. As part of these strict financial management practices to ensure proper use of user fees and full self-funding, District employees working in the Urban Erosion Control Program are not permitted to work on other District activities, such as the traditional conservation assistance to farmers, etc.

One District contacted for this study, whose jurisdiction includes all of Hunterdon County, New Jersey, operates its Urban Soil Erosion Program on an annual budget of $270,000 raised entirely through user fees except for a roughly $10,000 annual contribution from the county it serves. This budget covers a staff of 3 inspectors, 2 plan reviewers, and one clerk.

Applicability to Rhode Island

Reflecting increased awareness of the environmental problems associated with soil erosion from construction activity, Rhode Island state enabling legislation now allows local governments to develop and adopt soil erosion and sediment control ordinances and has even supplied a model ordinance as a blueprint. Soil erosion and sediment control ordinances typically specify design or performance standards for stormwater management on the development site, as well as erosion control measures during the period of construction.At present, fourteen Rhode Island cities and towns have adopted these, and another fourteen are in the process. Three additional municipalities, although not planning such ordinances, include soil erosion and sediment control provisions in their zoning and subdivision codes. Table 1 lists of these municipalities.

TABLE 1

STATUS OF MUNICIPAL SOIL EROSION AND SEDIMENT CONTROL ORDINANCES IN RHODE ISLAND	
IN EFFECT:	Burrillville Cranston East Greenwich Foster Glocester Johnston Lincoln North Smithfield Scituate Smithfield Tiverton Warren Warwick West Warwick
UNDER DEVELOPMENT:	Bristol Coventry Cumberland Hopkinton Jamestown Middletown Narragansett Newport North Kingstown Providence South Kingstown West Greenwich Westerly Woonsocket
NO ORDINANCE PLANNED, BUT PROVISIONS FROM STATE MODEL ORDINANCE INCLUDED IN ZONING AND SUBDIVISION CODES:	Charlestown Exeter Richmond

Adequate enforcement of soil erosion and sediment control provisions requires both proper plan reviews prior to construction and site visits during construction to ensure correct application of procedures. Currently in Rhode Island, review of development plans at the local government level is almost totally lacking, as is enforcement of on-site erosion control provisions, largely due to:

- Lack of a standard and routine procedure for conduction reviews of all proposed development;

- Inadequate knowledge of erosion control techniques on the part of local building inspectors, typically charged with oversight of these ordinances; and

- Inadequate funding for carrying out such an approach.

At present, a handful of Rhode Island municipalities submit selected development plans to whichever of Rhode Island's three Conservation Districts the project is located in. The resident District Conservationist, an expert trained in these matters, then conducts a technical review of the proposed permanent on-site stormwater management facilities as well as the soil erosion and sediment control techniques to be used during construction. Unfortunately, compensation of these districts for their services is both woefully inadequate and not borne by developers, coming instead from general municipal funds.

While the Conservation Districts represent a potentially good source of technical advice, site plan review, site inspections, and enforcement, several major changes would need to take place to effect such a system. For one, present compensation must be brought to a level equal to the cost of these services. One possibility for securing this funding is to include an additional fee for site plan review by a Conservation District among the other permit fees paid by developers. While not currently known what size fee would be needed to meet this expense, it should probably be levied on a sliding scale commensurate with the time needed to review the project. At present, no such fees are charged developers.

In addition, if enforcement authority is to reside in the Conservation Districts (possibly an unworkable choice given Rhode Island's tradition of closely guarding local authority)[6], authorizing legislation would be needed at the state level to confer such power.

[6]If trained District personnel are to be doing the site inspections, an efficiency argument can be made for conferring enforcement authority upon them, perhaps as deputies of the local jurisdiction.

CASE STUDY 2: CREATION OF A STORMWATER UTILITY BY A COUNTY

Location: Snohomish County, Washington

Snohomish County, Washington, is located along the shore of Puget Sound, just north of the Seattle metropolitan area. The county is currently experiencing rapid growth and development as the population drifts northward from Seattle. A stormwater utility was first established in the unincorporated areas of Snohomish county in 1981. Utility rates were established in 1983 to fund the detailed planning necessary to develop the specific functions of the utility. However, without specific details regarding the intended functions, the utility was unable to withstand strong opposition from rural residents and was repealed in 1984.

The defeat of the first stormwater utility demonstrated the need for presenting fully developed utility functions and activities to residents of the county. However, the county could not afford to fund the necessary research and planning activities that would allow for the selection of appropriate functions without the additional revenue from the utility rates. Eventually, the pressure of new development and the effect it was having on stormwater runoff led Snohomish County to a unique compromise.

Funds were available only to conduct a small-scale study so it was decided to perform a Regional Detention Siting Study, which concluded that six detention ponds were needed in the unincorporated urbanized portions of the county. On a second attempt to found the utility, the need for capital investment was presented as the basis for its creation. The utility was now accepted by residents, and the Snohomish County Surface Water Management Program was established in July of 1987, serving only the urbanized unincorporated areas of the county. User charges were first implemented in 1988.

At first, the new utility concentrated on constructing the recommended detention basins; later, with increased awareness of the effects of urbanization on water quality combined with a regional recognition of the need to prevent the degradation of Puget Sound, the utility is expanding to address water quality improvement in the area. To expand their role, the utility needed detailed information to develop functions that target nonpoint source pollution control and improve water quality. In response to this need for information the Program not only assumed responsibility for drainage management within its boundaries but became involved in a number of studies and research projects in the county.

Finance

The Snohomish County Surface Water Management Program is funded with a combination of user rates and charges, grants, special assessments, and the county general fund. The total budget averages approximately $3 million, with $1.5 million generated through utility rates.

REVENUE SOURCE	REVENUES
Utility Rates	$1,500,000
County General Fund	120,000
Special Assessments	323,000
Real Estate Excise Tax	280,000
Centennial Fund Grant	150,000
Other Grants	130,000
Average Household Rate (per month)	$1.83

Activities of the Utility

The utility's program involves four types of activities:

- Planning and Research
- Capital Improvement
- Monitoring and Maintenance
- Public Education

Planning and Research

The utility sponsors a number of studies to provide information for planning efforts. Specific activities currently underway include: development of drainage basin plans for several lakes, assisting local groups in developing a watershed action plan, a flood control study, and development of lake restoration and management plans for several lakes. Many of these projects are conducted for areas outside of the utility service area.

Capital Improvements

The utility is currently constructing six detention ponds recommended by the Regional

Detention Siting Study. It also manages the design and construction of facilities that convey or store stormwater throughout the area and of facilities that serve to improve the water quality of the rivers in the area. These include flood control activities and river and stream bank stabilization. The utility has switched its soil erosion approach from that of riprapping troubled stream banks to using vegetation to control erosion.

The capital improvements section is also responsible for responding to complaints about surface water control. The majority of these complaints are in response to the increased instances of flooding and erosion that occur in developing areas. In the first four months of 1989, there were 400 complaints recorded. Each of the complaints is investigated by an engineer authorized to design solutions to whatever problems are encountered. The utility has contracted with the County Roads Department for the installation of any new drainage control facilities that may be required.

Monitoring and Maintenance

The utility is responsible for the maintenance of stormwater facilities. Detention ponds are inspected regularly and the County Roads Department conducts maintenance on a contract basis. The utility is planning to build a disposal facility for the material collected by vactor trucks during the maintenance of detention ponds. This system will decant the liquid and dispose of it in the sewer system and then process the solids in various ways depending upon the level of pollutants present.

The utility monitors rainfall and stream flow in urban areas and will soon expand its program to include water quality testing. This expansion of monitoring activities is expected to allow the program to meet new federal stormwater regulations, as well as guidelines outlined in the Puget Sound Water Quality Management Plan and recommendations from the utility's own planning activities currently underway.

The regulation of new development and requirements for use of Best Management Practices to limit construction site erosion are controlled by the Community Development division of the Snohomish County government. There are no plans to incorporate these activities into the functions of the utility at this time.

Public Education

The utility sponsors a variety of educational activities aimed at fostering public understanding and support of utility objectives. These include preparation and distribution of brochures, staffing of exhibits, and involving local interest groups in the actual maintenance of detention ponds. The utility plans to continue to incorporate educational activities into its functions and responsibilities.

RESULTS

The Snohomish Surface Water Management Program has been successful in finding a solution to a dilemma common in the early implementation stage of a utility: how to fund necessary planning for the utility's functions without access to the revenue stream provided by utility rates once in place. By keeping advance planning to a minimum and focusing it on capital improvements (in this case, on the need for new stormwater detention ponds), the Snohomish Surface Water Management Program was able to emphasize the direct benefits provided by these improvements and thereby generate enough public support to establish the utility and begin to collect rates. The Program then began to install the promised detention ponds while integrating the support for water quality planning and research functions into its activities. The results of studies currently underway in Snohomish County will provide information necessary to support recommendations regarding appropriate water quality activities aimed at improving surface water. The Surface Water Management Program has been so successful in winning community support that its service area was recently expanded to include Lake Stevens, which is currently developing a Lake Restoration and Management Plan with utility assistance.

CASE STUDY 3: CREATION OF A STORMWATER UTILITY BY A CITY

Location: Everett, Washington

Everett, Washington, is a medium-sized city (population 63,000) located near the Puget Sound shore north of Seattle. Subsequent to the development of the Puget Sound Water Quality Management Plan, the Everett City Council decided that strong measures were needed to improve the quality of surface waters in the area and decided to expand their stormwater management program to address these issues. The program's focus was changed from flood control to the effects of nonpoint source pollution on the quality of stormwater runoff.

Everett is typical of many Rhode Island municipalities in that its stormwater management functions had always been located within its Public Works Department, handled in this case by the sewer utility. Part of its funding for flood control activities derived from the sewer use charges paid by residents and businesses. In the spring of 1989, Everett created a separate stormwater utility and although billing continued to be combined with the quarterly sewer bill.

FUNDING

Before expanding the scope of stormwater management in Everett, the average monthly portion of sewer fees going to stormwater management functions was $1.20 per household. Within a year of establishing the utility, monthly household rates increased to $3.40. Developer cash contributions, on the other hand, play a much smaller role in funding the new program, with the emphasis instead on requiring development to supply its own stormwater infrastructure. Formerly, developers were charged fees in lieu of constructing detention ponds; under the new program, the city requires most developments to provide runoff detention facilities such that fees-in-lieu are rarely collected.

Revenue Source	Revenues
User Rates	$1.4 million
Developer Fees	$10,000
Average Household Rate (per month)	$3.40

ACTIVITIES

The functions of the original program served to control the amount of stormwater runoff and to limit flooding. Activities included drainage facility maintenance, the control of new

development to reduce the amount of stormwater produced, and drainage basin planning. Since the creation of the utility, the activities of the stormwater management program have expanded to include functions that address stormwater quality. Three new functions have been added to the program:

- Capital Improvement Projects
- Water Quality Monitoring
- Public Education

Capital Improvement Projects

Capital improvements include construction of regional detention ponds, artificial wetlands, and facilities recommended in drainage basin plans. These projects serve to reduce the amount of disturbance to the natural drainage patterns within developed and developing areas, and to protect sensitive areas from harm.

Water Quality Monitoring

Surface water monitoring is designed to provide information about baseline water flow and trends in water quality, to assist in identifying possible sources of water pollution, and to serve as an indicator of the relative success of nonpoint source controls that have been implemented. Monitoring provides important feedback necessary to change the focus and adjust the activities of the program in the future should this be necessary.

Public Education

Educating the citizens of Everett as to how their activities affect water quality is intended to reduce contamination of surface waters. The increased community awareness resulting from educational and public outreach activities improves public support of the program and eases the implementation of proper nonpoint source control measures. Educational activities include the formation of "Stream Teams" (volunteers who educate local interest groups about the effects of nonpoint source pollution on surface waters), school presentations, development and distribution of brochures, as well as utility-sponsored household hazardous waste collection days.

RESULTS

Although still in the early implementation stages, the expanded storm and surface water management program in Everett has made significant progress in identifying and providing the framework for the functions that should be performed by the utility.

THE STORMWATER MANAGEMENT UTILITY:
A GUIDE TO PLANNING FOR THE NARROW RIVER WATERSHED, RHODE ISLAND

I. INTRODUCTION: THE MOVE TO USER FEE SYSTEMS FOR STORMWATER MANAGEMENT

In the past two decades, financing for solid waste management, water, and wastewater services has shifted to user fee systems in many areas. Stormwater management, however, has largely remained a local general fund program. This too is now changing. Recent trends in land development and environmental management practices have increased the need for proper stormwater management techniques. Already facing limited budgets, local governments have been forced to look to other sources for adequate revenue to support such programs. User fee financing, already successful for water and wastewater facilities, offers a workable funding alternative for stormwater management facilities.

Land development and urban redevelopment usually increase stormwater runoff by creating impermeable areas and changing natural drainage ways. The burden of managing this increased runoff falls mostly on local governments, which have traditionally relied on property tax funds to construct, operate, and maintain stormwater management facilities. Financing public works improvements from the property tax base, whether for stormwater or other needs, has faced increased public resistance in the last decade. The message of recent tax rebellions is that alternative funding means must be found. An effective alternative for stormwater management finance is the creation of a stormwater utility, which relies on user fees rather than tax revenues for funding.

In recent years, stormwater management utilities have been forming very rapidly. It is unclear how many currently operate in the United States, but for example, since 1986, 18 have come into existence in the State of Florida alone with others scheduled to come on line soon. Most public works officials agree that the utility approach is the best way to finance stormwater management. The main reason for their preference is obvious: utilities can generate stable and secure funds. Another important factor, however, is that many officials believe that the utility approach, where user charges are based on one's contribution to the problem, is more equitable than general fund financing from property or income taxes. The American Public Works Association (APWA) has concluded that:

> The user charge and the utility concept are the most dependable and equitable approaches available to local government for financing stormwater management. [1]

As with water and wastewater services, the utility system is user-oriented, with costs allocated according to services received, to the extent these can be identified. Each parcel of land within the utility is assessed a charge based on its stormwater runoff contribution as determined by size, terrain, impervious or paved area, and other characteristics. The idea is to relate user charges to a given individual parcel's stormwater contribution in excess of that

---

[1]American Public Works Association, Urban Stormwater Management. Special Report No. 49, p. 263.

contributed in its natural state. With the utility approach, the benefits of stormwater management are deemphasized, and emphasis is placed on the cause of the problem. Individual property owners are viewed as generators, and the role of government is to control the discharges. To finance the government's activities, property owners pay user charges in amounts proportionate to their discharges. The rationale for the utility approach, therefore, is the "polluter pays" principle. Neither property values and ability to pay nor perceived benefits and willingness to pay are generally considered.

In practice, estimation methods and precision for identifying each parcel's stormwater contribution vary greatly among utilities. As a general rule, the more precise and specific a system is regarding per parcel runoff contribution, the higher its initial implementation costs due to increased data collection requirements. Some utilities balance the goal of parcel-specific rates with the need to limit start-up costs by commencing with a flat rate system and phasing in specific charges after the utility has operated for several years, with infrastructure and revenue streams in place.

As evidenced by their proliferation, storm and surface water utilities are excellent tools for financing proper runoff management techniques, soon to become a major municipal concern as the U.S. Environmental Protection Agency's stormwater discharge rules take effect. Properly designed, such utilities may have the added benefits of encouraging systematic long-term perspectives for stormwater master planning, affording superior compliance monitoring in conjunction with a master drainage plan, and providing incentives for responsible and informed land use decisions by citizens and developers.

This document is intended to provide an initial discussion of issues and considerations germane to forming a stormwater management utility in the State of Rhode Island, particularly one which may serve several autonomous legal jurisdictions for whom this would be the first such joint public works effort. It focuses in particular on legal, administrative, organizational, and financing topics that are anticipated to be of primary concern in a utility's early planning process. Although more detailed information tailored to the specifics of the actual utility is required for implementation, it is hoped that the following work will aid initial consideration of this financing method found useful by many communities today.

II. ESTABLISHMENT OF A STORMWATER UTILITY

A. CHARACTERISTICS LINKED TO PUBLIC ACCEPTANCE

Securing public support for a user fee system to manage stormwater runoff can be a difficult task because the concept is often misunderstood by the public. As one Bellevue, Washington, official put it, "they think we are taxing rain." Compared to other types of public works, the benefits of a drainage system are relatively obscure. For example, prevention of damages (from flooding, erosion, pollution) is much more difficult to understand and value than an unencumbered trip on a new highway, or the convenience of turning on a faucet and drinking clean water. A well-designed public information effort may be necessary to point out the myriad benefits of proper stormwater management.

A successful stormwater management program for a particular community must ultimately be tailored to that community's individual characteristics and needs. In general, however, high degrees of public acceptance and government confidence have been demonstrated for stormwater utilities which integrate the following components:

1.0 ADOPTION OF A STORMWATER UTILITY ORDINANCE

The stormwater utility ordinance identifies the duties of the municipality, the users (property owners), and developers, and sets forth the legal framework for the utility's financing and operation. An equitable system for computing user fees is constructed, as well as a mechanism for establishing developer contributions. A sample of such an ordinance developed by the City of Tallahassee, Florida, is included in Appendix A of this report.

2.0 PREPARATION OF STORMWATER MASTER PLAN CONTROLS

A comprehensive stormwater master plan should be prepared to guide near-term and long-term stormwater management system improvements. Such a plan is also necessary for estimating revenue requirements, coordinating developer contributions, and determining additional capacity needs in new offsite facilities.

3.0 ESTABLISHMENT OF A USER FEE SYSTEM

User charges must be set at rates sufficient to cover the utility's annual operation, maintenance, and debt service requirements. However, if initial rates are set too high, public opposition could eliminate the program. On the other hand, if rates are set too low, insufficient revenues could delay full implementation. To keep rates low, some utilities use fees only to finance operations, administration, and repayment of long-term bonds. The large amount of funding needed for capital improvements is achieved through bonds which are then amortized over time. In Bellevue, Washington, for example, this source of capital allowed initial rates to be kept very low -- about $.80 per month for the average household. The rates were kept at this level for three years to allow the public to become used to the idea of paying a new utility charge for drainage. Even with such low rates, the utility received about 200 complaints in response to its first set of bills. Most utilities do include an orderly appeal process for users who want to contest their charges.

To the extent possible, it may be desirable to develop a user fee system that includes incentives for individual stormwater control activities and which incorporates differential charges according to the quantity of stormwater runoff contributed by a parcel, thus discouraging excessive land clearing and construction of impervious surfaces.

4.0 ESTABLISHMENT OF A DEVELOPER FEE SYSTEM

Developer contributions represent a major source of capital for constructing new stormwater management facilities. There are several options for developer contributions:

- Subdivision dedications require a developer to construct stormwater management facilities and dedicate them to a municipality upon completion of a subdivision.

- Fees in lieu of improvements require a developer to pay an impact fee for the capital improvements needed to service the development or to pay a portion of the cost of a larger project which will assist the subdivision.

- Availability charges recover debt service charges on an already constructed facility which will serve a new development. These may be compared to the connection charges sometimes required to pipe into existing wastewater treatment facilities.

- Developer incentives offer cost savings to developers who use appropriate stormwater management techniques in new developments.

5.0 ESTABLISHMENT OF A PERMIT FEE SYSTEM

Revenue from a permit system applying to new construction and modifications of existing structures may be minimal. However, the system establishes oversight and tight control of all stormwater management projects proposed in the community, facilitating compliance with the master drainage plan.

6.0 IMPLEMENTATION OF A PUBLIC INFORMATION PROGRAM

Local officials in communities having stormwater utilities have indicated that public information programs were helpful, and in some cases critical, to successful implementation, although some utilities have apparently been established without them. Public information programs typically included public meetings, slide shows, and mailings of informational brochures to residents. Some governments enlist the support of established citizen's organizations, create formal citizens' advisory committees, and mail sample bills to residents.

B. STORMWATER UTILITY ORGANIZATIONAL AND ADMINISTRATIVE CONSIDERATIONS

Before a community can decide to proceed with implementation of a storm and surface water utility, a thorough examination of this option must be made. Essential considerations include: the range of services to be provided and the location of responsibility for administering control programs; the utility's organizational structure; its rate structure; and its revenue potential and requirements. This chapter attempts to provide a structured approach to the initial phases of utility planning so that a community may determine whether or not the utility approach is the right choice. Should the decision be made to form a utility, more detailed research and planning will be required. Often at this point, a community will retain the services of a private consultant experienced in stormwater utility planning.

1.0 DELINEATION OF RESPONSIBILITIES

Historically, stormwater management has been inadequate, in part because responsibility for various activities has not been defined clearly. Therefore, planning for a utility often begins with what is sometimes referred to as a "functional requirements study." Such a study involves determination of the scope of activities necessary to manage stormwater and identification of the administrative departments best suited to perform each activity. Functions typically performed by utilities include administration, planning, design and engineering, operations and maintenance, regulation and enforcement, construction, and water quality management. Most communities with utilities take a comprehensive approach to stormwater management, consolidating all these functions within the utility. However, in cases where functions will be shared by several departments, clear specification of responsibility for these activities will help prevent management problems caused by fragmentation. It will also help a utility meet requirements for fiscal accountability.

Utilities are generally operated by or within Departments of Public Works, although this is not always the case. In some communities, a variety of Departments are involved including Finance, Utilities, Environmental Regulation, and Planning and Zoning. A common arrangement is for an agency such as the Department of Public Works to have responsibility for planning, design, engineering, and operations and maintenance, and for the Department of Finance to have responsibility for billing.

2.0 DECISION FOR PUBLIC OR PRIVATE MAINTENANCE OF FACILITIES

Once constructed, stormwater management facilities require periodic maintenance (routine,

restorative, or rehabilitative) for continued proper operation. An issue that merits special consideration in a functional analysis is whether stormwater management facilities should be maintained by the public or private sector. Some utilities make this determination simply on the basis of where the facilities are located. Those on public property are publicly maintained, and those on private property are maintained by private entities. Others decide on the basis of the land use served by the facility. Facilities serving residential properties are maintained by the utility; those serving commercial, industrial, or other non-residential users are privately maintained. Still others may decide to publicly maintain any facilities constructed primarily for the purpose of water quality management.

A strong argument in favor of private maintenance is that it limits direct public costs of stormwater management. However, one recent survey indicates that private stormwater management facilities in Maryland were not maintained as well as public facilities.[2] The APWA suggests that maintenance activities are best carried out by the entities with the "greatest interest in the specific benefits associated with each maintenance operation."[3] The APWA has also identified factors to be considered in deciding whether detention facilities are to be privately or publicly owned, and notes that adequate long-term maintenance can best be insured by public agencies.

3.0 MULTIJURISDICTIONAL STORMWATER MANAGEMENT UTILITIES

More often than not, political boundaries do not coincide with natural environmental ones. This is particularly the case for storm and surface water management, where hydrogeological features defining watersheds and drainage basins tend to diverge from municipal and county borders. Yet naturally occurring watersheds are often the most sensible and effective scale on which to manage runoff, necessitating multijurisdictional cooperation if efficient techniques are to be used. The Narrow River Watershed in Rhode Island exemplifies this phenomenon, comprising three separate municipalities (Narragansett, North Kingstown, and South Kingstown) for whom cooperative management may be the most cost effective solution.

Unlike utilities comprising only one governmental jurisdiction, multijurisdictional utilities must consider how costs and responsibilities will be shared among participants. Cost equity issues become particularly important when the respective jurisdictions contribute differentially to stormwater runoff (e.g., due to different development levels or hydrogeological features), necessitating greater program expenditures in some areas than in others. Cross-subsidization of

---

[2]Maryland Department of Natural Resources, "Maintenance of Stormwater Management Structures, A Departmental Summary, " 1986.

[3]APWA, op cit., p. 217.

expenses in one jurisdiction by another is likely to be extremely unpopular politically. In cases where it is desirable to coordinate the drainage efforts of several jurisdictions while also addressing equity issues, at least two options are possible.

Limited Multijurisdictional Cooperation

Under such an approach, each municipality could construct, own, maintain, and operate those facilities within its territory, drafting cooperative agreements for those functions it desired to share with other jurisdictions, such as planning, information sharing, and joint oversight of any drainage facilities crossing political boundaries.

However, several potential problems exist with such an approach. While it is possible to orchestrate cooperative agreements among governments regarding performance standards, the need for periodic renegotiation may become a cumbersome drain on resources. Moreover, such a system is vulnerable to political stresses either within a single jurisdiction or between several, with the possibility that the joint effort will be badly compromised or abandoned altogether. Finally, depending upon the management techniques required, individualistic efforts by municipalities may fail to realize economies of scale and contiguity, resulting in higher service costs and lower levels of performance.

Full Joint Cooperation

A better solution may be to employ a fully cooperative multijurisdictional management approach. For a hydrogeologic system such as a watershed, where program success as a whole depends on the correctly executed efforts of all parts, a fully joint approach may be the only satisfactory way to accomplish public goals.

At present, examples of this sort of intergovernmental cooperation for storm and surface water management are mostly lacking both within Rhode Island, where municipal cooperation has only recently been considered for public works, and among all stormwater utilities investigated for this study. Although watershed-wide stormwater management utilities may exist in the United States, none were located at this time. There are a handful of stormwater management utilities involving cities and the counties in which they are located, but by mutual agreement these are simply treated as county-level operations and thus do not necessitate complicated agreement and coordination between two or more independent governments.

3.1 SURVEY OF MULTIJURISDICTIONAL STORMWATER UTILITIES WITHIN THE UNITED STATES

This section presents several storm and surface water utilities that were identified as having multijurisdictional aspects to their operation. For this reason, they were contacted to

determine whether or not their experience might supply information germane to a multijurisdictional utility in the Narrow River Watershed, particularly regarding the distribution of capital and operating costs and functional responsibilities.

Table II.3.1 summarizes the applicability of these utilities' experiences to the Narrow River Watershed. For the most part, none of these utilities seemed a good compartor to the Narrow River region due to the relationships of the jurisdictions involved, which typically included cities and the counties in which they were located. The exception is Ft. Collins, Colorado, which while not multijurisdictional, includes multiple drainage basins and chose to address directly the issue of cost equity among regions with differing stormwater runoff contributions, the situation that exists in the Narrow River Watershed. The Seattle/King County utility may also be a good contact for discussion of their experience with inter-municipal cooperative agreements. In future years, the Everett, Washington, utility may become a good information source as it formalizes agreements with neighboring cities in conjunction with the Puget Sound Water Quality Management Authority's directives for watershed-based stormwater management.

TABLE II.3.1 SUMMARY OF CONTACTS WITH MULTIJURISDICTIONAL STORMWATER UTILITIES

UTILITY	CONCLUSION
Fort Collins, Colorado	Resolves issue of cost equity for cooperating regions with different stormwater runoff contributions.
Vancouver/Clark County, WA	City/county relationship is different from that existing among Narrow River Watershed towns.
Seattle/King County, WA	Limited inter-municipal cooperative agreements. May be a useful information source for discussion of their experience with these.
Everett, WA	Multijurisdictional approaches not yet in effect, but likely in near future. May then be a useful information source.

The following four summaries provide details of the structure of these multijurisdictional utilities and their applicability to the Narrow River Watershed.

SUMMARY #1

UTILITY: CITY OF FORT COLLINS (COLORADO) DEPARTMENT OF PUBLIC WORKS

CONTACT: DOTTIE NAZARENUS, (303) 221-6589

SITUATION:

The city of Fort Collins, Colorado (36 sq. miles, population 80,000), is located in a watershed draining into the Poudre River. The municipality operates a stormwater management utility which attempts to apportion user costs according to the sub-basin in which parcels are located. When the utility was established nine years ago, equity concerns were raised by the fact that development levels in areas throughout the watershed differed significantly. On the assumption that older, more developed areas had already made significant funding contributions to stormwater management infrastructure and should not be forced to subsidize facilities needed to accommodate new growth, Fort Collins divided its watershed territory into eleven naturally defined basins. A management plan was then conducted to determine what was needed to achieve an agreed upon level of treatment in each basin.

Cost apportioning is achieved in the following way. Operations and maintenance (O&M) costs are shared uniformly by all eleven sub-basins, as were costs for the initial management plans (expenses for these ranged from $15,000 to $25,000 per basin). Capital amortization costs, however, vary according to the construction needs for each basin as determined by the initial management plan. At present, residential monthly user fees range from $1.00 to $2.50 throughout the watershed. Billing is achieved through the city's electric utility monthly billing system.

As in many other utilities, per parcel fees are calculated by base rates multiplied by parcel size. Base rates within each sub-basin are scaled according to a parcel's percentage of impervious area. Alterations to property required to pass through the building permit process are also studied by the utility to determine whether reclassification into a higher rate category is in order.

APPLICABILITY TO THE NARROW RIVER WATERSHED:

Although the Fort Collins utility is confined to a single municipality, it squarely confronts the issue of regional cross-subsidization of stormwater management facilities, a potential problem for the Narrow River Watershed where local hydrogeology and development levels vary considerably.

SUMMARY #2

UTILITY: VANCOUVER/CLARK COUNTY (WASHINGTON) DEPARTMENT OF UTILITIES

CONTACT: SAM ADAMS, (206) 699-2375, EXT. 4830

SITUATION:

Clark County, Washington, traversed by Burnt Bridge Creek, operates a surface water and drainage utility within its borders aimed at maintaining the water quality of the creek. The utility's boundaries are described by the watershed itself, and the incorporated City of Vancouver falls within this area. To enable a single entity to carry out storm and surface water management activities, a legal agreement was drafted between city and county in which property within the City of Vancouver is subject to specified maintenance activities by Clark County for which city residents are billed.

All billing, maintenance, construction, and staffing activities are carried out at the county level with no impact on property ownership within city limits. Residential parcels within the utility district are charged a uniform rate of $15 per year, with commercial rates varying by size and permeability.

APPLICABILITY TO THE NARROW RIVER WATERSHED:

The multijurisdictional aspect of this storm and surface water utility is limited to an agreement for Vancouver to relinquish specific functions it would normally manage to Clark County, in which it is located. At the outset of the formation of this utility, there already existed working relationships between city and county which differed from those found between cities of the Narrow River Watershed. Thus, it appears unlikely that much information can be appropriated from this example.

SUMMARY #3

UTILITY: SEATTLE/KING COUNTY (WASHINGTON) DEPARTMENT OF UTILITIES

CONTACT: DAVE CLARK, (206) 296-6519

SITUATION:

King County, Washington, includes 29 cities and over 300 special purpose governments. The county operates drainage facilities within all unincorporated territories. Although it is party to a limited number of agreements with local governments (Kent, Redmond, and Issaquah are several) for stormwater activities requiring joint approaches, these are strictly ad hoc arrangements for single-issue resolution (e.g., splitting costs for a detention pond or cooperating on a watershed plan). Most cities within the county operate their own storm and surface water utilities. In no case does King County direct surface water management activities within the boundaries of an autonomous municipality or charge any related fees directly to city residents, although it is currently trying to promote a role for itself as a regional stormwater authority.

Several dynamics are militating to cause King County to seek a larger role in surface water and water quality issues. Annexations are occurring at a rapid pace, causing the utility's rate base to diminish, and the municipalities annexing territories are not themselves taking on an adequate role in storm/surface water management. Finally, without a renewal action by the County Council, the King County Storm and Surface Water Management Authority's charter will expire in July, 1991.

APPLICABILITY TO THE NARROW RIVER WATERSHED:

The King County Surface Water Management Authority is party to a number of cooperative agreements with municipalities in its boundaries, but these tend to be extremely limited in their scope and thus are not on a par with the cooperation being considered for the Narrow River Watershed. Nonetheless, it may be of some value to review these agreements and discuss their experiences at some future point.

SUMMARY #4

UTILITY: EVERETT (WASHINGTON) DEPARTMENT OF UTILITIES

CONTACT: DAN MATTHIAS, (206) 259-8800

SITUATION:

The Puget Sound Water Quality Management Authority has established directives for county-wide approaches to watershed management; it is therefore likely that in the future some sort of inter-local agreement will exist between Everett and its neighbors. However, no such cooperation currently occurs. The most concrete effort to date has been a recent discussion of jointly purchasing property for detention basins, but no agreements were outlined and the time frame for action was clearly in the future.

APPLICABILITY TO THE NARROW RIVER WATERSHED:

Although multijurisdictional approaches appear certain within the next several years, at present none are being used. Thus, while no information useful to the Narrow River Watershed can now be gleaned from this example, it may become a useful source in future years.

3.2 LEGAL APPROACHES TO THE FORMATION OF A MULTIJURISDICTIONAL STORMWATER MANAGEMENT ENTITY IN RHODE ISLAND

At least two options exist in Rhode Island for the formation of a unified legal entity to manage stormwater within the Narrow River Watershed, both of which require an act of the General Assembly for their creation. One is the formation of an independent "special district" to finance and manage such a program; the other is simply the formation of a legally recognized entity, albeit one with more limited scope of authority than that of a special district, according to the needs of the parties involved. This section discusses the advantages and disadvantages of each option.

Special Districts for Financing Infrastructure and Services

Special service districts have emerged within the last quarter century as important techniques for financing infrastructure. The number of special districts established in the United States has grown to comprise one-third of all government entities providing public services. Since World War II, the number of non-school special districts has doubled every 20 years, while the number of general purpose governments (counties, municipalities, and townships) has remained stable and the number of school districts has actually declined due to consolidation.

Recent inflationary pressures on public budgets and property tax "rebellions" have motivated some general-purpose local governments to limit their fiscal responsibilities, making them reluctant or unwilling to provide new services or extend existing ones to growing areas. When new facilities or services are needed, the creation of special districts can mitigate or eliminate the resulting increased fiscal burden on general governments. Apparently, voters who stand to benefit directly from improvements made by a special district are more willing to vote for special tax levies to pay for these than for higher general property taxes.[4]

Advantages of Special Districts

Certain aspects of the special district provision of public services are relatively advantageous compared to general-purpose government provision:

---

[4]In the course of this study, one stormwater utility was discovered that is a formally chartered special district serving the City of Louisville and Jefferson County, Kentucky, (502) 587-0603. This may be a useful information source at a future stage.

- The use of special district financing avoids the debt constraints of municipalities.

- Services and costs can be targeted to users, allowing the infrastructure burden to be shifted from all taxpayers to just those within the jurisdiction of a special district.

- Administrative efficiency can be increased by allowing service providers to concentrate on delivering only one type of service.

- Demands for service may be reduced to the extent that consumers pay the actual costs of the service they use and to the extent that consumers can can adjust their consumption according to real needs.

- Service delivery is largely shielded from local politics. Apart from the periodic appointment of special district board members or the possible review of proposed bond issues, local governments do not control the actions of special districts.

- Removal from the political process protects against diversion of funds to unrelated uses while freeing local political authorities to focus on other issues.

- A principal advantage, particularly in growing areas, is the ability to provide services where local governments have limited financial or administrative capacities or lack the tax base to support increased infrastructure needs (e.g., developers working in rural areas).

Disadvantages of Special Districts

Three principal disadvantages are often cited against special districts:

- The power of local governments to manage public services is diminished.

- An unmanageable proliferation of governmental units can ensue from excessive special districting.

- The political fragmentation resulting from district proliferation can contribute to inadequate and inefficient service provision, such as failure to exploit economies of scale and contiguity.

Yet studies of areas with multiple special service districts, such as Southern California,

have differed in their conclusions about the occurrence and extent of these effects.[5] It appears difficult to generalize about negative consequences of increased reliance on special district provision of services.

3.3 SPECIAL DISTRICTS IN RHODE ISLAND

With the exception of housing authorities, which follow a different set of rules regarding their formation, all special service districts require a specific act of the Rhode Island General Assembly for their creation. The specifics of their legislative charters vary considerably, but generally they include authority to raise revenues, issue debt within established limits, and perform enumerated functions.

Special districting in Rhode Island is comparatively more limited than elsewhere in the United States. At this time, special districts in Rhode Island consist principally of seven types:

1. Water districts, of which there are seven, which supply and sell drinking water and maintain the related infrastructure. One of these, the Kent County Water district, is noteworthy for the fact that its service area spans several political jurisdictions and it is self-financing through user fees.

2. Wastewater districts, of which there are two (Blackstone Valley District Commission and Narragansett Bay Commission), charged primarily with operating publicly-owned wastewater treatment facilities.

3. Fire districts, of which there are 47, largely concerned with fire protection, although many are responsible for other maintenance functions and some have relinquished fire control responsibilities altogether.

4. Rhode Island Solid Waste Management Corporation which owns and operates the state's central landfill and recently opened recycling center. Self-financing through tipping fees and sales of recycled products, it provides a portion of the financial support given to state-mandated municipal recycling programs during their first three years of operation.

5. The Pawtuxet River Authority, chiefly a conservation and advocacy group concerned with pollution of the Pawtuxet River but having no enforcement power. It is permitted to acquire real property and receives a small amount of state

---

[5]Schell, Freida L. "Quasi-governments: The Southern California Experience", Journal of Public Finance, Volume 12, October 1987.

funding as well as minor contributions from 5 cities and towns.

6. Housing authorities, of which there are approximately 25, charged with supplying and maintaining public housing. Recent legislation permits them to issue debt for construction and rehabilitation of housing.

7. Regional school districts, of which there are three, and local school districts, responsible for operating and maintaining public schools within their boundaries.

3.4 ALTERNATIVES TO SPECIAL DISTRICTS IN RHODE ISLAND

Perhaps the easiest and quickest way to form a legal entity to administer a stormwater management program across several towns is to petition the Rhode Island General Assembly for permissive legislation simply allowing these entities to join together for this purpose. Being incorporated municipalities, they already have the authority to levy and assess taxes, normally one of the privileges sought through special district status. Without more thorough investigation of legal alternatives, the precise differences between such an entity and a true special district are not clear. From an operational standpoint, the net result might be the same, but certain advantages or disadvantages may accrue to one legal approach over another.[6]

4.0 ESTIMATING REVENUE REQUIREMENTS

Determination of revenue requirements is an important step in utility planning and is the first step in preparing the utility financial plan. Hector J. Cyre, an expert in the development of stormwater utilities, has published rough estimates of costs for stormwater management. He reports that in most cities, basic stormwater administration, engineering, and reactive maintenance costs $15 to $25 per gross acre (in 1987 dollars).[7] He also projects that comprehensive management, including drainage master plans, preventive maintenance, and major capital improvements may cost $100 or more per gross acre.

Accurate estimation of the costs of comprehensive stormwater management is complicated and time-consuming. A current master drainage plan is essential for projecting costs, particularly

---

[6]Information based on a conversation with Joseph Coduri, Rhode Island Department of Administration, Office of Municipal Affairs, (401) 277-2854.

[7]Cyre, Hector J. "Developing a Stormwater Management Utility." American Public Works Association Reporter, March 1987, pp. 8-9.

regarding capital improvements. Estimates of costs (i.e. revenue requirements) should be developed for all the functions of the utility. In practice, the range of activities financed by utilities varies greatly. Some fund both operations and maintenance (O&M) and capital projects with utility revenues. Others use utility revenues only for planning and O&M, and finance capital projects by issuing bonds -- either general obligation bonds repaid with property tax revenues, or revenue bonds amortized with utility revenues.

5.0 ESTIMATING USER CHARGES

The following is a brief discussion of a methodology for estimating typical stormwater user charges on the basis of data readily available in Rhode Island. The approach suggested here, which involves estimating charges based on general land use data, should provide accurate enough information about revenue potential for local officials to determine whether a utility is financially feasible However, because the approach does not involve estimation of the amount of impervious area on individual parcels, it is not sufficient for implementation.

5.1 DATA NEEDED TO ESTIMATE CHARGES

Information needed to determine typical charges includes:

1. Land use data;

2. Rate factors derived from runoff coefficients for all land uses;

3. Revenue requirements for stormwater management.

Land Use Data

The land use data needed to estimate charges includes land use categories (not zoning information), total acreage in each category, and parcel area data (average parcel acreage is sufficient for initial planning studies). In Rhode Island, these data are generally available at the local level from the tax assessor's office.

As will be illustrated in the following example, these average parcel size data are useful for quickly preparing estimates of charges for typical parcels given different rate structures. In practice, the actual size of all parcels to be charged must be determined. Most utilities use the exact size of parcels (in acres or square feet) in their billing algorithms. Others assign Area Range Numbers (ARNs) to parcels which represent categories that include all parcels with areas in a certain range.

TABLE II.5.1 HYPOTHETICAL ACREAGE ESTIMATES FOR RESIDENTIAL LAND USE

Residential Acreage Category	Total Parcels	Total Acres	Average Parcel Size
0 - 0.5 acres	128,882	26,372	.20
0.5 - 1.0 acres	7,216	5,249	.73
> 1.0 acres	5,058	24,015	4.75

Rate Factors

Rate factors are numbers based on standard runoff coefficients which are assigned to parcels so that charges reflect actual runoff and the respective burden each property places on the stormwater system. Theoretically, to reflect runoff precisely, rate factors should include total area, percentage of impervious area, soil type, slope, and other factors. However, impervious area is the only factor that is usually used. This is because the calculations necessary to incorporate all relevant factors are not warranted economically.

For initial planning studies, rate factors are generally based simply on land use categories. Table II.5.2 presents a sample of hypothetical rate factors for several land use categories. The slight divergence of the items in the Rate Factor column from corresponding elements in the Average Percent Impervious column is due to adjustments made to account for runoff from the non-impervious portions of land within the use category. Because the structure of these categories may vary by jurisdiction, judgement is required when matching land use categories with rate factors. Rate factors are often derived from runoff coefficients in what is known as the Rational Method, a technique for estimating peak discharge from a property. Runoff is calculated using a runoff coefficient, a property area, and a measure of rainfall intensity.[8] In practice, the specific rate factors used by utilities vary greatly. Because of the potential for variability, rate factors must be chosen carefully. It has been estimated that charges to users in a given land use category could vary by as much as 60% depending on the rate factors and structure that are used.[9]

---

[8] This method is discussed in most hydrology texts; see, for example: Wanielistra, Martin P. Stormwater Management, Quantity and Quality. Ann Arbor Science, Ann Arbor, Michigan, 1983.

[9] Priede, Nilo. "Financing Stormwater Management Through a Utility" in Stormwater Management: An Update. Martin P. Wanielistra and Yousef A. Yousef, editors. University of Central Florida, July 1985, p. 147.

TABLE II.5.2 HYPOTHETICAL RATE FACTORS FOR STORMWATER UTILITY PLANNING STUDIES

Land Use Category	Average Percent Impervious	Rate Factor
Agriculture	NA	.10
Commercial	.85	.82
Industrial	.72	.70
Apartments	.65	.64
Residential: Up to 1/2 acre	.35	.40
1/2 to 1 acre	.20	.23
1 to 1+ acres	.12	.16
Schools	.50	.50

The stormwater utility's rate base is defined as all categories of system users to be charged. In practice, it is common for certain categories of parcels to be exempt by law rather than because they generate no runoff. Examples sometimes include public parcels such as government offices and street rights-of-way, tax exempt parcels such as hospitals and churches, and agricultural and undeveloped land. The utility approach is attractive in part because these types of uses, which do not generate revenues under a property tax system but are frequently large generators of stormwater runoff, often do pay stormwater charges. Although the decision to charge these uses may be controversial, the issue of the rate base is ultimately a policy choice which must be publicly resolved.

Revenue Requirements

Section 4.0 briefly described considerations in estimating costs or revenue requirements for stormwater management. The rate structure of a utility should be designed so that the sum of charges for all parcels is equal to its revenue requirements.

5.2 A GENERAL APPROACH TO DEVELOPING A UTILITY RATE STRUCTURE

A general approach to developing a utility rate structure involves two steps:

1. Estimation of a charge per "Equivalent Runoff Unit";

2. Determination of individual parcel charges.

"Equivalent Runoff Units" (ERUs) are used to represent runoff from a parcel. They are the units for which stormwater charges are levied, and they are calculated by multiplying a rate factor and a parcel area.

Estimation of Charges per Equivalent Runoff Unit

Once the information described in Section 5.1 has been collected, the charge per ERU may be easily determined by the following steps. In essence, the aim is to apportion the revenue requirements across all participating land use categories according to their runoff contributions.

1. Select the land use categories to be included in the rate base; eliminate those to be exempted.

2. Assign a rate factor to each land use category in the rate base; examples of these are found in Table II.5.2.

3. For each land use category, multiply the rate factor by the total acreage to obtain the number of ERUs in that category.

4. Sum the ERUs for all land use categories in the rate base (computed in Step 3) to determine total ERUs within the utility.

5. Divide the utility's revenue requirements by the total ERUs (computed in Step 4) to determine the charge per ERU.

Determination of Individual Parcel Charges

Per-parcel user charges can be estimated after the charge per ERU has been determined. To obtain the charge per parcel, individual parcel area is multiplied by its rate factor, yielding

its total ERUs; total ERUs are then multiplied by the charge per ERU, as determined above. Any applicable surcharges or credits stemming from factors which may increase or mitigate a parcel's runoff are then added or subtracted to yield the per parcel charge. In summary, such a billing algorithm would work as follows:

TABLE II.5.3 DETERMINATION OF INDIVIDUAL PARCEL CHARGES

INDIVIDUAL PARCEL CHARGE =								
AREA	x	RATE FACTOR	x	ERU CHARGE	-	CREDIT	+	SURCHARGE

Area	=	Parcel area
Rate Factor	=	Rate factor for the parcel's land use category
ERU Charge	=	Charge per equivalent runoff unit
Credit	=	Applicable credit (e.g., for on-site management)
Surcharge	=	Additional charge (e.g., for floodplain location)

6.0 BILLING CONSIDERATIONS

The costs of developing a billing system can represent a significant percentage of the cost of implementing a utility, particularly when extensive parcel mapping or digitizing is undertaken. However, once a system is established, billing costs themselves generally account for a very small portion of total expenditures. In practice, most utilities do not create entirely new billing systems but instead modify the existing billing systems of other utilities, adding new components as necessary to accommodate information needs or to include users not already on existing systems. The range of options for billing systems includes:

- Adding stormwater charges to other utility bills (e.g., water and sewer bills);

  Such bills are usually issued quarterly or bimonthly. The advantages to such a system are that (1) the account structure is basically in place, minimizing the cost of system development; (2) this method reinforces the idea that utility charges are a service fee and not a tax; and (3) the relatively frequent billing may help utility cash flow. Disadvantages include (1) the existing system may not include all parcels to be charged, or parcel size and land use data; (2) costs could be high if the cost of meter reading is not factored out of the cost-sharing equation; and (3)

people may confuse sewer and stormwater charges.

- Adding stormwater charges to property tax bills ;

  Such bills are generally issued annually or semiannually. Advantages to this system are that (1) tax assessors' files usually include parcel size and land use information, and most parcels to be charged will already be in the system; and (2) annual billing may minimize billing costs. Disadvantages include (1) this may not be legal in all areas; (2) cash flow may be poor due to billing infrequency; (3) it may complicate problems associated with turnover on parcels.

- Creating a new, separate billing system.

  Under a system created expressly for the new utility, ultimate flexibility exists as far as billing frequency and system design. However, this is probably the highest cost and most time-consuming solution.

A useful document for understanding aspects of creating a billing system is the publication, Surface Water Management, The Utility Approach: Drainage Utility Service Charges, Customer Account Development Process.[10]

7.0 SUMMARY

Experts agree that the best way to finance stormwater management is the utility approach, and many communities have recently created stormwater utilities. The rationale for the utility approach is simple: people should pay for stormwater management in relation to their use of the service. In practice, this means that people pay according to the amount of runoff from their property.

Planning for a utility involves systematic consideration of a variety of technical, administrative, financial, and political issues. However, even with efficient planning and management, new facilities cannot be constructed and maintained if people are not willing to pay. The experience of other utilities indicates that citizens will accept them if charges are not too high. Whether a utility will be accepted in a particular situation, however, depends on all the specifics of the proposal. Local officials must use their judgement to determine whether the utility approach is appropriate for their situation.

This guide has outlined a brief, general approach to utility planning studies. With this approach, officials can assess the effects of a variety of factors on user charges. While this may

[10]URS Corporation, Virginia Beach, VA, February 1987.

yield enough information for a decision on whether or not to proceed with establishment of a utility, it should be noted that significant effort is required for actual implementation. The time required to plan a utility can easily approach or exceed two years, and implementation can be expensive. Nonetheless, the utility system has in recent years proven itself an efficient, effective, and stable technique for addressing stormwater management.

III. CASE STUDIES

A. VARIETY IN STORMWATER UTILITY DESIGN

Although all stormwater utilities exist to manage stormwater runoff, great variety occurs in their administrative structures, rate systems, scopes of authority, and even environmental orientation. For the most part, when management objectives are clearly known at the outset of utility design, just about any may be accommodated within the utility structure. To illustrate the diversity found among stormwater utilities in the United States, it is instructive to compare two utilities reflecting nearly opposite approaches among structural and functional arrangements. The comparison is not intended to promote one system over another, but to demonstrate the flexibility and variety available to policy makers in designing a utility. Elements of one approach or another are clearly desirable, however, depending upon the policy objectives being pursued.

Table III.A summarizes the major differences between the two utilities compared, those of Bellevue, Washington, and Tallahassee, Florida. Following this table are descriptive profiles of each utility which discuss in greater detail the differences revealed in the table.

TABLE III.A SUMMARY OF MAJOR DIFFERENCES BETWEEN TWO ACTUAL STORMWATER UTILITIES

BELLEVUE, WASHINGTON	TALLAHASSEE, FLORIDA
An independent utility and authority.	A division of the city's Public Works Department.
Leveraged fund.	Pay-as-you-go system.
Monthly rate for typical quarter acre residential lot: $4.00.	Monthly rate for all residential lots: $1.00 (NB: Capital improvements not yet being funded, making expenses relatively low).
Parcel rates based on parcel size and extent of alteration to natural hydrogeology (e.g., grading, impervious features).	Flat residential rates, regardless of parcel size, grading, or percentage of impervious surface.
Financial incentives for individual stormwater management and runoff reduction activities.	No incentives for individual stormwater management or runoff reduction activities.
Actual per-parcel runoff contribution measured through assessor's property records and site visits as needed.	Estimated per-parcel runoff derived by random statistical sampling of 170 residential parcels (out of 21,000 total).
Permit oversight authority for activities affecting storm and surface water runoff.	No such authority. Permitting handled by other agencies.
Both flood control and water quality concerns addressed.	Focus on flood control only.

B. THE BELLEVUE (WASHINGTON) STORM AND SURFACE WATER UTILITY

Among the most thorough stormwater management utilities in the nation, both in terms of administrative authority and fee structure is the Bellevue (Washington) Storm & Surface Water Utility. Established in 1974, it was charged with designing, constructing, maintaining, and operating a drainage system to control storm and surface water runoff, urban flooding, and nonpoint source pollution to nearby lakes, which ultimately discharge into Puget Sound. The utility operates a series of channels and runoff detention basins financed by acreage- and permeability-based fees paid by landowners. Using the revenue from these fees, the utility was able to issue $10 million in revenue bonds to build its original stormwater control facilities. The secure, recurring revenues from these fees, coupled with the management of these funds through an independent utility, has proven an extremely successful technique for managing urban nonpoint source pollution.

1.0 Legal Authority and Oversight

The legal authority for establishing the Bellevue Storm and Surface Water Utility derives from a state law allowing independent stormwater utilities. These special government entities are empowered to collect fees from landowners and borrow against them to finance the construction and operation of necessary control facilities. In Bellevue's case, the utility is a completely separate entity of city government, legally the same as a sewer or water utility in its organization.

In addition to operating a drainage system, the utility maintains tight oversight of all new development and remodeling to ensure compliance with Bellevue's comprehensive storm and surface water management plan. A Development Review Staff of four reviews all new construction permits before issuance, and is responsible for issuing permits to clear and grade land. It may require additional information (e.g., soil reports) or design changes before granting approval. When permission to clear is sought, specific erosion control guidelines must be followed.

2.0 Rate Structure: Market Signals Provide Behavioral Inducements to Rate Payers

Traditional water, sewer, and electrical utilities charge rate payers according to individual consumption levels as determined through metering. Consumers thus aware of the true costs of their usage may adjust their consumption accordingly, an environmentally desirable effect. However, such "market signals" are absent from many U.S. stormwater utilities. Instead, rates tend to be based on statistically computed average measures of runoff contribution per parcel

according to its land use category (e.g., residential). Others utilities may refine this practice somewhat by factoring in parcel size as well, such that larger parcels owe larger fees, nonetheless still applying a uniform base rate reflecting average runoff per unit of area. Under each of these approaches, all parcels of the same use type are assessed either the same flat fee, or the same base rate which is then multiplied by parcel size, regardless of individual differences in impervious area or terrain. Neither of these systems provides incentives to landowners to pursue environmentally desirable behavior such as limiting impervious areas or pursuing individual stormwater management activities.

The Bellevue Storm and Surface Water Utility is notably different from other utilities in this regard. Parcel rates are assessed on the basis of individual site characteristics, according to a rate structure which classifies parcels by extent of development. More developed parcels on which grading and impervious features have caused greater disturbance to the natural percolation of rainwater are assessed higher rates. The utility calculated runoff coefficients for the following five development classes, each associated with a successively higher base rate:

- Undeveloped - Lands not covered by impervious surfaces and free of disturbances to the local hydrology.

- Light Development - Characteristics similar to undeveloped land with less than 35 percent of the land area covered by impervious surfaces.

- Moderate Development - Areas with 35-50 percent impervious coverage, where development has had an impact on the local hydrology.

- Heavy Development - Properties of fairly intensive development with 50-70 percent of the land covered by impervious surfaces.

- Very Heavy Development - Properties that have greater than 70 percent impervious coverage. This category also includes the majority of the roads and highways.

To initiate operations, the utility staff used aerial photos and property line maps to determine the runoff coefficients and parcel sizes for all properties in Bellevue. The coefficients are multiplied by parcel size to determine the final service charge. For example, owners of undeveloped property smaller than 2,000 square feet pay $.08 per month, whereas a moderate development with approximately an acre of land (40,000 square feet) would pay $3.28 a month. A heavy development of 98,000-100,000 square feet would pay about $15.60 per month. In 1989, an average household bill for a quarter acre lot was about $4.00 per month.

If a developer or homeowner provides some type of runoff control system such as on-site detention basins, development classification is reduced. Because all new development in the city

is required to provide such detention systems, there are few new customers in the high rate classifications.

In the event of new construction, remodeling, or other alteration to a parcel, its monthly fee may be adjusted to reflect the increase or decrease in runoff contribution. To facilitate this oversight, the utility's Rate Administration Division, with a staff of two, receives notice each month of all permits issued by the city and reviews them to determine if reevaluation is necessary.

The status of road and highway properties was a major consideration in designing a rate structure. Because roads and highways are major sources of runoff, and also benefit from drainage systems that alleviate highway flooding, Bellevue treated them as billable property. In some years, the city's Department of Public Works paid over $800,000 per year into the utility, and the State Department of Transportation paid $233,000. These revenue streams constituted a third of the utility's annual income. However, as other drainage utilities emerged throughout Washington, the state challenged all utilities rights to charge it. Although the court upheld this right, a compromise was reached requiring the state to pay for only 30 percent of their normal monthly charges.

CONTACT: Cathy Klein (206) 451-4476

C. THE TALLAHASSEE (FLORIDA) STORM WATER UTILITY

In May 1986, the City Commission of Tallahassee, Florida, voted to establish a stormwater utility both to upgrade an inadequate existing drainage system and to shift to a self-financing stormwater management system. Formerly, costs were borne by the General Fund and a transfer from the city's electric utility. It was decided as well to that the City should take responsibility for stormwater regulatory functions, previously handled by Leon County, and that planning, regulatory, and design functions should be consolidated within the utility rather than spread among separate agencies.

1.0 Legal Authority and Oversight

The Tallahassee Stormwater Utility, established in October 1986, was the first in the State of Florida. Today, 18 such utilities exist in the state, with others scheduled to come on line soon. Prior to 1985, the responsibility for stormwater management in Tallahassee was assumed by Leon County, at which point the city became dissatisfied with the manner in which this function was being handled and decided to transfer this operation to city government by means of a self-funding utility. The legal authority for establishing the utility derives from a Florida statute authorizing the formation of storm and surface water utilities and empowering them to set and collect rates and issue revenue bonds for system costs.

Unlike Bellevue, Washington, Tallahassee's utility is not an independent authority but an division of the Public Works department. As a result, its scope is less comprehensive than Bellevue's and is limited to the direct provision of drainage facilities. It does not, for example, include oversight authority to issue or review construction permits for activities which may have drainage impacts, such as land clearing or grading.

Whereas Bellevue's utility issues debt to finance capital improvements, the Tallahassee utility currently operates on a pay-as-you-go basis. Part of the reason for this is that although utility billing commenced in 1986, the basin by basin comprehensive drainage plan which will inform major infrastructure decisions is still underway, with completion expected in 1992. However, when comprehensive drainage plans are completed in 1992 and decisions to add significant infrastructure are finalized, the utility will probably have to consider floating debt to amortize these costs in order to keep monthly rates manageable, as conservative preliminary estimates call for over $70 million in capital improvements. Because Florida's Statutes and Constitution permit stormwater utilities to issue revenue bonds and other debts to finance system costs, no legal hurdles are anticipated.

2.0 Rate Structure: Averaging the Burden Through Statistically Derived Flat Rates

Tallahassee's rate system is significantly different from that of the Bellevue utility. Whereas the Bellevue utility computed through tax assessment records and direct observation each parcel's individual runoff characteristics, Tallahassee estimated average contribution statistically. This was done by analyzing a randomly-chosen, statistically significant sample of Tallahassee's more than 21,000 single family residential parcels; it was determined that a sample size of 170 parcels would provide a 95% assurance that the average impervious area determined was within 10% of the average for all parcels. Each of the 170 parcels was digitized and individually assessed for tree coverage, general soils and land slope characteristics, and impervious construction. These analyses resulted in an average impervious area of 2,659 square feet (or 17.5%) for an SFU equivalent. Thus, with 95% confidence, it can be stated that the average SFU impervious area is 2,659 square feet.

AVERAGE SINGLE FAMILY UNIT		AVERAGE PERCENTAGE OF IMPERVIOUS SURFACE		SINGLE FAMILY EQUIVALENT UNIT
15,219 sq. ft.	x	17.47%	=	2,659 sq. ft.

All residential units in Tallahassee, whether single family detached or part of a multi-unit complex, are assessed as an SFU equivalent and pay an identical monthly fee. No adjustments are made for individual parcel characteristics such as size or percent impervious, since this is all collapsed in to the average SFU runoff contribution, determined as described above. Non-residential parcels, however, are assessed rates based on the number of SFU equivalents that would fit into each parcel. For example, a nonresidential parcel sized 132,945 sq. ft. would be charged ten (10) times the single family flat rate, according to the following calculation:

TOTAL PARCEL SQUARE FOOTAGE		PERCENT IMPERV. SQUARE FOOTAGE		IMPERV. SQUARE FOOTAGE		S.F.U. EQUIVS.		BILL-ABLE UNITS
132,945	x	20.0	=	26,589	+	2,659	=	10

At its inception, this system was chosen in part because it was considered by the

consultant advising the city to be an equitable way to distribute costs. In fact, it is not equitable according to the "polluter pays" principle, which holds that system users should be charged according to their actual demands for stormwater management. It should be noted that under this system, relatively smaller residential parcels and those with relatively less impervious area implicitly subsidize the provision of stormwater services to larger and more impervious parcels, whose runoff contribution is presumably greater.

Also significantly, such a rate system provides no financial incentives for landowners to adopt environmentally desirable behavior, such as limiting land clearing, paving or alteration of natural drainage systems. Nor does the Tallahassee utility provide incentives for individual stormwater management techniques, such as private detention ponds. The utility does, however, require all property owners to pay user charges. No properties within utility boundaries are exempt, making this a particularly attractive funding approach to this city, which, as a state capital and county seat, includes an unusually large percentage of government property in its land area, a category which is otherwise exempt from municipal taxes.

At present, residential rates are $1.73 per SFU per month. Originally, in 1986, they were $1.00 per month, with subsequent legislation raising them 20% per year until an arbitrary maximum of $2.50 is reached, at which point it is hoped the utility will be fully self-funded. The utility continues to receive some General Funding, which is being gradually phased out, as well as a transfer from the city-owned electrical utility.

CONTACT: David Reed (904) 599-8150

IV.APPENDICES

A. STORMWATER UTILITY ORDINANCE FOR THE CITY OF TALLAHASSEE, FLORIDA

ORDINANCE 86-O-2596

AN ORDINANCE ESTABLISHING A STORMWATER UTILITY SYSTEM FOR THE CITY OF TALLAHASSEE; MAKING CERTAIN FINDINGS AND DETERMINATIONS; CREATING ARTICLE IX OF CHAPTER 25 OF THE CITY OF TALLAHASSEE CODE; ESTABLISHING A METHOD AND PROCEDURE FOR THE COLLECTION OF STORMWATER UTILITY FEES; ESTABLISHING STORMWATER UTILITY TRUST FUNDS; AND PROVIDING AN EFFECTIVE DATE.

BE IT ENACTED BY THE PEOPLE OF THE CITY OF TALLAHASSEE, FLORIDA:

Section 1. Findings and Authority.

1.01. The Stormwater Management System.

The City of Tallahassee presently owns and operates a stormwater system which has been developed over a number of years to serve the purpose of collecting and disposing of storm and other surface waters. A number of studies have been conducted by the City of Tallahassee and other government entities and such studies have indicated that the present system is inadequate to control and manage stormwater runoff within the City of Tallahassee. Such studies have additionally determined that it will be necessary and essential to construct improvements and extensions to the system to insure that the collection and disposal of stormwater within the City of Tallahassee to accomplish in order to protect the health, safety, and welfare of the citizens of the City of Tallahassee.

1.02. Authority.

The City is authorized by the provisions of Florida Statutes Chapter 166 and the Florida Constitution to construct,

reconstruct, improve, and extend stormwater utility systems and to issue revenue bonds and other debts if needed to finance in whole or part the cost of such system and to establish just and equitable rates, fees, and charges for the services and facilities provided by the system.

1.03. Findings and Determination.

It is hereby found, determined, and declared as follows:

(a) Those elements of the system for the collection of and disposal of storm and surface water are of benefit and provide services to all property within the City including property not presently served by the storm elements of the system.

(b) The cost of operating and maintaining the City Stormwater Management System and financing necessary repairs, replacements, improvements, and extension thereof should, to the extent practicable, be allocated in relationship to the user impacts, benefits enjoyed, and services received therefrom.

Section 2. A Stormwater Management System Fee.

2.01. Application and Classification.

A stormwater fee is hereby imposed upon each developed lot and parcel within the City for services and facilities provided by the stormwater management system. For purposes of imposing the stormwater fee, all lots and parcels within the City are classified as residential or nonresidential.

The City Manager or his designee is directed to prepare a list of lots and parcels within the City and assign a classification of residential or nonresidential to each lot or parcel.

2.02. Schedule of Rates.

There is hereby established the following uniform schedule of rates for the services and facilities of the municipal stormwater management system by the owner, tenant, or occupant of the premises using the services and facilities of said system:

Schedule of Fees for Stormwater Management:

(a) The City Commission, upon recommendation of the City Manager, shall by resolution establish reasonable rates for stormwater management systems for each residence, apartment, or single-family dwelling unit. Each residential dwelling unit shall be billed a flat fee established by the City Commission for residential units. For residential accounts not individually metered, the account holder of the master meter shall be billed the fee established for a single residential multiplied by the number of residential units.

(b) For nonresidential properties, a single family equivalent shall be determined periodically and shall be included in the rate resolution. The single family equivalent is the average impervious area for single family dwellings in the City. All nonresidential properties, i.e., enterprises, business establishments, government establishments, buildings, or other

non-residential occupancies not covered by subsection (a) of this section shall be billed based on the total impervious area of the property divided by the single family equivalent and then multiplied by the rate established for a residential unit. The total impervious area of the property and the number of single family equivalent units shall be updated by the Public Works Department based on any additions to the impervious area as approved through the permit process. For nonresidential properties that are not separately metered, the total bill will be sent to the account holder of the master meter.

For those properties that are separately metered, but the impervious area cannot be determined for each metered account for the County's records for each account located on the parcel, each metered account shall be billed based on an on-site visit or a meeting with the owner of the property to determine the proportion of single family equivalent units applicable to each metered property. For this determination, the proportion of impervious area shall be the occupied square footage divided by the total square footage of the building. Parking lots shall be assumed to be proportionate to occupied space. This calculation shall be done to the nearest tenth (0.1) of a single family equivalent unit. No individual metered nonresidential property shall be billed less than one (1.0) single family equivalent unit. Disputes concerning the owner's determination of the proportion of impervious area shall require the owner to notify in writing the Public Works Director or his designee of the

correction. Disputes involving the total impervious area for a parcel or the proportionate amount assigned to a metered account based on on-site measurement will be resolved by the Public Works Director or his designee.

2.03. Collection of Charge.

The stormwater fee is to be paid monthly by the owner, tenant, or occupant of each lot or parcel which is subject to the stormwater fee. Persons using the services and facilities of the stormwater management system who are not consumers of electricity, water, or gas shall be rendered bills or statements for the use of these services and facilities of said system, which said bills or statements shall be payable at the same time and in the same manner and subject to the same penalties and discontinuance of service of said system, of a consumer of the other utilities of the city to pay the rates and charges imposed under the terms of this chapter. The City may make collection arrangements with other governmental entities or other utilities for areas that are not served by City utilities.

2.04. Manager to keep records, make charges.

It shall be the duty of the City Manager or his designee to keep an accurate record of all persons using the services and facilities of the said municipal stormwater management system of the City and to make changes in accordance with the rates and charges established in this article.

2.05. Establishment of fund.

There shall be established a stormwater utility trust fund for the deposit of all fees and charges collected by the stormwater utility and for recording all appropriate expenditures of the stormwater utility system.

2.06. Severability.

It is declared to be the City Commissions' intent that, if any section, subsection, sentence, clause, or provision of this ordinance is held invalid, the remainder of the ordinance shall not be affected, it being declared that any such invalid portion did not induce the passage or adoption of this ordinance.

Section 3. This ordinance shall become effective _____.

INTRODUCED in the City Commission on the _____ day of _____, 1986.

PASSED the City Commission on the _____ day of _____, 1986.

CITY OF TALLAHASSEE

_____
JACK L. McLEAN, JR., Mayor

ATTEST:

_____
ROBERT B. INZER
City Treasurer-Clerk

B. STORMWATER RATE ORDINANCE FOR THE CITY OF TALLAHASSEE, FLORIDA

RESOLUTION NO. 86-R-1426

A RESOLUTION ESTABLISHING THE RATES TO BE CHARGED FOR STORMWATER MANAGEMENT.

WHEREAS, Ordinance No. 86-O-2596, adopted _____, places upon the City Commission the obligation to establish the rates and fees to be charged for stormwater management; and,

FURTHER WHEREAS, the City Manager has recommended to the City Commission a rate schedule which should be estabished.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF TALLAHASSEE as follows:

1. That the rates to be charged for stormwater management for each residence, apartment, or single-family dwelling unit shall be $1.00.

2. The rates to be charged for non-residential properties (i.e., all other occupants other than provided for in paragraph 1 herein) shall be the rate established in paragraph 1 ($1.00) multipled by the number of single family equivalent units. Single family equivalent unit equals the total square footage of impervious area of the property divided by 2,659 square feet (statistically developed average for single family residence in the City of Tallahassee). Single family equivalent units will be rounded to the nearest tenth (0.1) of a unit.

BE IT FURTHER RESOLVED that the foregoing rates shall become effective on and be applied to all bills rendered after _____, 19____.

PASSED AND ADOPTED by the City Commission of the City of Tallahassee this _____ day of _____, 1986.

_____
JACK L. McLEAN, JR., Mayor

ATTEST:

_____
ROBERT B. INZER
City Treasurer-Clerk

AN EXAMINATION OF THE FINANCING OF IMPROVED WASTEWATER TREATMENT IN CRANSTON, WARWICK, AND WEST WARWICK, RHODE ISLAND

AN EXAMINATION OF THE FINANCING OF IMPROVED WASTEWATER TREATMENT IN CRANSTON, WARWICK, AND WEST WARWICK, RHODE ISLAND

A. INTRODUCTION

A priority of the Clean Water Act,[1] as amended, is to limit the amount of contaminants released into our surface waters by municipal wastewater treatment. When a treatment plant is found to be in violation of national water quality standards for nutrients and other contaminants, the Clean Water Act requires that the best available technology be used to bring the plant into compliance. For many treatment plants that discharge to smaller water bodies applying best available technology means upgrading the facility to tertiary, or advanced wastewater treatment (AWT).

Prior to the 1987 amendments to the Clean Water Act the U.S. EPA maintained a fund that helped local governments finance the construction and improvement of wastewater treatment facilities through grants. To date over $50 billion dollars has been spent on wastewater treatment facilities under the Construction Grant Program.[2] The 1987 amendments to the Clean Water Act eliminated these grants, taking the money that would have gone into the grant fund and using it to "seed" state revolving loan funds (SRFs). SRFs offer loans to local governments at rates below the current interest rate. For example, the Washington State Revolving Loan Fund offers short-term loans (those that will be repaid within five years) at 0 percent interest, and long-term loans at 4 and 5 percent interest rates.[3] The main advantage of switching to state revolving loan funds is that SRFs are designed to be self sustaining, thereby eliminating the need for long-term federal contributions. The federal government will be "seeding" individual state funds until 1994. State government is also required to contribute capital. After 1994 the payments from previous loans will supply the SRFs with capital.

The self sufficiency of the SRFs is a considerable advantage over the Construction Grants Program. In theory, they will free a great deal of federal money after 1994 for use in other areas. The switch from the grant program to the SRFs, however, has not been without problems. Perhaps the most significant is the impact on smaller communities who may find the transition from grants to loans difficult to accept and manage.

The remainder of this report will focus on three communities in Rhode Island that are faced with making this transition in order to upgrade their wastewater treatment facilities: Cranston, Warwick, and West Warwick.

---

[1] Federal Water Pollution Control Act, 1972, amended 1987.

[2] Water: Laws and Management, Charles D. Mosher, 25th Annual AWRA Conference, 1989.

[3] The Washington State Water Pollution Control Revolving Fund (SRF), Washington State Department of Ecology, Draft Brochure, 1989.

B. WASTEWATER TREATMENT IN CRANSTON, WARWICK, AND WEST WARWICK

Cranston, Warwick, and West Warwick are two cities and a town on the outskirts of Providence in the State of Rhode Island. It is estimated that these communities make up approximately one third of the state's population. They each own and operate a small wastewater treatment facility that discharges to the Pawtuxet River. Both the Cranston and West Warwick facilities serve residents from adjoining areas. All three of the wastewater treatment facilities are at, or near, secondary treatment. The Warwick and West Warwick plants are currently upgrading to secondary. West Warwick is also adding additional capacity (see Table 1).

In conjunction with efforts to clean up Narragansett Bay, the estuary that receives the waters from the Pawtuxet River, the water quality of the river has been evaluated. The concentration of nutrients and other pollutants in the river was found to be a factor contributing to water quality problems in the Bay. As a result of this evaluation the treatment facilities along the river, including those in Cranston, Warwick, and West Warwick, will be required to adopt best available technology to reduce pollutant discharges to the river. This will involve the upgrading of the facilities to tertiary, or advanced wastewater treatment. Preliminary estimates indicate that it will cost between $20 and $40 million dollars per plant to bring AWT to the Pawtuxet River. The termination of the Construction Grant Program has caused a great deal of concern as to the ability of these areas to meet the demands of carrying additional debt to finance facility upgrade.

Discussion with officials in Cranston, Warwick, and West Warwick leads to questions about the ultimate effect on the quality of water in the river of upgrading these treatment facilities. The lower reaches of the Pawtuxet River (the areas that receive the effluent from the treatment plants) have a history of poor water quality. Initial estimates indicate that the combined discharges of effluent to the river make up approximately 50 percent of summer flow. This high percentage is due in part to the presence of a large reservoir on the river. Although the law requires that the Scituate Reservoir discharge a minimum of 12 million gallons of water per day, in times of summer drought the reservoir may not have the capacity to meet this requirement. There is also a preliminary plan to place a second reservoir on the Pawtuxet to meet increasing demands on the water supply. This has the potential of affecting the amount of flow in the lower reaches of the river, most likely increasing the percentage of effluent in the summer months. The Pawtuxet River also has some residual deposits of pollutants from the textile industry that was once a heavy user of the river. A great deal of the manufacturing that used to take place along the river has relocated, but the contaminants remain in the sediments. Based on this background information, it may prove very difficult for the Pawtuxet River to become "swimmable and fishable," one of the major goals of the Clean Water Act.

This situation is made especially difficult in the communities discussed here because of a proposal that was made in the early 1970s. During conversations with officials of Cranston, Warwick, and West Warwick they referred to a proposal they made to centralize wastewater treatment in the area. Their plan called for centralization of wastewater treatment in Cranston and upgrading the Cranston facility to advanced wastewater treatment. The officials consulted reported that the EPA put the proposal "on hold" pending further study. The question of regionalization and

AWT was not raised again until EPA required the upgrade of wastewater treatment along the river in the late 1980s. To the local governments in the Providence region, it appears that regionalization was examined and dismissed by EPA while the Construction Grant Program was financing projects and was not raised again until the funding strategy changed. They resent the fact that

Table 1: Description of the Communities

	Cranston	Warwick	West Warwick
Population	75,631	87,654	29,873
Households	21,000	24,000	11,620
Households Served by Sewers(1)	44,403	14,000	17,700
Median Household Income(2)	$29,617	$32,061	$26,685
Percent of Households Below the Poverty Line(3)	7.30%	6.60%	10.60%
Unemployment Rate(4)	4.20%	3.20%	3.80%

(1) Both Cranston and West Warwick are "regional" facilities, processing wastewater from adjacent areas.

(2) 1989 median household income was established by updating the 1980 census data to 1987 using per capita income estimates for Rhode Island and to 1989 using the Consumer Price Index.

(3) The percent of households below the poverty line in the State of Rhode Island is 10%.

(4) The unemployment rate for the State of Rhode Island is 3.5%.

(5) Year of Data:

Population - 1989
Number of Households - 1989
Numbered of Households Served by Sewers - 1989
Median Household Income - 1989
Percent Below the Poverty Line - 1980
Unemployment Rate - August 1989

Sources:

The 1980 Census: General Social and Economic Charateristics for the State of Rhode Island, 1981.
Rhode Island User Charge Study , 1989
Land Use 2010 - State Land Use Policies and Plan, State of Rhode Island, DRAFT, 1989.
The State of Rhode Island Employment Security Department,
Personal Communication, October 1989.
Personal Communications with City and Town officials, October 1989.

they must now bear the costs of upgrading their facilities, especially since it was deemed a low priority when monies were available to reduce the burden. This increases political resistance to upgrading wastewater treatment in the area, and continues to move the focus of the requirement to upgrade treatment along the Pawtuxet River from the benefits of improved water quality to the costs associated with the projects.

C. THE COST OF UPGRADING TO ADVANCED WASTEWATER TREATMENT

Regardless of the potential for the long-term success of the clean-up effort, the Clean Water Act requires that these communities attempt to improve the water quality of the river, thereby reducing the contamination of the Bay. The expected schedule approaches the following:

- Three years for planning;
- Three years for detailed design development;
- Approximately 3 years for construction.[4]

However, upgrading the treatment plants is a very expensive effort. Tables 2 and 3 summarize the costs of wastewater treatment before and after upgrading the facilities. All estimates shown are in 1989 dollars.

In order to better understand the effect of the cost of the plants on Cranston, Warwick, and West Warwick, five scenarios were developed to examine different ways that the capital needed to fund the upgrading could be obtained.

- Scenario 1 - This scenario approximates the costs of obtaining the capital from Rhode Island's SRF. All of the capital is obtained from the fund and repaid over 20 years at a 4 percent interest rate. Full funding from the SRF is unlikely.
- Scenario 2 - This scenario approximates partial funding of the capital by a SRF that requires local matching of funds. Seventy (70) percent of the capital would be obtained from the SRF at a 4 percent interest rate with the remaining thirty (30) percent from the bond market at a 7 percent interest rate. This would also be amortized over 20 years.
- Scenario 3 - This scenario assumes that SRF financing is not available and that the entire capital cost must be raised in the bond market at a 7 percent interest rate and repaid over 20 years.

---

[4] Personal Communication, Rhode Island Department of Environmental Quality, October 1989.

- Scenario 4 - This scenario assumes that the capital required will be raised in the bond market at an interest rate of 8 percent.

Table 2: Current Cost of Wastewater Treatment

	Cranston	Warwick	West Warwick
Level of Treatment	Secondary	Secondary(1)	Secondary(1)
Plant Capacity	23 MGD	5 MGD	5 MGD(2)
Operations & Maintenance Costs	$3.0 million	$3.0 million	$1.7 million
Debt Service	$4.0 million	$3.0 million	$2.0 million(4)
Rate Base	$7.0 million	$6.0 million	$3.7 million
Level of Debt	NA	$28 million	$22 million
Current Rate for Average Household per year(5)	$165	$185(3)	$160
Total Residential Cost per Household (6)	$165	$318	$203
Percent of Median Household Income(7)	0.56%	0.99%	0.76%

(1) These plants are currently upgrading to secondary treatment.

(2) West Warrwick is currently expanding its capacity to 8.0 MGD (Million Gallons per Day).

(3) User fees include principal repayments only. ($1 million) The City General Fund pays the $2 million interest.

(4) Users have only paid a portion of the debt service. Currently, West Warrwick is considering a bond issue to repay the General Fund for past contributions toward the debt.

(5) These rates are approximate and were provided by city and town officials.

(6) Total residential cost per household is the total cost of waterwater treatment (O&M and Debt Service) divided by the number of households served by the system.

(7) Percent that the total residential cost per household makes up of the 1989 median household income.

(8) All values are in 1989 dollars.

Sources:
Rhode Island User Charge Study, 1989.
Personal Communication with City and Town Officials, October 1989.

- Scenario 5 - This scenario assumes that a grant program would be developed to assist in upgrading small plants. Half of the capital would be in the form of a grant and the remaining 50 percent would be raised in the bond market at a 7 percent interest rate over the next 20 years.

The annual debt service to finance the upgrade to AWT under each of these five scenarios is presented in Table 4. The difference in the debt service between the first four scenarios for all three towns is not very pronounced. As expected, the grant program results in the smallest level of debt.

With the exception of Scenario 1, all of the financing scenarios presented above require the local governments to finance either a portion or all of the debt through a local bond issue. A major factor in considering the feasibility of such financing is the current and future bond rating of the communities. The current bond rating of the three communities in question is as follows:

- Cranston - A;
- Warwick - B and AA1;
- West Warwick - A1 by Moodys and A+ by Standard & Poors.

City and town officials estimate that the additional debt required to upgrade their wastewater treatment facility will severely limit the ability to raise capital in the future.[5] Some officials fear that the end result will find their city or town denied access to the bond market. Some have even taken steps to warn their creditors of their position.[6]

West Warwick's situation is particularly precarious. Shortfalls from rate revenue during the past several years have found the treatment plant using money from the town's general fund to supplement its revenue. Officials at the treatment facility have recently been informed that the money provided from the general fund is to be regarded as a loan and the treatment plant may be forced to float bonds to repay the almost $9 million dollar debt. This additional bond issue will undoubtedly result in higher rates for sewer users and could have a serious effect on the town's ability to secure future capital.

D. FINANCIAL IMPACT

One of the major concerns of the communities of Cranston, Warwick, and West Warwick is the impact that upgrading wastewater treatment plants will have on the wastewater treatment costs per household. How much will average wastewater treatment costs per household increase after

---

[5] It is possible that the negative impact on the bond rating for these communities could be mitigated through the establishment of a special district which would issue the bonds. Further research is required to determine if this approach is feasible.

[6] Personal Communication with City and Town Officials, October 1989.

AWT upgrades come on line? Will this increase impose a hardship on residents of the communities of Cranston, Warwick, and West Warwick? A complete answer to these questions

Table 4: Scenarios for Servicing New Debt

	Scenario 1 (1)	Scenario 2 (1)	Scenario 3 (1)	Scenario 4 (1)	Scenario 5 (1)
Cranston					
Total New Del	$35 million	$35 million	$35 million	$35 million	$17.5 million
Debt Service	$2.6 million	$2.8 million	$3.3 million	$3.6 million	$1.6 million
Warwick					
Total New Del	$27.5 million	$27.5 million	$27.5 million	$27.5 million	$13.7 million
Debt Service	$2.0 million	$2.2 million	$2.6 million	$2.8 million	$1.3 million
West Warwick					
Total New Del	$25 million	$25 million	$25 million	$25 million	$12.5 million
Debt Service	$1.8 million	$2.0 million	$2.3 million	$2.5 million	$1.2 million

Note: All Scenarios assume a 20 year amortization period.

(1) Scenario 1: 100% of additional capital at 4% interest.
Scenario 2: 70% of additional capital at 4% and the remainder at 7%.
Scenario 3: 100% of additional capital at 7%.
Scenario 4: 100% of additional capital at 8%.
Scenario 5: 50% of additonal capital in the form of a grant, the remainder at 7%.

(2) The midpoint of the range for Additional Debt to Upgrade to Advanced Wastewater Treatment presented in Table 3 was used as a basis for the analysis of these scenarios: Cranston $35 million, Warwick $27.5 million, West Warwick $25 million.

(3) All values are in 1989 dollars.

Sources:
Personal Communication with City and Town Officials, October, 1989.

requires development of a financial projection model and collection of detailed financial data for each of these three communities. This effort was beyond the scope of this project.

A recent report published by Smith Barney contains projected average wastewater charges per household for 18 communities in Rhode Island, including the three communities of interest in this study.[7] The report focuses on average cost of wastewater treatment per household rather than on customer rates since many communities in Rhode Island use a combination of rates and tax revenue to finance their wastewater facilities.[8] The following table presents the Smith Barney forecast of average cost per household in the year 2001 (in year 2001 dollars) for the three communities. It also compares these costs with the average cost per household in 1989 from the Rhode Island User Charge Study.[9] Note that the average cost per household in 1989 is expressed in year 2001 dollars so that a comparison can be made between the two values which excludes the impact of inflation.

Facility	Average Cost per Household		
	1989 (2001 dollars)	2001 (2001 dollars)	Percent Change
Cranston	296	496	68%
Warwick	571	922	61%
West Warwick	364	664	82%
Narragansett Bay Commission[10]	146	565	287%

Note: Assumes financing at an eight percent interest rate.

Source: Smith Barney

While the Smith Barney report does not provide specific information on the approach used to project average costs per household, it is likely that standard financial projection techniques were used. A short summary of a typical financial projection model is provided here as background for the reader.

---

[7] *Rhode Island Department of Environmental Management Wastewater SRF Program: Financial Plan*, October 1989, and *addendum*, December 14, 1989, Smith Barney.

[8] Average cost of wastewater treatment per household is defined as the total cost of wastewater treatment multiplied by the share of cost applicable to the residential sector divided by the number of households served.

[9] *The Rhode Island User Charge Study*, US EPA, 1989.

[10] Average cost per household for the year 2001 is derived from the estimate for the year 2000 and an expected inflation rate of five percent. A projection for the average cost per household for the year 2001 for Narragansett Bay Commission Facility was not available.

Financial projection models typically assume that average customer cost for each sector increases at the same rate as total costs increase.[11] This can be expressed in the following model:

$$\text{Average Cost per Household(year)} = \text{Average Cost per Household(1989)} * \frac{\text{Total System Cost(year)}}{\text{Total System Cost(1989)}}$$

$$\text{System Cost(year)} = \text{Debt Service(year)} + \text{O\&M Cost(year)}$$

The underlying assumption in this model is that the average customer cost for residential users will rise at the same rate at which total system cost increases. Since residential customers are by far the largest customer class served by these wastewater facilities, this assumption appears to be reasonable. The major inputs into such a model are the following:

1. Average cost of wastewater treatment per household in 1989, before AWT construction is started;

2. Amount of debt in 1989 and schedule for debt retirement;

3. Cost of AWT and financing mechanisms;

4. Year that AWT comes on line;

5. Rate of inflation.

If the need arises to update the financial projections made by Smith Barney in the future, the model described above could be used as a starting point for making such updates.

The Smith Barney report also presents estimates of the ratio of average cost per household to median household income for the 18 communities included in the report. For Cranston, Warwick, and West Warwick, this ratio is below 1.5 percent of median household income in the year 2001, a common benchmark used to define hardship as shown below.

Community	Ratio of Average Cost per Household to Median Household Income
Cranston	.77%
Warwick	1.39%
West Warwick	1.16%

Note: Assumes financing at an eight percent interest rate.
Source: Smith Barney

[11] More detailed rate projections would be made if an actual rate study were to be conducted.

The median income projections used by Smith Barney to calculate the ratios shown in the above table assume that household income will increase faster than the rate of inflation over the next decade. Our calculations indicate that the Smith Barney income projections assume that income will increase at a rate of 1% to 1.5% per year above the rate of inflation. If these increases do not materialize, then median income in the year 2001 will be lower than expected and the ratio of average cost per household to median income would rise accordingly.

E. REGIONALIZATION

Regionalization of wastewater treatment in the Providence area is often considered the long-term solution to the problem of financing AWT along the Pawtuxet River. There are two alternatives that could potentially be instituted in the area:

- Alternative 1 - Pump all effluent to the Narragansett Bay Commission facility in Providence for treatment and disposal.

- Alternative 2 - Pump the effluent from West Warwick and Warwick to Cranston for treatment and disposal.

To obtain an initial indication of how the cost of these two regionalization alternatives compares to upgrading each of the three individual treatment plants, an estimate was made of the cost of laying the required pipeline. These estimates are shown in Table 5.

Alternative 1 involves pumping effluent from each of the three communities to the Narragansett Bay Commission facility for treatment. The current capacity of the facility is 64 MGD[12] with an average daily flow of 47 MGD. The combined average daily flow the three facilities in question is 19 MGD.[13] Bringing an additional 19 MGD of effluent to the facility for processing and disposal would require a capacity expansion and a reexamination of the plant's impact on water quality in the Bay. The end result may be that the Narragansett Bay Commission plant would have to upgrade to AWT. At a minimum, plant capacity for secondary treatment would have to be increased. The total cost of this option depends on whether the expansion of the Narragansett Bay facility is to secondary or tertiary treatment levels.

While an estimate of the cost of expanding of the Narragansett Bay Commission Facility has not been made, the cost of piping the effluent from the three facilities to the Narragansett Bay Commission Facility is estimated at $51 to $54 million.[14] The total cost of upgrading the Cranston, Warwick, and West Warwick facilities is estimated to be between $75 and $100 million. Therefore,

---

[12] MGD = million gallons per day.

[13] Rhode Island User Charge Study, Rhode Island Environmental Protection Agency, 1989.

[14] This is based on an estimate of $1000 per foot for labor and materials. Pumping stations, if needed, would be an addition to these costs).

pumping the effluent to the Narragansett Bay Commission Facility for treatment would be cost effective only if the cost of expanding the facility were less than $24 to $46 million.

Table 5: Estimated Cost of Pipe for Regionalization Alternatives

	Estimated Piping Cost
Alternative 1:	
Distance to NBC Facility(1)	9.75 to 10.25 miles
Cost of Pipe(2)	$51 to $54 million
Alternative 2:	
Distance to Cranston facility (1)	5.25 to 7 miles
Cost of Pipe(2)	$28 to $37 million
Cost of Cranston Upgrade	$30 to $40 million
Total Cost of Alternative 2	$58 to $77 million

(1) Distances to the Narragansett Bay Commission wastewater treatment facility were estimated assuming that the pipes would follow major roads.

(2) Based on estimate of $1000 per foot for labor and materials. Pumping stations, if needed, would be an addition to these costs.

(3) Alternative 1: Pumping all effluent to the Narragansett Bay Commission plant for treatment. (This alternative also includes expansion of the Narragansett Bay Commission plant.)
Alternative 2: Pumping all effluent to the Cranston plant for treatment and upgrading the Cranston plant to AWT.

(4) All values are in 1989 dollars.

Sources:
Personal Communications with City and Town Officials, October 1989.

Another issue that may influence the overall feasibility of Alternative 1 is the effect on the Pawtuxet River. It may prove to be illegal to remove the discharges from the river. Since the three treatment plants play a large role in the net flow of the river, pumping their effluent to Providence for treatment and disposal would reduce the flow in the river. If this is unacceptable then the problem could be addressed by either laying a pipe to return treated effluent to the Pawtuxet River or by requiring the reservoir to release additional water to maintain the river's flow. The first alternative is expensive. The second alternative is not likely to be feasible since it would reduce water supply in the area.

Alternative 2 would involve the pumping of sewage from West Warwick and Warwick to Cranston for treatment. The Cranston facility has sufficient capacity to handle this increment (the current average daily flow is approximately 12 MGD, while the capacity is 23 MGD)[15]. Thus, it would not be necessary to expand plant size. Additional pipe would have to be laid, however, at a cost of $28 to $37 million (see Table 5).

The total cost of Alternative 2 not only includes the cost of piping but the cost of upgrading the Cranston facility to AWT, as well. The total cost of this alternative is $58 to $77 million. This is a bit less than the estimated cost of upgrading each facility, $75 to $100 million, and therefore is slightly more cost effective.

Another important factor that must be considered in the discussion of regionalization is political feasibility. These treatment plants are a source of tax revenue and jobs in these communities. It may be difficult to phase them out in favor of other alternatives without conclusive evidence of substantial savings to the people in the area. The estimated benefits of regionalization may not be large enough to offset perceived costs at this time.

F. FINANCING OPTIONS

The financing options chosen for upgrading wastewater treatment facilities from secondary to tertiary treatment must supply funds needed both for a large initial capital investment and for increased operation and maintenance costs. The first requirement, funds to finance the capital construction program, is often achieved by selling bonds or obtaining a loan which is paid back using future taxes or rate revenues. The second cost element, funds for increased operation and maintenance expenditures, requires an ongoing revenue source such as taxes or rate revenue.

Four major classes of financing options are available to the communities of Cranston, Warwick, and West Warwick to finance the upgrade of their wastewater treatment facilities from secondary to tertiary treatment. The first is local taxes and rate revenue. For capital expenditures, local taxes and/or rate revenue are used to make bond payments or repay loans. For O&M expenditures local taxes and/or rates are used as the annual funding source. The second and third sources of funding are intergovernmental assistance and private sector investments. Intergovernmental assistance can come in the form of below market rate interest loans or in the form of grants to

[15] Rhode Island User Charge Study, Rhode Island Environmental Protection Agency, 1989.

finance planning and/or construction of facilities. Private sector investments are investments made by the private sector, such as building of sewer lines by a developer. Finally, public-private partnership may be a viable alternative. A brief discussion of each of these funding alternatives is provided below.

1. Local Taxes and Rates

At the local level, taxes and rates are the primary revenue sources available for financing the upgrade of wastewater treatment facilities. In addition, impact fees can be an effective method of financing infrastructure needed in growing areas. Bonds and loans can be used as a financing mechanism for new capital projects. It is important to note, however, that funds raised through bonds and loans are not a new source of revenue. The bonds or loans must be repaid with revenue sources such as taxes and/or rates.

Each of these local funding alternatives is discussed in turn below.

a. Rates and Charges

Rates and charges are an appropriate mechanism for raising revenue for programs where there is a defined population being served. Typically, for wastewater treatment plants, rates are levied based on estimated volume of wastewater. In some cases, where estimation is difficult, a flat rate is used. In addition, charges are often levied for hook-up to the facility. Pre-treatment fees for certain business and industrial users are often a component of the rate structure as well. A primary consideration when examining rates as a potential funding source is the level of rates needed to finance the particular project.

Wastewater rates can be used to encourage water conservation. In particular, an increasing block structure in which successive units of wastewater are billed at increasing rates. Current sewer rates for the three towns examined in this report send either no such market signals or only very weak ones to consumers. Cranston residents are charged a flat annual fee regardless of their water use. Sewer users in West Warwick pay a small flat fee on consumption up to 36 Hundred Cubic Feet (CCF) a flat (rather than increasing) unit charge per CCF thereafter. Among the three municipalities, Warwick users receive the strongest market signals regarding their generation of wastewater both because they pay a unit charge on <u>all</u> water consumed (not just units consumed in excess of some arbitrary ceiling), and because the unit charge per CCF is highest. However, as in West Warwick, Warwick's unit charge is flat rather than rising with successive units demanded (See Table 6).

b. Taxes

Local and state governments finance a variety of activities using tax revenue. In general, taxes are calculated using different formulas, or tax rates, on different bases. Tax rates are simply unit charges per unit of base. There are two general types of tax structures: (1) fixed rates for each unit of tax base (for example a gasoline tax of five cents per gallon), and (2) ad valorem rates expressed as a percentage of the value of the tax base (such as property taxes of $1.20 for each $100

of assessed property value). In addition, tax surcharges are often levied temporarily to raise money for a particular purpose.

Income taxes, property taxes, sales taxes, and commodity taxes are the most common types of taxes utilized by state and local governments. The federal government and a number of state governments impose income taxes to raise revenue for programs. In some states, cities are also

Table 6
Sewer Rates in Cranston, Warwick, and West Warwick

Municipality	Single-family Residential Rate	User Fee Rate Basis
Cranston	$165	Flat Annual Fee
West Warwick	$48	Flat Annual Fee per 0-36 CCF(1) $1.10 per CCF thereafter
Warwick	$41.15	Flat Annual Service Charge plus $1.47 per CCF

(1) CCF - Hundred Cubic Feet

(2) All values are in 1989 dollars.

allowed access to this revenue source. Sales taxes are heavily used by states. Property taxes are the prevailing type of local tax and a major source of revenue for local governments in Rhode Island. Finally, commodity taxes are levied on particular items such as gasoline, cigarettes, and liquor. In many cases, there is a direct relationship between the commodity tax and use of funds. The federal gasoline tax which is used for highway improvements is such an example. In other instances, the relationship between the commodity tax and the target population is tenuous. In Washington State, for example, an eight cent per pack cigarette tax helps finance wastewater treatment plant upgrades and other water quality programs. The New Hampshire liquor tax finances a broad range of activities across that state. Other examples of commodity taxes include real estate transfer taxes, taxes on hunting and fishing equipment, taxes on restaurant and hotel income, and severance taxes for minerals.

c. Impact Fees

Impact fees are fees imposed by local governments on developers to cover the cost of services needed to support the development. Impact fees are imposed by local governments in Rhode Island to provide funding for activities such as recreation and police. It is important to note that impact fees are useful only in cases where facilities must be built to accommodate new growth. Impact fees are not a feasible financing mechanisms for upgrading existing facilities to serve the existing population. Thus, impact fees are not a viable revenue alternative for the upgrade of wastewater treatment plants from secondary to tertiary treatment. They can provide supplemental financing to allow additional capacity to be built in the plant to accommodate expected future growth, however.

d. Bonds and Loans

Upgrading wastewater treatment facilities from secondary to tertiary treatment requires a large expenditure of capital funds. Once upgraded, the facility will serve residents for many years. Bond financing distributes the burden of repayment for a long-life facility across all individuals who benefit from it. Bonds also provide the large funds needed up-front to finance capital acquisition. *It is important to note, however, that since borrowed funds must be repaid, the ultimate source of repayment of the bonds is either taxes or rate revenue.* Bonds are not suited to fund on-going routine expenses such as the operation of a wastewater treatment facility.

There are two types of bonds commonly used by local governments to finance capital acquisitions: general obligation bonds and revenue bonds. A third form of debt financing, state revolving fund, can also be used by local governments to finance capital acquisitions. This third alterative is discussed below under intergovernmental assistance.

General obligation bonds are backed by the full faith, credit, and taxing power of the local government issuing the bonds. While a particular revenue source may be earmarked for their repayment, guarantee for repayment of the bond is provided by the entire stream of tax revenues paid to the local government. For this reason, a general obligation bond may be considered a stronger guarantee of repayment than a revenue bond. Because this guarantee represents the most direct obligation of the issuer, the accumulated level of outstanding general obligation, along with

constitutional and statutory limits on debt capacity and on tax levy capacity, affects credit ratings. These factors can become constraints on maintaining a good credit rating and thus, on the addition of new general obligation debt. Beyond a certain level, existing bond limitations and taxing authority may be insufficient to permit issuance of new bonds.

Revenue bonds are backed by revenue from a dedicated source such as rate revenue. Because revenue bonds have far fewer statutory constraints, they have replaced general obligation bonds as the primary form of municipal financing. In theory, because this form of debt has its own guarantee (the project revenues) its issuance should not decrease a locality's credit rating. In practice, however, revenue debt represents an indirect obligation of the issuing government. In addition, because the lender has only the project revenues to depend on for repayment, the value of the guarantee is not as great as that of a similar general obligation bond. Therefore, relative to comparable general obligation bonds, interest rates for revenue bonds are generally higher.

In most cases, established utilities issuing bonds will issue revenue bonds. New utilities may not have enough history to issue revenue bonds. In these cases, general obligation bonds are issued or, alternatively, a "double-barreled" bond may be issued. This is a bond backed by both a dedicated revenue source and the full faith and credit of the local government.

2. Intergovernmental Assistance

Intergovernmental assistance can reduce the local financing burden. Assistance is generally provided in one of two ways: grant programs and loan programs. Potential funding from these two sources in the State of Rhode Island is discussed below.

a. Grant Programs

Until recently, the federal government was a major source of funding for building and upgrading of wastewater treatment facilities. The Federal Construction Grant Program of the Clean Water Act has issued over $50 billion to fund the development and upgrading of wastewater treatment plants. The 1987 amendments to the Act eliminated this program, creating SRFs instead.

Since the federal government no longer provides grants to communities for wastewater treatment facilities, the only option remaining for grant funds is at the state level. In most cases, states provide very little grant funding to local governments for wastewater treatment programs.

A brief survey of other states indicate that much of the country will be experiencing "rate shock" when it comes to upgrading wastewater treatment facilities to meet water quality goals. Clearly, there has been a shift to state and local responsibility for the funding of these activities, which will place more of the burden on residents. The states surveyed are all planning to use SRFs to fill the gap left by the Construction Grant Program and few plans are being made for developing grant programs for areas that find repaying these loans a hardship. Some states may offer "extra-low" interest rates to these communities.

The Rhode Island State Legislature has authorized a $10 million grant program to assist communities on the Pawtuxet River to conduct planning studies for the upgrade of wastewater treatment facilities. The grants will be financed through state bonds which must be approved by the voters of the state. The situation in Cranston, Warwick, and West Warwick makes Rhode Island one of the first states to face the problem of communities that need immediate financial assistance.

b. State Revolving Fund

When the federal government decided to discontinue its grant program for wastewater treatment facilities, it authorized the creation of State Revolving Funds to provide financial assistance to local governments for the construction of wastewater treatment facilities and other select activities. State Revolving Funds are loan funds which provide financing to local governments at below market interest rates. Once a state has created a program which satisfies federal requirements, the federal government provides an initial infusion of capital. The state must also provide capital to the revolving fund. While not all of the states surveyed had their SRF up and running, they all anticipated that funds in the SRF would remain at a level sufficient to meet demands for capital well into the future.

The State of Rhode Island has nearly completed the steps required by the federal government to obtain federal funds for its State Revolving Fund. It is expected that these steps will be completed in the very near future, allowing the State Revolving Fund to begin accepting applications and making loans. Rhode Island has authorized $40 million in bonds for the State Revolving Fund, which must be approved by the voters.

c. Hardship Criteria

One of the potential goals of state level loan and grant programs can be to alleviate financial hardship resulting from the upgrade of wastewater treatment facilities. The State of Washington uses a combination of a grant program and its State Revolving Fund to provide financial assistance to communities which would experience financial hardship as a result of local financing of wastewater treatment facilities.[16] A few other states in the country also operate programs with similar goals.

The hardship criteria used for this program is that the average cost of wastewater treatment exceeds 1.5 percent of median household income. Projects are rated according to evaluation criteria, which include public health needs, environmental needs, and financial needs. In the case of secondary treatment, the environmental need is constant across projects. In effect, all secondary projects are thus rated on financial need. For projects which meet the hardship criteria of average cost exceeding 1.5 percent of median household income, a reduced interest rate over the long term is offered. This interest rate can fall to 0 percent over the 20 year loan period if necessary. Projects which do not meet hardship criteria are typically offered a loan at 5 percent interest for 20 years.

In addition to loans from the State Revolving Fund, the State of Washington offers grants funded through an 8 cent per package tax on cigarettes. This program, the Centennial Clean Water Fund, prioritizes projects based on a number of criteria. If a project is high enough on the priority list and meets the financial hardship criteria, then the community has two alternatives:

- 50 percent grant plus low interest loan;
- 65 percent grant.

---

[16] Personal Communication, Washington State Department of Ecology, October 1989.

Financial hardship does not release a community from its obligation to build facilities which are required to meet the state's environmental objectives. The projects must be built. At the same time, the state recognizes that some communities may experience financial hardship as a result of building the facilities and, through its financial assistance program, works to reduce this financial impact.

3. Private Sector Investments

In some cases, wastewater treatment facilities can achieve some of their goals by imposing a portion of the cost of these facilities directly on the private sector. For example, a wastewater utility may require that a new development install all new sewer lines needed to hook up to the utility's sewer system. This method of financing has two effects that are distinct advantages for the public sector. First, it relieves the public sector of part or all of the financing burden. Second, use of private spending in lieu of public spending provides private incentives to minimize costs.

The major disadvantage of this alternative is that the wastewater facility has less control over the activities conducted by private parities. Sewer lines built by private parties may not meet the standards set by the wastewater facility. A second disadvantage is that parties responsible for the private expenditures may provide political resistance to this alternative.

4. Public-Private Partnerships

As communities across the country have faced the high costs of building environmental projects and reduced availability of federal funds, a search has begun for alterative approaches of project construction and finance. Some communities have found that cooperation between the public and private sector has facilitated completion of needed environmental projects. These public-private partnerships are defined as any arrangement in which responsibility is shared for at least one stage of an environmental project: proposal, selection, financing, design, construction, ownership, or operation. Benefits from public-private partnerships can include reduced project costs, faster project completion, and possibly, assistance with project financing.

The traditional procurement process for environmental projects, such as wastewater treatment facilities, is a three-step procurement process. This process was developed by the Environmental Protection Agency over the last twenty years to provide check points for the flow of federal grants to municipally owned wastewater treatment plants. The three steps in this process are planning, design, and competitively bid construction contracts. EPA or state review occurs at each step along the way.

This procurement process was designed to ensure that the money provided by the Federal Construction Grant Program was well spent. The procurement process also resulted in increased costs of wastewater facilities due to the costs of complying with EPA's regulations and with separate state contracting laws. Typical requirements included compliance with Davis/Bacon prevailing wage rules and a requirement that construction contacts be let via issuance of numerous small contracts rather than one large contract. Oversizing of project and "gold plating" also added to project costs under the Construction Grant Program.

Public-Private partnership can achieve cost savings over projects built under EPA Construction Grant Program regulations. Prior to 1986, cost savings of up to 40 percent could be achieved. These cost savings were the result of design-build construction processes which are more efficient than EPA's 3-step procurement process and of tax credits and accelerated deprecation which provided incentives to the private sector to invest in wastewater facilities. A number of projects were completed through public-private partnerships during this era.

The cost savings which can be achieved through public-private partnerships since the Tax Reform Act of 1986 have been reduced due to the removal of tax credits and accelerated depreciation from the tax laws. A realistic expectation for cost savings from public-private partnerships developed after 1986 is 10 to 15 percent, with 20 percent savings an upper bound in most cases. Furthermore, none of the public-private partnerships built since 1986 have included cash equity in any of the wastewater facilities constructed. The interest in public-private partnerships has also declined since 1986. Nevertheless, some projects are underway which were initiated after the 1986 tax reform. These projects typically include construction of a wastewater treatment facility by a private firm for a fixed price coupled with a cash-backed plant operation agreement for up to 20 years. Typically, financing is provided by the public agency.

Three examples of public-private partnership projects initiated after the 1986 changes in the tax law are wastewater facilities built in Mount Vernon, Illinois; Edgewater, New Jersey; and Clinton, Kentucky. In Edgewater, New Jersey, a six MGD secondary plant has been completed for $9.9 million. The original budget was expected to be $16 million if constructed under the guidelines for the EPA Construction Grants program. By using a public-private partnership instead of State Revolving Fund financing, the plant was completed sooner and at the same price as if a State Revolving Fund loan had been used. In Mount Vernon, Illinois, a secondary plant was built for $3 million less than the lowest cost public construction alternative. The plant was completed less than a year after the contract was signed with a construction firm. It is meeting BOD and effluent requirements by wide margins. The State of Kentucky has a wastewater privatization law which was used successfully by the community of Clinton, Kentucky to build a 3000 gallon per day wastewater treatment facility. The facility cost was 30 percent less than an EPA grant plant would have cost. The project was financed by the construction firm using the small town's bond anticipation notes.

Two factors are key to the success of public-private partnerships:

- Availability of public financing for turnkey (design-build-operate) projects;
- Cooperative state officials.

Since the tax incentives for private firms to invest in wastewater facilities were removed in the Tax Reform Act of 1986, public financing of public-private partnership projects is essential to the success of such ventures. While the federal State Revolving Fund legislation does not allow private ownership of facilities, the legislation does allow a municipality to obtain funding for up to 80 percent of the project from a SRF for a turnkey project, which can include an operating agreement for up to five years under strict performance guarantees. In order for a local project to make use of

these provisions in the federal law, however, the state's State Revolving Fund program must adopt rules which allow funding for turnkey projects.

Adopting rules for the State Revolving Fund program which are flexible enough to allow financing of projects built through turnkey contracts requires the cooperation of state officials. Perhaps the most important change in the contracting procedure needed is to drop the requirement that design drawings be completed before loan funds are provided to municipalities. Such provisions prevent municipalities from using these loans for fast-track turnkey projects with private firms. Under the old system, state staff (or EPA staff in some cases) reviewed plans and specifications to determine their cost effectiveness before construction began. For public-private partnerships to achieve their full potential, it will be necessary for state staff to drop this requirement for turnkey projects and substitute other requirements which will not impede design-build efforts.

If a state SRF program is structured to allow municipalities to contract for turnkey facilities, the result could be lower cost financing for the municipalities and improved ability by the SRF to finance more projects.

G. CONCLUSION

This brief examination of the situation in Cranston, Warwick, and West Warwick, Rhode Island, serves to underscore the fact that upgrading to advanced wastewater treatment is expensive. Along with the $75 to $100 million cost of the upgrade, one must also consider that these communities are facing other costs for wastewater treatment. Warwick and West Warwick are still in the process of upgrading to secondary treatment, which has the potential to increase rates. West Warwick is in the midst of an expansion project designed to increase the plant's capacity and may face additional debt to repay funds borrowed from the town general fund. These costs combine to make the prospects of financing the required upgrade to AWT seem discouraging, especially without the possibility of grants from the federal government.

Four major funding alternatives have been identified which could be used by the communities of Cranston, Warwick, and West Warwick to finance the upgrade to AWT and other related activities. These alternatives, described in detail above, include:

- Local bond sales financed through local rates and/or taxes;
- State loans;
- State grants;
- Public-Private partnerships.

In addition, combinations of these alternatives could also be considered.

The specific impact on residents of the three communities of upgrading to AWT depends on the financing package employed. The analysis of financial impact of upgrading the wastewater

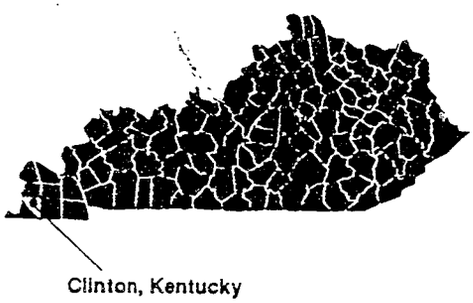
treatment facilities in Cranston, Warwick, and West Warwick conducted by Smith Barney suggests that these upgrades will not result in a financial hardship to these three communities. This conclusion is based on current estimates of the costs of facility upgrades and assumptions about the future course of the economy. It is possible that conditions could change and that one or more of these three communities, or other communities within the state of Rhode Island, could experience hardship as a result of upgrading wastewater treatment facilities to AWT. The State of Rhode Island may want to consider incorporation of hardship criteria into their SRF program to allow for this possibility. Such a program would only be activated if communities upgrading wastewater treatment facilities were, in fact, to face financial hardship.

Public-Private partnerships may be a promising vehicle to reduce the cost of upgrading treatment facilities to AWT. The success of public-private partnerships rests on the availability of public financing. One approach which could assist communities in building facilities through public-private partnerships and in financing those facilities would be to adopt rules for the State Revolving Fund Program which allow communities to build facilities through turnkey projects. The most important change in the contracting procedure from the previous Construction Grant Program is to drop the requirement that design drawings be completed before loan funds are provided to municipalities. By structuring the SRF program in this manner the State could reduce the cost of upgrading wastewater treatment facilities resulting in lower customer rates and increased state financing of projects through the SRF.

WASTEWATER TREATMENT

Turnkey Contract

WASTEWATER TREATMENT PLANT
CLINTON, KENTUCKY



- The City of Clinton entered into a turnkey agreement with Aqua Corporation to upgrade and operate a wastewater treatment plant owned by the city
- Clinton issued tax-exempt bond anticipation notes to finance the project
- The private partner completed the project for 30% less than the estimated cost of public construction and grant financing

SUMMARY

Under an order from EPA to upgrade its wastewater treatment system since 1981, Clinton faced fines from EPA if its treatment plant did not meet the secondary treatment standards of the Clean Water Act. The city was not high enough on the state priority list to be eligible for federal grants, so Clinton investigated alternatives. After the state passed a privatization act in 1986, Clinton contracted with a private company to upgrade (design and construction) and operate its wastewater treatment plant. The city retained ownership of the plant in order to obtain tax-exempt financing.

PARTIES INVOLVED AND TIMEFRAME

Public Partner (owner)	Clinton, Kentucky
Private Partner	The Aqua Corporation
Population	1,600 (1988)
Median Household Income	$13,080 (Hickman County, 1979)
Form of Government	Mayor/City Council
Project Initiated	September 1987
Project Completed	July 1988
Total Capital Cost	$950,000

WHY WAS A PRIVATE PARTNER CHOSEN/ALTERNATIVES CONSIDERED?

- Private partner had the expertise to upgrade and operate the plant
- Clinton retained ownership to obtain tax-exempt financing

A small town with limited resources, Clinton was unable to raise the capital necessary to upgrade their wastewater plant. While plant expansion can often be financed from additional revenues generated by growth, plant upgrades often require large capital investments without any new sources of funds. Also, construction and operation of the new plant required technical expertise beyond that of the municipal staff.

The city had planned to finance the project with federal construction grants but when that was not possible, they began to look for a private company with the resources and technical expertise to construct and operate the plant. Clinton decided to retain ownership of the plant in order to obtain tax-exempt financing.

WHAT WERE THE FINANCING ARRANGEMENTS?

- Clinton issued tax-exempt bond anticipation notes backed by user fees
- The notes are for three years and can be renewed or long-term bonds can be issued upon maturity
- The city implemented a new rate policy to increase revenues

Clinton issued three-year, fixed-rate bond anticipation notes totalling $950,000 at a 6.95 percent interest rate to finance the project. To comply with state law, Clinton passed an ordinance declaring that ultimately they intended to issue bonds. Clinton chose to issue short-term notes because they wanted the security of a fixed rate. The purchasing bank agreed to a fixed rate for the short-term notes, but the bank would not offer a fixed rate for long-term bonds. Also, Clinton could issue short-term notes with lower upfront costs than long-term bonds.

Liberty Bank of Louisville purchased the notes, and in return, receives tax-exempt interest income. The 1986 Tax Reform Act provides that if a municipality issues less than $10 m[illegible] a year in securities for public facilities, the interest is tax-e[illegible]ot when they are purchased by a bank.

The notes are backed by user fees, which were set to pay off the debt over a 15-year period. Each time the three-year notes are renewed, the city and the bank can negotiate an interest rate to renew the notes through the bank, or the city can find another purchaser. Revenues from user fees allow Clinton to reduce the dollar amount of the notes when renewed.

The city implemented a new rate policy in October 1987. Previously, revenues for wastewater treatment were drawn from property taxes and a $36 yearly charge per customer for sewer service. Under the new system, sewer charges increased to a flat rate of $15 per month for residential customers. Commercial customers pay $15 per month for the first thousand gallons and $3.25 for each additional thousand gallons.

WHAT WERE THE PROCUREMENT ARRANGEMENTS?

- Clinton negotiated with Aqua Corporation in a sole-source procurement process

Because of prior experience working with engineers from Aqua Corporation, the city decided to negotiate with them in a sole-source procurement process. Clinton signed a contract with Aqua Corporation for design and construction to upgrade the plant and a 5-year service agreement for operation and maintenance.

WHAT WAS THE DIVISION OF RESPONSIBILITIES?

City of Clinton

- Own the wastewater treatment plant
- Issue bond anticipation notes to finance the project
- Collect user fees to cover debt service

The Aqua Corporation

- Assist Clinton to secure financing for the project
- Design, construct, and operate the wastewater plant
- Secure the environmental permits
- Comply with environmental permit requirements
- Guarantee performance of equipment

HOW WAS THE PROJECT IMPLEMENTED?

- State law authorized local governments to enter into turnkey contracts with private companies

The state legislature passed an act in 1986 enabling local governments to contract with private companies to own and/or operate water and wastewater treatment facilities. Clinton's project was the first wastewater system to be upgraded by a private partner pursuant to the law.

WHY WAS THE PROJECT SUCCESSFUL?

- Private construction and tax-exempt financing reduced the cost of the project

Clinton conducted a study as part of the process of applying for EPA construction grants that estimated the project cost at $1.3 million. Aqua Corporation upgraded the wastewater plant for only $950,000. Through upgrading the plant and private operation, Clinton solved its effluent quality problems.

LESSONS LEARNED

- Clinton could keep user charges down because of low cost of capital

Although sewer charges for residential customers increased to $15 per month, Clinton's user charge is low compared to similar sewer systems in the state. This was an important objective in Clinton because many of the residential customers are retired and on fixed incomes. By financing the project with short-term notes at a low fixed rate of interest, Clinton could keep sewer charges low. The city is considering lowering sewer charges at the beginning of 1990.

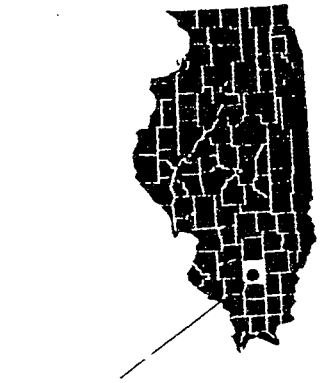
CONTACT

Bob Yates, Mayor
City of Clinton
P.O. Box 178
Clinton, KY 42031
(502) 653-3621

WASTEWATER TREATMENT

Turnkey Contract

WASTEWATER TREATMENT PLANT
MOUNT VERNON, ILLINOIS



Mount Vernon, Illinois

- **Mount Vernon entered into a turnkey agreement with Environmental Management Corporation to design, construct, and operate an upgraded and expanded wastewater treatment plant owned by the city**
- **The city issued tax-exempt and taxable general obligation bonds to finance the project, which were guaranteed by a letter of credit from a Japanese bank**
- **The private partner completed the upgrade and expansion in substantially less time and saved the city approximately $3 million (32 percent) compared to the city's initial pay-as-you-go plan**

SUMMARY

The area around Mount Vernon was experiencing rapid growth due to the location of new automobile manufacturing plants. The auto plants attracted a large number of associated businesses interested in locating in Mount Vernon. It was necessary for the city to act quickly to take advantage of the opportunity for growth. However, the city was under a 1986 sewer connection ban because of compliance problems at its wastewater treatment plant.

To overcome sewer restrictions quickly, Mount Vernon contracted with Environmental Management Corporation (EMC) to design, construct, and operate an upgraded and expanded wastewater treatment plant. Sewer restrictions were lifted after the first phase of construction was completed. Within 18 months, the city attracted approximately $300 million in private investment.

PARTIES INVOLVED AND TIMEFRAME

Public Partner (owner)	Mount Vernon, Illinois
Private Partner	Environmental Management Corporation
Population	17,470 (1986)
Median Household Income	$13,171 (1979)
Form of Government	City Council/Manager
Project Initiated	June 1987
Project Completed	October 1988
Total Capital Cost	$6.5 million

WHY WAS A PRIVATE PARTNER CHOSEN/ALTERNATIVES CONSIDERED?

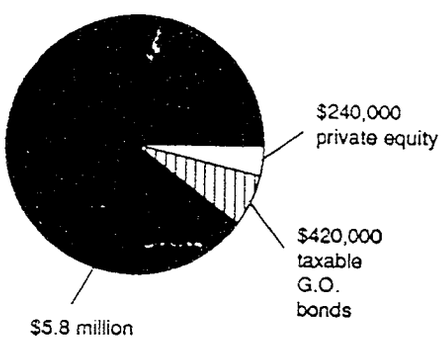
- Considered pay-as-you-go and federal grants but timing was critical
- Private partner proposed to complete the plant more quickly than public alternatives
- The city and EMC decided against private ownership

Mount Vernon contracted with EMC in 1984 to operate its wastewater treatment plant and to bring it into compliance with environmental regulations. However, the city needed to upgrade and expand the plant to come into full compliance. Mount Vernon passed a sales tax increase to finance a pay-as-you-go upgrade and expansion to be completed by 1994. The city also began working to obtain federal grants. However, the options chosen by the city could not be implemented quickly, so when EMC proposed to upgrade and expand the plant in a shorter time, the city accepted.

The city and the company jointly decided against the company's original proposal for private ownership, because of reduced tax benefits of private ownership after the 1986 Tax Reform Act and the potential that federal funds previously spent on the wastewater plant would have to be refunded. Public ownership allowed much of the cost of the project to be financed with tax-exempt bonds.

WHAT WERE THE FINANCING ARRANGEMENTS?

Total Capital Cost: $6.5 million



To finance upgrading and expansion of its wastewater treatment plant, the City of Mount Vernon issued 20-year tax-exempt general obligation bonds of $5.8 million and $420,000 of taxable general obligation bonds to pay project costs not eligible for tax-exempt financing. A Japanese bank issued a $6 million letter of credit to guarantee the bonds, raising the bond rating to AAA. EMC contributed $240,000 to finance the project.

The bonds are backed by the City of Mount Vernon, which pledged its full faith and credit and dedicated sales tax revenues to pay off the bonds. A previous 1/2 cent sales tax increase that the city passed for a pay-as-you-go upgrading of the wastewater plant now provides revenues to back the bonds.

The city could not use revenues from sewer charges to back the bonds because sewer charges were dedicated through 1994 to pay off bonds issued in 1975 to finance construction of the existing plant.

WHAT WERE THE PROCUREMENT ARRANGEMENTS?

- The city negotiated with a private partner in a sole-source procurement
- Fixed-price contract signed to upgrade and expand plant + 20-year service agreement

Through a sole-source procurement, the city signed a fixed-price contract with Environmental Management Corporation (EMC) to design and construct an upgraded and expanded wastewater treatment plant. When construction was completed, the city's contract with EMC to operate the existing plant was changed to a 20-year service agreement for EMC to operate and maintain the upgraded and expanded plant.

WHAT WAS THE DIVISION OF RESPONSIBILITIES?

City of Mount Vernon

- Own the wastewater treatment plant
- Issue general obligation bonds to finance the project
- Collect sales tax revenues and make monthly payments to EMC through a bond trustee
- Secure the environmental permits

Environmental Management Corporation (EMC)

- Design, construct, operate, and maintain the upgraded and expanded wastewater treatment plant
- Guarantee compliance with environmental permit requirements
- Guarantee performance of plant equipment
- Dispose of sludge
- Operate the city's existing wastewater plant during construction

HOW WAS THE PROJECT IMPLEMENTED?

- Mt. Vernon avoided conflicts with state procurement rules by voting for home rule
- EMC made preliminary proposal to Illinois EPA to avoid permitting delays

Because the city voted for home rule in 1986, it avoided conflicts with state procurement rules.

EMC worked with Illinois EPA before the agreement was signed to prove that its design would meet effluent requirements. As a result, the company helped the city avoid delays in permitting the project.

WHY WAS THE PROJECT SUCCESSFUL?

- Strong leadership by the mayor and public information campaign were important factors
- Sewer restrictions were lifted quickly
- City was not responsible for costs of change orders

Strong leadership by the mayor was important to the success of the project. The mayor insisted that negotiations be open to the public and that the public be kept informed. As a result, the community supported private sector involvement in the project.

Timing was critical for Mount Vernon because the city needed to solve its compliance problems quickly to accommodate new industry. Through negotiations with Illinois EPA, sewer restrictions were lifted after the first phase of construction was completed. By comparison, the city's initial plan to upgrade and expand the plant on a pay-as-you-go basis was estimated to cost $9.5 million and not be completed until 1994.

The fixed-price contract for design and construction guaranteed that the city would not pay costs that exceed the initial bid (change orders), which had added 20% to the bid cost for plants in nearby communities. EMC absorbed the cost of change orders.

LESSONS LEARNED

- Mount Vernon learned that it is important to find a partner that will accept responsibility for all aspects of the project

Mount Vernon learned that it is important to negotiate a public-private partnership that places responsibility for design, construction and operation with a single company. When problems occur, EMC has full liability. The city wanted to avoid the difficulties it experienced with an earlier expansion of the plant, when serious problems could not be resolved because none of the different private partners involved would accept responsibility.

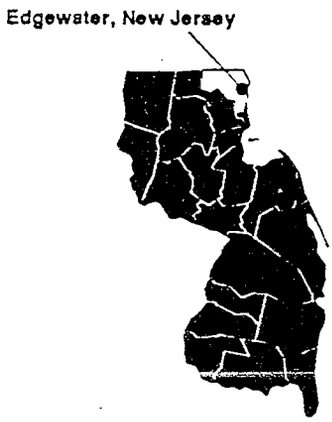
CONTACT

James Bassett, City Manager
City Hall
1100 Main Street
Mt. Vernon, IL 62864
(618) 242-5000

WASTEWATER TREATMENT

Turnkey Contract

WASTEWATER TREATMENT PLANT
EDGEWATER, NEW JERSEY



- **The Borough of Edgewater created the Municipal Utility Authority to issue tax-exempt bonds for improvement of its wastewater treatment system**
- **The authority entered into a turnkey agreement with Lotepro Corporation to design, construct, and operate a secondary treatment plant, owned by the authority**
- **Through tax-exempt bond financing and private construction, the project was completed for approximately 25% less than the estimated cost of financing the project with federal grants**

SUMMARY

After years of waiting for federal grant money to upgrade its wastewater treatment plant, grant money was no longer available in New Jersey. The Borough of Edgewater faced the July 1988 Clean Water Act deadline to provide secondary treatment. In addition, a state construction ban prevented new development in Edgewater until its wastewater system was improved. Edgewater's long-term contract to treat sewage from the neighboring Borough of Cliffside Park required Edgewater to ensure capacity to meet Cliffside Park's needs in addition to its own.

Edgewater created the Municipal Utility Authority to own the existing wastewater treatment plant and issue bonds to finance construction of a secondary treatment plant. Following competitive negotiation, the authority entered into a **turnkey** agreement with Lotepro Corporation to design, construct, and operate the secondary treatment plant.

PARTIES INVOLVED AND TIMEFRAME

Public Partners (owner)	Edgewater, New Jersey Municipal Utility Authority
Private Partner	Lotepro Corporation
Population	4,674 (1987, Edgewater)
Median Household Income	$20,737 (1979, Edgewater)
Form of Government	Mayor/City Council
Project Initiated	January 1986
Project Completed	Scheduled July 1989
Total Capital Cost	$16 million

WHY WAS A PRIVATE PARTNER CHOSEN/ALTERNATIVES CONSIDERED?

- Federal grants were no longer available
- Cost of bond financing was comparable to cost of state loans
- Chose to create municipal utility authority to contract with a private partner

Edgewater planned to use federal grants to construct a secondary treatment plant, but when they finally neared the top of the state priority list, federal grant money was no longer available in New Jersey. Edgewater decided that the cost of bond financing was comparable to the cost of financing the project with state loans, which had replaced grants. Under a new state privatization law, Edgewater created the Municipal Utility Authority to issue bonds and contract with a private company to design, construct, and operate a secondary treatment plant owned by the authority.

WHAT WERE THE FINANCING ARRANGEMENTS?

- $16 million of tax-exempt general obligation bonds were issued to finance the project, backed by Edgewater and Cliffside Park
- A sewer connection fee of $2000 was instituted by both boroughs to help pay debt

The Municipal Utility Authority issued $16 million in 30-year, tax-exempt general obligation bonds to finance the project. The bonds are backed by the full faith and credit of the Boroughs of Edgewater and Cliffside Park. The bonds were insured, raising the rating to AA.

The debt will be paid by property taxes, user fees, and sewer connection fees from new developments in both boroughs. Revenues from Cliffside Park are deposited in Edgewater's general fund.

For this project, Edgewater and Cliffside Park instituted a $2000 sewer connection fee for new developments. Because the sewer connection fees are dedicated for payment of the bonds, those revenues are deposited in a special account.

WHAT WERE THE PROCUREMENT ARRANGEMENTS?

- Private partner chosen through competitive negotiation
- Signed agreement with Lotepro to design and construct plant + 20-year service agreement, renewable every five years, for operation and maintenance

The authority issued an RFP and selected Lotepro Corporation through competitive negotiation. The authority signed a contract with Lotepro to design and construct the plant and a 20-year service agreement consisting of an initial 5-year contract, with the option for three, five-year renewals at the discretion of the authority. The contract also requires Lotepro to operate the existing plant during construction.

A 50-year contract, signed in 1955, between the Borough of Edgewater and the Borough of Cliffside Park requires Edgewater to treat one-half of Cliffside Park's sewage through 2005. The contract was extended to 2017 to coincide with the length of the bond issue. Cliffside Park pays a per-gallon user fee for sewage treated at the Edgewater plant.

WHAT WAS THE DIVISION OF RESPONSIBILITIES?

Borough of Edgewater

- Create the Municipal Utility Authority
- Back the general obligation bonds with the full faith and credit of the borough

Municipal Utility Authority

- Purchase the existing primary treatment plant from the Borough of Edgewater
- Sell revenue bonds to finance upgrading the primary treatment plant and construction of a secondary treatment plant

Borough of Cliffside Park

- Back the general obligation bonds with the full faith and credit of the borough
- Pay user fees to Edgewater for treatment of one-half of its sewage, under a long-term contract

Lotepro Corporation

- Operate the existing plant during construction
- Design, construct, and operate a secondary treatment plant
- Secure the environmental permits
- Comply with environmental permit requirements
- Guarantee performance of plant equipment

HOW WAS THE PROJECT IMPLEMENTED?

- State law allowed local governments to contract with private companies to build and operate wastewater treatment facilities
- Because of their low debt limit, Edgewater created a special authority to issue bonds

Edgewater was able to seek a private partner as a result of a state law passed in 1986. The law enables local governments to contract with private companies for the finance, design, construction, and operation of wastewater treatment plants.

Edgewater created the Municipal Utility Authority to issue bonds because the bonding capacity of an authority is not limited by the state. The Borough of Edgewater did not have adequate bonding capacity because of its low debt limit set by the state.

HOW WAS THE PROJECT IMPLEMENTED? (Continued)

- Municipal employees kept their jobs at the plant and maintain benefits as local government employees

The contract required Lotepro to retain the treatment plant's municipal employees. The employees maintain their benefits because they are still employees of Edgewater. The authority reimburses Lotepro for their salaries and benefits.

WHY WAS THE PROJECT SUCCESSFUL?

- Tax-exempt bond financing was faster and less expensive than alternatives
- Strong demand for development assured adequate revenues from user fees

Edgewater saved approximately 25% of the estimated cost of financing the project with federal grants. With private construction and bond financing, the project could proceed more quickly and they did not have to meet procurement and wage rate requirements associated with the federal grant process.

Edgewater had a large amount of valuable land ready for development upon completion of the new wastewater system. With strong developer interest, the authority could anticipate sufficient revenues from user fees.

LESSONS LEARNED

- Control over operating costs was strengthened by a 20-year service agreement, with option for renewal every five years

The authority increased their control over operating costs by negotiating the 20-year service agreement with the option for renewal every five years at the discretion of the authority. While the agreement is a 20-year commitment for Lotepro, the authority is committed for only 5 years. If the authority decides it can operate the plant at a lower cost than Lotepro, it can take over operation at the end of any of those five-year periods.

CONTACT

Bryan Christiansen
Mayor and Chairman of Municipal Utility Authority
Borough of Edgewater
916 River Road
Edgewater, NJ 07020
(201) 592-1100