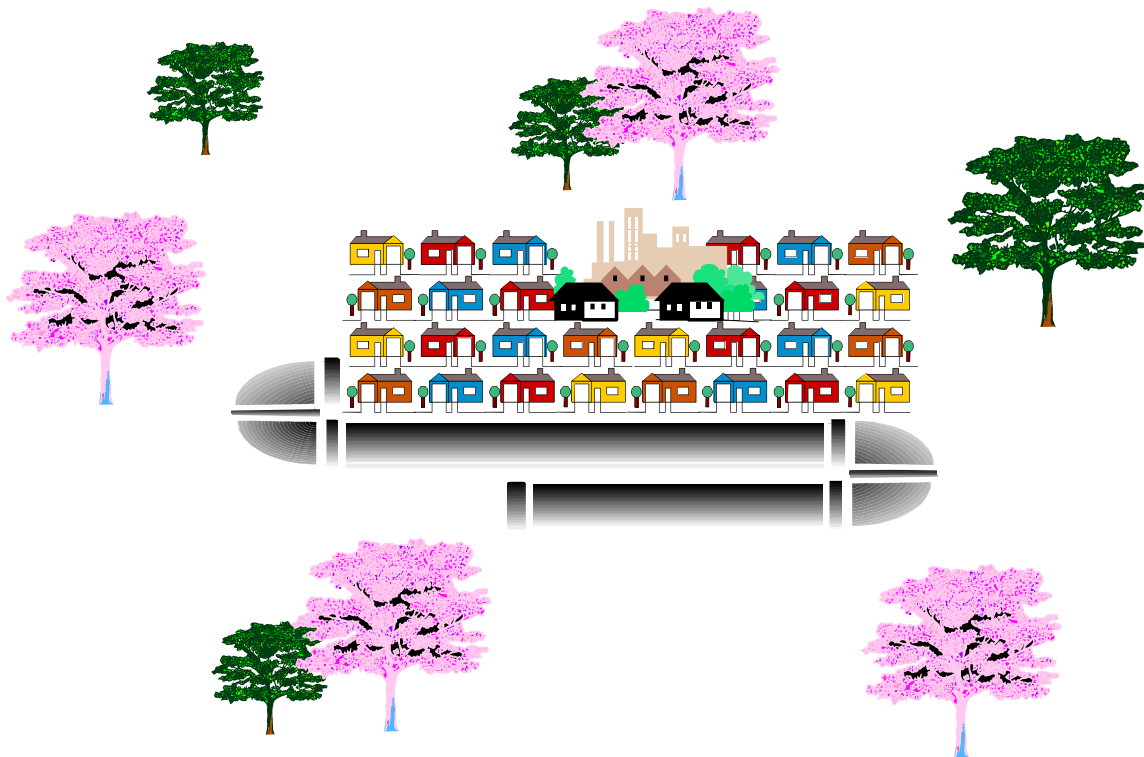


Plumbing The Future

Sewage Infrastructure And Sustainability In Western Pennsylvania



ENVIRONMENTAL LAW INSTITUTE RESEARCH REPORT

PLUMBING THE FUTURE

SEWAGE INFRASTRUCTURE AND SUSTAINABILITY IN WESTERN PENNSYLVANIA

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Executive Summary

Laws, policies, and institutions drive the infrastructure decisions that determine a region's economic and environmental future. Decisions about constructing or rehabilitating facilities to handle sewage can either support the sustainable use of land and watersheds, efficient patterns of growth and economic development, and the continued vitality and economic health of existing urban communities, or they can contribute to sprawl, higher costs, and loss of urban vitality. Choices about sewage infrastructure are a significant piece of the land use puzzle, but they are poorly understood and little studied in comparison with more familiar growth and development issues such as transportation, education, taxes, water supply, and land use regulation.

Such issues are being confronted across the nation as states, regions, and localities pursue vital economic development while battling sprawl and urban decay. The Environmental Law Institute (ELI), at the invitation of the Heinz Endowments, studied the relationship between sewage infrastructure decisions in southwestern Pennsylvania and effects on the urban, suburban, and rural landscape of the region. Examining the challenge of sustainable land use in the context of a complex metropolitan region is essential if the lessons of smart growth are to be meaningful and the implications of alternative choices are to be understood.

Aging infrastructure in this region's older communities causes substantial water quality impairments many days per year during rainfall or snow events. Indeed, costs to remedy existing sewage infrastructure problems in Allegheny County alone may exceed \$3 billion, with substantial expenditures also needed in the older urban areas of the surrounding counties. These are the very areas that have lost population or that are at best static in population and economic development. At the same time, other public and private funds are being expended to support new infrastructure and development in new – formerly rural – areas. Without careful targeting of all of these investments and sufficient attention to preserving existing investments in infrastructure, the region will incur unnecessary expenses which, in turn, could undermine its competitive position, social institutions, and economic vitality.

Southwestern Pennsylvania presents an interesting comparison with other metropolitan regions. Unlike areas of significant population growth (such as Atlanta), southwestern Pennsylvania is facing infrastructure decisions not driven by a rising base of new ratepayers but by a net (almost zero-sum) redistribution of population from its older communities to newer ones. Nevertheless, the choices confronting metropolitan regions across the U.S. are quite similar – the need for substantial rehabilitation of infrastructure in older urban centers where population is declining, while addressing rising demand for new infrastructure in formerly rural areas in surrounding counties. Only approaches that address needs on a regional basis can begin to address these complex problems in a cost-effective, resource-efficient manner.

Sustainable approaches to decisions about sewage infrastructure investments should serve four objectives. The process should (1) result in an environmentally sound system for handling and treating sanitary sewage; (2) promote informed local decision making and reward responsible behavior; (3) achieve cost-efficiency and resource-efficiency; and (4)

support economic development and redevelopment that maintains the vitality of the region's existing communities and existing infrastructure investments. This report examines ways in which the laws and policies affecting sewage infrastructure investment can advance these objectives, and how such investment can satisfy the needs of existing urban areas to remedy problems with older infrastructure while assuring that these solutions do not increase pressures for sprawl.

In southwestern Pennsylvania private and public investment decisions tend to favor new construction and extension of sewerage to new locations over the rehabilitation, repair, and maintenance of older systems serving existing communities. Specifically, funding on the bond market is most available to projected growth areas and to those established communities with rising economic fortunes. Such funding is beyond the reach of many older communities with static or declining ratebases. At the same time, subsidized state and federal funding is primarily devoted to converting unsewered areas served primarily by on-lot systems (with existing environmental problems) to newly constructed sewage conveyance systems and treatment plants.

These facts suggest that unless governments at all levels focus greater attention and funding upon rehabilitating older systems, both market forces and (largely implicit) governmental priorities will work against older urban areas. This adds to the influences that already disadvantage these areas in comparison with new development. Pennsylvania's chief vehicle for publicly supported funding of sewer infrastructure is PENNVEST, which administers federal and state revolving loan monies. This program, among others described in the report, could seek to overcome current effects by offering specific incentives for local government decision makers to engage in collaborative planning, and could offer greater priority to rehabilitation of existing infrastructure in older communities.

Current institutional relationships and environmental enforcement priorities can also discourage cooperation among municipalities and communities. Indeed, the current system in place in Pennsylvania produces some disincentives for communities to work together to assess, repair, or replace the failing infrastructure that results in pollution from combined sewer overflow (CSO) or sanitary sewer overflow (SSO) discharges to the region's rivers and streams. Local governments are encouraged to address these problems in isolation from one another.

Rather than seek collaborative, least-cost, resource-efficient approaches that might require engagement with other governmental units, local municipalities respond to enforcement actions in ways that either shift costs to other units of government or that attempt to solve problems by resorting only to their own financial and planning resources. One noteworthy exception to this general tendency is the Three Rivers Wet Weather Demonstration Project, which is attempting to energize municipal interest in a collaborative approach and a regional strategy (within Allegheny County) using a modest amount of federally earmarked money as an inducement. But incentives for such collaborative opportunities are not provided elsewhere in the region, nor are they built into the general pattern of municipal governance and decision making.

Pennsylvania has a number of existing laws that can provide for integration of infrastructure planning and investment with smart growth and redevelopment objectives. Its Sewage Facilities Act, for example, can be seen as a precursor of later "smart growth" laws in other states. The Act has the capacity to guide development and redevelopment decision-making through links to infrastructure investment. Instead, it often serves in practice as a reactive exercise that responds to externally-driven development proposals. Similarly, Pennsylvania's Clean Streams Law and Chapter 94 wastewater regulations provide some growth controls in situations where sewage facilities are overloaded. But these laws are not implemented in such a way as to drive decisions in any direction other than the construction of additional collection and treatment capacity by individually targeted municipalities.

Both the Sewage Facilities Act and the Clean Streams Law, as well as the Municipalities Planning Code, *allow* collaboration among neighboring governmental jurisdictions and broader consideration of development decisions across municipal boundaries. But although regional approaches are allowed, the laws provide little direct incentive for cooperation among municipalities in solving watershed problems. Municipality-by-municipality enforcement, governance, financing, and infrastructure planning remain the ingrained norm in practice. As a result, development and infrastructure decisions are made in isolation from one another and without reference to the objectives of sustainable infrastructure.

Opportunities abound to link sewage infrastructure decisions with decisions about economic development and redevelopment. Laws, policies, and institutions can be used to support efforts to work across individual municipal boundaries in order to realize broader socioeconomic goals at lower cost and with a more positive effect on the environment. For example, investment by adjacent urban municipalities in a cooperative program of targeted maintenance and repair of privately owned sewer laterals serving houses in areas with substantial storm water infiltration into sanitary sewers may reduce or eliminate the need for each municipality to construct its own large, costly storage basins to retain wastewater and storm water for future treatment. Foregoing such construction can have longer term effects than simply avoiding one-time capital costs. Such basins can require long-term maintenance, and may occupy scarce urban land that would be far more suitable for parks or economic development purposes. Similarly, adoption of county-based approaches to prioritizing infrastructure capital investments could help counties maintain the rural character and economy of the region while reviving older town centers and municipal infrastructure where it already exists, thus helping to maintain quality of life and avoid costly programs to acquire open space or protect farmland.

Regional, collaborative, incentive-based approaches to rational infrastructure financing and patterns of development are consistent with the direction given by Pennsylvania's 21st Century Environment Commission last year. The Commission identified "a healthy environment, a dynamic economy, and the well being of communities" as "directly linked." It called for county and local collaboration backed by state action to avoid wasteful sprawl, to provide flexibility for local officials to work together on a regional basis, and to promote consistent actions on behalf of sound development. A careful revamping of sewage infrastructure decision making is an important step toward this future.

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Introduction

Laws, policies, and institutions often drive the infrastructure decisions that determine the economic and environmental future of a region. Decisions about constructing or rehabilitating sewage infrastructure can either support the sustainable use of land and watersheds, efficient patterns of growth and economic development, and the continued vitality and economic health of existing urban communities, or they can contribute to sprawl, higher costs, and loss of urban vitality.¹

In southwestern Pennsylvania, as in most regions of the country, many of the decisions about sewage infrastructure are made in isolation from these concerns. Older urban systems are causing water quality problems, attracting the attention of environmental regulators, and necessitating a search for significant funding on shrinking or static tax bases. At the same time, state and federal funds as well as private capital resources are devoted primarily to extending service to new, unsewered areas and rural areas currently served by individual on-lot systems. Sewage infrastructure is yet another field in which the region's municipal governments are pitted against one another for economic development and tax base. Systematic regional approaches are slow in coming, but will be essential for the future of the region.

This report examines ways in which the laws and policies affecting sewage infrastructure investment can be used to satisfy the needs of existing urban areas to remedy problems with older infrastructure, while assuring that these solutions do not increase pressures for sprawl. It also seeks to help decision makers find ways to assure that new development supported by sewage infrastructure investments is sustainable and consistent with regional goals.

Overview

This introduction identifies four goals for sustainable infrastructure decisions that emerged from many conversations with officials and

citizens in the region. These serve as the framework for the analysis and recommendations in the chapters that follow.

Chapter One describes the demographic, environmental, and technical issues affecting current sewage infrastructure, and pending or anticipated decisions about the future of this infrastructure. Chapter Two then identifies the legal and institutional issues affecting local governments and others engaged in decision making. Chapter Three examines financial alternatives and opportunities for financing infrastructure improvements, rehabilitation, or replacement under the current system. Finally, Chapter Four identifies some promising approaches. These include new uses for existing laws, policies and institutions, as well as recommendations for new initiatives.

The recommendations are intended to stimulate further thinking about the key issues that interlink economic development, land use, environmental protection, and financing in the region. They address opportunities available to local and county governments, the state legislature, state and federal administrative agencies, funding institutions, and citizen organizations. And they may serve as a model that can assist others in addressing these issues elsewhere.

Sustainable Infrastructure

While various institutions in the region have specific goals - such as minimizing costs, promoting economic development, or meeting internal institutional milestones - it is critical to identify the characteristics that define an infrastructure system that will support environmental protection, economic development, and community stability. These goals must be made plainly visible to the ratepayers, taxpayers, and decision makers whose support will be needed to accomplish the tasks ahead. The following characteristics define a viable approach

to sewage infrastructure that serves objectives of sustainability.

The process results in planning, funding, construction, and maintenance of infrastructure that disposes of sanitary sewage in a safe, healthful, and environmentally sound manner.

Divided governmental responsibilities may obscure this objective from time to time, particularly in the context of particular financing or enforcement decisions. But it is essential to keep the environmental health objective in view. For example, enforcement should produce discernibly cleaner water as well as compliance. And infrastructure investments should neither put waters at risk nor defer problems further into the future.

The process promotes informed local decision making, including responsible individual behavior and governance.

The process for deciding upon infrastructure investments is likely to work better when it identifies the benefits and burdens of the choices being made. This may mean going well beyond the "alternatives" analysis currently required in sewage facility planning programs. Institutions that take the time and trouble to define watersheds and sewersheds,² to identify negative impacts and expected benefits, and to assess and compare opportunities for collaboration and cooperation, will be more effective in making the case for funding, or in justifying innovative technical solutions. The process also is likely to work better when it makes clear - to the public and to local governmental institutions - where responsibility lies for the existing impairments in water quality and overloads of existing systems. Only development of this information and its disclosure to the public will make it possible to work on a regional basis, and to engage local elected officials in making the necessary case for action. Any necessary increases in local taxes or sewer rates or surcharges, or the incursion of debt, will be possible only where the benefits are made clear, and where individual and governmental

responsibility is comprehensible.

The process identifies infrastructure investments that are cost efficient and resource efficient, and supported by a durable funding base for long term maintenance and operation.

Investments in repairs and new facilities that are targeted to maximize their cost effectiveness in addressing environmental problems are likely to result in lower costs than are investments made on the basis of jurisdictional boundaries. Financing mechanisms to support infrastructure investments must be broad based and durable enough to handle inevitable changes in development and demography over multiple decades. Financing of sewage infrastructure must also take into account fairness to ratepayers/taxpayers. Approaches may include incentives in rate setting for good performance - such as superior maintenance, removal of storm water inflows to sanitary sewer systems, and other cost effective approaches that benefit the system as a whole.

Resource efficiency is a related concept. Resource-efficient solutions make the best use of water and land resources in addressing human and ecological needs. Solutions that encourage retention of open space, that address storm water simultaneously with wastewater problems, and that promote development in accordance with local comprehensive planning goals can be the basis for improving performance of infrastructure.

The process supports sound economic development and redevelopment.

Financing of wastewater infrastructure should be consistent with regional development goals. Effective systems of planning and financing infrastructure do not tilt the scales toward abandonment of existing facilities. Nor do they subsidize construction that can finance itself in other ways. Put another way, funding for rehabilitation should not be disfavored in comparison with funding for extension or construction of new systems. Skewing the availability of funding toward newly developing

areas may contribute to unequal competition among communities - which may artificially stimulate the decline of older communities to the detriment of the region as a whole.

Similarly, where upgrades to a sewer collection system produce economic benefits, some of the benefits should be recaptured by the communities that have invested in the upgrades.

While this will ordinarily happen because of improvements in property values where the environmental harm is alleviated in the same community where the infrastructure was repaired, in some cases the benefits will be primarily realized by downstream communities. In these instances, it may be appropriate to assure that some of the financial rewards are reaped by the communities making the investments.

Chapter One

Current Environmental and Infrastructure Conditions

The critical infrastructure reality in southwestern Pennsylvania is driven by the population decline of the region's older communities - a "hollowing out" of the older urban areas, leading to a loss of tax base and rate base, coupled with diminished economic development in some of these areas. Yet even as the cities and older municipalities have declined in population, land development is expanding on the periphery. Building of new homes and new communities requires the provision of new infrastructure for these communities, commanding financial investments and attention -- while the older communities are left with an aging infrastructure and a static or declining tax base or rate base on which to support necessary investments in rehabilitation, replacement and repair.

Significant and energetic efforts have been undertaken, particularly in the City of Pittsburgh, to draw development downtown and to renew the vitality of the urban core. But, the backdrop to this critically important activity is that in the last several decades the population has dropped significantly across the entire region. A brief examination of demographic trends in the seven county area is telling.

Population (in thousands)			
	1980	1995	2015 (projected)
Allegheny	1,450	1,309	1,592
Armstrong	77	74	77
Beaver	204	188	209
Butler	148	165	182
Fayette	159	147	158
Wash.	217	208	228
Westm.	392	376	415
	2,647	2,467	2,861

Sources: U.S. Census Bureau; projection for 2015 by Southwestern Pennsylvania Regional Planning Commission (now Southwestern Pennsylvania Commission).

In sum, the region as a whole has lost 180,000 residents in just 15 years. This continues a population decline that began even earlier. For example, in 1970, Allegheny County had over 1.6 million residents. Thus, Allegheny County alone experienced a loss of 300,000 in just the 25 years from 1970 to 1995. The City of Pittsburgh lost nearly a third of its population over the same period.

City of Pittsburgh (population...in thousands)			
1970	1980	1990	2015 (projected)
520	424	370	406

Sources: U.S. Census Bureau; projection for 2015 by Southwestern Pennsylvania Regional Planning Commission (now Southwestern Pennsylvania Commission).

Of the multi-county area, only Butler County has gained in population. This local boom is largely due to new development in Cranberry and Adams Townships made possible by highway construction and improvements linking the City of Pittsburgh with the Pennsylvania Turnpike and I-79 in this area. Even this growth is not county-wide, as the older City of Butler, like most older municipalities in the region, declined in population.

At the same time as the region's population has been dropping, southwestern Pennsylvania's older sewage collection systems are discharging millions of gallons of raw, untreated sewage to the region's rivers and streams every time it rains. Water pollution problems associated with sewage are occurring as the legacy of older system designs, older collection structures experiencing failures and malfunctions, older homes contributing to infiltration of rainwater into sewer systems because of poor maintenance and older pipes, and the contribution of some new housing to existing sewage systems that cannot handle all of the flow.

Meanwhile, growing communities on the periphery are building new sewers at a rapid pace.

The construction of new residential and commercial development - supported by subsidized highway construction, availability of inexpensive land, fear of urban crime, and other drivers of sprawl - makes it possible to raise financing for expanded systems. The addition of ratepayers supports the incursion of debt. This is in contrast with the older urban systems, some of which serve shrinking populations or must spread new infrastructure maintenance and replacement costs across a static base of ratepayers. Thus, even without the intervention of government, shifts in population are stranding older infrastructure and demanding new infrastructure in previously rural areas. This leads to wasteful expenditures and increasing capital demands as old systems and new systems compete for ratepayers on which to finance their infrastructure.

But government funding also plays a role. Rural and exurban communities also obtain the bulk of subsidized funds available through state and federal governmental programs via PENN-VEST and the U.S. Department of Agriculture.³ These publicly subsidized funds are chiefly used to install sewers in unsewered areas that have existing environmental problems. They are not intended to support sprawl. But the focus of subsidized funding in the outer rural areas, together with the greater availability of *non-governmental* funding to support new exurban growth communities, means that neither private nor governmental funding has been targeted chiefly toward southwestern Pennsylvania's older urban areas.

This dynamic has begun to change, particularly as greater recognition of urban problems has caused federal and state environmental agencies to shift their focus. But the full integration of sewer and wastewater infrastructure investments with revitalization of older urban communities still lies ahead.

If the Southwestern Pennsylvania Commission's projections (made in 1994) for a population rebound by 2015 are ultimately to prove correct, a dynamic reversal will need to occur - particularly in Allegheny County. Infrastructure decisions are, in fact, key to the future economic vitality of the entire region. Unless they support revitalization of older urban

areas, population growth in the periphery will result in both the loss of more farmland and open space and the economic weakening of existing towns and cities.

Allegheny County

Still the largest of the region's counties in population and economic development, centered on the City of Pittsburgh and including more than 100 other independent municipal jurisdictions, Allegheny County presents a complex array of issues relevant to a sewage infrastructure that can support land use goals.

Most of the county's population has its wastewater treated by the Allegheny County Sanitary Authority (ALCOSAN). ALCOSAN was incorporated as a municipal authority under Pennsylvania law in 1946. It signed initial agreements in 1949 with 58 municipalities to convey their sanitary sewage in large interceptor sewers to a sewage treatment plant on the Ohio River, which still treats the system's wastewater. ALCOSAN's service area now includes the City of Pittsburgh, 79 other municipalities in Allegheny County, one (McDonald Borough) in Washington County, and two (N. Huntington and Penn Township) in Westmoreland County. ALCOSAN's seven member board of directors includes 3 appointed by the Allegheny County commissioners, 3 by the City of Pittsburgh, and one appointed jointly.⁴ The current service area population is 897,000, and is projected to increase to 965,000 by 2015, even without further additions to the service area.⁵

ALCOSAN maintains and operates the metropolitan treatment plant and 9 large interceptor sewers. However, municipal collector sewers conveying sanitary sewage to the interceptors (and at least 11 other interceptor sewers connecting to the ALCOSAN interceptors) are owned and maintained by the individual municipalities or municipal authorities served by ALCOSAN under agreements. Many of these municipal sewer collector systems are anywhere from 50 to 100+ years old.

ALCOSAN's wastewater treatment plant is sized to handle a 200 million gallon per day (mgd) average daily flow, and up to 225 mgd in wet weather (rain, snow, etc) conditions. The plant is

currently being expanded to a capacity of 275 mgd.

There are also communities in Allegheny County not connected to or served by ALCOSAN. These include 35 municipal treatment authorities not within the ALCOSAN system, as well as unsewered areas in the county served by individual on-lot systems. The Pennsylvania Department of Environmental Protection (DEP) directed ALCOSAN to study some of these areas for possible connection to the system based on DEP concerns that their treatment plants might become overloaded or that water quality could not be sufficiently assured by continued reliance on on-lot systems.⁶ If the unsewered areas of the existing ALCOSAN service area were added to the system along with all of the study areas identified by the DEP, ALCOSAN's service population could rise to 1,126,000 by 2015.⁷

Water Pollution

In many areas, both within and outside the ALCOSAN system, sewer lines are hydrologically overloaded. Within the ALCOSAN service area, during dry weather, sewer collectors run near capacity and everything goes to ALCOSAN for treatment. But in wet weather (even very small amounts of rainfall) the load increases and causes overflows all along the system.⁸ Indeed, ALCOSAN has estimated that of the total flow treated at the wastewater treatment plant "48 percent is...billable flow with the remaining 52 percent attributable to storm water from the combined sewer areas and inflow/infiltration from the sanitary sewer areas."⁹ In other words, of the flow reaching the plant for treatment, more than half of the volume is storm water or inflow/infiltration - rather than customers' wastewater, which is billed on the basis of water usage. Not only that, the unbillable flow is only that which reaches ALCOSAN's treatment plant. During wet weather, substantial excess flows (of wastewater and storm water) are diverted to area rivers and streams through interceptor system regulators, before they even enter the ALCOSAN interceptors. Thus, the volume of storm water and wastewater stressing the collector systems is far higher than the plant based figures suggest.

There are two basic kinds of storm water problems for sewage collection and treatment in

the region. These are typical of older communities throughout the nation. They are *combined sewer overflows* (or "CSOs") and *sanitary sewer overflows* (or "SSOs").

Combined sewer overflows result from a design technique used for the construction of municipal sewers many years ago. Sewer collection lines in older urban communities were often designed to handle *both* sanitary sewage and storm water runoff from streets, roofs, and buildings. These combined systems in most cases were built prior to municipal, state, or federal requirements for sewage treatment. When wastewater treatment plants were constructed, the plants (and their collector sewers) were provided with bypasses to prevent them from being overwhelmed during wet weather events. Combined sewer overflows (CSOs) are the discharge of mixtures of storm water and untreated sewage from these combined systems. The U.S. Environmental Protection Agency (EPA) reports that, nationwide, combined sewer systems serve about 950 communities comprising about 40 million people, including many communities in western Pennsylvania. The City of Pittsburgh and some of the older municipalities (especially along the Monongahela River and Allegheny River) have combined sewers that are subject to these overflows.

CSOs are not prohibited outright by federal or state law, but must be identified in the Clean Water Act discharge permits applicable to the wastewater treatment plants with which they are associated. In order to gain further control over these discharges and to eliminate and reduce them, EPA required systems with CSOs to implement "nine minimum controls" by January 1, 1997.¹⁰ These controls include such things as maintenance programs, maximum use of the sewer collection system for wet weather storage so that combined flows can be treated in dry weather, use of pollution prevention programs to reduce contaminants, and notification of the public about CSO occurrences. The controls must be accompanied by the development of a long term control plan. ALCOSAN is currently finalizing its proposed long term plan. About 80 percent of the wet weather problem, by volume, in the ALCOSAN system is believed to be attributable to CSOs. EPA has brought a number of high profile cases against cities and municipalities to abate CSOs, requiring the expenditure of hundreds of millions of dollars and payments of penalties.

Sanitary sewer overflows occur when sewer collection lines that are designed to handle *only* sanitary sewage become overcharged with storm water entering the system from a variety of external sources. These sewer lines then either backup and discharge from manholes or other outlets or into homeowners' basements, or - more often - they discharge through designed diversion structures which are intended to limit the amount of flow into large interceptor sewers. Sources of the storm water entering these sanitary sewer systems include *inflow* and *infiltration*. Inflow comes from such design defects as manholes and other features being located below grade and serving as a conduit for storm water into the sanitary sewer system. Other sources of inflow include breaks or gaps in collectors that admit stream flows, and hookups of residential roof drains and foundation drains to the sanitary sewer system. Infiltration comes from deterioration of collectors and house laterals (the homeowner owned portion of the system which conveys wastewater to the municipal collector), allowing storm water to enter the lines.

SSOs are illegal under the federal Clean Water Act, and EPA has been developing enforcement strategies to require their abatement. In general, they are regarded as discharges for which a permit cannot be issued under the Clean Water Act, although a federal advisory committee is examining whether there should be a way to permit some unavoidable SSO discharges under limited circumstances where abatement or total elimination is not feasible. In the ALCOSAN system, SSOs are believed to contribute somewhere between 12-20 percent of the wet weather discharges by volume. There are 40 identified SSO outfalls associated with 51 ALCOSAN municipalities, where the separate sewer systems are discharging untreated sewage and storm water into area streams.¹¹

Discharges from SSOs and CSOs include some hybrid problems. For example the Nine Mile Run watershed communities (Edgewood, Swissvale, and Wilkinsburg) have separate sanitary sewers, some of which are charged with storm water from inflow and infiltration. But these separate sanitary sewers connect with the City of Pittsburgh's combined sewer before the latter conveys the sewage to ALCOSAN's interceptor.

Also, some communities that contribute a significant amount of storm water to the system may have direct connections to an ALCOSAN interceptor. This may result in the interceptor being so full that it backs the problem up to the next community, which may have an SSO outfall at its point of connection to the interceptor. So a community discharging untreated sewage in wet weather conditions may not, in fact, be fully responsible for the volume of the discharge that reaches the environment. The problem, like the system of sewers, is complex.

Because both SSO and CSO discharges release raw sewage - overland or directly into waters of the Commonwealth and the United States - these conditions pose a potential threat to public health and safety and to the environment. Wet weather discharges impair stream quality, raise the probability of human disease, impair aquatic habitat for fish and other wildlife, and require warnings about recreational and boating uses on the area's mainstem rivers many days each year.¹² While wet weather discharges of untreated sewage have historically been regarded as less of a public health threat than dry weather discharges because of the dilution provided in the receiving waters by the additional volume of storm water, the volume of polluting material is quite substantial, reaching into the billions of gallons of untreated discharges from sewers each year in the region.

Technical and Financial Issues

Inflow and infiltration (I/I) comes from deteriorating collector sewers, mislocated manhole openings, and even stream inflows. For example, there are about 11 locations in the ALCOSAN system where streams flow into combined sewers - about 683 million gallons annually.¹³ Poor maintenance and lack of regular inspection and replacement of municipal collectors means that many lines are functioning like perforated pipes, like French drains for groundwater, storm water, and waste water, conveying all of them to the point of connection with ALCOSAN, or to a leak or unauthorized discharge. Substantial contributions of storm water come from tens of thousands of roof drains, foundation drains, and sump pumps. House laterals deteriorate. They are seldom maintained or replaced by homeowners unless a catastrophic failure occurs, resulting in visible sewage on the street or in the homeowner's

basement. And few municipalities engage in regular inspection or maintenance checks with respect to these connections.¹⁴ Likewise, large interceptors are not always being used to their fullest to manage wet weather flows to assure that untreated discharges do not occur; they are managed to protect the plant, which has a limited capacity in comparison with the volume of wet weather flows.

Technical solutions and alternatives for dealing with the large volume of storm water and waste water that cause wet weather discharges may include the following approaches (including combinations):

- (1) reduce the amount of I/I in separate sanitary sewers originating from house laterals and other private sources such as roof and foundation drains;
- (2) reduce the amount of I/I in separate sanitary sewers through repair/replacement of municipal collectors, and through better municipal maintenance programs that schedule inspections and replacement of deteriorated lines, clean outs of obstructions, etc.;
- (3) eliminate stream inflows;
- (4) convey more of the mixed storm water and wastewater to the wastewater treatment plant and provide additional treatment capacity for this volume;
- (5) construct storage (flow equalization) tanks and storage systems in individual municipalities, sewersheds, or other locations, to contain wet weather volumes for later treatment during lower flow periods.

Currently, legal responsibilities for these solutions fall upon different governmental entities and persons. And the choices among them have sharply differing financial and political implications.

Solutions that address municipal collectors must be financed by the municipalities or municipal authorities – either out of general tax revenues or, where possible, through surcharges on water/wastewater bills. Many of the solutions requiring construction of storage systems also will require direct outlays by municipalities. These solutions may fall heavily on older, financially unstable municipalities, but may be difficult politically even in jurisdictions with more affluent

voters. Municipalities have widely differing financial and technical capabilities, so approaching solutions on a municipality by municipality basis may not produce the hoped for gains in water quality. Some cooperative models (such as formation of the Girty's Run Joint Sewer Authority) may provide models for inter-municipal cooperation in dealing with municipal problems.

Similar financial and political issues may arise if the problem is addressed at the homeowner/house lateral level. Costs to individual homeowners may be quite substantial, and produce either a voter backlash or a complete inability to pay (in poorer jurisdictions). Municipalities' problems with imposing direct costs on homeowners may lead them to greater reliance on constructed storage – which can be financed and paid for over the long term out of ratepayer revenues and surcharges, even though a homeowner-based solution (or combined solution) might produce technically superior results. Yet actions addressing homeowner sources can be important in helping solve the wet weather pollution problem. For example, the McCandless Township Sanitary Authority found that about 15 percent of homes had illegal connections of drains to sanitary sewer laterals and 17 percent had air vents below grade, thus allowing significant inflow.

Particular municipalities or homeowners may also have some reasons to prefer solutions that rely more heavily on ALCOSAN (or another treatment authority if not in the ALCOSAN system). Treatment authority expenditures are generally spread across the entire rate base, not just the particular communities contributing to increased wet weather flows. Although construction of additional treatment capacity is extremely expensive, such a solution may be more attractive to some municipalities than requiring their residents to expend as much as \$5,000 apiece to rehabilitate house laterals, and/or investing municipal funds in rehabilitation of collector sewers or construction of large storage basins.

ALCOSAN is expanding its Ohio River wastewater treatment plant to increase its primary and secondary treatment capacity from 225 mgd to 275 mgd. This will enable it to deal with dry weather flows from projected population growth,

but also will provide capacity to handle a greater volume of wet weather flows than currently receive treatment. If coupled with construction of storage in the municipalities, and municipal or county programs to reduce inflow/infiltration, this expansion will begin to address the problem of wet weather discharges. But in terms of dealing with the massive volume of untreated wet weather discharges, it is not nearly enough. In the longer term, ALCOSAN has proposed constructing a wet weather primary treatment facility in addition to its secondary treatment facility to provide a total wet weather treatment capacity of 875 mgd . This peak volume "reflects the projected combined capacity of the [existing ALCOSAN] deep tunnel interceptors that parallel the three rivers." However, even this substantial expansion would not provide the secondary treatment required by federal and state law for municipal wastewater discharges. And it would capture only about 65 percent of average annual wet weather flows.¹⁵ Storage, wet weather management approaches, and other flow based solutions are being proposed in ALCOSAN's Long Term Control Plan, due this year.

There are storm water management issues as well. If municipal collector systems are repaired and roof and foundation drains are kept out of sewer lines, the excess water must go somewhere. This may then become a storm water management issue, again requiring substantial expenditures by individuals, municipalities, the county (under Act 167, discussed below), and adjacent communities. This involves another series of laws, permits, jurisdictions, and engineering solutions.

Armstrong, Beaver, Butler, Fayette, Washington, and Westmoreland Counties

The surrounding counties have many of the same problems described in connection with Allegheny County. Older sewer systems and wastewater treatment plants are contributing SSO or CSO discharges to the region's waterways. These counties also have an additional set of issues (shared to some extent by the outlying municipalities in Allegheny County). Rural and exurban communities have failing on-lot systems that are impairing water quality. Other areas are undergoing new development which cannot

reasonably be served by construction of on-lot systems. Some smaller wastewater treatment plants are not satisfactorily maintaining required water quality and compliance with permit standards.

These circumstances have led to the desire by the Pennsylvania Department of Environmental Protection to encourage the consolidation of smaller sewer collection and treatment systems into larger authority-operated systems, and to promote the replacement of on-lot systems with sewer systems. While such infrastructure changes serve the goal of environmental protection by reducing or eliminating current discharge problems, at the same time they often create the opportunity for additional, sewered development in the future - often with little regard for the effect of such development on the landscape as a whole or the economic viability of older, sewered communities.

In high growth areas, wastewater treatment plants must be expanded to cure environmental problems. But these expansions in turn support further development of regions adjacent to the current growth areas. For example, the Brush Creek Water Pollution Control Facility in fast-growing Cranberry Township, Butler County, is overloaded and must be expanded even to serve the existing population, let alone the large volume of possible development.¹⁶ The plant expansion will make possible further development in the area without linking such new development to efficient land use nor to the fortunes of the county's older communities. Similar overload problems are occurring in Hempfield Township in Westmoreland County.¹⁷ These infrastructure expansions will stimulate additional population growth and development in these areas.

In the counties surrounding Allegheny, the perceived environmental problem is still the release and potential release of untreated or inadequately treated sanitary sewage - rather than the patterns of development which are producing these problems. Solutions are, in turn, driven by current financing realities and institutional preferences for new construction. These factors promote the extension of existing sewer collection systems to a larger ratebase by sewerling larger areas of the region, and encourage the replacement of on-lot systems with sewers and

wastewater treatment. While this promotes near term environmental improvement, the effect on development and future growth is significant.

While, to some extent, the counties of southwestern Pennsylvania are in competition with one another for development, business, and residents, they also share many problems and common regional interests. Solutions to sewage infrastructure problems should address the areas of common interest. If changes to financial or planning mechanisms are addressed at the state

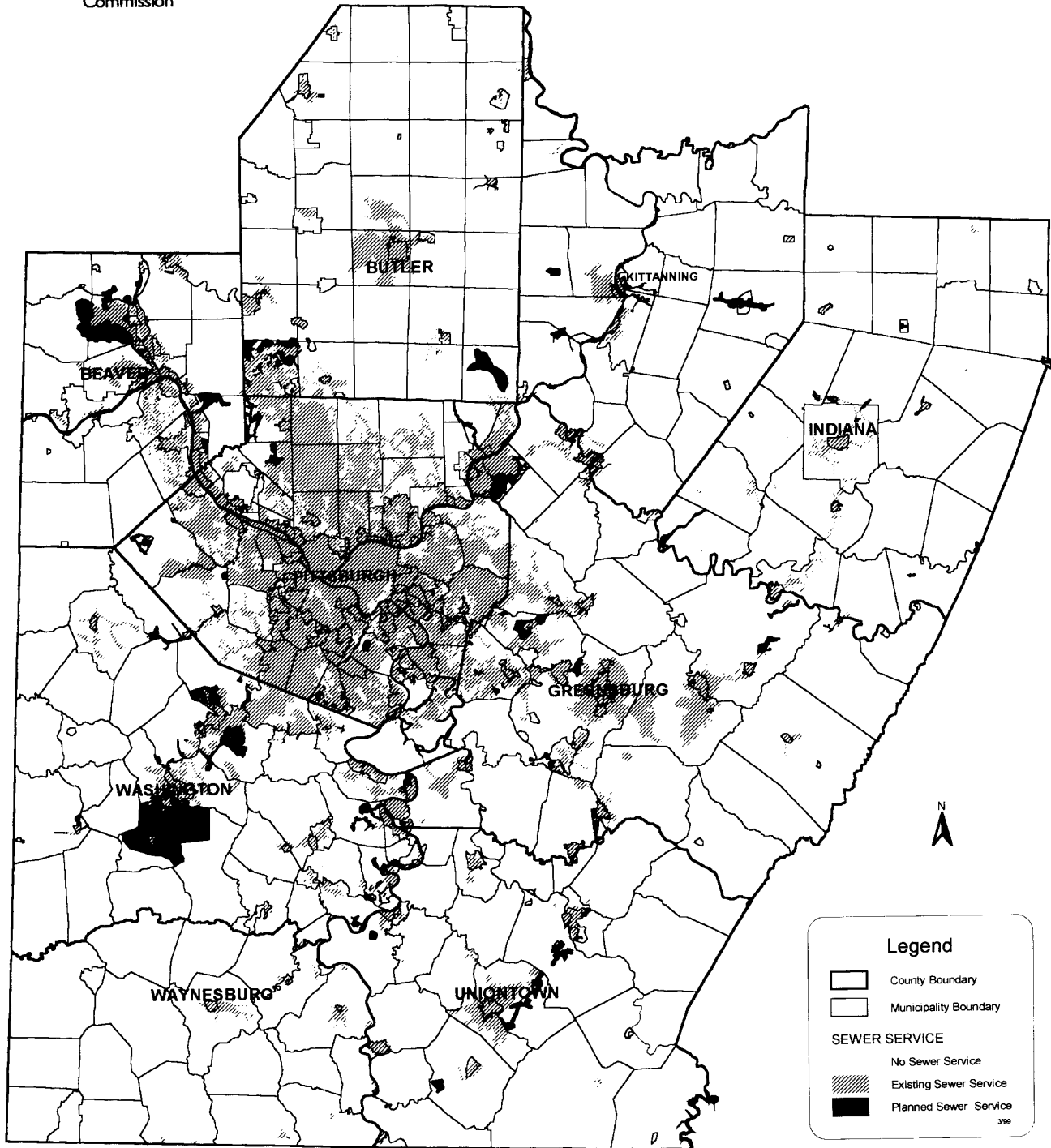
level, the changes will need to accommodate both the urban and rural areas of the region.

Common interests of the counties include the need to revitalize the older urban centers and not simply to attract greenfields development at the margins of the respective counties. The remainder of this report examines the incentives, institutions, and opportunities that may affect the counties' ability to achieve such revitalization in the sewage infrastructure context.



Southwestern
Pennsylvania
Commission

SEWER SERVICE AREAS IN THE NINE COUNTY REGION



Chapter Two

Current Legal and Institutional System

The existing legal and institutional system strongly affects decisions on solving environmental problems, investing in infrastructure, and directing patterns of growth and development.

Governmental entities with varying objectives, and overlapping jurisdiction and authority, have a great deal of influence on choices made about the region's infrastructure. But these entities often work on only their own piece of the puzzle with little attention to the picture that is emerging as a result of their labors. This chapter describes the agencies and governmental units that affect development and sewage infrastructure decisions. It identifies the interests of each, and the resulting implications of their focus on particular portions of the problem. In broad terms, this chapter makes the case for greater cooperation and a wider focus on potential solutions.

This chapter focuses on regulatory agencies and regulated entities. Chapter Three looks in greater detail at financing agencies and entities.

U.S. Environmental Protection Agency (EPA)

EPA's Region 3, headquartered in Philadelphia, has jurisdiction over a five-state area, which includes Pennsylvania, Maryland, Virginia, West Virginia, and Delaware. The EPA administers the federal Clean Water Act, and conducts oversight of the Pennsylvania Department of Environmental Protection's (DEP's) permitting program for wastewater discharges, which must operate in conformance with that Act. The EPA also reviews DEP's water quality standards (goals for the quality of rivers, lakes and streams), and the Commonwealth's reports on the causes and extent of water quality impairment. EPA provides some funding for regulatory purposes to the DEP, as well as grant funds for specific programs such as those to address runoff. And its budget contains the federal portion of loan funds that the Commonwealth makes available to communities under PENNVEST (discussed in Chapter Three).

The EPA has a significant focus on enforcing compliance with CSO control measures and on eliminating SSOs altogether.

Under existing EPA policy, discharge permits may be issued for CSOs, but nine required control measures must be implemented in order for a CSO discharge to be lawful:

1. proper operation and regular maintenance programs for the sewer system and the CSOs;
2. maximum use of the collection system for storage of combined storm water and sewage for later treatment;
3. review and modification of industrial wastewater pretreatment requirements to assure that adverse CSO impacts are minimized;
4. maximization of flow to the wastewater treatment plant for treatment;
5. prohibition of CSOs during dry weather;
6. control of solid and floatable materials in CSOs;
7. pollution prevention measures;
8. adequate notification to the public about CSO occurrences and impacts;
- and 9. monitoring to characterize CSO impacts and the efficacy of CSO controls.

The discharger must also develop and submit a long term control plan.¹⁸ ALCOSAN's 1994 discharge permit, for example, required it to implement the nine measures and to develop a long term control plan - which will be submitted this year.

EPA has developed a graduated hierarchy of enforcement actions to be taken in response to SSOs, which are illegal under the Clean Water Act.¹⁹ Based on its enforcement policies, in 1994 EPA issued a letter under § 308 of the Clean Water Act to each of the municipalities in the ALCOSAN service area, requiring them to inventory and identify all CSO and SSO discharges. Then in 1995, EPA issued a § 308 letter to ALCOSAN requiring it to map the system and provide information on CSOs and SSOs and on its service contracts with municipalities. In 1997, EPA sent 51 ALCOSAN communities § 308 letters requiring them to conduct monitoring and to provide flow data with respect to their contributions of storm

water and wastewater to the 40 identified SSO outfalls in the ALCOSAN system. In July 1998 ALCOSAN also received a § 308 letter directing it to provide additional information on flow volume and on contributing municipalities with reference to sewer lines located in the Chartiers Creek sewershed (upstream of Rosslyn Farms Borough) and sewer lines in the Saw Mill Run sewershed. This information may be used by EPA in preparing one or more enforcement actions to require the municipalities and ALCOSAN to eliminate the SSO discharges.²⁰

EPA's focus on SSO enforcement actions and CSO compliance may well drive the infrastructure agenda in the older municipalities, and may have significant effects regionally if the older municipalities address requirements community by community rather than on a collaborative basis. It may also have indirect effects if it leads to incursion of costs in ways that make older communities less competitive with new communities for residents, businesses, and institutions.

Pennsylvania Department of Environmental Protection (DEP)

The Department of Environmental Protection was formed several years ago when the former Department of Environmental Resources was divided into its regulatory and pollution control functions (which went to DEP), and its conservation and land management functions (which went to the new Department of Conservation and Natural Resources). DEP's southwest region, headquartered in Pittsburgh, is responsible for pollution prevention and control in a 10 county area. With respect to wastewater issues it has historically focused much of its attention on the southwestern counties other than Allegheny County, because of the concurrent jurisdiction of the Allegheny County Health Department within the county. DEP is responsible for administration of two key laws relevant to sewage infrastructure - a planning law known as the Sewage Facilities Act (also known as Act 537), and the Pennsylvania Clean Streams Law.

The *Sewage Facilities Act* requires each municipality to prepare and periodically update an official sewage facilities plan.²¹ Sewage facilities planning is intended to provide a level of

scrutiny to infrastructure decisions that they might not otherwise undergo if the only review were that provided under local zoning and site plan approval requirements. The plan is intended to identify how sewage will be handled and properly disposed of in the municipality; it lays out how the necessary sewer conveyance and treatment facilities will be located, constructed and maintained.

When a new development requires the extension of sewer lines or the construction of additional capacity for wastewater treatment, the municipality is required to prepare and approve a plan revision, which is then submitted to DEP for review. Private requests to the municipality may also precipitate a revision of the official plan. Failure of a municipality to act within 60 days of receipt of a complete proposed plan revision causes the revision to be deemed approved by the municipality. DEP is then itself subject to time limits on "private request" revisions.

Exemptions under Act 537 are also important.²² For example, subdivisions of ten lots or less are exempt from sewage facilities planning where the land is suitable for on-lot disposal of sewage.²³ Also new land developments that will connect to public sewer systems that do not have an overload nor require a new or modified DEP permit do not require plan revisions and DEP approval. Perhaps more significant, subdivisions of one acre or larger proposing the use of on-lot systems are exempt if they are not in areas conducive to nitrate contamination of groundwater and not in High Quality and Exceptional Value watersheds, provided that soil testing shows the availability of primary and replacement on-lot sites on each parcel.²⁴ These exemptions may be a boon to some forms of low density sprawl development - particularly in developing areas on the rural fringe. Small subdivisions of farms, and one-acre lot residential development may lead to many of the concerns that Act 537 and good municipal planning are intended to avoid.

Most Sewage Facilities Act planning has been conducted in response to identified environmental needs. For example, the DEP may identify a pollution hazard and require a municipality to submit a plan revision. Or planning has been reactive - responding to

private proposals for development, such as the construction of new housing or commercial facilities.

Sewage facilities plans in Allegheny County mostly date from 1970, with a smattering in 1989 and the early 1990s. (ALCOSAN's 1996 plan, prepared at the direction of DEP, focuses primarily on its own facilities). Act 537 could provide a meaningful vehicle for older municipalities (or counties) to consider appropriate alternative solutions for wet weather discharges and the deterioration of sewer collectors and house laterals. It may be possible to use Act 537 more proactively to design solutions to hydraulic overloading, particularly inasmuch as state funding support may be available for planning wet weather solutions using this instrument (see Chapter Three).

At the same time, both because the Act is one of the few planning tools that results in any state level review and because preparation of the sewage facilities plan is required (rather than optional), it could be converted into a tool to rationally direct greenfields development in southwestern Pennsylvania into sustainable and appropriate channels rather than reinforcing haphazard infrastructure development and financing. A number of other key issues deserve examination.²⁵ For example, do private revisions drive the process in unsustainable directions? Are sewage facilities plan revisions consistent with the capital improvements contemplated in municipal (and county) comprehensive plans? Does Act 537 provide enough incentive for regionalism and planning across municipal boundaries? Can the law be made both more flexible and more effective as an instrument of smart growth? The Act presents an important and under-explored set of opportunities for rationalizing sewage infrastructure's relationship to other development goals. Proper use of the Act may also provide opportunities to prevent disinvestment in existing sewage systems.

The *Clean Streams Law*²⁶ applies to all the waters of the Commonwealth. It provides that "[t]he discharge of sewage...into the waters of this Commonwealth, which causes or contributes to pollution as herein defined or creates a danger of such pollution is hereby declared not to be a reasonable or natural use of such waters, to be

against public policy and to be a public nuisance."²⁷ The law requires both a construction permit and a discharge permit for construction and operation of facilities that will discharge into the waters of the Commonwealth.

Chapter 94 of Title 25 of the Pennsylvania Administrative Code implements the Clean Streams Law and portions of the Sewage Facilities Act. Each wastewater treatment plant must submit an annual report which evaluates the current and future hydraulic and organic loads received. The report must include "a proposed plan to reduce or eliminate overloaded conditions, ...a discussion of the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, ...a discussion of the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, excessive infiltration, and other system problems..."²⁸ In the ALCOSAN system, ALCOSAN compiles the 83 municipal reports on the contributing sewer systems prepared by the participating municipalities and submits them as part of its report.

If the annual report establishes that there is an existing overload, the permittee must prohibit new connections to the facilities (subject to certain narrow exemptions), begin working toward the "planning, design, financing, construction, and operation of the sewerage facilities that may be necessary to provide required capacities to meet anticipated demands," and submit a corrective action plan.²⁹

DEP may approve permits for new connections to overloaded sewerage facilities where a corrective action plan is in place and the new service is consistent with the Sewage Facilities Act plan and will not have a "significant adverse impact on the water quality of the receiving waters."³⁰ Most Allegheny County jurisdictions are under restrictions such that anything over 2 dwelling units has to come to DEP for an approval/exemption. Similarly, the Brush Creek wastewater treatment plant in fast growing Cranberry Township in Butler County was placed under a connection ban in late 1998

because it has remained in overloaded status pending an upgrade to its treatment capacity scheduled to be completed in October 1999.³¹

Under corrective action plans, municipalities are required to do physical inspections, conduct flow monitoring, and make repairs. DEP's experience has been that many municipalities tend to write reports, defer expensive actions, and seek numerous extensions of time (10-15 years in some cases). Corrective action plans are not themselves enforceable in court, but some leverage for their implementation is provided by the associated limitations on new connections. However, while connection restrictions produce an incentive for corrective action in communities that are experiencing development demand, they often do not provide significant leverage in many of the older communities with shrinking populations and declining tax bases. Also, many of the problems in older systems are wet weather related, and thus are not significantly aggravated by new connections (which tend to increase dry weather flows only marginally and do not add I/I in wet weather). Unlike connection bans in communities suffering from constant overloads, connection restrictions imposed in response to wet weather problems may not directly bring about any improvement in water quality pending implementation of a corrective action plan.

The DEP may *order* imposition of a connection ban if needed to prevent or eliminate public health hazards or pollution resulting from violation of the Clean Streams Law.³² Other enforcement orders may be issued as well. For example, in December 1998, the DEP issued enforcement orders to the City of Pittsburgh and three suburban jurisdictions contributing to raw sewage discharges to Nine Mile Run in wet weather conditions. The order requires the municipalities to conduct sewer surveying, mapping, testing, and repairs, all of which must be completed by November 2001.³³ DEP enforcement orders are appealable to the Environmental Hearing Board, and then to Commonwealth Court.

Citizen groups may also seek to enforce pollution control laws by filing an action in federal or state court against the municipality or municipal authority discharger. Citizen enforcement may promote enforcement action by

the state or federal government. DEP and EPA have the opportunity to forestall a citizen suit if they take appropriate enforcement action after receiving notice of a citizen's intent to file suit. For example, the Pennsylvania Environmental Defense Foundation in 1998 filed a notice of intent to sue with respect to SSO discharges to Chartiers Creek. This notice may affect the speed with which agencies will move and the types of solutions that will be imposed, or agreed to, by the municipality and the regulatory agency.

DEP's priorities with respect to sanitary sewage systems in the region can be described, in order of highest to lowest priority, as:

- (1) promoting construction of sewage collection and wastewater treatment facilities in areas without changes in population that have no sewers or that have wildcat sewers resulting in discharges. These on-lot or wildcat discharges tend to be daily and represent the greatest threat to water quality since they occur in low flow as well as high flow conditions;
- (2) promoting construction of sewer collection and treatment facilities in areas where development density has increased such that on-lot systems can no longer be effective, or where there are small treatment plants that cannot be operated in compliance on a consistent basis;
- (3) expanding existing treatment plants that can't meet dry weather permit standards;
- (4) addressing wet weather SSOs; and
- (5) addressing CSOs.

Pennsylvania law provides links between Part 94 and the Sewage Facilities Act (Act 537) in order to assure that corrective action and other activities are integrated with the official plan for sewage infrastructure. Specifically, Part 94 corrective action plans must be compatible with Act 537 official plans. Also "no official plan or revision [under Act 537] will be approved nor will a supplement be considered adequate by the Department...that is inconsistent with the requirements of this chapter [94]."³⁴ While these links have resulted largely in technical compliance rather than rethinking of sewage infrastructure decisions, they may provide a basis for doing much more planning and innovation as communities address wet weather flows.

Allegheny County Health Department

The Allegheny County Health Department exercises concurrent jurisdiction with DEP over sewage and discharges of wastewater within the county. It enforces under the local Health Administration Law (Act 315) and the county's sewage management regulations. Indeed, the Health Department does inspections under contract to DEP.

The relationship between the DEP and the Health Department is largely cooperative, but requires substantial consultation in order to operate smoothly. Either the county or DEP may issue an enforcement order. In the past some orders have been co-signed by DEP to ensure that any appeal is heard by the Environmental Hearing Board and Commonwealth Court rather than processed through county procedures and then appealed to Common Pleas Court. More recently, however, the DEP has objected to co-signed orders due to the potential for a dual appeal process, preferring to issue its own unilateral orders. The overlap of responsibilities between the county Health Department and the DEP has also sometimes led to differences of opinion on how particular communities should be handled, or how rapidly compliance could be achieved. DEP enforcement may also serve as a back-up to county action. For example, in the mid-1980s, Allegheny County's Health Department had the lead on resolving discharges affecting Girty's Run, but the problem remained unresolved until DEP issued a connection ban order to five municipalities and ordered them to develop a joint corrective action plan. The order led to formation of an authority and development of a plan for substantial construction of facilities.

Municipalities

Municipalities serve both a proprietary role in constructing, maintaining, and repairing sewer collection systems,³⁵ and a regulatory role with respect to customers' use of the systems. For example, municipal ordinances can prohibit connections to the systems of roof drains, foundation drains, and other sources of inflow from homes and businesses. They also may require private property owners to engage in repairs or correction of problems affecting the

municipal systems. Municipal enforcement can be an important component of any strategy that relies on I/I reduction, and that seeks to minimize burdens on taxpayers/ratepayers throughout the municipality by targeting specific customers that are responsible for hydraulic loading of the sewage system. Municipalities are also responsible for permitting of on-lot systems and development of on-lot management systems to assure the maintenance and enforcement of requirements designed to prevent such systems from causing pollution.

Municipalities own and operate most sewer collection systems. Such responsibilities can also be turned over to municipal authorities - a common device under Pennsylvania municipal law. "It shall be lawful for any county, city, borough, incorporated town, or township" to contract with an authority to provide "sewer, sewerage, or sewage treatment service to it or to its inhabitants."³⁶ Capabilities for management and maintenance of sewer systems vary widely among municipalities, with differing levels of financial capacity, technical capacity, attention to problems, and preventive versus reactive maintenance. Municipalities can fund improvements to and operations of sewer systems either out of general revenues or via surcharges. If charges are imposed, they are to be based on water consumption. Revenues can be set to equal the system's operating expenses, operating expenses plus debt service, or operating expenses plus debt service plus ten percent for a sinking fund.

Municipalities and municipal authorities are vulnerable to environmental enforcement orders that may require substantial expenditures to correct wet weather problems. Yet, from a technical and environmental point of view, a municipality may often be the wrong unit to address these wet weather infrastructure issues. For example, a municipality may be responsible in part for a CSO or SSO problem that could be solved far more cost-effectively by expenditures in an adjacent municipality. Often the consensus needed for such a step is difficult to achieve unless some entity has invested heavily in defining the problem and outlining potential alternative solutions, including their costs and benefits. So long as the analysis and consideration of alternatives is done municipality by

municipality - as it often is under enforcement circumstances (or Chapter 94 corrective action conditions or Act 537 planning) - the necessary data for a cost effective regional or multi-municipality solution may never be developed. Agreements among adjoining municipalities, or formation of a broader based municipal authority, may be needed to solve the problem cost effectively.

Municipal decisions about sewage infrastructure are also related to land use planning and regulation.³⁷ The Sewage Facilities Act official plan is supposed to be consistent with each municipality's comprehensive land use plan. However, a comprehensive plan may not have been revised in many years and may not provide sufficient guidance for infrastructure planning purposes. Revisions to the comprehensive plan, like those to the sewage facilities plan, are often reactive rather than aiming toward rationalizing growth or redevelopment.³⁸

Municipalities can also use a Capital Improvements Program to phase the planning and construction of public financed facilities in ways that support sound development.³⁹ But such capital programs are not always prepared or adhered to in ways that anticipate and promote sustainable investments or rehabilitation of older facilities. Again, municipal land use powers and capital planning may not sufficiently anticipate environmental problems.

Existing agreements between municipalities and between municipalities and treatment authorities (such as ALCOSAN) also affect the solution of sewage infrastructure problems. In some cases these agreements may provide opportunities for cooperative, cost-effective approaches; but in others they appear to create legal impediments to solutions. This is particularly likely where alternative solutions to CSO or SSO problems require expenditures by different entities.

One of the difficulties in compelling the municipalities to shoulder the burden of dealing with and reducing wet weather flows in Allegheny County is the language of the agreements between the municipalities and ALCOSAN. The standard 1949 agreement provided that ALCOSAN would "intercept all

sewage and wastes of the Borough/Township which are discharged from any municipal outfall sewer located along the interceptor sewers of the [ALCOSAN] system."⁴⁰ And ALCOSAN further agreed to make "such changes in and additions to the Sewage Disposal System as may be necessary to enable the Borough/Township to comply with any future lawful orders of the State Board or any other State or Federal Agency in respect of the treatment and disposal of the Borough's/Township's municipal sewage and wastes which enter [ALCOSAN's] interceptor sewers, and shall issue additional revenue bonds for such purpose."⁴¹ These provisions may lead the municipalities to insist that ALCOSAN accept all of the mixed storm water and sewage and that it invest in storage and treatment capacity.

Further issues are presented by the requirement that charges by ALCOSAN "shall be based or computed upon the quantity of water used in or upon such lot or parcel as determined by gauging or metering or otherwise..." This provision also requires "uniform" charges.⁴² This provision may make it difficult for ALCOSAN to assess differential charges based upon the contribution of storm water from particular municipalities to the treatment load or to the need for facility reconstruction.⁴³

The only provision in these older agreements that may provide ALCOSAN some leverage is a provision allowing it "to promulgate, issue, publish and enforce rules and regulations...[which] may include provisions prohibiting or regulating the discharge into the Borough's/Township's sewerage system of oils, acids and other substances which may be harmful to [ALCOSAN's] ... structures or which may interfere with the sewage treatment processes at the plant."⁴⁴ If this provision can be interpreted to apply to the addition of storm water to municipal sanitary sewage, it may provide an opening for imposing certain requirements on the municipalities. The municipalities under the same paragraph agreed to exercise for the benefit of ALCOSAN "all rights and powers" which they possess to carry into effect the purposes and intent of the Agreement, and to enact and enforce ordinances incorporating ALCOSAN rules and regulations upon request. Moreover, the DEP may be able to force changes in the municipal and intermunicipal agreements by taking enforcement

action directly against the municipalities, and/or directing them to develop corrective action plans.

Agreements between municipalities and ALCOSAN entered into more recently have provided some direct leverage in requiring the municipality to address the addition of storm water to the system. For example, one such agreement provides that: "The Municipality understands and agrees that the said intercepting sewer is of limited capacity and that therefore this Agreement is limited to handling the Municipality's sanitary sewage only, with no admixture of storm water. The Municipality covenants that it will not connect to ALCOSAN's intercepting sewer any sewer which discharges storm water from roof drains or other connections or into which flows a surface or sub-surface stream, foundation drains or the acid drainage of a coal mine...The quantity of sewage to be discharged from the Municipality to the ALCOSAN interceptor will not exceed [number] mgd."⁴⁵ The same paragraph of the agreement goes on to provide that ALCOSAN may install flow measuring devices at the municipality's expense, and the municipality covenants to pay excess costs - a surcharge - whenever the gross volume discharged to ALCOSAN exceeds a particular amount.⁴⁶

Use of metered water charges may no longer be an appropriate approach to billing the older systems, given the large volumes of storm water conveyed by these systems. Perhaps charges in the future should be based on some adjustments to water use based on per capita flow from municipalities. This raises the difficult question as to whether old agreements can be changed and whether there are statutory impediments of any kind to these changes, or bond covenants that may make it difficult to change financing arrangements.

Agreements between municipalities create a similar set of issues. In the Pittsburgh area, the older communities are along the rivers. As people moved outward decades ago, the newer communities needed to hook systems into these older sewers in order to have access to ALCOSAN. The municipalities often signed agreements with very nominal conditions, in order to convey the sewage. These contracts usually did not limit flow. As the population

changed, the newer communities had a large flow going to the older communities, but paid very little. And in some cases they were able to enforce agreements against the older communities when disputes arose about volume or maintenance expenses. These agreements, too, pose potential impediments to cooperation.

Cooperation will require attention to local governance. This can either be externally driven - as it was with DEP's order to the Girty's Run municipalities, and as it may be with EPA's pursuit of the § 308 process with respect to the 51 SSO communities - or it can be created by voluntary cooperative processes. There are some existing entities that may provide varying levels of help or opportunities to work together. The local Council of Governments (COG) structure in Allegheny County may provide a forum to deal with some issues. For example, the Turtle Creek COG provides some services for inspection and maintenance of sewers - vacuum truck and television capability. Similarly, Allegheny County is making its Geographic Information Systems (GIS) capability available to municipalities to assist them in mapping their sewer infrastructure and develop cost effective strategies.

Some resources are available regionally to help municipalities integrate their decisions with others on a voluntary basis. The Southwestern Pennsylvania Regional Planning Commission, renamed the Southwestern Pennsylvania Commission (SPC) in 1999, acts as the region's metropolitan planning organization for federal highway planning and funding purposes. It also provide economic and other projections to assist planners throughout the region. Formed in 1962, the Commission added Indiana and Greene counties in 1998 to its prior membership of Allegheny, Armstrong, Beaver, Butler, Washington, and Westmoreland counties. Fayette County is an associate member. The SPC is conducting a study of planned water and sewer construction in the region. This may help local planners and governmental officials discern where investment is being targeted on a broader basis than simply municipality-by-municipality.

The most innovative, and newest entry into this field of inter-municipal cooperation is the Three Rivers Wet Weather Demonstration Project. The next section briefly discusses the issues facing

this entity and some of the opportunities that its creation presents.

Three Rivers Wet Weather Demonstration Project

The Three Rivers Wet Weather Demonstration Project is the result of a partnership between the Allegheny County Health Department – the first line regulator in the county, and ALCOSAN – the regulated sewage treatment entity. The project, modeled on an effort to address wet weather pollution issues on the Rouge River near Detroit, is intended to provide a way to coordinate new approaches to wet weather compliance within the ALCOSAN municipalities. It is a serious idea that is creating real possibilities for new money, coordinated responses, targeting of expenditures, and identification of new technical solutions applicable to the particular wet weather problems of Allegheny County. The project received a Congressionally-designated startup grant from EPA of \$1.75 million, on May 29, 1998. Additional federal funding of \$2.5 million for the project was received in 1999. Matching funds and services are provided by the county Health Department and ALCOSAN. The project will be incorporated as a nonprofit entity, and will conduct planning and administer subgrants (on a matching basis) to municipalities for demonstration of worthwhile approaches to abatement of SSO discharges.

The creation of a new entity, a nonprofit institution, has some significant advantages. Initially, it helps to avoid the settled responses that institutions and local governments normally have to one another based on long institutional and political interactions. Moreover, because it will initially have money to disburse (as well as explicit Congressional endorsement), positive responses are more likely than negative ones.

The project has already had some effect in negotiating with EPA regarding monitoring required in the § 308 letters received by the 51 municipalities constituting the sewersheds for the 40 SSO outfalls in the ALCOSAN system. EPA agreed to conditional suspension of flow monitoring by municipalities conditioned on their submission of reports by October 19, 1998 with quality assurance and quality control information.⁴⁷ This may allow municipalities, in

some cases, to divert resources from monitoring to such things as repair of collectors, identification and abatement of sources of inflow, and enforcement of local ordinances.

The project is currently the forum for the biggest picture thinking about the array of inter-related issues in the region relating to sewage infrastructure financing and decision making. It is looking beyond the enforcement issue, beyond municipal boundaries, and beyond merely seeking traditional solutions such as bond-funded construction of storage (equalization) basins municipality by municipality. Through its three substantive committees – finance, governance, and technical – it is also serving as an initial forum for discussion among various actors in the region about some of the solutions. At the same time, however, the project has a daunting task. In order to receive continuing federal support – particularly at a high enough level to even begin to address the wet weather problem – it must show early successes. In addition, the project must find a way to engage the attention of the participating municipal elected officials so that it can demonstrate the kind of seriousness of purpose that will persuade EPA, DEP, and financing agencies to support its new approach.

Moreover, even though the project is currently the site of the biggest picture thinking in the region, its horizons are somewhat constrained even on its own terms. It is initially focusing only on the § 308 SSO communities, even though other communities share many of the same needs for reduction of inflow, innovations in financing, and technical solutions, if the environmental condition of the three rivers is to be meaningfully improved. Moreover, the project is focused on Allegheny County. Some other vehicle may be needed if a regional approach to water quality and sewage infrastructure is to be developed.

Initial issues for the Three Rivers Wet Weather Demonstration Project include defining its mission and developing criteria for participation by municipalities. The project must clearly require commitment of some kind from municipal participants if it is to serve as an umbrella organization for wet weather issues and for dealing with EPA. Some of the issues that will need to be addressed are the needs for participating municipalities to pass ordinances

prohibiting and requiring removal of downspout and driveway drain connections, inspection and enforcement commitments by the municipalities, agreements to renegotiate current inter-municipal agreements and/or agreements with ALCOSAN, work with adjacent municipalities on a sewershed basis, possible imposition of user fees for maintenance, joint management agreements, and a commitment to reduce I/I.

Defining what constitutes acceptable (and exemplary) participation will be a key task for the project. In the near term, the project will also need to set out criteria for appropriate subgrants to municipalities or other entities in order to "demonstrate" appropriate solutions to wet weather problems. Some of the criteria will need to encourage inter-municipal cooperation. Cooperation is essential as it is likely to lead to cheaper solutions (reduced contractor mobilization costs, engineering, construction of facilities in the "right" location regardless of municipal boundaries). Cooperative priority

setting makes for more cost effective solutions, and a unified cooperative approach will make it easier for the Three Rivers Wet Weather Demonstration Project and its participating municipalities to deal with (1) the regulatory agencies (EPA and DEP), and (2) its Congressional funders who will want to see progress before authorizing further targeted appropriations in the region.

The project will need matching funds. But it will also provide a basis for information that can lead to public decision making that can support funding. Under the initial commitment, Allegheny County has agreed to share access to its Geographic Information System (GIS) with participating municipalities free of charge in exchange for information resulting from the municipalities' work with the system. Data of this sort, such as flow data and sewer mapping, can make the regional case for comprehensive solutions and cooperation between municipalities.

Chapter Three

Financing Alternatives

On many levels, the sewage infrastructure issue involves money – how it can be obtained, where it should be spent. Critical concerns include municipalities' and authorities' access to capital for new construction and repair and maintenance funding for older systems; and questions relating to the availability of publicly subsidized funds.

Most CSO solutions in other major U.S. cities have benefitted from significant contributions of federal dollars. With the demise of the federal construction grants program in the 1980s and the conversion of Clean Water Act infrastructure grant funding to state revolving loan funds, these federal funds have often come in the form of "demonstration projects" or been tied to specific economic development and regional activities. Targeted federal funds have typically dealt with providing remedies to obvious water pollution problems that had a *clear impact on economic activity*, such as impacts on fisheries, drinking water, waterfront development and the like (e.g. San Diego, Boston Harbor, Atlanta Olympic games). Clearly, the Three Rivers Wet Weather Demonstration Project hopes to emulate some of these approaches. Nevertheless, it is clear that substantial funding will need to come from the municipal entities themselves, from the Commonwealth of Pennsylvania, and from numerous grant and loan programs operating in the Commonwealth under an array of authorities.

First, what needs to be financed? ALCOSAN in 1996 estimated that it would need \$300-500 million to deal with scheduled plant expansion and related CSO reductions. More recent estimates for comprehensive long term wet weather control plan expenditures indicate projected expenditures by ALCOSAN of over \$900 million, plus up to \$2 billion in potential municipal sewer upgrades and rehabilitation over a long period of time.⁴⁸ Dealing with CSOs and SSOs piecemeal – community by community – would require expenditures in excess of these amounts. For example, as a result of enforcement actions, Penn Hills addressed the sewage overloads plaguing that community and its wastewater treatment plant. Expenditures included construction of new collectors,

construction of storage, connection to the ALCOSAN system, and various maintenance commitments, resulting in costs of \$50 million for a community of 50,000. Pursuing similar independent expenditures for the many SSOs and CSOs in the region could require funding on a similar scale – not necessarily a cost effective approach.

Municipalities may be facing substantial expenses for the construction of storage, for the replacement of sewers, for inspection of (and possible financial assistance to replace) house laterals, and for storm water controls needed because of the removal of storm water from the sanitary sewer system. Similar problems face many of the older municipalities outside of Allegheny County.

Some communities may be able to finance these expense on the bond market and service the debt through surcharges on their ratepayers. Others may have a substantial problem in pursuing this route. The most difficult cases are older jurisdictions where there are no funds to do anything but fix what is broken, and barely even that. In many of these distressed or static communities there is no source of new revenue to sustain the capital costs. While there are some exceptions – like a redevelopment in a built up community – where there is no potential for new growth it can be hard to finance infrastructure commercially on an existing ratepayer/taxpayer base.

This section examines some of the issues surrounding each type of financing currently and potentially available.

Bond Financing

Most municipal debt is financed through the issuance of bonds. Tax exempt revenue bonds of the kind often used for sewer projects come in two types. *Regular revenue bonds* are paid out of the net income of the project (viz. serviced by the ratepayers); the sewer revenues serve as the backing for the bonds. *Guaranteed revenue bonds* are similar, in that they are also paid out of net

income from the project, but the real estate tax base of the municipality guarantees payment to the bondholders in the event of any shortfall.

As a more secure investment, guaranteed bonds often carry a lower interest rate. As a result, some communities choose to issue guaranteed revenue bonds even though projected net income will easily be sufficient to service the debt.

Revenue bonds are normally issued for a term of 20 years. Guaranteed revenue bonds are subject to the Pennsylvania Local Government Unit Debt Act, which requires that they have a level debt service after completion of construction; and payment of principal must begin within one year after completion. Regular revenue bonds, in contrast, are not subject to the Act. They may also structure their payout in order to correspond to project revenues - viz. higher payments to bondholders when more ratepayers have come on line.

Communities can purchase "bond insurance" for revenue bonds. This allows a community to obtain a lower interest rate in exchange for the payment of more basis points. In effect, a community can "buy" a AAA rating, paying the basis points and capitalizing them. It is worth noting that revenue bonds can be just as attractive to communities as interest-subsidized PENNVEST financing (discussed below). The Commonwealth of Pennsylvania has a AA bond rating, which is exceeded by some municipalities (or which can be exceeded by purchasing bond insurance).

Some older communities cannot afford to use revenue bonds. They have no "net revenues" from repairs or upgrades to sewer systems and have limited ability to raise rates to existing ratepayers based on local economic conditions. These communities hope for external funding (from PENNVEST or CDBG or some other program). Since the end of EPA construction grants, it has been difficult for these communities to make repairs or upgrades to their aging sewer systems. Consequently, many older communities assiduously avoid the incursion of new debt for sewer rehabilitation. There is no upside for them - no new revenues nor any new economic development linked to the expenditure.

Indeed, some local observers believe that these communities even avoid applying to

PENNVEST or CDBG or to other funding programs because they cannot afford the initial studies that would be required to support a subsidized loan or grant. Moreover, conducting the studies to support an application would merely call attention to a problem which might then attract the attention of enforcement agencies, placing the local government in an even worse position.

PENNVEST

The Pennsylvania Infrastructure Investment Authority (PENNVEST) was created in 1988 to provide a unified funding approach for water and sewer infrastructure investments using federal revolving loan fund monies and state monies, including bond proceeds and general revenues. PENNVEST has disbursed almost \$2 billion in funding across the Commonwealth since 1988. Loan and grant assistance is available to communities for construction, improvement, expansion, extension, acquisition, repair or rehabilitation of facilities for the collection, treatment, filtration, or disposal of wastewater.⁴⁹

PENNVEST provides low interest loans (1-6 percent) with 20 year terms, and some grants. Grants are allowed only where repayment of a loan would be unlikely and the recipient would be unable to do the project without a grant. Ordinarily, if a grant is made, it must be combined with some loaned funds. Interest rates are determined on the basis of economic conditions in the county where the project is located, and specifically upon unemployment rates. Where a municipality is the applicant, PENNVEST may use the municipality's unemployment rate if this would qualify the project for a lower interest rate than if the county rate were used.⁵⁰

PENNVEST may fund up to \$11 million per project (or \$20 million for a project serving more than one municipality). The PENNVEST board may authorize a higher amount if the project would provide consolidated service to a region encompassing four or more municipalities.⁵¹ The financial criteria used to determine the need of applicants for financial assistance include:

- (1) comparison with the fair and reasonable costs incurred by comparable systems,
- (2) the incomes of affected ratepayers and

their ability to pay increased rates to support the project,

(3) other sources of funding available to entities seeking assistance, and

(4) a determination that PENNVEST funding will not supplant financial resources already available to the applicant.⁵²

Advance funding can be made available to support project design, but the maximum is \$350,000. This provision is most useful to small projects. It is functionally limited to start-up systems in small communities without other access to funding. Advance funding is *not* available to assist with design of rehabilitation or upgrades to existing systems, as these are deemed to have ratepayers who can bear the design costs.

PENNVEST Funding Priorities

The PENNVEST rating system gives highest priority to providing new regional sewers and sewage treatment capacity to unsewered areas with failing septic systems, giving these projects the highest potential ranking. This preference is not required by the statute.

The statute establishes the basis for setting priorities for projects in broad terms: (1) benefits to public health, (2) contribution of the project to economic development as well as social and environmental values, (3) benefits to public safety or welfare, (4) improvement in the ability of the applicant to come into compliance with laws, (5) improvement in the adequacy or efficiency of the system, (6) cost effectiveness of the project, (7) whether the governmental unit to be served by a sewage treatment system is subject to construction or connection limitations, and the date of such limitations, (8) whether the project encourages consolidation of systems, (9) whether a storm water project is sponsored by more than one municipality and is located at strategic locations identified by basin wide studies, and (10) whether the project will resolve known drainage or storm water related problems. In assigning priorities, PENNVEST is required to consult with the DEP and the Department of Community and Economic Development.⁵³

Far more significant for PENNVEST funding decisions than the statute, however, are the "wastewater project evaluation criteria" in the regulations. They establish five factors.⁵⁴ A "draft"

guidance manual⁵⁵ sets these factors out with greater specificity, assigns weights to them, and defines their content:

(1) *Public Health and Safety* - 45 %. Points are assigned by DEP in four subcategories. "Community environment and aesthetics" provides up to 20 points. The highest score in this subcategory that a collection system or treatment plant can get for a project addressing raw sewage discharges during *wet weather* flows is category "C." (The ability to score "C" was the result of a 1998 revision made by DEP in order to *improve* the eligibility of such projects). In contrast with CSOs and SSOs, areas with malfunctioning on-lot systems are rated category A or B. The other three subcategories are drinking water contamination (which provides a range of 0-15 points); adverse affect on public bathing (0-5 points); and threats to public safety due to potential failure of structures (0-5 points).

(2) *Environmental Impact* - 25%. The subcategory for effect on "fish and aquatic life" allows up to 12 points. Twelve points are awarded where the pollution to be eliminated by the proposed project has eliminated fish from the waterway; six are awarded where an existing fishery is depressed by the pollution; 3 where a fishery is periodically threatened or affected by the pollution; and 0 where no documentation of effect is shown. The boating and recreation subcategory allows up to 4 points, based on whether such use of the receiving waters is prohibited, inhibited, potential, or unaffected by the pollution to be addressed. Effects on water supply for industry, irrigation, and stock watering allow up to 3 points each.

(3) *Economic Development* - 15%. This category is scored by the Department of Community and Economic Development, based on the potential of the project to generate long term jobs in the community to be served.

(4) *Compliance* - 10%. The compliance category allows up to 10 points, but the maximum is allowed only for orders addressing on-lot problems, for a wastewater treatment facility that cannot meet its dry-weather limits consistently, or similar dry-weather discharge problems with sewer

collection facilities. Collection system problems generally can score no higher than 5 points in this category. No points may be awarded unless there is an issued enforcement order, or the basis for an enforcement order reflected in a required 537 plan revision or new discharge permit, or a sewer connection ban or approved corrective action plan.

(5) *Adequacy, Efficiency and Social Impact* -5%. The adequacy, efficiency and social impact category assigns up to 2 points for consolidation of existing discharges into a centralized system. It also awards up to 2 points if the population served is greater than 50,000 or is a small municipality of 3,500 or less; it awards up to 1 point if the median household income of the community to be served is below the Pennsylvania median.

While the maximum possible points awarded using DEP criteria are 85, typical projects receive scores ranging from 30 to single digits. This may be affected by an applicant's lack of funding to collect data on environmental conditions. For example, an aquatic life survey is often not done because of expense, or because discharges to a mainstem river are difficult to assess in this category. The bulk of the points come from the community environment and aesthetics subcategory, which is heavily weighted toward elimination of failing on-lot systems. Since the scoring potential for sewage infrastructure projects addressing wet weather problems was upgraded, their funding by PENNVEST has become more likely. PENNVEST and DEP now describe such projects as an "automatic" medium ranking, which in the current climate means that they are likely to receive a funding offer if the economic qualifications are met.⁵⁶

Typically, 5-12 applications for PENNVEST funding are received in the DEP's southwestern region in each of the three PENNVEST funding cycles each year. The regional DEP office rates them; then DEP has a statewide meeting to accommodate and rationalize the ratings awarded by the various regions. The numerical ratings are converted to ranges (denominated High, Medium, and Low) in order to dampen the effect of subjective differences in regional scoring. PENNVEST then converts these DEP ratings to its own numbers; and does the same with the ratings

it gets from the Department of Community and Economic Development.

PENNVEST then considers the ranked projects in order and funds down the list as far as it deems it can go with the funds available. In practice, any project that has received a single High Priority in any of the categories (particularly public health and safety, environmental impact, or economic development) has been funded. Thus, any project that is rated high by DCED will be funded, even if its environmental scores are low or moderate. Likewise, a project to sewer an area with failing septic systems is likely to be funded. Because of an increase in PENNVEST funds, as well as the upgrade in scoring potential for addressing wet weather discharge problems (to Medium), CSO and SSO projects are more likely to be funded. While relatively few CSO or SSO projects were submitted to PENNVEST in the past, it is likely that applications for funding this category will rise in the near future as the region wrestles with these infrastructure problems.

PENNVEST and House Lateral Rehabilitation

Under current policies, PENNVEST funding may not be available to help municipalities address I/I from house laterals. Under the statute, PENNVEST funding is available for a broad range of sewer collection and treatment activities. But PENNVEST regulations provide that "[c]osts of acquisition or construction of interior plumbing and that portion of house laterals that is neither owned by, nor the responsibility of, the applicant wastewater system" are "not eligible for financial assistance."⁵⁷ This regulation has been viewed by PENNVEST officials as prohibiting the use of any PENNVEST loan or grant funds for the rehabilitation of homeowner-owned house laterals contributing to wet weather problems.

However, PENNVEST regulations could be read to bar only funding for initial construction or purchase of these privately owned fixtures. The statute defines "eligible cost" as "all...expenses necessary or incident to the acquisition, construction, *improvement, expansion, extension, repair or rehabilitation* of all or part of a project."⁵⁸ But the regulations only bar use of PENNVEST funds for "acquisition or construction" of homeowner-owned house laterals - not the other activities in italics. It may be worth further inquiry to discern whether PENNVEST could be

persuaded to interpret its regulations to allow funding of repair or rehabilitation work on homeowner-owned house laterals as part of a larger project intended to reduce I/I and eliminate SSOs or CSO discharges.

Moreover, even if the PENNVEST regulations are interpreted to exclude house laterals from funding, the *statute* does not appear to require the PENNVEST board to maintain such regulations. It defines "eligible costs" with reference to expenses incurred on a "project," and "project" in terms of eligible costs related to all or part of any "facility or system, whether publicly or... privately owned...for the collection, treatment or disposal of wastewater."⁵⁹ This issue will deserve further scrutiny if PENNVEST funding is believed to offer a significant opportunity for municipalities in the future as a strategy takes shape for wet weather problems.

Interestingly, there also appears to be an unnecessary asymmetry of funding available to assist homeowners with failing sewage disposal systems. Currently, subsidized loan funds are available to homeowners to replace their failing on-lot systems, but not to replace failing house laterals, even though both contribute raw sewage to the environment. PENNVEST has developed a low-cost loan program for replacement of failing septic systems, in cooperation with the Pennsylvania Housing Finance Agency and the DEP. Under the on-lot program, the loan funding is usable for testing, design, permits, and construction costs associated with repair, rehabilitation, improvement, expansion, or replacement of an existing individual on-lot disposal system. The applicant must own and occupy the single-family residential unit served by the on-lot system, and the owner's family income cannot exceed 150 percent of the statewide median household income (adjusted for inflation). In 1998, this established a maximum family income eligibility of \$53,881. Loans are originated by participating commercial lenders, and carry an interest rate of 1 percent. Loans of up to \$15,000 are made for a term of up to 15 years and are secured by a mortgage on the property.⁶⁰ It would be worthwhile to examine whether such a program could be made available to homeowners needing to replace failing house laterals - which contribute to much the same set of environmental hazards and which may require expenses of similar magnitude.

PENNVEST Funding in Southwestern Pennsylvania

Statewide, \$35-60 million is disbursed at each of the 3 annual PENNVEST meetings. In the southwestern Pennsylvania region, about \$40-50 million is disbursed in PENNVEST loans each year. Funding is mostly by loan, and the interest rate is set based on community capability as provided under the statute. While PENNVEST can offer loans as low as 1 percent, the rate for Allegheny County is 4 percent because it is not economically distressed under the PENNVEST statutory definitions.

PENNVEST money, in practice, is rarely used in the most urban areas. Urban construction and rehabilitation projects often need too much money compared to the funding PENNVEST typically awards. Although funding ceilings allow funding of projects up to \$11 million, typical PENNVEST financing is a few hundred thousand dollars for engineering (where advance money is available), and \$1-2 million for construction. Thus, in practice, it primarily funds small projects. However, some PENNVEST funding has been awarded to address urban wet weather issues in southwestern Pennsylvania. For example, in 1998, PENNVEST approved a \$10.7 million loan to the Girty's Run Joint Sewer Authority for the construction of equalization (storage) facilities to eliminate wet weather discharges of untreated sewage to Girty's Run, the Allegheny River, and local basements from sanitary sewers.⁶¹

PENNVEST funding (for all purposes -- not just sewage) - from the program's inception to mid 1998 - provided \$78.6 million in loans and \$2.9 million in grants in Allegheny County; \$18.7 million and \$0.8 million, respectively, in Armstrong; \$68.6 million and \$0.9 million in Beaver; \$31.8 million and \$0.4 million in Butler; \$51.8 million and \$3.2 million in Fayette; \$36.3 million and \$2.8 million in Washington; and \$104 million and \$1.6 million in Westmoreland.⁶²

On a per capita basis, PENNVEST funds received since 1988 are about \$63 in Allegheny County. The next lowest county in the region received funding of three times that -- Washington at \$188 per capita. Butler, Armstrong and Westmoreland are at \$195, \$263, and \$281, respectively; while the highest are Beaver at \$370 and Fayette at \$374, more than six times that of

Allegheny County. All of these counties, with the exception of Butler, have lost population. While much of this difference in funding reflects the targeting of support to smaller and disadvantaged communities with less access to private capital markets, it also reflects the greater availability of PENNVEST funding (at least in the past) for extension of water and sewers - and for replacement of on-lot systems - rather than for rehabilitation of existing systems.

PENNVEST funding will need to play a larger role in the sewer urban areas if sufficient funds are to be available to correct CSO and SSO problems. In November 1998, PENNVEST approved funding offers for two CSO projects in southwestern Pennsylvania.

PENNVEST has strongly maintained that it is not engaged in the construction of new sewers into unsewered areas in order to support new, sprawl development. And indeed, developments of this type would not generally meet the funding criteria noted above (which emphasize existing environmental problems and funding based on economic need). But there is evidence that municipalities have used PENNVEST money to address existing problem areas, while sprawl development occurs in adjacent areas, with both areas conveying sewage to the same wastewater treatment plant. In effect, while there is no direct connection between PENNVEST sewer expenditures and sprawl development, there may be an indirect effect - with public funding reducing the financial burden that might otherwise be spread across new development as well as existing ratepayers.⁶³

Governor Ridge in January 1999 proposed that PENNVEST funding be revamped to provide incentives to communities to utilize sound land use practices.⁶⁴ Development of this concept may be an important step toward linking funding and development decisions more directly, and by placing a priority on such concepts as rehabilitation of existing infrastructure, maintenance of older urban centers, and avoidance of demand inducing infrastructure investments in inappropriate locations.

Rural Utilities Service

The Rural Utilities Service (RUS) is a U.S. Department of Agriculture program providing

low cost loans and grants for water, wastewater, and waste disposal infrastructure in rural communities.⁶⁵ Its budget in Pennsylvania has been about \$48 million per year (about 2/3 loan, 1/3 grant). RUS funds are available to rural areas and communities with a population of less than 10,000. The counties of southwestern Pennsylvania fall within two RUS service areas, located in Westmoreland and Butler Counties, respectively. Applicant communities must show that they are not able to finance the project from their own resources through private or commercial credit at reasonable rates and terms. RUS uses a rate of \$35 per month as a rule of thumb in making the determination of ability to pay.

Grants may be combined with loans in RUS-supported projects. Grants may be made up to 75 percent of project costs when the median household income of the project's service area is below the poverty line or below 80 percent of the state non-metropolitan median household income. Grants may be made up to 45 percent of project costs when the median household income of the service area is greater than 80 percent of the non-metropolitan median household income but less than 75 percent of the metropolitan median household income. Loans allow a maximum repayment period of 40 years, but the repayment period cannot exceed the useful life of the facilities financed or legal limits on municipal indebtedness.

RUS has its own scoring methodology, which emphasizes service to areas with small populations and low incomes. Health priorities are general and do not appear to favor construction of new systems over the rehabilitation of older systems; however, projects resulting in mergers and consolidations of smaller systems do get additional points. In southwestern Pennsylvania, most municipalities seeking RUS funding for sewer infrastructure are under a consent order or other enforcement condition with the DEP, so the scoring methodology plays little role in priority setting. Funding is primarily a question of timing. Applicants for RUS funding need not have completed a 537 Sewage Facilities Act Plan prior to receipt of funding, but an environmental assessment is required.

RUS requires agreements in connection with financing that the municipality will limit

connections and will not extend sewers constructed with RUS funds into new areas. In other words, the idea is to preserve rural communities, not subsidize the creation of sprawl. However, further analysis may be needed to determine what happens when these limitations come into conflict with recent Pennsylvania amendments to the Sewage Facilities Act that allow private parties to initiate a private revision request in order to force a municipality to expand its service/capacity. It is possible that this may produce a conflict that supports conversions to support greenfields development. Similar issues may arise where the RUS has funded connection of an unserved area to a plant, which then uses the expanded ratebase to spread the costs of additional upgrades and extensions of sewers to new development areas elsewhere in the area.

Community Development Block Grant (CDBG) for Water and Sewer Facilities

Community Development Block Grants are federal funds that are administered and distributed by state and local agencies. The Allegheny County Economic Development Department administers grant funds in an account that is designated specifically for water and sewer projects. This account, which funds in-county jurisdictions other than the City of Pittsburgh, Penn Hills, and McKeesport (each of which have their own CDBG eligibility), disburses about \$1.2 million to \$2 million per year to Allegheny County municipalities and authorities. It funds drinking water distribution systems, treatment plants, sewer collection systems, and storm water projects - usually supporting about 15-40 projects per year, out of 50-100 applications received.

Most of the applications and grants are funneled by municipalities and authorities through the local COGs (councils of governments). In order to be eligible for CDBG funds, the project must primarily benefit low income residents.⁶⁶ Typical grants require a 50 percent match (viz. dollar for dollar match). In distressed communities the grant may go as high as 75 percent of project costs. Projects of \$25,000 or less are eligible for 100 percent grant funding, however. The maximum grant amount is \$350,000; however a typical grant is \$25,000- \$75,000.⁶⁷

Ordinarily, a pre-application is submitted in June or July. These are reviewed and either rejected or the community is invited to submit a full application. Upon receipt, the full application is initially reviewed by the County's evaluation staff for its eligibility. The eligible projects are then reviewed by County program staff and ranked for fundability using 12-15 evaluation criteria (as well as evaluation by the County Health Department). In general, sewer and water projects should provide significant health benefits, prevent downstream flooding, provide greatest dollar benefit per household, and/or correct violations cited by the DEP or county health department.⁶⁸ Projects not funded in a particular round are retained on a contingency list for possible funding in the future.

Monongahela Valley communities have received most of the grants under this county program, with others going to older Allegheny River communities and some outlying areas. CDBG funding may provide some assistance to communities seeking to abate SSOs - particularly where low cost measures are available, or where these funds can be used to help match other grant or loan moneys. All of the SSO communities that received § 308 letters from EPA are eligible for funding under this program, except for Churchill Borough (which does not meet economic criteria). Although the amounts available are low, larger projects can be pursued on a phased approach. For example, Elizabeth Twp. is gradually sewerage areas now served by septic systems. South Versailles is funding the fourth phase of its sanitary sewer projects partly with CDBG funding, as well as with economic development funds from the state and Rural 2000 funds. Various uses of CDBG water and sewer funds are possible. For example, Beaver County uses these funds to pay for tap-in fees for low income households. This is also allowable under Allegheny County's guidelines.

Community Development Block Grant (CDBG) for Economic Development

The economic development fund under CDBG may also fund water and sewer infrastructure, but must link the funding to job creation. In general, the funding must produce a ratio of 1 permanent job for each \$30,000 invested. For example, the West Mifflin sewer extension

project (about \$0.5 million) is being funded as a job creation CDBG grant.

The state Department of Community and Economic Development has a grant program, the Infrastructure Development Program, that also may provide grants for construction of sewage facility collection lines

Appalachian Regional Commission

The Appalachian Regional Commission (ARC) has a grant program that can assist distressed communities in construction projects, including sewer collection and treatment plants, when they are deemed vital to economic development. The role of ARC funding is shifting in the region, and deserves further attention to determine whether it can be more closely linked to improvement and redevelopment of *existing* urban centers rather than construction aimed at attracting greenfields development by potential business enterprises.

Designated Federal Appropriations

Some funding is available to municipalities and authorities when Congress appropriates money for specific projects. The Three Rivers Wet Weather Demonstration Project is an example of this approach, but one which offers flexibility to make subgrants to communities on a matching basis.

Other local examples include appropriations under the Water Resources Development Act administered by the U.S. Army Corps of Engineers and appropriations under the Clean Water Act administered by the U.S. EPA. For fiscal year 1999, for example, Scott Twp., Penn Hills, and Shaler Twp. each received \$500,000 designated appropriations to address sewage infrastructure projects. The Nine Mile Run project also received a \$500,000 appropriation. Although all of these amounts are small in comparison with the magnitude of the sewage infrastructure problem in Allegheny County and the rest of the region, designated federal funding has been a key component of every successful large scale metropolitan attempt to address CSO and SSO infrastructure solutions in the country, from Boston to New Orleans.

Authority for Improvements in Municipalities (AIM)

This Allegheny County program provides small loans to municipalities. The maximum loan under the program is \$75,000, repayable in five years, and may be used to fund 100 percent of the cost of projects. The interest rate is 3.5 percent. Studies are not eligible costs, but engineering, design, legal, and construction are eligible. AIM funding is also usable as part of a local match for CDBG grant funds. Some grant funding is also available under this program for projects that benefit more than one municipality, but grant funds may be used only for construction and materials. The maximum grant is \$50,000 or 75 percent of project costs, whichever is less.

Improvement Program of Allegheny County (IMPAC)

This program provides financing for single family homes to do necessary improvements, which may include rehabilitation of sewer laterals or removal of roof drain connections. It provides for low interest loans (0-3 percent), with a maximum loan of \$15,000 for 15 years. It is staffed by the County Health Department and paid for with CDBG funding. Eligibility requires income below \$39,800 (or \$45,770 for families of 3 or more).

Shared Municipal Services Program

The Commonwealth's Department of Community and Economic Development has a grant program intended to encourage cooperative municipal services. The program provides grants of up to 50 percent of project costs with local match for services that are based on cooperation between two or more municipalities. More analysis of this program will be needed in order to determine whether it can serve as the basis for more substantial cooperation by communities on wet weather and sewage infrastructure management, but it may provide a basis for funding cooperative sewer inspection, maintenance, and repair where two or more communities are doing this in a collaborative way to address wet weather flows cost effectively.

DEP Sewage Facility Planning and Storm Water Planning Grants

Pennsylvania law provides for DEP administered sewage facility planning grants for up to 50 percent of the costs of Act 537 official plans and revisions.⁶⁹ The grant is made to reimburse allowable costs incurred in connection with an adopted sewage facilities plan update.⁷⁰ This program may be usable by individual municipalities seeking to assess and plan for correction of wet weather flows and hydraulic overloads of sewer collectors. While many older municipalities have not prepared official plan revisions for many years, grant funding may serve as an incentive to conduct a thorough review, update, and solution to wet weather problems and development issues.

Act 167 storm water management planning grants from DEP are available to counties, with up to 75 percent reimbursement. Municipalities are also eligible for 75 percent reimbursement where enactment and implementation of ordinances is mandatory. Such planning funds may assist in addressing the wet weather problem, and particularly in counties and locations where reduction of I/I entering sewer systems will create its own over-land problem of storm water discharges.

DEP Wastewater Treatment Plant Operating Grants (Act 339)

Wastewater treatment plant operating grants also have a significant bearing on infrastructure financing and decision making. Act 339 provides for an annual operating grant of 2 percent of the capital expenditure for the plant in question. It serves as an important source of revenue for wastewater treatment throughout the Commonwealth. While the grant is characterized as an operating grant, it may have the same effect as a capital subsidy. In effect, it is a buy-down of the capital costs of wastewater treatment plant acquisition, construction, or capital improvement.

This means that the grant program can influence municipal and authority decision making.

The operating grant program has some peculiar interactions with the PENNVEST loan program. Under the terms of the PENNVEST program, if a plant's capital expenses were funded

by PENNVEST, then the plant operator is *ineligible* for the 2 percent operating grant on those expenses. While this limitation is intended to avoid double dipping, it may also act as an incentive for a community or an authority not to use PENNVEST funding, even if PENNVEST money is initially cheaper than going to the capital markets directly. It may be that operating grants should not always be barred in older communities with little potential for growth in their ratebases - where low-interest PENNVEST funds may be particularly needed.

The 339 grant program also creates other issues that can bear on how wet weather pollution is addressed. For example, because of the 339 operating grant, some Pennsylvania communities may be moderately encouraged to incur capital expenses at the treatment plant rather than other sorts of expenses (such as minimizing inflow from collection systems or house laterals). This is because the capital expenses for the plant will be subsidized at a rate of 2 percent per year in perpetuity - unlike all other expenses, including other capital expenses and maintenance and rehabilitation expenses. Thus, the program may distort decisions away from resource-efficient and targeted solutions because of the differing costs of capital for the respective approaches.

These factors suggest a need to reevaluate the 339 program, including examination of ways to make it more flexible. For example, it may be appropriate to allow systems to receive grants where they incur expenses *in place of* capital expenditures in order to solve a problem more cost-effectively (for example, by strengthening maintenance, inspection, rehabilitation, and homeowner enforcement in lieu of building storage facilities or expanding treatment capacity).

In January 1999, Governor Ridge proposed elimination of the 339 operating grant program and redirecting the funding toward a new environmental stewardship fund which would support capital improvements and pollution cleanup. The redirected funding would be part of a broader funding initiative focused on "cleaner water, better parks, preserving open space, and controlling sprawl."⁷¹ If 339 were eliminated, however, it could have the effect of immediately driving up sewer rates in older urban communities where the operating grant is a significant benefit (often those communities with

static or declining numbers of ratepayers). Unless the redirected funds were somehow returned to these urban communities (through targeted capital investments or maintenance funds, for example), such a move might have unintended effects that work against smart growth and urban revitalization. Furthermore, this approach could increase the costs of capital for older systems dealing with wet weather flows.

Further evaluation of the 339 program is clearly needed in order to assure that it contributes most effectively to smart growth and cost-effective pollution prevention. Or, if it is eliminated, the funding saved should be targeted to maintenance and rehabilitation of older systems where such funding is critical to their economic sustainability.

Revenue and Debt Service Issues

Relevant to all of these public and private financing mechanisms – and particularly the loans, or the loan-funded portions of projects that receive some grant funds – is the issue of the revenue stream which will support the financing. Basically, ratepayers need to provide the funding to cover operating expenses and to service the municipalities' or systems' debts – either the revenue bond debt, or the debt incurred through the various loan programs.

This issue is most straightforward for larger existing systems. For example, ALCOSAN revenues were about \$58 million per year in 1996.⁷² Customer charges supply 80-90 percent of the revenues.⁷³ The system bills about 320,000 customer accounts, either directly or through the municipality, depending upon the agreement. Rates in 1996 were \$1.30 per thousand gallons of water used, plus a quarterly charge of \$2.53 per bill, rising by 1998 to \$1.82 per thousand gallons plus a quarterly charge of \$2.70 per bill.⁷⁴ (Flat rate users are billed using an assumption of 20,000 gal. per quarter). ALCOSAN rates are relatively low compared with other parts of the country. Current ALCOSAN rates are about \$13 per month. In addition, of the 83 ALCOSAN municipalities, about 52 have some kind of add on surcharge, ranging from \$.36 to several dollars per thousand gallons, and/or some fixed charge per quarter. Typical charges are \$.50 to \$2.00; municipalities that more recently joined the system often have

higher charges, relating to their payment of capital costs.⁷⁵

Depending upon the capital improvements constructed to handle all wet weather problems, ALCOSAN rates in 2018 may rise to \$36.50 per month. This would still be below current rates in some other major metropolitan areas with large capital expenditures for wet weather problems, but far above historic rates in western Pennsylvania's older systems.⁷⁶ Moreover, if municipalities need to shoulder a significant portion of the expense of wet weather solutions, surcharges could rise significantly in various jurisdictions.

PENNVEST and RUS grant and loan funding for new systems is currently made available on terms that attempt to keep resulting rates below \$35/month. This underscores the point that public monies have been aimed, in part, at providing infrastructure funding in areas where private funding capacity is low – such as small communities with failing septic systems or "wildcat" sewers discharging into streams.

But as these problems are addressed, the urban sewer systems cannot be neglected by public financing entities. Small and disadvantaged communities also exist within the urban matrix, and many of these face substantial capital needs.

It may be desirable to examine forming new municipal authorities to focus on infrastructure investments for particular districts or areas within (or across) municipalities in order to assure that additional capital expenses for elimination of CSO and SSO discharges are borne by those that are responsible for the discharges. Conversely, it may make sense to spread the charges as broadly as possible across a system in order to avoid disadvantaging older, poorer jurisdictions and in order to assure that a reasonable interest rate can be obtained on the debt. Detailed comparisons of these approaches should be made in order to allow a reasoned examination of the alternatives, as well as to identify instances where state involvement would be particularly helpful. Such an approach would also be useful in giving appropriate credit to those municipalities that have already incurred substantial capital expenditures and maintenance costs in abating or

eliminating their own contributions to hydraulic overloading and discharges.

The next chapter examines financing alternatives, technical alternatives, and

governance alternatives. Integrating governance with financial and technical approaches is essential if the region is to pursue a path of sustainability rather than a costly, disjointed approach.

Chapter Four

Paths Toward a Sustainable Sewage Infrastructure

This report identified four goals for a sustainable sewage infrastructure system: (1) to construct and maintain an environmentally sound infrastructure; (2) to promote informed local decision making and responsible behavior; (3) to achieve cost-efficiency and resource-efficiency; and (4) to support sound economic development and redevelopment.

This chapter considers how decision makers and the public can identify the financial, technical, and governance policies that will allow the region to reach these goals. Currently the enforcement, financing, and regulatory systems do not prioritize responses to development demand and environmental problems. And they are not watershed based. The public financing system prefers providing new sewers to existing unsewered communities, while market-based financing favors construction of new systems that are growing or that can be extended to new customers in the future. Neither fully addresses older communities needing to incur substantial capital expenses for rehabilitation of existing systems. Nor does either system encourage regional approaches or intergovernmental cooperation.

Local governance structures make each municipal entity separately responsible. They do not address watershed or sewershed issues in a cost-efficient or resource-efficient manner. Enforcement responses are affected by multiple enforcement entities and by the disparate financial resources of the separate municipal entities targeted for enforcement. Regional approaches are not well-developed, although the Three Rivers Wet Weather Demonstration Project provides an opportunity for such approaches (albeit within the ALCOSAN system). Nor are regional approaches well-supported by state laws and institutions. Although regional approaches are not prohibited, municipality-by-municipality enforcement, governance, financing, and infrastructure planning are the ingrained norm in the Commonwealth.

This section identifies options that may provide a basis for future collaborative decisions in making the region's sewage collection and

disposal systems more supportive of communities and more economically and politically sustainable.

Many issues are primarily *financing* questions. Since funding is often a limitation both in older sewered communities and unsewered areas, a process needs to be developed that helps local governments and county and state officials identify what improvements should be done first, what should not be done, and what can be done more effectively through cooperative or targeted strategies. Subsidiary issues include how to help older communities with declining tax bases repair or replace their failing infrastructure, how best to expend limited federal, state, and local grant monies and subsidized loan resources, and how to help homeowners deal with correcting problems with failing house laterals and septic systems.

Issues also include *technical* decisions. Will fixing of collector sewers in urban areas lead to storm water management problems? How can house laterals be repaired or replaced in a cost effective manner? How can technical solutions avoid being a one-shot fix that won't hold up to demographic and economic change?

Issues of *governance* may be the most complex. Can targeting of cost effective solutions overcome the fragmentation of the region into hundreds of autonomous municipalities, authorities, county institutions and other entities? Are there ways to affect development and assure that sewage facilities solutions are consistent with economic development strategies and land use conservation? What avenues exist for cooperation among municipalities on funding, maintenance, and decision making that may be mutually beneficial?

Financing Paths

Financing can be approached at a variety of levels. The following areas deserve attention.

State Institutions

- State and federal loan funding is primarily awarded through PENNVEST. The PENNVEST

board could be asked to consider the implications of possible changes in its funding priorities. Current priorities are driven primarily by the informal environmental and economic guidelines used by PENNVEST and DEP and DCED. Just as adjustments in the prior weighting of PENNVEST's wastewater project criteria have made it possible for wet weather projects to achieve a medium score in the environmental category, so could further changes accommodate *preferences* for comprehensive wet weather solutions. For example, discussions might focus on changing the current system to award more points for wet weather projects that are *regional* in nature or that are coordinated with other expenditures. Such a shift in approach could increase the availability of PENNVEST funding to older urban and suburban jurisdictions facing possible large expenditures.

- Discussions could be commenced with the governor and the legislature in order to make it possible to make more funds available generally to older systems and older municipalities in the region. One possible approach might be a legislative change allowing zero percent interest loans to older municipalities facing particularly hefty capital costs driven by the need to abate wet weather discharges. A related approach might allow deferral of interest payments, with zero percent rates in the early years, in instances like these.

- A related approach could include the establishment of a state wet weather abatement fund which would be made available contingent upon the provision of federal appropriated dollars and a local contribution. Although the general provision of grant funding by the federal government was phased out in the 1980s, the fact is that every large scale wet weather project since then has been funded by some combination of special federally-designated appropriations and state and local moneys. The state legislature could assist this region substantially by helping to create the conditions under which such a substantial federal contribution might become possible. In effect, a state commitment could, by making significant matching funds conditionally available, energize Congressional support for a substantial special appropriation - in effect, guaranteeing the efficacy of a federal investment in solving a high profile problem.

- Further approaches at the state level might include consideration of new state financing mechanisms connected with growth management and land use objectives. Pennsylvania's 21st Century Environment Commission has reported on the critical need to control sprawl and encourage the use and re-use of older town centers and urban communities rather than greenfields development.⁷⁷ The Commission also, in the context of protection natural resources and open space, called for a new bond funded mechanism like the prior Key 93 program. Blending these two ideas may suggest that a new bond funded program include a component for rehabilitation of older urban systems in order to deal with the sources of sprawl. Perhaps such a program could authorize grants to cooperative sewer rehabilitation ventures by older urban municipalities located in regions of the Commonwealth where sprawl is occurring and threatening open space.

New Uses of Other State Funds

- Among the issues that might be considered legislatively, or with respect to regulatory changes by the DEP, is the Act 339 wastewater treatment plant operating grant program. Currently this important funding program provides plant operators a subsidy of 2 percent of the capital cost of the facility. But this subsidy has the indirect result of simply rewarding capital expenditures incurred at wastewater treatment plants. One area for possible modification might include discussion and consideration of ways to make other costs eligible for an operating grant - particularly where such costs enable the plant to *avoid* capital expenditures. For example, decision makers could consider whether system expenditures for control of inflow should be eligible for inclusion in the capital base upon which the operating grant is calculated. These I/I programs are often things that need ongoing maintenance dollars, and where retention of technical expertise is needed (both related goals of the 339 program). And they may result in cost effective avoidance of the need to construct and operate additional capacity, producing a net savings to the Commonwealth and the sewage treatment authority.

- Local governments and the Commonwealth could explore the possible use of Sewage Facilities Act Planning Grants in order to fund the

identification of possible cost-effective solutions to SSO and CSO problems in older municipalities. Indeed, use of the Act 537 process may provide a way for older communities (who often do not undertake revisions to their official plans because of the absence of new development) to have the Commonwealth share the costs for much of the preliminary work that is needed to develop wet weather solutions (costs that cannot be funded under the PENNVEST advance funding program). Further discussions could examine the feasibility of this funding source, and whether or not DEP can make sufficient funding available. In addition, these grants may provide some funding that can be used to match Three Rivers Wet Weather Demonstration Project grant funds, particularly where the resulting Act 537 plan can be cooperative (e.g. prepared cooperatively among several municipalities by sewershed). This concept deserves further exploration as a potential partial funding mechanism.

Local Approaches

- Planning agencies and county governments may help municipalities and authorities make the case for funding, and for targeted funding, if they encourage the development of information that *demonstrates* the links between expenditures on I/I reduction (or the rehabilitation of older systems) to environmental, social, and public health outcomes. It can be difficult for municipalities, municipal authorities, and other public entities to explain or justify the expenditure of several million dollars to "fix" problems that appear to be limited to a few overflowing manholes or that appear several miles away at a CSO or SSO outfall. Establishing a funding source for the development of this information may be critical. Not only can it make the case for local ratepayer/taxpayer funding, but also for continued federal investment in the Three Rivers Wet Weather Demonstration Project, grant funding by the ARC and other programs, and demonstrating the environmental outcomes needed to qualify for points on the PENNVEST criteria that are often not awarded (such as effect on stream biota). The sharing of GIS capability of the Allegheny County Health Department with municipalities is a step in this direction that could be emulated by other counties, and that could be expanded upon by the judicious expenditure of county or regional development funds.

- Dealing with wet weather problems municipality by municipality may lead to divergent solutions. Or it may produce lack of action in some critical areas because of the lack of ability to go to the bond market - as in the case of distressed municipalities and others with declining tax bases. Leaders in the region could consider the formation of bond banks or regional financing mechanisms. These could be set up at the county level, could involve the creation of a county or multi-jurisdiction municipal authority, or a number of other alternatives. More favorable interest rates could be achieved for certain necessary debts that would benefit the system and region as a whole than could be achieved if the individual municipal entity sought to finance the debt itself. Use of a mechanism of this sort might lead to a favorable approach where funding could be drawn down as needed and repaid according to variable schedules as needed to accommodate the municipality and its ratepayers. The Upper St. Clair Municipal Authority in December 1998 authorized action toward establishing a potential bond bank that could be used by other municipalities to borrow money for capital projects such as sewer repairs, and is engaged in a study of potential demand.

- Alternatively, a municipal authority might be established that could enter into contracts with individual municipalities to provide sewer infrastructure inspection, maintenance, and rehabilitation services. Or an existing authority (such as a county authority, or - in Allegheny County - ALCOSAN) might offer such services. The formation of such an entity, or the change in direction that might accompany such an assignment of functions to an existing entity clearly raises many political as well as financial considerations. This approach, however, may provide a way to realize some consistency in practice and economies of scale, while allowing for variability in participation - as municipalities could opt to purchase these services from the authority or not, as suited their particular needs.

- Among the financing issues that deserve further discussion and analysis in the region are the possibilities for de-linking sewage ratepayer billing from water use. For example, since half the flow reaching the ALCOSAN wastewater treatment plant consists of unbilled storm water, and much additional volume that has to be pumped and handled by municipal systems

(resulting in the need for future expenditures to correct SSO and CSO outfalls) is also storm water, it may no longer make sense to base all charges on water consumption.

In the past this system was acceptable since it was a reasonable way to allocate costs in the absence of other methods, and because during wet weather events the excess flow was simply bypassed – thus not incurring treatment costs. But now there are ways to monitor actual flow, and costs do need to be incurred – either in eliminating bypasses, eliminating SSO and CSO outfalls, or building additional treatment capacity for the higher flow. Most municipal contracts and other provisions require the use of water consumption as the basis for uniform rates. But modifications should be explored in order to reflect actual contributions of storm water to the systems, and in order to provide economic incentives for municipal systems to rehabilitate their collectors and engage in active I/I reduction programs.

A partial modification of rates to credit superior performance, and to conform billings to actual stresses on the system, could be highly effective. Many avenues could be explored for this – rebates to municipalities or customers, add-on service charges to certain high flow jurisdictions, adoption and enforcement of new ALCOSAN rules and regulations affecting the municipalities, or state legislative changes authorizing appropriate charges where needed to address wet weather pollution discharges. One version of this approach might include gross credits for reductions of flow entering a treatment authority system. These could be structured so as to spread the reduction across an entire municipality's ratepayers. The idea would be not just to reward capital expenditures by municipalities (viz. a dollar-based offset), but to reward *effective* expenditures by municipalities. At bottom, such an approach could encourage appropriate performance, and would directly recognize that reduction of storm water I/I entering the system means avoided treatment costs (both capital costs and operating costs).

- A local or regional forum could be organized to examine broadly the relationship between existing jurisdictional responsibilities and infrastructure choices. The purpose could be to move toward more cost-efficient and resource-

efficient solutions. The current system, based on fragmented municipal jurisdictions, can encourage building a lot of storage, both because such expenditures can be capitalized and because the costs can be spread across a broad set of ratepayers. But aggressive I/I programs, homeowner oriented programs, and other solutions may be preferable from a technical and resource-based perspective. Similarly, the current system may encourage municipalities to attempt to shift responsibilities to downstream collector sewer municipalities or treatment authorities (such as ALCOSAN) under older municipal service agreements, even though the most technically efficient solution may be in the generating municipality. These financing, technical, and governance issues need to be analyzed together because they are integrally linked. Also, ways of crediting municipalities that have already incurred hefty capital expenses and that are imposing significant surcharges on their customers should be examined. Equitable treatment, as well as avoidance of decisions driven solely by jurisdictional imperatives, should be goals of the regional process. While the Three Rivers Wet Weather Demonstration Project may provide one forum for this kind of discussion in Allegheny County, ultimately the issues must be addressed on an even wider scale.

- Another issue for regional discussion is how to identify ways of capturing benefits in appropriate settings to pay for upgrades to failing sewer systems. For example, in the City of Pittsburgh, the proposed Nine Mile Run project is intended to reclaim and improve an industrial waste disposal area for the construction of over 700 homes and apartment units, as well as to expand park and recreational access. Millions of dollars are to be expended in the area including subsidies from the City, the Pittsburgh Water and Sewer Authority, and the state and federal government.⁷⁸ Some of the water quality problems in the area will need to be addressed by the upstream municipalities whose sanitary sewers are overloaded because of I/I. Yet sewer expenditures by these municipalities, several of which are not in strong financial condition, will produce benefits that will redound almost entirely to the City of Pittsburgh. The question is whether any form of benefits sharing, or the formation of a special district or authority, might enable some of the economic development resulting from the rehabilitation of Nine Mile Run to help support

the expenditures that must be made by the upstream communities. If the communities were all within the City, this kind of benefit distribution would happen automatically. Similarly, if ALCOSAN made the expenditure, the costs and benefits would be spread automatically across the entire rate base. But because of the differing municipal entities - typical of Pennsylvania - a new solution would be needed if any of the future benefits are to help finance the expenditures.⁷⁹

Funding Rehabilitation of House Laterals

A myriad of approaches should be explored for the funding of work on house laterals. Some of these could be grouped with state or local approaches, above, but they are identified here for ease in comparing potential alternatives.

- A key area is the importance of the Three Rivers Wet Weather Demonstration Project in identifying and perhaps supporting local demonstration projects in the near term to demonstrate the efficacy of targeted expenditures on house laterals. Appropriately designed projects may reveal how much I/I can be addressed by focusing on house laterals and how cost effective these expenditures may be in comparison with alternatives such as the construction of storage and efforts based solely on rehabilitation and maintenance of municipal collector sewers. The Project could consider making grants to cooperative, sewershed based efforts to locate and make appropriate fixes to house laterals in conjunction with concurrent municipal investments in the collectors. These federally-derived grant moneys can be used to "demonstrate" approaches of this type, and are *not* subject to the limitations that are believed by some to prevent PENNVEST funds or bond proceeds or other public funds from supporting work on these privately owned parts of the sewage collection system.

- Another approach that deserves substantial consideration at state, county and local levels is the exploration of tax relief for private expenditures on house laterals. Such relief might take a number of different forms, including state income tax deductions or credits for expenses incurred in connection with a municipal or state order, or various types of real estate tax credits, or other tax-related innovations that may assist

home owners. Fiscal analysis may be needed to determine what measures would achieve the appropriate level of response, and to tailor a tax relief program to particular upgrades or repairs that result in an avoided cost for municipalities or authorities.

- As noted in the preceding chapter, serious consideration could be given to changing PENNVEST limitations and/or priorities on loans/grants for house laterals. Work could be undertaken to determine whether authorizing PENNVEST to provide such funding would take changes to regulations, guidelines, policy, or the statute. In addition, if such work were recognized as eligible, it would be necessary for PENNVEST to consider the circumstances under which such expenses would be fully funded or partially funded. One way of addressing the funding mechanism might be a PENNVEST loan to capitalize a municipality or municipal authority to set up a program for the inspection, evaluation, and repair of house laterals where undertaken in connection with a program to address wet weather discharges.

- Pennsylvania's loan program for replacement of on-lot systems should be examined for possible expansion to include the repair or replacement of house laterals. While Pennsylvania's subsidized loan program for on-lot systems has not been widely used, such a program (if well marketed and targeted in connection with a municipal program to upgrade collectors and house laterals) could play a significant role in local financing of I/I controls in poorer communities. In addition, the program may be far more attractive where lenders have been lined up by the municipality or treatment authority undertaking the I/I abatement. In such a setting the program can achieve a desirable level of visibility and loan volume - thus making a potential loan program for house laterals potentially more successful than the existing parent program for individual on-lot systems. Discussions among PENNVEST, the Pennsylvania Housing Finance Agency, DEP, commercial lenders, and municipalities may offer some early solutions.

- Low or no-interest loans with 20 or 30 year pay-outs (attached to the benefitted property) may also be a possible approach to financing these repairs and replacements. It may be possible to

establish an authority to set up such a program, or to use federal or state grant funds or community development funds as the seed money or interest subsidy.

- Another approach that clearly will require further research, including legal opinions by finance and bond counsel, would be examining the availability of municipal bond financing of house laterals as part of a project to fix collectors. This approach has apparently been used in other parts of Pennsylvania (such as Lower Paxton Borough, where an authority funds these projects, provides maintenance, and also provides \$500 reimbursement for sump pump and area drain rerouting). Review of the tax exempt status and legality of bonds for these purposes may show that bond financing is one of the most appropriate approaches, and one that can then be spread across the rate base.

- One approach that has been tried is to use housing transactions as the occasion to finance repairs to house laterals and disconnection of storm drains. Some local ordinances require inspection and correction of certain of these conditions in order for a transaction to be legal. Tying the event to a real estate closing can mean that funding is available and the repair is made. (Similar approaches have been used in some jurisdictions, and in the Commonwealth of Massachusetts, with respect to failing on-lot systems). These approaches are, however, insufficient when used alone in southwestern Pennsylvania. First, the turnover in housing stock is lower in this region than in any other in the country. Second, the magnitude of the costs may make it unaffordable for some homeowners to sell, and may encourage them to retain residences longer than they otherwise would, or convert residences to rental property, or abandon them in some instances. Third, these ordinances are typically not targeted to particular problem areas and so may result in homeowner expenditures that produce little environmental or health and safety benefit, while completely missing other areas that need early remediation. Such ordinances may be important parts of financing solutions, but must be linked with other appropriate mechanisms.

- A sewer maintenance/replacement "authority" which is supported by revenues from customers may provide another kind of funding

source that can be targeted to areas where work is needed (rather than a whole municipality or authority), but nevertheless provide a significant enough funding base to support debt. Various combinations of the authority concepts, loan funds, and grants or rebates may be needed in order to deal with the significant portion of the I/I problem that is attributable to house laterals and other customer-owned and maintained facilities.

- A related long term approach might be to offer insurance for customer laterals, with premiums collected with customer's regular payment of utility rates. The proceeds could then be used (as with the case for some gas, telephone and other programs) to cover necessary maintenance or repairs in the future.⁸⁰

Many of these paths toward financial solutions are interrelated. Some are mutually exclusive. But the sheer array of possibilities can be taken as a sign of hope and a guarantee that ways can be found to put together appropriate and sustainable financing solutions in the region.

Technical Paths

Organizations and institutions – including enforcement and funding institutions – could seek to establish approaches and criteria that reward use of creative/innovative technologies and solutions, both in addressing wet weather problems and in handling new construction of sewage collection and treatment capacity. Much in the traditional approach to wet weather problems leads to the construction of storage – a potentially costly and middle-of-pipe fix that does not target problems at their source and that requires substantial maintenance over the long term. Incentives for control of I/I and storm water can be much more effective, although designing such approaches can be complex.

- Modifications in funding mechanisms could be explored to encourage innovation. For example, PENNVEST could award additional points in evaluating programs that attack problems at their source. The Three Rivers Wet Weather Demonstration Project could target its funds on programs that rely on innovative management of sewershed loading. The McCandless Sanitary Authority has projected that for each gallon taken out of the system you save a dollar on construction of storage. Thus,

investments in innovation could be highly worthwhile.

- Targeting and prioritizing work on key I/I and house laterals may be critical. In some areas house laterals are believed to be more than 50 percent of the source of wet weather overloads. Moreover, technical innovation will be needed even where a municipality or authority focuses on its collector sewers. Experience has already shown that in cases where a municipality merely cleans, lines, repairs or replaces the municipal collector sewers in order to eliminate I/I, the result can be to change the point of inflow to the next downstream leaking joint rather than to eliminate it. The excluded water follows the repaired lines, or backs up with a rise in the local water table. Similar problems can occur where roof drains are disconnected from sewer lines; indeed the storm water may flood basements and foundations where not conveyed away. In short, a holistic approach will be needed in order to avoid converting a hydraulically overloaded sewer problem into a local storm water management problem. Some areas have examined a targeted prioritization approach – including evaluation of entire systems with I/I problems, in order to determine where the water should go.

- Not all leaky house laterals or sewer lines are significant contributors to wet weather discharges. Thus, development of a pilot program in a sewershed area may be critical to avoid the incursion of unnecessary expenditures.

- Use of large interceptor sewers for storage, and pursuit of modified permit and treatment regimes may be an approach that is useful. ALCOSAN is already considering expanding primary treatment capacity for wet weather events, and its deep tunnel interceptors may be able to be managed to retain more storm water in wet weather events.

- Substantial consideration should be given to whether the implicit Pennsylvania policy of sewerage more of the state and driving both new development and older rural communities away from on-lot systems serves the Commonwealth's other development and water quality objectives. Clearly, centralized collection and treatment of sanitary sewage is well understood, but it may be the case that community on-lot and other forms of

disposal are appropriate in some parts of the region.

- Substantial work is going into storm water solutions, driven both by Act 167 and federal Clean Water Act requirements for permitting of storm water discharges. Permitting of storm water discharges is now moving into smaller urban jurisdictions. Innovative solutions to storm water handling may assist in solving the sanitary sewage problem by reducing infiltration and inflow. Incentives should be developed to promote solutions that deal with these problems simultaneously.

Technical solutions come in many forms. The biggest impediments to innovative use of technology appear to be the limitations inherent in the financial and governance systems that affect choices in the Commonwealth. Technical solutions at the homeowner level may not be fundable by appropriate state or local mechanisms; technical solutions at the municipal level may result in undesirable impacts on tax or ratebases; technical solutions at a regional or authority level may not sufficiently differentiate financial responsibility. And enforcement priorities can drive construction of large-scale storage facilities by municipalities with adequate tax and rate bases, and foot-dragging and recalcitrance by municipalities with fewer resources. Designing incentives for choosing the best technical solutions is the biggest task that confronts policy makers today, but it is a challenge that many have not found necessary to pick up.

Governance Paths

State law sets the conditions under which sewage infrastructure decisions are made. Accordingly, it will be important to assure that state law leads to achievement of cost-efficient, resource-efficient solutions, with real accountability and durability. Indeed, the Commonwealth of Pennsylvania has many of the necessary tools on the books – including the Sewage Facilities Act, PENNVEST, and the Municipalities Planning Code – that, if used properly, can promote smart growth, orderly development, revitalization of urban communities, and protection of the environment.

Broad Regional Governance Issues

Agreement among Pennsylvania's southwestern counties may be critically important in influencing policy at the state level toward approaches that revive older towns and city centers, pay for environmental infrastructure, and preserve farmland and open space. The development situations, population, government, financial conditions and other conditions in these counties and their municipalities are quite different. Nevertheless, there are some key commonalities that suggest opportunities for better integration of infrastructure decisions with development and redevelopment choices.

For example, the region already must work together on transportation infrastructure decisions as required by the federal TEA-21 legislation. The Southwestern Pennsylvania Commission is the forum where this comes together in the transportation context. The region's county and local governments are also mutually engaged in competition with other parts of the nation (and the Commonwealth) for attraction and retention of business and jobs, thus providing further reasons to pursue a regional strategy. The region is also characterized by numerous towns and municipalities with long-time, loyal residents who value the quality of life and characteristics of the area. Southwestern Pennsylvania is one of the areas in the nation where people tend to remain in their homes the longest, and where the period between moves is also long. This gives these jurisdictions something to build on as infrastructure is upgraded and replaced. It also means that they cannot rely on traditional strategies used in go-go boomtown metropolitan areas (like the Atlanta region, for example) to finance growth on the expectation of an ever-rising group of new residents and ratepayers. *Instead, the approach should be built on long term retention of home owners and ratepayers, and reinvestment in existing communities.*

- A forum should be created for consideration of these factors in the context of regional sewage infrastructure solutions, so that appropriate support can be garnered at the state level. A potential forum for discussion of these issues is the Southwestern Pennsylvania Commission, which has recently launched a preliminary analysis of sewer infrastructure proposals and demands in the 9-county region.

Support for this effort could be provided by numerous institutions in the region, both public and private. SPC could be charged with developing a regional sewage infrastructure plan, using the model of the TEA-21 transportation planning process. This could help target wise expenditure of state and federal infrastructure funds in ways that strengthen communities and urban cores. Indeed, such a process might be used to create important links to land use controls and other tools that help address storm water management, land development, transportation, and open space, as well as sewage and protection of water bodies from pollution.

- Among the needs are new forms of regional cooperation. Both the construction of new sewers in unsewered areas and the reconstruction of older sewer collection and treatment systems often require involvement of jurisdictions beyond a single municipality. Further work is needed to enable communities to compare the relative advantages and disadvantages of county sewer districts, sewer maintenance districts, service contracts among municipalities and municipal authorities, and sewershed based management under agreements between municipalities. Many of these approaches can already be pursued under the Commonwealth's Municipal Authorities Act and under the enumerated powers of municipalities under state laws. Others may require additional authority or official encouragement through financing or state support.

- Another area that deserves significant attention is the modification or amendment of existing sewer agreements between municipalities. Some of these agreements are impediments to the control of hydraulic overloads, but cannot be modified without the consent of both parties. Leverage could be applied by the DEP or EPA to obtain this consent where beneficial to the environment. Or state-level financial incentives could be provided to the respective municipalities to change these agreements. Similarly, agreements between municipalities and treatment authorities may need to be modified in order to pursue resource-efficient solutions to wet weather discharges.

- Creation of new agreements on a *sewershed* basis may provide ways for municipalities to engage in cost effective cost sharing, maintenance,

sharing of facilities, and other approaches to control of wet weather flows. The impetus for new agreements between or among municipalities may flow from reactions to enforcement mandates, from actions by a wastewater treatment authority to require changes by municipalities in the ways they connect to the treatment authority's interceptors, from state requests for revisions to Sewage Facilities Act official plans, from incentive programs such as the Three Rivers Wet Weather Demonstration Project's possible criteria in the future as it receives more grant funding to disburse on a matching basis, or from new state laws or incentive programs.

- In the near term, the Three Rivers Wet Weather Demonstration Project can help to define goals and first steps toward appropriate governance reforms, at least within the ALCOSAN service communities. For example, it may consider confining its limited grant funding to sewershed-based projects. Or it may seek to fund proposals that "demonstrate" innovative approaches to governance as well as to technical solutions. For example, it may elect to fund only jointly-sponsored projects that could not be pursued by municipalities acting alone. Although the Project has only limited funds at the outset, it may be able to pioneer and test governance approaches that will stimulate greater interest in the long-term operation of the project and its continued support by area politicians and the federal (and possibly state) governments.

Linkage to Other Goals

The Governor's 1999 executive order on land use planning identifies long term planning goals and calls for the integration of existing tools with these goals. It includes measures such as the provision of advice to local government on the use of existing tools to manage growth and encourage cooperation with neighboring municipalities and county governments. It also calls for identification of laws, regulations, practices or policies, including the disbursement of public funds, that will advance the Commonwealth's land use objectives. In addition it calls for annual recommendations regarding changes in law or policy to support achievement of these goals.⁸¹ The order's public policy goals include the integration of infrastructure maintenance and improvement plans with sound land use practices.

- Substantial work can be done in the area of linking sewage facility infrastructure decisions to other community goals in the interest of sustainable development. For example, state law could encourage better "nested" planning - relating different planning and funding obligations more closely to one another. The Municipalities Planning Code (MPC) is at the base of this hierarchy. Amendments to the MPC have been proposed in many recent sessions of the legislature, and it is reasonable to expect amendments to be enacted in the next few years - particularly if the 21st Century Commission's report has any influence. The MPC should require municipalities to consider infrastructure and infrastructure financing on a regional basis, for example. Amendments improving consistency requirements with county and regional planning, and promoting intermunicipal planning could help make this tool more useful in guiding development decisions.

- Next in the planning arena is the municipal "capital improvements program", a device authorized under the MPC under which municipalities can phase their public facilities investments in ways that support sound development and achievement of the goals of the comprehensive plan.⁸² This tool is not always used or used as a planning mechanism. Incentives could be developed to encourage the capital improvements program to be an integral part of decision making in the context of development and infrastructure finance decisions.

- The next in the hierarchy is the sewage facilities plan. This plan is often revised only reactively, but it is intended to be consistent with the municipality's comprehensive plan in order to assist in the targeting of development and the achievement of comprehensive plan goals.⁸³ The sewage facilities plan should dovetail with the comprehensive plan and the capital improvements program in order to assure that land use and economic development goals are attainable.

- The sewage facilities plan could become an instrument of "smart growth." The state of Maryland recently enacted legislation that requires the state to deny infrastructure funding except in those areas that have been designated by local governments as targeted growth areas. This "smart growth act" has been hailed by land use

advocates and local governments as a way to assure that expenditures are consistent with local plans and with protection of open space and agriculture while assuring the vitality of existing urban centers. Pennsylvania's Sewage Facilities Act, and its links to PENNVEST and other financing, could be seen as a cousin to this approach. The key difference, however, is that in Maryland it is the counties - fairly large areas - that for the most part determine where the growth areas are to be. In Pennsylvania, with its proud tradition of municipal autonomy, designating a growth area in every township or borough may be tantamount to little control at all. Nevertheless, the sewage facilities plan, to the extent to which it carries out good decisions made in the comprehensive plan, could serve as a basis for smart growth. The Municipalities Planning Code and Act 537 could be amended in order to strengthen these potential connections - especially if each required consideration of growth areas and impacts *across* jurisdictional boundaries.

- Finally in the planning hierarchy comes the project plan. This is the plan by which funding of sewer improvements is carried out. If the other plans are well integrated, the project itself should support smart growth and sustain existing infrastructure, housing, and economic development investments.

Many municipalities make minimal use of the opportunities for consistency afforded by these instruments. But state law could make sewage facilities more integrally related to the decisions authorized by the whole array of planning and financing tools under Pennsylvania law. In rural areas, often the sewage facilities act plan is the major planning exercise. But, in practice, amendments are often reactive to development proposals, and important decisions and issues are often deferred to DEP - which is *not* charged with examining the closeness of fit with the comprehensive plan or other key factors. Linking growth and development more closely to the nested array of planning authorized under Pennsylvania law should provide some significant opportunities to control sprawl, revitalize urban centers, and protect rural Pennsylvania.

Enforcement

A special set of governance issues is raised by the character of enforcement and its relationship

to sewage infrastructure decisions. Enforcement is often regarded by municipalities and municipal authorities as wholly negative in character. Enforcement agencies may appear to demand the politically or financially impossible, or to be impatient with normal governmental processes. At the same time, however, enforcement can drive changes and make it possible to do things politically that might have been impossible otherwise.

- For example, enforcement actions can sometimes help shake funding loose - as in the case of federal funds going to New Orleans to assist with its wet weather enforcement-driven upgrades. Enforcement actions can also produce governance and institutional changes that cannot occur readily otherwise. For example, enforcement orders may make it possible to change the terms of intermunicipal agreements that currently make it difficult to marshal adequate assets or address problems involving more than one municipality. Enforcement can also drive cooperative approaches among affected jurisdictions - as in the case with Girty's Run in Allegheny County.

- Enforcement actions may also be necessary to achieve compliance by recalcitrant communities and others not making a substantial effort to meet their legal commitments. This can be important as an equity issue, where some communities have already committed substantial funds to resolution of part of the problem while neighboring communities are failing to shoulder their portion of the load.

- Numerous enforcement issues need to be examined in developing sustainable approaches for the region. One key issue that is still being discussed (within EPA) is whether, or under what circumstances, SSO outfalls can be permitted. Enforcement agencies have not identified whether there are circumstances under which residual SSO discharges are simply unavoidable technologically even with a massive investment. Federal or state acceptance of such a position is unlikely without careful investment in analysis of regional alternatives, impacts on water quality, and a plan for continuing improvements. Such programs may even need to consider whether non-point source (runoff) discharges from farms

and fields should be controlled as part of an offset or mitigation of residual wet weather discharges.

- Similar difficult questions that could be considered by DEP and EPA and the municipalities are whether wet weather flows can be minimized through targeted approaches based on sewersheds and contributions of hydraulic load (or wastewater) rather than addressed merely on the basis of jurisdictional responsibilities. Chapter 94 enforcement is not watershed based. Its implementation often simply encourages expenditure by individual local governments of enough dollars to persuade the DEP to approve additional sewer connections. Other tools may be more appropriate so that enforcement can serve a watershed approach. Must construction of storage/equalization be favored as a solution to enforcement actions, even though it is costly and not necessarily sustainable, simply because it can more readily be brought about as a visible fix to which a municipality can sign on when faced with an enforcement action? Enforcement solutions should recognize the importance of watersheds, sewersheds, and hydraulic loads in ways that cut across jurisdictional boundaries.

Consideration of this array of issues and others will require engagement by EPA, DEP, and county health departments in more creative ways than simply arms-length fulfillment of their respective enforcement priorities. Creation of a forum for discussion of these governance issues

will play a key role in whether this kind of engagement with enforcement agencies can occur. A region that is clearly addressing its environmental responsibilities and supporting cost-effective innovation is more likely to be taken seriously as a partner in solving water quality problems than is a region where it is every municipality for itself.

Conclusion

The path to sustainable development lies through investment in appropriate, targeted infrastructure that protects the environment, strengthens communities, and provides a strong economic base. Solving environmental problems and economic development problems simultaneously is the path of the 21st century - a path of smart growth. As it did at the turn of the 20th century (pioneering industrial innovation and productivity), and the turn of the 19th (as the gateway to the seemingly limitless opportunities of the western frontier), southwestern Pennsylvania can again lead the way.

Further work needs to be done by the many institutions and people invested in the future of this region in order to put together approaches that will make it a leader in linking infrastructure and sustainable development goals. This report will, we hope, assist in energizing these discussions around those ideas with the greatest potential for long term sustainability.

Endnotes

1. For a broader introduction to the concept of sustainability in the context of southwestern Pennsylvania, see Environmental Law Institute, *Policy Opportunities for a Sustainable Bioregional Approach* (1994), prepared by ELI for the Heinz Endowments (and available from ELI and the Heinz Endowments).
2. “Sewersheds” are often coextensive with watersheds, but may include portions of other watersheds where a municipality’s sanitary sewage is pumped over geographic watershed boundaries.
3. PENNVEST is the Pennsylvania Infrastructure Investment Authority. It administers and awards loans and grants of state water and sewer funds as well as the state revolving loan fund monies received from the federal government under the federal Clean Water Act. U.S. Department of Agriculture funding for rural communities is administered by the federal Rural Utilities Service. Both programs are described in detail in Chapter Three.
4. ALCOSAN charter and Bylaws; see also ALCOSAN, Pennsylvania Act 537 Comprehensive Sewage Facilities Plan (July 1996) (hereinafter “ALCOSAN 537 Plan”), 7-7 and 7-8.
5. ALCOSAN 537 Plan, at 4-6.
6. ALCOSAN 537 Plan, 5-73 to 74. The study areas include the Kilbuck/Tom’s Run, Robinson Run, and Miller’s Run areas, and the communities served by the Dravosburg sewage treatment plant, Oakmont sewage treatment plant, Plum Creek sewage treatment plant, Oakmont/Plum sewage treatment plants, the Holiday Park sewage treatment plant, and the Longvue #1 sewage treatment plant.
7. ALCOSAN 537 Plan, at 4-6
8. ALCOSAN 537 Plan, 4-13.
9. ALCOSAN 537 Plan, 4-14.
10. 59 Fed. Reg. 18688 (April 19, 1994).
11. There are undoubtedly more SSOs that are wholly local, consisting of surcharging manholes, constructed bypasses, and basement flooding.
12. The Allegheny County Health Department issued health advisories on 45 days of the recreational boating season in 1997, advising the public to avoid contact with the rivers on those days.
13. ALCOSAN 537 Plan, 5-61.
14. A pilot program by South Fayette Twp. found that 88 percent of homes tested in the initial phase had failures at the point of connection between the house lateral and the municipal collector sewer. Minutes, 3RWWDP Science and Technical Committee, Nov. 12, 1998.
15. Although the conveyance capacity of the city and municipal combined sewers is greater than that of ALCOSAN’s existing interceptors, the difference is not large. Indeed, the deep tunnel interceptors can deliver 875 mgd to the treatment plant. ALCOSAN 537 Plan, 4-34. Annual average wet weather capture at current 225 mgd treatment plant capacity is about 30 percent; if increased to 875 mgd, capture would be about 65 percent. ALCOSAN 537 Plan, 5-3.
16. See Rona Kobell, “Overloaded Sewage Plant Stymies Cranberry Development,” *Pittsburgh Post-Gazette*, Dec. 23, 1998. The DEP ordered the municipalities served by the plant to stop issuing new building permits until upgrades are put in place.

17. Ernie Hoffman, "Sewage plant expansion gets court's approval," *Pittsburgh Post-Gazette*, Oct. 14, 1998. The township's municipal authority is nearly doubling the New Stanton wastewater treatment plant's capacity.
18. 59 Fed. Reg. 18688 (April 19, 1994).
19. Memorandum, Steven A. Herman, Assistant Admin. for Enforcement and Compliance Assurance, "Addition of Chapter X to Enforcement Management System (EMS): Setting Priorities for Addressing Discharges from Separate Sanitary Sewers," March 7, 1996.
20. EPA has suggested informally that wet weather flows should be no greater than 250 gallons per capita per day – a number that is consistent with newer construction and little entry of storm water into the system. But many areas in this region cannot even come close to this in wet weather. Some readings suggest flows as high as 800-3,000 gpcd. Personal communication, EPA, DEP. *See also* Don Hopey, "\$3 billion sewer plan under review," *Pittsburgh Post Gazette*, Feb. 7, 1999.
21. 35 P.S. § 750.1 et seq.
22. DEP "Permit Guide: Sewage Facilities Planning".
23. 25 Pa. Admin. Code § 71.55.
24. 25 Pa. Admin. Code § 71.51.
25. Note, for example, that the recent amendment to 25 Pa. Admin. Code § 71.21(a)(6) provides that DEP no longer needs to approve the best of the alternatives identified, but only an "acceptable" alternative identified in the official plan.
26. 35 P.S. § 691.1 et seq.
27. 35 P.S. § 691.3.
28. 25 Pa. Admin. Code § 94.12 (4), (7), (8).
29. 25 Pa. Admin. Code § 94.21. Part 94 is self-executing. It requires the permittee to impose a restriction on new connections. DEP often issues letters reminding municipalities of this obligation, directing them to develop corrective action plans and to restrict new connections until the plan has been approved. These letters are not orders and are not reviewable as such.
30. 25 Pa. Admin. Code § 94.21(c).
31. Michael Logan, "Plant discharges caused sewer ban," *Pittsburgh Post-Gazette*, Dec. 29, 1998.
32. 25 Pa. Admin. Code § 94.32.
33. See Don Hopey, "Clean up sewage excess, state tells city, 3 suburbs," *Pittsburgh Post-Gazette*, Dec. 9, 1998; Jason Togyer, "State demands cleanup of Nine Mile Run," *Pittsburgh Tribune-Review*, Dec. 9, 1998.
34. 25 Pa. Admin. Code § 94.14.
35. See Chapter 12 of the Municipalities Planning Code.
36. For authorities, see The Municipal Authorities Act of 1945, 53 Pa. C.S.A. 301-322; see also Clarke M. Thomas, *Invisible Governments: Pennsylvania's Municipal Authorities*, Institute of Politics, U. Pittsburgh, 1998.

37. Land use planning and zoning authority is exercised by each of the Commonwealth's 2,572 independent municipalities. Pennsylvania's 67 counties also have planning and land use regulatory powers, but county zoning and subdivision regulations only apply where there are no municipal regulations. County land use planning is only advisory – except for storm water and solid waste (where municipalities must adopt the storm water plans, and at least half the municipalities representing half the affected population must approve the solid waste plan).

38. See Pennsylvania Environmental Council, *Guiding Growth*, 6-2 to 6-3. See also 25 Pa. Admin. Code § 71.21(a)(5)(i) & (ii).

39. MPC 209.1(b)(7).

40. 1949 Standard Agreement, Paragraph 6.c.

41. Paragraph 6.d.

42. Paragraph 10.

43. See also para. 12: "All bills for sewage service charges shall be computed on the basis of the quantity of water used, whether the water is furnished by the waterworks system of the Borough/Township or secured from any other source..." [The approach is spelled out for metered water users, flat rate customers, and users of water from private water sources or public streams]. However, municipal governments have the option to pay the aggregate bill and to bill their customers individually [para. 16].

44. Paragraph 17 (emphasis supplied).

45. N. Fayette Twp., 1991, para. 3.

46. *Id.* The agreement also requires that "Upon the occurrence of such excessive quantities of sewage from the Municipality due to infiltration or any other cause, or upon the detection in the Municipality's sanitary sewage of storm water, water from streams or acid mine drainage, the Municipality shall take immediate action to locate and eliminate the cause or causes of the violations of the Agreement or to implement such alternate measures as are acceptable to ALCOSAN to mitigate or diminish the adverse impacts to ALCOSAN resulting therefrom. If the Municipality does not do so promptly after receiving written notice from ALCOSAN, ALCOSAN shall have the right to terminate this Agreement and to disconnect and divert all of the sewage from the Municipality..." Additional provisions include a covenant by the municipality to comply with federal, state, and county laws and to indemnify and hold ALCOSAN harmless for any damages "arising out of or resulting from any noncompliance [with] said laws because of any sewage or waste that is conveyed to ALCOSAN sewers from the Municipality's sewers..." Paragraph 4.

47. Letter, Thomas J. Maslany to Timothy K. Equels, August 27, 1998.

48. Personal communications re: long term control plan briefings, January 1999. See also Don Hopey, "\$3 billion sewer plan under review," *Pittsburgh Post Gazette*, Feb. 7, 1999.

49. 35 P.S. § 751.1 et seq.

50. 35 P.S. § 751.10(e),(f).

51. 35 P.S. § 751.10(i).

52. 35 P.S. § 751.10(l).

53. 35 P.S. § 751.10. The PENNVEST regulations list nine criteria: (1) whether the project will improve health, safety, welfare, or economic well being of the public, (2) whether the project will lead to an “effective or complete long- term solution” including compliance with laws, (3) cost-effectiveness in comparison with other alternatives, (4) consistency of the project with other state and regional resource management and economic development plans, (5) whether the applicant has demonstrated the ability to operate and maintain the project properly, (6) whether the project encourages consolidation of systems where the consolidation would enable customers to be more effectively and efficiently served, (7) whether a storm water project is sponsored by more than one municipality and is strategically located as determined by basin wide studies, (8) the availability of other funds at reasonable rates and the need for PENNVEST assistance or participation to assure funding, (9) a project will not be considered if it will have a detrimental impact on environmental or other public resources or values unless the harm can be satisfactorily mitigated. 25 Pa. Admin. Code § 963.5 (regulations); compare 25 Pa. Admin. § 961.3 (former guidelines).

54. 25 Pa. Admin. Code § 963.8.

- (1) Public health and safety
 1. Direct human impact due to onlot malfunctions or inadequately treated sewage
 2. Severity of individual or public water supply contamination.
 3. Degree of impact on public bathing areas.
 4. Severity of safety hazards from deteriorated facilities.
- (2) Environmental impact
 1. Damage to fish and aquatic life
 2. Loss of boating and recreation opportunity
 3. Impact on industrial water supply uses.
 4. Impact on crop irrigation.
 5. Degradation of streams used for stock watering.
 6. Reduction in pollution as called for in the Chesapeake Bay Agreements.
- (3) Economic development
 1. Development activity and job creation/retention resulting directly or indirectly from the project.
 2. Degree of local distress in the county where the project is located.
- (4) Compliance
 1. Enforcement status of the project.
 2. Existence of overload conditions.
- (5) Adequacy, efficiency and social.
 1. Extent that reorganization or consolidation of facilities will be accomplished.
 2. Population directly affected.
 3. Median household income in comparison to statewide median.
 4. The ongoing ability of the applicant to operate and maintain the facilities
 5. An increase in the reliability of service.
 6. Efficiency when compared with other alternatives.

55. PENNVEST & DEP, PENNVEST Project Priority Rating System Guidance Manual (Final Draft, 1998).

56. The Clean Water Act also requires scoring for purposes of disbursement of federal funds. DEP’s regulations set out these criteria. However, these regulations are not used by PENNVEST and DEP except to satisfy EPA requirements, although they are technically required for PENNVEST’s funding decisions. 25 Pa. Admin. Code § 103.5(c). The PENNVEST guidelines are the ones actually used to create the priorities on the “intended use list” which determines what gets funded. The EPA-oriented § 103 regulations are -- even more than the PENNVEST guidelines -- tilted toward favoring replacement of on-lot systems with wastewater collection and treatment plants, and toward resolving pollution problems affecting small waterways rather than mainstem rivers. For example, they award substantially more points for frequent on-lot malfunctions (e.g. up to 24, while limiting wet weather sewage system collection problems to a maximum of 10), etc. Under the DEP-PENNVEST guidelines, demonstrating the impact on the stream segment is less important than under the older EPA criteria. The new PENNVEST criteria also allow credit for projects addressing wet weather flows. For example CSOs and SSOs are likely to be scored category C for public health, rather than having low scores or no scores as under the 103 regulations.

57. 25 Pa. Admin. Code § 963.12(a)(1). The previous guidelines had similarly excluded “Cost of acquisition or construction of house laterals and interior plumbing.” See 25 Pa. Admin. Code § 961.8(a)(1).
58. 35 P.S. § 751.3.
59. 35 P.S. § 751.3.
60. PENNVEST, “On-Lot Sewage Disposal System for the Individual Homeowner: Funding Program.” These subsidized loans are available where the municipality certifies that the area is not served by public sewers and will not be served by public sewers within five years.
61. PENNVEST New Release, March 25, 1998.
62. PENNVEST funding provided on a county basis (www.pennvest.state.pa.us).
63. At the November 6, 1998 Institute of Politics seminar on “Sewer Infrastructure Investments for the 21st Century: Creating Strategic Solutions for Southwestern Pennsylvania,” one participant noted that PENNVEST funds used in Butler County to fix a problem area made possible adjacent new development supported by the upgraded infrastructure. Another participant commented that in South Fayette Twp. in Allegheny County, a growth area, PENNVEST funds were used to address wildcat sewers and failing septic systems in older areas, while the new growth was funded by municipal expenditures for new sewers (funded by private development tap in fees, etc.).
64. DEP, “Ridge Launches Growing Greener Initiative,” Update, Vol. 5, No. 6 (Feb. 5, 1999).
65. 7 U.S.C. § 1926. See www.usda.gov/rus/water for more information.
66. Allegheny County Community Development Project Proposal Form.
67. Project Criteria Guidelines.
68. Allegheny County Dept. of Econ. Dev., 8 Steps to a Successful Community Development Block Grant.
69. DEP, “Act 537 Sewage Facilities Planning Grants”, Doc. 362-5512-002, Dec. 17, 1997.
70. See 25 Pa. Admin. Code § 71.43.
71. See Don Hopey, “Land, water plans unveiled,” *Pittsburgh Post-Gazette*, January 28, 1999. See also DEP, “Ridge Launches Growing Greener Budget Initiative,” Update, Vol. 5, No. 6 (Feb. 5, 1999). In addition to an environmental stewardship fund, the governor also proposed increasing expenditures on farmland and open space protection, and use of some PENNVEST monies for control of nonpoint source water pollution.
72. ALCOSAN 537 Plan, 7-9.
73. ALCOSAN 537 Plan, 7-8, 7-10.
74. ALCOSAN 537 Plan, 7-1 (1996 rates); ALCOSAN, Customer Rate and Billing Guide, January 1998.
75. Memorandum Tom Schevtchuk, CDM, to Jan Oliver, ALCOSAN, July 14, 1998.
76. Personal communications re: long term control plan briefings, January 1999. See also Don Hopey, “\$3 billion sewer plan under review,” *Pittsburgh Post-Gazette*, Feb. 7, 1999.
77. See Report of the Pennsylvania 21st Century Environment Commission, September 1998. The report and additional information are available at www.21stcentury.state.pa.us.

78. See Tom Barnes, "Neighbors object to East End Apartments," Post-Gazette, March 13, 1998.

79. This example may or may not be the best case for applying such an approach. Clearly there are other situations where upstream municipalities are producing problems for downstream municipalities and where the economic conditions are quite the reverse (the upstream municipality is both in better financial condition and the downstream municipality will experience few direct benefits from expenditure). Moreover, equity issues also enter into these cross-jurisdictional relationships. Municipalities clearly have had ongoing responsibilities to maintain their systems adequately -- so how can they be rewarded or subsidized for doing what they arguably should have done before? But these issues all contribute to the question of whether there are ways to establish appropriate benefits-sharing and cost sharing mechanisms where the costs are incurred in one place and the evident benefits are realized elsewhere (such as on the mainstem rivers, or in small tributaries).

80. This approach was proposed by Prof. Ronald Neufeld of the University of Pittsburgh at the Institute of Politics' November 6, 1998 seminar on "Sewer Infrastructure Investments for the 21st Century: Creating Strategic Solutions for Southwestern Pennsylvania."

81. Executive Order 1999-1, "Land Use Planning." The order declares the following policy objectives "to guide all Commonwealth agencies when making decisions that impact the use of land in Pennsylvania:

1. Soundly planned growth is in the best long term interest of the Commonwealth and should be encouraged at all levels of government.
2. Farmland and open space are valued Commonwealth natural resources and reasonable measures for their preservation should be promoted.
3. Development should be encouraged and supported in areas that have been previously developed or in locally designated growth areas.
4. Because land use decisions made at the local level have an impact that expands beyond municipal boundaries, regional cooperation among local governments should be encouraged.
5. The constitutional private property rights of Pennsylvanians must be preserved and respected.
6. The Commonwealth shall work to improve the understanding of the impact of land use decisions on the environmental, economic, and social health of communities.
7. Sustaining the economic and social vitality of Pennsylvania's communities must be a priority of state government.
8. Infrastructure maintenance and improvement plans should be consistent with sound land use practices."

82. See MPC § 209.1(b)(7).

83. See 25 Pa. Admin. Code § 71.21(a)(5)(i) & (ii). See also Pennsylvania Environmental Council, *Guiding Growth*, pp. 6-2 to 6-3.

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