

# Regional Water Management Task Force

## Benchmark Report

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September 5, 2006

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## Introduction

This benchmarking report provides insights into the best practices in comparable regions that have advanced regional water planning and management. For each region, the circumstances that prompted regional initiatives are considered. The report then focuses in depth on the role of *one prominent regional entity in each region*—its structure, governance, powers, funding, functions, decision-making processes, and strategies to enlist cooperation from constituent groups.

**Selection of the four benchmark regions.** This report examined regions highlighted in previous studies of Southwestern Pennsylvania's water quality and identified more benchmarking candidates through surveying regional water management across the United States. The benchmarking process evaluated thirteen metropolitan areas or geographical regions. Seven of these regions had been mentioned or profiled by the National Research Council (2002) and Carnegie Mellon University Heinz School students (2005). Six additional regions were selected to broaden the potential best practices to study. The complete list included: Atlanta, the San Francisco Bay Area, Boston, Chicago, Cleveland, the Delaware River Basin, Louisville, the mid-Atlantic Highlands (the Canaan Valley Institute operating in Maryland, Pennsylvania, Virginia, and West Virginia), Minneapolis-St. Paul, Milwaukee, Portland (Ore.), St. Louis, and Seattle.

These thirteen regions were screened with three questions. First, how many water management challenges does the region share with southwestern Pennsylvania? Second, does the region have comprehensive water management plans? Third, does the region appear to be concerned with the connections among regional water management planning, land use planning, and transportation planning? In order to establish some comparability across regions from which best practices might be assessed, a region's metropolitan planning organization had to be involved in coordinating or contributing to regional water management. In the Delaware River Basin, Louisville, the mid-Atlantic Highlands, Portland, and St. Louis, various weaknesses included water management receiving marginal metropolitan planning organization support or involving few policy-makers; planning appearing too uncoordinated; or the scale and scope of operations extending far beyond the bounds of what the Task Force might propose.

The remaining eight regions were evaluated and ranked for relevance and performance. This dual index permitted selection of regions for study that were not so dissimilar from southwestern Pennsylvania that findings would be irrelevant, yet not tightly bounded by similarity as to exclude significant innovations that have been developed elsewhere. However, regional comparability was deemed of more importance than best practice; therefore, the combined index rank gave more weight to the Relevance-Contextual Similarity Index than the Performance-Innovation Index.

The Relevance-Contextual Similarity Index compared southwestern Pennsylvania with potential benchmark regions in terms of physical, political, demographic, and infrastructure characteristics. Physical and geographic factors included land area, annual precipitation, number of rivers, and reliability of water supply. Political factors included the number of counties in the region and the number of municipalities. Demographic factors included the 2000 census population of the region, the projected 2030 population, and the degree of sprawl, the last of

which was a composite of three different recent nationwide assessments. Infrastructure-related issues included 2004 United States Environmental Protection Agency Combined Sewer Overflow permits and 1990 census-based estimates of septic tank usage in the region.

The Performance-Innovation Index gauged how long regional water management plans had been in place, how comprehensive the plans are, and what environmental impact the plans have had. More specifically, the date of plan passage or implementation was one factor. The existence of regional flood, stormwater, water supply, wastewater, and watershed plans was another factor. The integration of regional water management planning with land or transportation plans was also considered. The types of powers available to enforce the plans were noted. Stakeholder involvement and cooperation were also important criteria.

This analysis determined that the five most relevant regions were Chicago, Cleveland, Milwaukee, Minneapolis-St. Paul, and Seattle. The five best-performing regions were Atlanta, the Bay Area, Cleveland, Milwaukee, and Minneapolis-St. Paul. The combined index resulted in Cleveland, Minneapolis-St. Paul, Milwaukee, and Chicago as the top four benchmark regions. The regions selected for further study were Atlanta, Cleveland, Milwaukee, and Minneapolis-St. Paul. Atlanta's high ranking in Performance-Innovation called for closer examination and caused that region to be selected over Chicago.

**Significant observations from other regions.** A few observations about the regions that did not receive full analysis or site visits are provided here, as these regions also have innovations and strategies that could be of interest to the Task Force.

The urbanized Boston metropolitan area relies on an integrated water and sewer authority that serves millions of people in scores of municipalities. Should the Task Force decide to reduce the scale of the project to the region's more densely populated counties, this model of regional service provision should be closely studied.

The city of Portland is distinguished by its planning partnerships with federal, state, tribal, and other local governments throughout the region, and the public. City officials combine Endangered Species Act recovery planning, Northwest Power and Conservation Council sub-basin planning, state salmon recovery planning, state water quality planning, and regional wildlife planning into a single watershed-based approach.

Given that this Task Force includes only representatives from Pennsylvania, the multi-state Delaware River Basin Commission was not considered for closer study. Nevertheless, since southwestern Pennsylvania's water quality problems involve three states, the Delaware River Basin Commission could be a model should the Task Force or a future body decide that regional water management can be achieved only through comprehensive planning for the entirety of the Three Rivers watershed.

Similar to some of the planning entities analyzed in this report, but distinct in its institutional arrangements, is the Bay Area Integrated Regional Water Management Plan. In November 2002, California voters passed Proposition 50, which authorized \$3.4 billion of general obligation bonds to fund water and wetlands projects and set aside \$380 million for plan grants. The California Department of Water Resources and the State Water Resources Control Board

administer the program. In the nine-county San Francisco Bay Area, local governments, environmental groups, business groups, and numerous agencies involved with water supply, water quality, wastewater, stormwater, flood management, watershed management, and habitat conservation all signed a Letter of Mutual Understanding to establish the Bay Area IRWMP. Signatories will develop multi-objective plans that expand upon the benefits of any individual agency's single project to address water supply, water quality, flood protection, stormwater, wastewater, recycled water, watershed, habitat protection and restoration issues. With \$838,230 in Proposition 50 grants, four functional plans will be completed to allow for swift implementation of projects in the next round of funding. The Letter assigns responsibility to partners for those parts of the plan for which they have jurisdictional responsibility, while adopting the plan does not shift agency authority or commit agency resources elsewhere.

**Information sources for the benchmark regions.** The benchmark reports were produced from review of available online planning documents, news articles, and direct interaction with the regional organizations as well as state, county, and local elected officials. On-site visits were conducted at all four metropolitan areas. Despite the variety of environmental circumstances, political dynamics, and institutional diversity in these regions, research and interviewing made clear that regional water management is a complex and evolving process. In no region did a single entity control all regional planning and service provision. As a result, local politics remained ingrained in policymaking. In all regions, seasoned engineers, planners, and politicians emphasized the collaborative nature of regional water management and the gradual process of advancing it.

## **Atlanta Metropolitan Area**

### ***Metropolitan North Georgia Water Planning District***

**Demographics.** The Metropolitan North Georgia Water Planning District (MNGWPD) executes integrated watershed, wastewater, and water supply planning for sixteen counties covering 5,150 square miles of land. The region is home to 94 local and 16 county governments and 9 water and sewer authorities. The region's major urban center is Atlanta, which is surrounded with large suburbs such as Roswell and Marietta. The 2000 Census recorded the region's population at nearly 4 million people; the region will grow steadily over the next thirty years, adding between 3 or 4 million more inhabitants. Fifty inches of annual precipitation fall on the 5 rivers, 2 lakes, and reservoirs that serve as the region's water supply. However, the Chattahoochee River is one of the smallest rivers providing surface water for a major city in the United States, and the region's geology provides limited groundwater resources. The region's leaders believe integrated water management is essential to support a sustainable economy in the future.

**Birth of the regional entity.** Past droughts, ongoing pollution problems, and future constraints on growth compelled leaders to create an entity to address these regional problems. Droughts from 1998 to 2002 demonstrated the vulnerability of the region's water supply. Sewer and wastewater plant overflows and spills remained a problem as the major rivers reached their discharge assimilation capacities; sewage overflows and phosphorus flowing downstream were killing West Point Lake. Stormwater runoff and non-point source pollution degraded stream water quality and resulted in court-mandated Total Maximum Daily Loads (TMDLs). Federal consent decrees to rehabilitate the city of Atlanta's wastewater system and to implement TMDLs for impaired streams have imposed some of the most aggressive schedules in the country, and courts have threatened to withhold future water and wastewater permits, which would likewise halt development. Intrastate and interstate conflicts over water consumption also demonstrated the limits of these resources in the future. This range of problems demanded a regional water management effort. The Metro Atlanta Chamber of Commerce and the Regional Business Coalition established the Clean Water Initiative Task Force, which ultimately produced recommendations that Governor Roy Barnes introduced to the state legislature. The Georgia General Assembly created the Metropolitan North Georgia Water Planning District (MNGWPD) in 2001 and required it to develop comprehensive, watershed-specific, integrated plans for watershed management, wastewater and water supply, and conservation. The District finished the plans in less than four years and began working with the local governments that the state legislature had charged with implementing the plans.

### ***Structure and Organization***

**Membership.** The MNGWPD's 27-member Governing Board manages the district's business. Counties with a population of at least 200,000 (currently 5) are represented by their county commission chair. The mayor of the most populous city (Atlanta) is on the board as is the county commission chair or mayor of a city with a water or sewer system from the remaining counties (currently 11). Georgia's Governor, Lieutenant Governor, and Speaker of the House appoint six, two and two citizen members respectively. Legislation establishing the district also provided for its evolution. The district consists of counties with a census population of more than 500,000 and the counties geographically contiguous to those counties, although contiguous

counties with fewer than 100,000 residents can seek to be removed from the district. Any county contiguous to a member county can apply for inclusion in the district's planning and be admitted by the director.

**Staffing.** The board oversees the work of regional planners and consultants with whom they collaborate. Most staff members are part of the Atlanta Regional Commission's Environmental Planning Division, but staff members from the Chattahoochee-Flint Regional Development Center, the Coosa Valley Regional Development Center, the Georgia Mountains Regional Development Center, the Lake Allatoona Preservation, and the Northeast Georgia Regional Development Center also contribute to the district's work.

Stakeholders from throughout the sixteen counties helped shape the district's plans and policies. Both the MNGWPD board and planning staff are aided by the expertise of the region's water, wastewater, and stormwater officials in local and state governments with its Technical Coordinating Committee. The District's Finance Committee works with officials from the state's Environmental Facilities Authority, Department of Community Affairs, and Department of Natural Resources to discuss district and project funding. The nearly 200 members of this committee conduct their work in four subcommittees on wastewater; stormwater; water supply and conservation; and, education and outreach. The advisory councils for the Chattahoochee, Etowah, Flint, Oconee, and Ocmulgee river basins and the Lake Lanier Basin, which total nearly 300 members, consist of environmentalists, business leaders, developers, neighborhood and civic leaders, agriculturalists, public utilities staff, and the media.

**Funding.** The district's work relies both on state and local funding, although officials anticipate that this support may lead to greater federal funds in the future. The district received \$5.3 million in local dues and \$2 million in state funds for its first two years, with an ongoing \$250,000 annual state contribution. State funds were critical to initiating the work and necessary to convince local governments to back the project. Much of this funding supported plan development. Consulting engineering firms assisted in the quick completion of plans. The chief engineering planning consultant coordinated the integration of plans, while one firm produced the wastewater and water supply plans and another developed the watershed plan. Ongoing funding, initially set at a minimum of \$1 million but since lowered to \$500,000, draws from per capita assessments, water usage fees, or other formulas devised by the District. The District's per capita assessment can vary from year to year based on financial needs. For the District's 2006 budget (\$1,116,199), the board continued to employ a per capita assessment at a rate of \$.15 per capita, which produced \$596,199 in local dues. The Board requested \$250,000 in the Fiscal Year 2007 state budget for the District's 2006 calendar year. The District's region wide planning is one strategy for securing federal funding for local projects, particularly in the United States Environmental Protection Agency's Appropriations Bill. Through Fiscal Year 2005, the District won federal grants totaling \$2.6 million.

### ***Regional Water Management Policies, Practices, and Programs***

The MNGWPD has worked to develop plans and to encourage their implementation. The legislation establishing the district also established a demanding time frame for plan development. In 2002, the district produced a short-term wastewater capacity plan and model stormwater ordinances. In 2003, the planners completed a district-wide watershed management

plan, a long-term wastewater capacity plan, and a water supply and water conservation plan. To reach upward of 75% of the public with education programs by 2006, officials estimated that \$1 million would be spent in its first year and at least \$500,000 in subsequent years.

In the process of identifying opportunities to build upon and to coordinate with existing watershed planning efforts, planners found that the existing Clean Water Campaign was one effort to expand upon. The Campaign had brought together a variety of agencies, twenty local governments, and the Atlanta Regional Commission to educate the public about regional water management challenges and problems. Another crucial district function is to **facilitate intergovernmental cooperation** necessary for local governments to implement the plans. Among the policies in place to reinforce regional coordination and cooperation are the requirements that planners take into account the recommendations of basin advisory councils as well as maintain regionally consistent policies, model ordinances, and minimum performance standards.

Among the district planners' first efforts were a series of **model stormwater ordinances** to provide consistent regulations across the region. Although many counties had already developed some stormwater management strategies and watershed planning, district officials discovered a great deal of variation in the plans and a lack of specifics necessary to address the quality of particular watersheds. Existing stormwater programs had insufficient public education and participation, ordinances with loopholes, weak implementation strategies, small staffs unable to enforce existing requirements, and little funding.

State policies also needed revision, such as Department of Transportation compliance with road runoff, erosion and sediment control enforcement, lawn fertilizer reformulation, enabling legislation for stormwater authorities, and provision of additional financial resources. In response, district planners have developed a **comprehensive plan to address stormwater problems**. Planners have identified the need for stream buffer ordinances and vegetation protection measures. They have also outlined costs and strategies to develop **stormwater utilities**, whether managed by local governments or a regional entity. While the former can better target watershed retrofit and restoration projects, the latter draws revenue from throughout the region to help remediate effects of past growth. Both allow long-term financial planning and effective redevelopment planning that ease the costs to local governments and ratepayers. The district's planners point out that general revenue from property taxes, bonds, development impact fees, special assessments, or user fees can all generate revenue in different ways acceptable to different populations and keep local governments in control of funding and expenditures. At the same time, they recommended a separate district stormwater fee to administer and coordinate local stormwater management.

Although the district does not dictate how local governments or counties should establish their programs, district officials define consistent levels of service to ensure equity throughout the district; provide guidelines for enforceable inter-jurisdictional agreements to support stormwater management; create models and templates to insure consistent stormwater utility structures; and establish operating policies for the district. In order to facilitate resolution of inter-jurisdictional stormwater management and funding issues, the District has researched legislation to allow the creation of multijurisdictional stormwater authorities, and law firms have provided pro bono services, even as the District's Technical Coordinating Committee continues to study this issue.

The district's **watershed plan** is designed to improve water quality in streams throughout the region through legislation, monitoring, and engineering work. Water quality monitoring places responsibilities on local governments, the district, and state and federal partners in ensuring comprehensive, consistent work across the region. Local governments will conduct long-term ambient trend monitoring, dry weather illicit discharge screening, commercial and industrial inspections, watershed assessment monitoring, data collection for assessing TMDL implementation and delisting, and biological and habitat assessments. The district is expected to provide the expertise to assess the effectiveness of best management practices and restoration projects as well as to develop and to maintain regional databases. The plan assigns regional network and mainstream monitoring to the U.S. Geological Survey. In conjunction with the state, the district will set and carry out monitoring of TMDLs, especially in water supply watersheds. Although district-wide monitoring efforts were to begin in 2005, the Georgia Environmental Protection Division (GEPD) requested additional internal review of the monitoring plan and protocols, delaying the program until 2007. Long-term work involves restoring impacted watersheds and encouraging sustainable design in new developments to prevent stormwater runoff problems at the outset.

The district's **wastewater planning** effort was staged to address immediate barriers to growth and then to design a more efficient system. A short-term wastewater capacity plan was quickly completed in 2002, and the long-term wastewater capacity plan was completed a year later. By law, the long-term wastewater plan will be reviewed each year and updated at least every five years for the duration of its thirty-year outlook. District officials also believe that future wastewater management plans will become integrated with land use and transportation planning.

The wastewater plan calls for construction of six new wastewater treatment plants, the expansion of 39 existing plants, and the retirement of 61 plants. Upgrading plants will protect water quality and enhance supply by creating new opportunities to reuse treated effluent for non-potable irrigation. The plan strategically locates the new wastewater treatment facilities in high-growth areas of the region and reduces the number of smaller plants from 102 to 48.

Although the plan does not empower the district to assume responsibility for the region's wastewater collection systems, it does emphasize the need for **improved collection system inspection and maintenance** to reduce overflows and leakage. Local jurisdictions that own and operate the wastewater management systems will handle much of the implementation. First, they integrate the district's plan into their master plans as well as developing or refining local plans further. Preparing local master plans demonstrates conformity with the district plan but also allows improvements and innovations that local officials can identify in their jurisdictions' circumstances and factors. Local governments also make their plans conform with the district plan by including countywide and basin-wide perspectives; committing to a 30-year planning horizon with 5-year updates; engaging regularly in inter-jurisdictional dialogue, cooperation, and resource sharing; planning for future wastewater services areas, collection systems, septic system use areas, and transitions from septic systems; and carrying out education and public awareness activities. The regional wastewater plan guides the extent to which local jurisdictions can alter the district's plan while they remain consistent with it.



**Compliance and capacity issues:** The success of the long-term plan depends on local governments' execution. District officials believe that sanitary sewer overflows and pipe breaks can be reduced by ensuring that jurisdictions comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) Permit Program and proposed Environmental Protection Agency Capacity, Management, Operations and Maintenance regulations. They also recommend that local utilities establish a capacity certification program for their wastewater collection system to ensure that they have adequate wastewater collection and treatment capacities before authorizing new flows and sewer system connections. In this regard, the District relies on high-performing entities within the region to demonstrate best practices, sometimes in the forum of the Wastewater Subcommittee. In these meetings, Atlanta officials have explained their use of a dynamic hydraulic modeling of sewer system capacity to issue conditional certifications that allow a project to be constructed but not occupied. Gwinnett County officials have demonstrated their use of the modeling program SewerCAD to identify weak pipes. With an ability to project capacity to 2015, officials analyze system scenarios when new developments are proposed. This program also enables county staff to identify any pipe sizes, system improvements, or other requirements necessary to ensure that capacity is available for that development. If changes need to be made to the sewer system, the developer is responsible for the cost of installing the larger pipe or other required infrastructure to meet the needs of his proposed development.

District planners also advocate better **management of septic systems** to avoid future failures and public costs for correcting them. One-fifth of the region's wastewater flows into septic systems, and planners expect the systems to be a permanent element of wastewater management. However, because many of the systems are located in areas with special water quality protection considerations, all septic systems, according to officials, should meet improved siting, design, and construction requirements; they also should have minimum lot size requirements, increased tank size for garbage disposals, and more detailed inspections during construction. After installation, local officials need to ensure that the systems are pumped every five years and to maintain tracking a system for septic haulers. The District intends to create a Septic System Inspection and Maintenance Guidance Committee to advance guidelines.

The commitment to clean water – and the necessity of it in the region – shows in the district's effort to have plants **treat wastewater to levels that can be reused** or returned to stream and water supply lakes to support the region's growth. The system will operate more efficiently as municipalities and counties enact more regular sewer system inspection and maintenance regimes. Long-term planning for the region will require more joint planning of cities and counties that takes into account areas with septic systems that will be more closely regulated as well. If successful, the plan will meet future wastewater management needs without damaging the environment or harming downstream users, which facilitates the state Environmental Protection Division's permitting decisions.

The district worked to create a **water conservation** program that would be highly cost-effective. By establishing conservation pricing; legislating plumbing retrofits on old homes, low-flush urinals for large new buildings, rain sensor shut-off switches on new irrigation systems, and sub-unit meters in new multi-family buildings; assessing and reducing water system leakage; conducting residential and commercial water audits; distributing low-flow retrofit kits to residential users; and, increasing public education and awareness plan, the district estimated that

every dollar invested in implementing the conservation program would yield a savings of \$2.50 in water supply and treatment costs.

The **water supply plan** involves building new infrastructure and developing new interconnections between systems. Four new water treatment plants were scheduled for completion by 2005. Twenty-one water treatment plants will expand, and four will close. Working with state officials, water suppliers will limit basin withdrawals, reallocate water from Lakes Lanier and Allatoona, and complete the permitting for construction reservoirs. Reclaimed water will be returned to Lake Lanier and the Chattahoochee River. New system interconnections will increase reliability and security as well as support projected water demand growth. Interconnections allow water utilities to have a backup supply to meet the essential needs of eating, drinking, toilet flushing, fire fighting, and hospital uses. Regionally informed local water plans require officials to consider demand, supply, service areas, treatment, transmission and distribution, and capital improvement but also to create system interconnections; to initiate water conservation measures; to reuse water; to develop plans for droughts and emergencies; to coordinate water supply, wastewater, and watershed plans; and, to contribute to educational and public awareness activities. By updating the water supply plan every 5 years, District officials provide local jurisdictions with an opportunity to modify it. Planners intend for the water supply plan to be flexible in order to accommodate new projections, changing land uses, legislation and regulations, court rulings, and additional funding for these systems.

Integrating stormwater, wastewater, and water supply plans has required both analysis and implementation. Developing and utilizing a **common land use database** has made it possible to evaluate existing land use throughout the region as well as predict future conditions. Without inventorying existing water quality conditions as well as water and wastewater permits, planners would have struggled to identify the problems crossing political jurisdictions. Analysts now proceed to study how water quality conditions will change under with an array of decisions and implementation strategies regarding watershed, wastewater and water supply programs. The model also allowed planners to assess how on-site septic systems affected regional water quality. District-wide implementation of the watershed management plan will benefit wastewater management by increasing the assimilative capacity of streams as well as maintain or improve the water quality from which the region's supply is drawn.

To increase the sustainability in terms of quantity and quality of the region's resources, district planners look for interconnections of different water management processes. For example, by setting wastewater treatment standards at higher levels, the district is increasing streams' assimilative capacities but also creating a usable water source that builds up the region's supply. By treating wastewater to a higher level, regional water stewards can draw and transfer water from one basin within the district and discharge wastewater into other basins within the district.

### ***Decision-Making Processes for Regional Water Management***

As MNGWPD is committed both to the region's growth and its environmental quality, the agency strives to develop plans that balance economic development and regional water quality. MNGWPD's authority in regional water quality management planning is supported by the Georgia Environmental Protection Division. The state GEPD Director has the power to **modify**

**existing permits to make them conform to new district plans.** At the same time, the GEPD Director **will not approve permits** for water withdrawals, supplies, wastewater system capacity, or stormwater permits of local governments unless the governments are in compliance with the plan or the GEPD Director certifies to the MNGWPD board that the local government is making its best effort. In addition, governments that do not enact plan model legislation or meet standards **lose eligibility for state project funding** for an array of water infrastructure and conservation projects. Municipalities and counties that do not meet plan requirements will also become ineligible for various state grants and loans.

**Cost-efficiency.** The MNGWPD works to coordinate infrastructure development, to reduce the costs of regional water management, and to make the low-interest funding possible available to local governments through the Georgia Environmental Facilities Authority. District planners have attempted to reduce wastewater treatment costs through gradual, consolidated expansion that makes use of previous infrastructure investments. By developing, evaluating, and comparing alternative wastewater treatment plans, planners were able to select a strategy that costs approximately \$500 million less than the cost of the other alternatives considered, including implementation of individual existing plans. However, most of the region's new facilities and collection system rehabilitation will be financed by bond funds and repaid by users. Planners estimate that investment in wastewater collection and treatment systems in the District will reach \$24 billion over the next 30 years as well as expenditures of another \$18 billion to operate and maintain the systems. The programmatic measures of the wastewater plan to maximize efficiency and savings across the region will total \$64 million as the District works to increase financing opportunities through state loans; increase federal funding through a unified funding appeal; locate additional funding for District activities; and evaluate possible public-private partnerships.

**District-local government relations.** As the MNGWPD's plans grew out of a collaborative effort, the responsibilities and strategies delineated in the plans clarify implementation and regulation roles. In regards to watershed management, local governments work to implement local stormwater management programs, develop and implement TMDL plans, protect source waters, and create and execute watershed improvement plans. However, the district's plans do not replace projects required by state or federal court orders. District staff train local officials and coordinate the implementation of ordinances and monitoring programs. The district advances watershed education and public awareness. District officials review the status of the watershed management plan and its implementation in order to report on progress and to identify needs for updates. The GEPD also assists in implementation and management of water quality compliance. The GEPD collaborates with the District to assess whether local governments are meeting the plan's goals. The GEPD also helps the district by creating additional programs or regulations to meet non-point source pollutant load reductions. The wastewater plan relies on continued involvement of state agencies to set standards, regulate, permit, and fund wastewater facilities.

The District's water supply and wastewater plans build upon rather than replace other emerging strategies to advance regional cooperation. District planners recognize that existing inter- and intra-jurisdictional agreements among governments and utilities reflect the ideal of cooperative service delivery. The Atlanta Regional Commission and other regional development centers as well as Georgia House Bill 489 (the Service Delivery Strategy Act) also help establish district-

wide relationships, facilitate understanding of common and unique problems, and advance trust among governments. Expanding upon this work to implement the wastewater plan requires the district to make use of existing tools; develop and share model inter-jurisdictional agreements; create a fair-share funding formula framework; negotiate service expectations and commitments; create a formal dispute resolution framework; recommend strategies for state involvement; and publicize and reward successful partnerships.

**Local government responses.** Much decision-making in the district remains at the local level, whether it be how quickly to comply with the plan or in what fashion. The District's annual surveys are one gauge of progress throughout the region. In 2005, of eighty-one local governments (representing 97% of the District's population) that responded to the storm water survey, the 63% of governments that did not have a stormwater utility were considering one and investigating funding structures. Of the eighty-four percent of operators of sewer systems (that serve 97% of the population with sewer connections) that responded to the wastewater survey, 80% of these systems' officials have reviewed their wastewater master plan to ensure consistency with the District plan. Another 37% had developed policies regarding septic systems, while 90% had already met the requirement to establish policies concerning connection to public sewers by the end of 2005. Of the 83% of water suppliers (providing service to 99% of the District's population) that replied to the conservation questionnaire, 40% of respondents had adopted a multi-tiered rate structure of conservation pricing ahead of the 2006 deadline. In addition, five of the six major joint water supply plans recommended by the District were being developed.

The District's planners also work with local governments to modify the plans during the **annual plan review**. The Plan Review Surveys allows local government officials to suggest changes to the plan, which inform how MNGWPD staff, Technical Coordinating Committee, Basin Advisory Councils, and MNGWPD Board make decisions on how to amend the plans. In 2005, topics discussed for amendment included a Revised Model Floodplain Management Ordinance; the schedule for water quality monitoring; stormwater operations and maintenance and watershed improvements; buffer ordinances; septic systems in "critical areas" and septic system maintenance; new wastewater facilities; replacement of older, inefficient plumbing fixtures; and sub-unit meters in new multi-family buildings. The cooperation of district planners and local officials and stakeholders was demonstrated in addressing a water conservation plan measure that recommended that older residential buildings meet the plumbing codes for new buildings prior to transfer of ownership. When the measure proved impractical, the District convened a Water Conservation Retrofit Steering Committee composed of real estate leaders, mortgage brokers, water providers, environmental groups, representatives from state government and representatives of the fixture industry. The committee recommended a more flexible plan for water providers to have in place by 2010.

**Land use impact.** Over the long term, MNGWPD planning work may influence land use as well. The District has offered a floodplain mapping seminar that explains how Cobb and Gwinnett counties should determine new 100-year floodplain boundaries based on future land use conditions. The work of updating floodplain maps in conjunction with anticipated future land use allows communities to alert residents of flood risk and potentially to regulate new development to keep it out of harm's way.

**Reasons for success.** While it is too early to tell whether the plan will solve all of the region's water problems by 2030, district officials have identified what has contributed to their success to date. Involving stakeholders in the beginning of the planning in the Technical Coordinating Committee made the creators of the plans the implementers of the plans. Being able to rely on the existing talents inside the Atlanta Regional Commission and other regional development centers reduced costs and start up time, and extensive involvement of state officials in the planning and decision-making have resulted in a plan more likely to be implemented and less likely to be undermined. The enabling legislation was ambitious in terms of deadlines, enforcement powers, and incentives to turn the plan into action rather than soften it as guidelines.

## **Cleveland Metropolitan Area**

### ***Northeast Ohio Areawide Coordinating Agency***

**Demographics.** The Northeast Ohio Areawide Coordinating Agency (NOACA) carries out transportation planning, transportation-related air quality planning, and areawide water quality management planning for five counties covering 2,005 square miles of land. The region is home to 165 local, general-purpose governments. The region's major urban centers are Cleveland, Elyria, and Loraine. The 2000 Census recorded the region's population as 2,148,143. Over the next thirty years, the population is expected to grow very little and to disperse outward from the inner urban core to outlying municipalities. The population dispersal has created a situation in which regional economic development risks degrading some of the region's highest quality waters.

The northeastern Ohio region is endowed with five rivers and Lake Erie shoreline. The annual precipitation of 36 inches recharges these resources. The City of Cleveland currently draws lake water from four offshore intake points, treats, and distributes it to an estimated 1.5 million customers in over 70 communities; wells provide water for much of the region's population outside of this system.

**Birth of water management role.** Addressing the region's water pollution problems became a NOACA role in 1975 when the agency was designated by the Governor of Ohio as the entity responsible for preparing an areawide water quality management plan. In 1979, NOACA completed its first Clean Water Act Section 208 plan. Two decades later the agency completed an updated and expanded 208 plan, *Clean Water 2000*.

**Ongoing responsibilities.** NOACA plays an important role in regional water management. First, NOACA gathers data about the region's water pollution problems. Second, NOACA staff work with a variety of levels of government to advance regional water quality and to disseminate strategies to improve it. The NOACA Governing Board decides how the agency's staff will provide planning and support to waste management districts, health districts, soil and water conservation districts and planning commissions as well as to member communities. The staff works with municipalities, regional authorities, other regional metropolitan planning organizations, and the Ohio Environmental Protection Agency (OEPA) to create and to sustain the partnerships necessary to improve water quality in a region where municipal home rule traditions have inhibited the development of single, centralized planning and service entities. NOACA supports regional water management in a variety of ways, such as providing a regional policy forum for communities and water agencies; fostering information sharing among agencies and reporting on regional trends and conditions; conducting limited field investigations for local and state agencies; assisting water management agencies in locating funding for their work; and building awareness throughout the regional of water quality issues through public education.

### ***Structure and Organization***

**Membership.** The NOACA Governing Board is designed to bring the metropolitan area's principal elected officials and regional transportation and environmental planning administrators together for decision-making as well as to provide the region's citizens an approximation of

equal representation by population. The current board consists of 11 representatives from Cuyahoga County; six representatives from the City of Cleveland; seven representatives from Lorain County; five representatives from Lake County; three representatives from Medina County; three representatives from Geauga County; one representative from the Greater Cleveland Regional Transit Authority; one representative from the Ohio Department of Transportation; and, one representative from the Northeast Ohio Regional Sewer District. If a weighted vote is called, the voting shifts to represent the region's population. Cuyahoga County officials have 35 votes; Geauga County officials have 3 votes; Lake County officials have 6 votes; Lorain County officials have 7 votes; Medina County officials have 4 votes; and the Ohio Department of Transportation, 1 vote, out of a total of 56. The President of the Governing Board is the chief policy officer of NOACA. Board members' terms vary as the county commissioners who are Board members become and remain members concurrent with their tenure as a county commissioner. NOACA's Standing Committees provide advice and policy recommendations to the Board and establish a forum for in-depth discussion and analysis of regional issues.

**Staffing.** NOACA's nearly 40 full-time employees include planners, engineers, and support staff. There are five staff in the environmental planning unit as well as three staff in the organization working on the Cuyahoga River Remedial Action Project, a federally funded initiative to restore the once seriously degraded Cuyahoga River.

**Funding.** NOACA's environmental planning is supported by the United States Environmental Protection Agency, the OEPA, and annual dues paid by local governments throughout the region. Roughly 80% of NOACA's overall budget is derived from transportation agencies; local dues supply 13% of revenue, while the state and federal environmental protection agencies provide about 3 1/2% of the agency's funds. The agency determines the basic dues, which may be increased or decreased by the Governing Board each year, by using U.S. Census population data for members within each county. In May 2006, the Board raised the environmental planning budget to \$500,000 annually.

### ***Regional Water Management Policies, Practices, and Programs***

NOACA's role as a planning organization includes advancing regional **water quality** management. As regional experts, they work closely with both state and local agencies and watershed organizations. As a result, NOACA's 208 Water Quality Management Plans document the successes and limitations of past work as well as charting regional strategies for the future. For example, the *Clean Water 2000* plan notes the remarkable changes in water quality subsequent to point source pollution control efforts but also the ongoing water quality contamination from urban combined sewers and storm water runoff. The plan also identifies the region's most serious water quality threat in the future as non-point discharges in the region's rapidly developing areas. This non-point-source pollution threatens drinking water reservoirs, headwaters, and the finest streams. *Clean Water 2000* is an attempt to address the problems in a region where some older water pollution problems linger and where shifts in population and employment patterns create land use changes that create new water quality problems. NOACA officials believe that executing the plan will do more than incrementally improve water quality – it will prevent degradation back toward the unacceptable water quality conditions of twenty years earlier.

NOACA's authority in regional water quality management planning is supported by OEPA's anti-degradation rule and Ohio case law. The **OEPA Director will not process applications** for NPDES permits or permits-to-install (septic systems) **that conflict with *Clean Water 2000***. This framework puts pressure on municipalities to insure that sanitary sewer extensions are consistent with the plan, to make regular inspections of septic systems, and to meet stricter storm water management requirements. NOACA views this policy as empowering local communities to guide development how they see fit and to make land use decisions that protect water quality.

Because watersheds in the NOACA planning area extend beyond its boundaries, NOACA **collaborated with a neighboring planning agency**, the Northeast Ohio Four County Regional Planning & Development Organization (NEFCO), to develop elements of *Clean Water 2000*. Rivers draining into Lake Erie run through both of these planning areas. Local and state officials from both planning agencies met to develop water quality management policies. The two agencies first came together as the Northeast Ohio Lake Erie Basin Board to produce the first areawide water quality plan in 1979. The 1979 plan identified public jurisdictions that would lead infrastructure developments to improve water quality in the region, coordinated the treatment of wastewater plant sludge in the area, and recommended stormwater policies and county policies for managing septic systems. The recent planning effort reunited these experts and incorporated the knowledge of other regional leaders as well. Public officials from throughout the area's municipalities, counties, sewage agencies, health agencies, conservation department and groups, watershed groups, and state health and environmental agencies supported development of the plan. Despite minor amendments to the plan over time, *Clean Water 2000* has superseded all of the initial plans, with the exception of the wastewater management facility planning policies that the 2000 plan retains but expands upon.

*Clean Water 2000* addresses eight areas of water quality and offers recommendations for policy changes on the local or state level. The report is based on NOACA's examination of wastewater management facility planning; the management of home sewage and semi-public sewage systems; non-point source pollution and stormwater management; protection of critical water resources; urban stream restoration; watershed planning; ongoing regional water quality management planning; and areawide coordinated infrastructure planning. The plan analyzes water quality issues in these areas, delineates NOACA policies regarding them, identifies resources to address them, and explains policies that would improve this work.

NOACA's ability to offer a regional perspective allows the agency to mediate intergovernmental competition and conflict. By **delineating sewer service areas** as well as approving any boundary changes and new facility planning areas, NOACA prevents small systems from competing for users that can result in inefficient and ineffective service provision. This NOACA power is supported by the OEPA, **which will not issue permits for or loans to systems that are inconsistent with the NOACA plan**. NOACA officials point out that land use plans could reinforce this authority if economic development procedures were amended to extend this provision to the extension of wastewater services to unsewered areas.

NOACA's plan also advocates **six programs to reduce non-point pollution**. NOACA advises municipalities and counties to adopt and implement programs for stormwater control at development and redevelopment sites and believes state legislation should reinforce their efforts. The agency recommends erosion and sediment control programs for construction sites. NOACA



believes a model buffer ordinance adopted by the state will help protect riparian zones. NOACA encourages rapidly growing communities to implement conservation design to minimize storm water infrastructure development. With its knowledge of transportation planning and design matters, the agency has developed recommendations to reduce road salt usage, especially in areas that drain into surface and groundwater drinking supply points. NOACA encourages counties to take more active roles in pollution management plans and to secure loans for their watershed organizations that implement programs. NOACA's involvement in non-point pollution issues ranges from identifying resources and pointing out strategies, to guiding greater local government involvement, to highlighting areas for state legislative action and policy change.

As NOACA is primarily a planning agency, many of its projects involve facilitating cooperation and expanding the network of regional environmental organizations. Following the release of *Clean Water 2000*, NOACA used grant money to establish the Northeast Ohio Regional Storm Water Task Force to assist 100 regulated communities in meeting EPA Phase II stormwater permit requirements by developing **local stormwater management plans**. Representatives of these communities, local environmentalists, and state and federal environmental regulators worked to establish a model plan to meet the EPA's six minimum control measures. NOACA bolsters the efforts of an array of agencies and organizations by bringing them together and advocating for their support. For example, the region has established watershed organizations to steward the remediation of 4 of 5 rivers. NOACA emphasizes the vigor of these non-profit organizations and calls upon local, county and state government agencies to work more closely with them and provide more support for their projects. In the case of the one river that lacks a watershed organization, NOACA will lead the effort to establish it.

*Clean Water 2000* also promotes strategies for improving the **management of septic systems**. NOACA and NEFCO worked closely with seven county health departments as well as state environmental and health officials to develop a plan to prevent septic systems from contaminating the region's waters. *Clean Water 2000* advances a life-cycle approach to septic tank regulation that reforms site evaluation procedures, inspections of system installation, homeowner maintenance and ongoing monitoring, pumping requirements, and property owner education. The guidelines for septic tank regulation include regular inspection for optimal performance; staffing at the county level that makes inspections possible at least every five years; and a pumping program that educates, tests, registers, and regulates pumpers and haulers as well as records that allow adherence to a pumping schedule. Not only did the committee call for more rigorous regulation of septic systems, but it also asserted that the state legislature needs to adopt these standards and to hold local governments accountable for adhering to them. The committee concluded that state standards and authority over these systems would be necessary to combat this pollution. The recommended course of action, if adopted in its entirety, will overcome the lack of resources and lack of uniform standards across the region that undermines controlling this pollution.

While NOACA addressed septic tank problems by calling for region wide standards, the agency emphasized that non-point source pollution and stormwater problems are watershed-specific. For this reason, NOACA **prepares local governments** to take action. *Clean Water 2000* requests local governments to evaluate their non-point source pollution programs by comparing their existing legislation with model ordinances, analyzing whether policy changes can address

any gaps, updating or rewriting legislation as necessary, and training staff to implement any amended policies or programs. Given the region wide non-point source pollution problems, the plan recommends state leaders to establish a statewide stormwater management program that fosters more intercommunity cooperation and standardized local programs. However, NOACA emphasizes that local groups must lead the effort, whether it is an array of government or non-profits working to improve a river or watershed or established soil and water conservation districts that can persuade communities and developers to put controls in place before the state attempts enforcement. Given the proliferation of stream stewardship programs in the region, NOACA increasingly serves as an advocate for their support and a clearinghouse for information about them.

NOACA draws upon agency resources to assist the region in **efficient infrastructure development**. NOACA's involvement in both water resources and highway infrastructure planning allow it to inform local governments about how to carry out and synchronize infrastructure projects so that land use remains compact, mobility is increased, infrastructure development costs are reduced, open space is preserved, and the economic viability of existing communities increases. These goals are the guiding principles in NOACA's Framework for Action 2025 regional plan. This work has involved development of data gathering and decision-making modeling, analyses of land use and infrastructure investment decisions that communities make in isolation, and evaluation of the resulting sprawl and environmental damage expected to result from local plans.

Although NOACA does not have a statutory or clearly-defined role in the region's highly localized land-use planning, agency officials believe policies in *Clean Water 2000* can begin to establish **connections between water quality and land use**. Once Urban Stream Restoration Plans are implemented, NOACA can consider using its water management planning responsibility to guide local governments toward following best land-use practices in order to support watershed work. However, NOACA also recognizes and highlights other state programs that allow land-use controls that enhance water quality. A most promising program in NOACA's view is a state revolving fund to establish conservation easement and to carry out remediation work.

### ***Decision-Making Processes for Regional Water Management***

**Public involvement in planning.** As NOACA is committed to both the region's growth and its environmental quality, the agency strives to develop plans that balance economic development and regional water quality. NOACA planners created a regional plan that emphasized the watershed approach to reduce nonpoint source pollution and called for optimal use of existing infrastructure; they also used the planning process as an educational tool for decision makers and the public. To the extent that the *Clean Water 2000* will guide decision makers, it is also important to recognize that the development of the plan relied upon the participation of an array of decision makers throughout the region. The Task Force that assisted NOACA in creating the plan was chaired by the executive director of the Northeastern Ohio Regional Sewer District (NEORS) and the manager of the Akron Public Utilities Bureau. Elected officials and agency officials alike also joined the task force. Their expertise was utilized in work groups on home sewage management strategies; critical areas identification; and, protective mechanisms. A

public meeting was held in each of the seven counties that the plan covers, and a meeting was also held in each of the region's five watersheds.

**Recognizing individual community needs.** NOACA's regional focus and local expertise allows its staff to determine when regional policy needs uniformity but also when variation in resources and pollution problems within the region may require a diversity of approaches and measurements. NOACA officials reason that urban communities need to be able to set their own goals in terms of more or less stringent levels of pollution control given their unique built environments and varying resources. Existing measurements and load programs may not be the most helpful tools for urban stream restoration programs where complex land uses affect water quality in myriad ways and are not easily controlled. *Clean Water 2000* asserts that establishing Urban Stream Restoration Plans could intensify clean up and care for these waters. By focusing on the root causes of the condition and addressing them with a community-generated strategy for solving them, energies and resources could be better tailored and directed to solving a particular water problem. Communities may even seek stronger land-use control measures, or state revolving loans to initiate projects that will change local land uses. The implementation plan would identify responsible parties and their goals to restore the stream to community-chosen levels. These plans would be reviewed by NOACA to examine whether downstream interests are protected and best management practices will be utilized as well as to identify other sources of technical and institutional support. After NOACA adopts the Urban Stream Restoration Plan as part of the overall regional Water Quality Management Plan, OEPA would also add it to the state Water Quality Plan.

**Collaborative plans.** *Clean Water 2000* clarifies implementation and regulation roles in an urbanized area of the state where many local and state agencies are involved in water quality work. Despite the array of parties that collaborated to produce the plan, no binding legal agreement was necessary to bring them together to complete the document. The first 208 plan for wastewater facility planning placed NOACA in charge of reviewing plans and applications for funding of treatment facilities for consistency with local and areawide population projects. If NOACA found flaws with the application, it explained them both to the designated facility operator of that sewered area and the OEPA. The OEPA consulted that wastewater treatment entity on the risks of ill-planned facilities on inaccurate projections and decided whether a project should proceed.

**Selection of sewer service areas.** *Clean Water 2000* updated the region's designated facility managers and facility planning areas, after which counties updated their facility planning maps. As a result, the region's decision makers now have better knowledge of which local and county jurisdictions have the most responsibilities for wastewater facility planning. The maps have been updated to reflect how one wastewater facility ceded service to another because it lacked the means to extend service quickly or efficiently; to remove areas from an facility planning area that an entity no longer intends to extend service to; or, to show "option zones," areas that NEORS D may extend service to if agreement is reached with local officials in the future. When the OEPA accepts a 20-year wastewater plan, it will also be incorporated into the water quality management plan. *Clean Water 2000* states that the NOACA board must approve all future facility planning area boundary changes as well as that NOACA and NEFCO must both approve any changes that cut across their planning area boundaries. At the same time, the plan gives local governments the ability to manage growth inside their jurisdictions. A wastewater entity

cannot identify a future service area that a local government does not plan or desire to be sewered. Areas that remain unsewered are expected to meet existing and future more stringent requirements for on-site systems. NOACA's guidance over the planning process is ensured by a rule that the OEPA will not approve permits, loans, or grants without a consistency review by NOACA regarding accurate boundary definitions, local government sewerage plans, and population projections. When any disputes over boundaries for service provision to arise, NOACA has instituted the means by which an entity can retain its authority over the area or the conditions under which an aggrieved municipality can be transferred to another entity's facility planning area.

**Advocacy with state government.** NOACA staff also work to persuade state agencies to decide to change existing policies in order to encourage local action. In some instances, NOACA officials push for more stringent policies, such as asking the OEPA to require assessment and mitigation of impacts to critical water areas when it receives and issues its permit to install applications for new or increased discharges. In other instances, NOACA officials ask state regulators to rethink regulations that use criteria based on ideal "reference streams" that differ greatly from urban streams, which have more factors leading to their degradation. By promoting flexibility for the urban watershed planning process, NOACA believes it can unleash more local and community innovation and efficiency. NOACA acts to identify the region's priorities given multiple water quality issues. The plan asks OEPA officials to prioritize the enforcement of NPDES permits for construction site activity that can deteriorate plan-delineated resource waters and surface drinking water supplies. The identification of critical water resources also allows NOACA to inform state agencies how their programs – and changes to them – can protect these waters. NOACA's plan proposes that the state EPA reduce interest rates in its Water Pollution Control Loan Fund for applicants who upgrade their treatment facilities and increase their ability to treat septage that might otherwise contaminate clean waters.

NOACA's planning and forums make it a critical partner in advancing regional water management. As an entity that engages problems in one section of the state, NOACA must not only navigate the region's politics but also work within the limits imposed by economic and political conditions throughout the rest of the state. Many of NOACA's recommendations regarding management of septic systems have been passed by the state legislature. However, economic conditions in a distressed part of the state have prevented the state legislature from adopting all of NOACA's recommendations.

**Achievements of persuasion.** NOACA promotes regional water management within the constraints of its advisory capacity. While OEPA tells a local government if it can or cannot build a wastewater treatment plant, NOACA makes a recommendation as to whether the local government *should* build the plant – that is, whether building a new plant is the best way to use available funds and protect the region's water resources. NOACA's advisory role will be critical then in assisting rapidly growing communities finding ways to connect to the excess capacity in the NEORSD system; many outlying communities, however, are reluctant to join NEORSD as its combined sewer separation work will raise rates in the near term. In the long run, though, NOACA will have an important role in reworking facility planning areas as new communities join the NEORSD system and older package plants close down. NOACA's Water Quality Subcommittee was the forum in which county health departments negotiated the regional standard for increased septic tank oversight. Although NOACA is not a service provider with

decision-making authority over regional resources, it provides leadership in areas that other entities may be lacking. The OEPA's limited staff and resources to handle stormwater issues required NOACA to take a leadership role when developers became concerned about the wide variability in regulations in undeveloped parts of the region. NOACA convened a Task Force consisting of regulators, environmentalists, developers, and local officials to develop standard ordinances to be adopted throughout the region so that the laws were the same everywhere and so that communities could not use lax regulations to gain a competitive advantage.

Despite NOACA's limited influence over regional water quality management, it remains a critical regional resource for addressing regional water problems in a more comprehensive manner. As NOACA is a transportation and an environmental planning agency, its planning work can educate local decision makers about the interconnections of these infrastructure investments. Although it has no official statutory land planning role, NOACA also provides local elected officials with a forum to discuss and debate regional land-use planning matters. Overall, NOACA stands as an example of enhancing forward-thinking regional water resource management without a big regulatory hammer.

## **Milwaukee Metropolitan Area** *Southeastern Wisconsin Regional Planning Commission*

**Demographics.** The Southeastern Wisconsin Regional Planning Commission (SEWRPC) creates regional land use, transportation, and water plans for seven counties covering 2,689 square miles of land. The region is home to 154 local governments, excluding schools and special districts. The region's major urban centers are Milwaukee, Racine, and Kenosha. The 2000 Census recorded the region's population as 1,931,165. Over the next thirty years, the population will add between 200,000 and 500,000 people.

The southeastern Wisconsin region is endowed with five rivers, Lake Michigan shoreline, and more than one hundred lakes. Municipalities and towns draw water from Lake Michigan and a deep sandstone aquifer. Thirty-two inches of annual precipitation recharge these resources, although some new growth relies on small aquifers of limited capacity. The Commission claims that this resource wealth not only supported past residential, commercial, and industrial growth but also can serve the region for "all time to come," unless wasting it creates constraints for sound future development.

In the region, 477 square miles are served by public sanitary sewers; 420 of these square miles are within the Milwaukee Metropolitan Sewerage District (MMSD). Although close to 60% of the region's population is served by MMSD, many growing communities are outside of the MMSD planning area. By 2035, some 639 square miles should have public sewer and water supply services, more than 93% of the regional population.

**Birth and history of the agency's water resource management role.** Established in 1960, SEWRPC quickly established its role in regional water management. Regional floods that same year created bottom-up pressure for the agency to do more than transit planning. With the energetic leadership of Kurt Bauer, who was executive director from 1962 until 1996, SEWRPC integrated transportation, land-use, and environmental planning into one comprehensive approach. This early work was not simply flood mitigation research, but broad-based watershed planning. In 1975, SEWRPC became the region's state-designated and federally-recognized areawide water quality planning agency. Over time, SEWRPC's planners, engineers, biologists and other environmental research specialists have become a diverse environmental planning staff that possesses a wide range of expertise. Its water quality planning efforts stretch from the region's urban harbors to its best trout streams.

Addressing the region's water pollution problems has been an important SEWRPC role for more than twenty-five years. In 1979, SEWRPC developed the region's water quality management plan in accordance with Section 208 of the Federal Clean Water Act, a necessary precursor to Milwaukee Metropolitan Sewerage District's (MMSD) 1980 Facilities Plan. In 1987, SEWRPC prepared an estuary plan to combat pollution of the Milwaukee Harbor.

**Current scope.** SEWRPC's work remains essential to regional water management in the future. First, SEWRPC's plans guide the development and implementation of operations and programs on the local level. Second, SEWRPC staff work to create the frameworks for public involvement necessary to advance regional water management. SEWRPC does not operate or manage any of the region's water supply or wastewater infrastructure, but the entity does specialize in

developing and advancing comprehensive plans for regional water supply and for regional water quality management. In addition, SEWRPC officials work to coordinate land use and water planning. Its expertise in these areas has resulted in plans that shape how the Wisconsin Department of Natural Resources (WDNR) regulates water quality in the region.

### *Structure and Organization*

**Membership.** Each of the seven member counties has three commissioners in SEWRPC. One is appointed by a county executive, while the other two are appointed by the governor, who selects one of these individuals from a county-provided list. Customarily, most commissioners are from the private sector rather than recruited from the ranks of local public officials. The commission adopts policies and plans for the region as well as establishes an annual budget. Four standing committees – Executive; Administrative; Planning and Research; and Intergovernmental and Public Relations – are supplemented with advisory committees made up of elected and appointed public officials and expert citizens. Commissioners – especially those on the Executive Committee – provide leadership necessary to bring all interests into the decision-making process. They sponsor a planning process that benefits the region. SEWRPC’s planning programs, which are reviewed and approved by federal and state funding agencies, are carried out by five divisions: Transportation Planning, Environmental Planning, Land Use Planning, Community Assistance Planning, and Economic Development Assistance.

**Staffing.** SEWRPC’s 80 full-time employees include 43 professionals; the organization also relies on the talents of part-time employees and consultants. Overall, this staff’s skills include planning, zoning, operations, hydrology, engineering (including hydraulic engineering, civil engineering, and sanitary engineering), surveying, mapping, and ecological expertise in limnology, vegetation, and soils. The environmental planning division includes five engineers, four planners, one conservation specialist and four research analysts. Six biologists work with SEWRPC on natural areas planning, wetland and environmental corridor delineation, wetland mapping, and coastal management planning.

**Funding.** In 2006, more than 50% of SEWRPC’s \$7.3 million budget came from local sources. By state statute, SEWRPC has the authority to levy a tax apportioned to each county at no more than .003% of equalized valuation, although counties pressure SEWRPC to maintain the rate closer to .0015%. Annually, the levy generates one-third of the commission’s budget. One-quarter of SEWRPC’s 2006 revenue, which is also its most variable, came from its local contracts. The third of its budget from the federal government is nearly all for transit, leaving just 6% of the budget derived from state monies. Much of SEWRPC’s environmental planning work began in the 1970s when state and federal funding opportunities were more abundant. Nevertheless, revenues from the county levies and contract work allow SEWRPC to continue its environmental planning, with 90% of SEWRPC’s water planning work funded with revenue from its levy.

### *Regional Water Management Policies, Practices, and Programs*

**Multiple planning roles.** As the region’s water planning experts, SEWRPC works closely both with state and local agencies. SEWRPC executes **plan and permit reviews** necessary to abate pollution. It also **develops data** for statewide water quality and watershed management

programs as well as county land and water resource management programs. SEWRPC conducts **watershed planning** and assists in **facilities planning** beyond MMSD boundaries. Sewer or water utilities hire consultants to create facilities plans, but these plans require SEWRPC data as well as SEWRPC and WDNR review, including SEWRPC review for consistency with its regional plan.

SEWRPC assists local governments in their design and implementation of **local water-quality plans**. After adoption of the 1979 Regional Water Quality Management Plan, SEWRPC staff worked with county land conservation departments, local planners, lake protection and rehabilitation districts, and sewage treatment plant operators to improve facilities and programs. SEWRPC's 1987 Planning Report supported efforts by the WDNR and MMSD to improve the water quality of Milwaukee Harbor estuary by controlling separate and combined sewer overflows. More recently, SEWRPC created subregional stormwater plans for incorporated communities and their surrounding unincorporated areas. Upon request, SEWRPC has provided technical assistance to build detention ponds to reduce stream pollution. The state's stormwater discharge permit system compels most communities to action, and SEWRPC remains committed to producing detailed plans for local governments that seek their services. SEWRPC's Regional Water Quality Management Plan Update may contain recommendations that would support the establishment of storm water utilities to advance this work.

SEWRPC's expertise allows it to **promote intergovernmental cooperation**. SEWRPC develops a regional map of all sewer service areas, watershed boundaries, and the status of sewer extension plans in each area. In delineating sewer service areas, SEWRPC identifies possible areas to consolidate service. MMSD's primary service area is Milwaukee County, although it does provide service to all or parts of ten communities in four neighboring counties. Any extension of MMSD service beyond Milwaukee County requires approval by the MMSD and SEWRPC. SEWRPC staff participates in intergovernmental meetings to facilitate local agreements to create **interconnections in sewage facilities**, most recently in the Racine area. SEWRPC officials estimate that their recommendations have resulted in 12 to 15 treatment plant mergers or joint contracts, often while avoiding creation of separate units of government. As a result, over the past two decades, the number of public treatment plants fell from 62 to 48, while one new plant was added. Ten of the abandonments involved connections to the MMSD system. Three involved the Walworth County Metropolitan Sewerage District. Although communities were initially reluctant to abandon plants, they did so because the SEWRPC's respected analyses indicated it was cost-effective. Two more abandonments are scheduled by 2010. With plant arrangements approaching the optimal level, the trend is unlikely to continue.

SEWRPC's regional water planning makes it possible for the Milwaukee Metropolitan Sewerage District to employ a **watershed approach** to plan its future facilities. MMSD's strategic planning was initiated by the Clean Water Act, which resulted in the 1977 Milwaukee Water Pollution Abatement Program. The MMSD now develops facility plans every 10 years, which each plan developed for a 20-year period. In executing its 2020 plan, MMSD will improve infrastructure such as treatment plant capacity and storage tunnel volumes; advance policies that minimize storm water inflow into sanitary sewers; and improve efficiency or effectiveness within the system. MMSD's collaboration with SEWRPC on watershed planning better positions it to receive state and federal funding. SEWRPC officials also were able to establish relationships with and conduct investigations in areas of the watershed that extend beyond the seven-county



planning area. SEWRPC's assessment of regional water quality management needs allows the MMSD to employ its limited financial resources and infrastructure to achieve maximum environmental benefits. The cooperation of MMSD and SEWRPC gives MMSD a watershed context for demonstrating tradeoffs of alternative projects and for identifying the best places to invest capital for the long-term benefit of its system and customers.

MMSD and SEWRPC have both advanced **flood management** programs, particularly after destructive flooding in the region in 1997. Flood management projects include establishing floodwater basins and easements, building berms and floodwalls, improving stream corridors, flood proofing property, and instituting best management practices for stormwater. MMSD's Greenseams program protects lands with water-absorbing soils. MMSD works with the national non-profit, The Conservation Fund, to assist a local community or land trust to own and to manage land as conservation easement held by MMSD. MMSD protects homes and businesses from flooding to prevent floodwater from entering the sewer system. Flood proofing property eliminates the need for basement floor drains that funnel water into the sanitary sewer system. To date, MMSD has spent \$200 million on flood management projects and planned \$300 million of work for the future. SEWRPC's long involvement with the region's flooding problems has resulted in flood hazard mapping of more than 1200 miles of rivers and streams. SEWRPC created its first comprehensive plan for the Menomonee River watershed in 1976; in 1990, SEWRPC prepared a plan for the MMSD to develop storm water drainage and flood control measures. SEWRPC has also supported MMSD research into removing concrete channel lining in the Menomonee and Kinnickinnic Rivers as well as collaborated with the United States Army Corps of Engineers (USACE) on its studies of the Des Plaines River. SEWRPC plans inform regional efforts to lock floodplains into place to avert problems that would otherwise emerge with increased urbanization.

The Milwaukee area's sensitivity to flood control and water management also draws on a second prominent misfortune from the 1990s. In 1993, heavy rainfall and inadequate filtration spawned contamination of Milwaukee's water system by the parasite *Cryptosporidium*. A massive outbreak of illness resulted, affecting approximately 400,000 people and causing 50 deaths. Following this episode, the city of Milwaukee launched an \$89 million upgrade of its water facilities; it is now considered a model of advanced online water quality monitoring technology, and its water is a highly sought-after resource throughout the region. (There is no evidence that the outbreak resulted from any planning failure by SEWRPC.)

**A state-regional memorandum on water quality roles.** SEWRPC and MMSD, in conjunction with the WDNR, initiated coordinated regional water quality management in 2003 by committing to the watershed approach to water quality and facilities planning. In their 2003 Memorandum of Understanding, the entities agreed to cooperate on their common missions to protect public health and the environment in cost-effective ways. Joining efforts will permit more efficient and effective reduction of sewage overflows, flooding, polluted runoff and waterborne disease risks. The Memorandum achieved the full backing of leaders in all agencies for a new level of collaboration among staff from different organizations that had built up much trust from years of working cooperatively. The Memorandum also promoted collaboration throughout the region. Without MMSD supplying much of the funding, the Regional Water Quality Management Plan Update may not have been possible. Without SEWRPC's respected expertise, upstream watershed communities might not have participated. The Memorandum also

secured the organizations' consent to arrive at agreements over funding and analysis responsibilities for public involvement and water quality evaluation tools to complete the cooperative planning process.

The Memorandum specified the planning work that required extensive cooperation. Three projects required the joint work of SEWRPC, MMSD, and the MMSD's consultant team: watercourse modeling; Milwaukee Harbor and Lake Michigan water quality modeling; and, evaluation of best practices for pollution abatement. In addition, SEWRPC worked with WDNR to produce the regional water quality management plan, while the MMSD handled its facilities planning. The WDNR participated in research and analysis, reviewed plans throughout the process, and approved the scope of these final plans. A consultant team carried out technical work specified by SEWRPC and MMSD. All three entities encouraged citizen involvement and contributed to database development necessary to complete the work in compliance with court orders and United States Environmental Protection Agency (EPA) policies.

The Memorandum also delineated each organization's particular responsibilities in the planning process and the duty of the parties to respect these traditional roles and authorities. As the regulatory authority, the WDNR set water quality standards and implemented the Clean Water Act. As the regional planner, SEWRPC ensured that water planning was consistent with land-use planning. As the manager of the region's largest wastewater treatment facilities, the MMSD handled the research, recommendation, funding, and implementation of sewerage and flood management facilities and programs.

**Current status of water quality and water supply planning.** Two plans currently in development by SEWRPC will guide future regional water quality management. SEWRPC Planning Report No. 50, A Regional Water Quality Management Plan Update for the Greater Milwaukee Watersheds, relies on the EPA watershed approach to meet Clean Water Act Section 208. The plan is a framework for managing surface water in the region that will abate existing pollution problems – especially WDNR regulations for total maximum daily pollution loading – and potentially eliminate future pollution problems. The four elements of the plan address: land use, point source pollution abatement, non-point source pollution abatement, and groundwater. Establishing strong institutions to carry out the plans, developing economical and efficient programs, and supporting collaboration throughout the region are all necessary for the success of the plan. Local communities must maintain sanitary service areas, manage storm water, update sewerage system facilities, and integrate land and water resource planning.

SEWRPC Planning Report No. 52, A Regional Water Supply Plan for Southeastern Wisconsin, examines how the region can eliminate existing water supply quality and quantity problems as well as avoid them in the future. The principles guiding the plan emphasize that water system supply planning must be carried out in conjunction with land-use planning and that land use and water supply planning must acknowledge that natural resources are limited, including water from the Great Lakes and groundwater aquifers. The plan documents water supply service areas, forecasts demand for future use, identifies existing and potential water supply problems, proposes conservation efforts to reduce demand, maps groundwater recharge areas for protection, and analyzes development constraints posed by maintaining a sustainable water supply. The report sketches out and evaluates an array of means to meet water supply problems and recommends sources and infrastructure needed to deliver the supply as well as explains what

new entities would be necessary to provide these services. The completed plan will identify and advocate the smaller suppliers that can be combined for cost savings. Recommendations for conservation may ultimately be achieved through policies set by utilities and statewide measures. As with regional water quality management planning, SEWRPC indicates that without the refinement of water supply service areas, local water supply plans that contribute to the regional plan, and adaptation of the regional plan to local and county comprehensive plans, water supply goals cannot be met.

Because these plans address similar resources, SEWRPC officials have coordinated the development of the two plans. For example, drainage basin withdrawals and sewer system discharge requirements were studied in tandem. Both plans also indicate how to protect groundwater recharge areas and how to manage stormwater in order to maintain existing hydrologies.

The outcome of the collaboration of the MMSD, SEWRPC, and WDNR should be a cost-effective and workable plan to abate water pollution throughout the region's six watersheds. These entities intend to advance integrated water planning and management by incorporating the MMSD's 2020 facilities planning and flood management systems. Fully funded programs may save the region money in the long run as it will be able to shift from monitoring to modeling. However, fiscal constraints can limit actual operations; indeed despite SEWRPC's cooperative planning with the WDNR on the first areawide water quality plan, inadequate funding restricted SEWRPC work to sewer service area planning, groundwater inventories, and local projects such as conducting cost-effectiveness analyses for new sewer service connections. At the very least, SEWRPC officials expect people to develop a better understanding of their community's influence on watersheds and regional water quality. Continuing to improve water quality will raise costs of wastewater treatment throughout the region, but some of these costs will be offset by having a plan that prevents wasteful expenditures building unneeded facilities. Moreover, the cost of meeting and exceeding water quality requirements costs less when the knowledge exists to implement the most cost-effective solution.

As both the SEWRPC planning area and the region's watersheds are larger than any one entity exerts control over, planning, programming, and cooperation is important not just among MMSD, SEWRPC, and WDNR, but also with other agencies and experts. Among the planning efforts that also contribute to regional water quality management are county land and water resource management plans; "smart growth" plans at the local, county, and regional level; and WDNR basin planning in addition to the sewerage system facility plans, stormwater management plans, and land-use plans of communities throughout the region. However, despite the fact that state law requires communities to adopt long range plans, the law does not mandate consistency with the regional land use plan. Nevertheless, the planning effort will have attempted to balance urban and rural considerations; to develop cost-effective ways to reduce point and non-point source pollution; to restore and to mitigate past and future urbanization impacts; and, to determine where diminishing returns on pollution control set in, which are critical in times of scarce resources. The effort will result in detailed recommendations for local governments to act upon to improve pollution control.

### ***Decision-Making Processes for Regional Water Management***

Following its designation as the areawide water quality planning agency, SEWRPC took the lead in determining where the region's sewer systems would extend. By **delineating sewer service areas**, SEWRPC guides proposed development. In reviewing proposals for sewer extensions, SEWRPC examines whether development will occur in an approved sanitary sewer service area or compromises environmentally sensitive land. As a result, developers look at planned sewer areas first when they begin to make decisions about building projects. **The state does not issue permits for new sewer construction that do not conform to SEWRPC plans.** The WDNR insure implementation of the SEWRPC plan by tying the plan's adoption to the state agency's regulatory decisions. The state's regulatory actions are legally bound to conform with what SEWRPC developed in its original Regional Water Quality Management Plan, although officially SEWRPC remains an advisor to the state. In this regard, the state is not making decisions for local people, but rather keeping decision-making among the region's leaders to work together to find the best solution.

Inside SEWRPC, planners attempt to **coordinate land-use and water planning** in a comprehensive manner. The commission prioritizes projects that cross community boundaries and have a regional impact. SEWRPC uses land-use planning to discourage development that will require costly extension of services and to encourage development of areas in need of system development, which minimizes environmental impacts and public expenditures. Because SEWRPC's Regional Land Use Plan for 2035 was completed before the Water Supply Plan, the land-use plan may be amended and revised according to water supply planning needs. The state also requires communities to adopt "smart growth" plans regarding land use, utilities and community facilities, and intergovernmental cooperation by 2010 or lose their ability to enforce zoning, land subdivision, and mapping against aggrieved parties. And, conversely, state administrative rules limit sanitary sewer construction to areas planned as sanitary sewer service areas, areas which are established in the regional land use planning process.

**State-regional cooperation.** Managing water regionally emphasizes decision making and cooperation across entities and levels of government. For example, the region's water supply planning proceeds on two levels. The State's Groundwater Advisory Committee will make two reports to the state legislature regarding this resource, which will in turn become recommendations for the state's designated groundwater management areas. SEWRPC hopes its supply plan will be sophisticated enough to become the model for these recommendations. To create such a plan, SEWRPC led a cooperative team consisting of commission staff, consulting engineers and lawyers, and hydrogeologists from the Wisconsin Geological and Natural History Survey, United States Geological Survey, and the University of Wisconsin-Milwaukee. Additionally, its Advisory Committee on Regional Water Supply Planning, which included municipal and county officials, academics, and business and industrial leaders, guided, reviewed, and approved the plan.

Regional water quality planning with the 2003 Memorandum also necessitated decision making that integrated different entities and interests. An Oversight Committee consisting of two individuals from the MMSD, SEWRPC, and WDNR, appointed by each agency, facilitated collaboration. The Oversight Committee's approved each agency's work plan. Its regular meetings kept critical project managers in contact and allowed for the agencies to ensure coordination of their studies. The Oversight Committee's role also negotiated and resolved any disputes arising from work plans or technical committee meetings. The Memorandum did not

impose a single method of collaboration, but instead allowed for coordinated planning programs as well as joint work. The parties agreed to make decisions in terms of a comprehensive watershed planning framework. In addition, scientific evidence for cost effective and feasible means of water management will guide selection of strategies that most improve water resources at the least total cost to the region. Examining how to most improve water quality at the least cost comes first; after developing the best plan, the entities will assign implementation responsibilities for new policies, new and repaired infrastructure, and new programs.

The memorandum also required the organizations to cooperate on **public involvement**. SEWRPC and MMSD established shared committees, and their close communication allowed them to avoid duplicating each other's efforts to prepare and to distribute information and educational materials. The strategies to create public involvement included the creation of advisory committees, the sponsorship of cooperative actions relying on public involvement, and watershed education efforts. MMSD officials stressed the "truly collaborative" public involvement. Advisory Committees brought a wide array of talents and interests into regional water management activities. The committees involved in the regional water quality management plan update were classified as technical, intergovernmental, and citizen.

SEWRPC has created a Technical Advisory Committee composed of municipal wastewater and water infrastructure staffs, academics, business and agricultural enterprises, and community and environmental organizations. A similar group was convened to create the 1979 Regional Water Quality Management Plan. SEWRPC-sponsored advisory committees generally draw upon prominent state and regional experts. Inside this peer group, many political issues are addressed and eliminated through consensus arrived at by these leaders. These committees thoroughly review and critique SEWRPC draft plans and receive responses to all of their questions and concerns. Several members of the SEWRPC committee also served on the MMSD technical advisory team, and the committee's work was supplemented by a subcommittee that reviewed waterway and harbor modeling projects. The Technical Advisory Committee developed and reviewed two critical SEWRPC reports, the aforementioned Planning Report 50 and Technical Report 39 – Water Quality Conditions and Sources of Pollution in the Greater Milwaukee Watersheds.

The region's governments also participate in the **Watershed Officials Forum (WOF)**. The chief elected representative and their planning or engineering designees of every county, city, village, and town are involved in the forum. Forum events could be called by SEWRPC, MMSD, or jointly to address particular questions. Attendance at each event is optional. In these meetings, local officials both received briefings and provide feedback. The MMSD did occasionally meet with the Milwaukee County Intergovernmental Coordinating Council, a subset of officials from the WOF, to solicit additional input beyond its Technical Advisory Team consisting of these municipalities' lead engineers. However, in the earliest stages the WOF was primarily educational and allowed limited input. The WOF will be most active and most engaged when presented with and asked for responses to various alternatives to improve regional water management.

SEWRPC and MMSD also engage with a **Citizens Advisory Council (CAC)**. Leaders in the Watershed Officials Forum recruit citizens, business and industrial representatives, and environmentalists to serve on this council and to discuss issues in particular watersheds.

Although meetings have focused on local watershed issues, attendees freely contribute comments about watershed-wide and regional issues. By contributing to the development of policy and shaping decisions, the public has obtained some “ownership” of the decisions and given its “informed consent,” which MMSD officials hope will reduce polarization regarding MMSD problems. These plans have also identified stakeholder roles and responsibilities to help improve water quality in an attempt to generate a sense of stewardship and expectations.

Collaboration is not limited to these three committees, however. SEWRPC officials advance regional water management planning by extending discussions with interested groups. SEWRPC makes presentations to county land conservation staff and county comprehensive plan committees. The Milwaukee River Basin Partnership sends members to meetings of the Technical Advisory Committee, but SEWRPC and Oversight Committee members also attend the Partnership’s meetings to provide and to gain more information about areawide planning. Basin partnerships as well as smaller county or town association meetings are also venues in which interested municipal officials obtain briefings and provide feedback. In addition, extensive regional water management planning creates opportunities to involve additional SEWRPC staff. Given SEWRPC’s effort to integrate land-use and water planning in smart growth programs, SEWRPC staff with specializations other than water issues may also work with the Watershed Officials Forum to reduce demand for participants’ time in multiple meetings.

At the same time, SEWRPC and MMSD also rely on internal committees in their planning. SEWRPC has a Technical Advisory Committee, while the MMSD has a Technical Advisory Team and a Policy Committee. In MMSD Facilities Planning, the Technical Advisory Team consists of engineers and public works directors in the MMSD service area as well as county, state, and federal representatives. This committee addresses water quality planning, levels of service, local sewer and flooding issues, and infiltration and inflow reduction. The MMSD Policy Committee, a group of MMSD commissioners, and MMSD service area politicians and public works officials met infrequently to discuss MMSD planning; meetings were open to SEWRPC officials. Nevertheless, those interviewed believe that the CAC and WOF contributed the most to SEWRPC and MMSD’s coordinated planning processes.

**Major public events.** Regional water quality management required establishing additional outlets to distribute information and encourage involvement. To this end, a 2004 “Clean Rivers, Clean Lakes” Conference drew 270 participants. A similar 2006 event drew more than 400 attendees. Both SEWRPC and MMSD spread news about their joint efforts and accomplishments in newsletters. A project website linked all of the activities of various partners in the planning efforts and avoided duplicating information provided on partners’ websites. Planning fact sheets were produced in collaboration with university extension services, which specialized in recruiting local officials for ongoing education and training. Finally, public informational meetings and open houses have been held periodically to solicit additional input from individuals not already formally participating in the planning processes.

**High-tech planning.** As the region proceeds to carry out its plans, sophisticated water quality models and simulations will be used to assess the performance of the individual facilities making up the system and the system’s overall quality. Planning objectives will guide the approach

water managers use throughout the region, but scientific data will be used to assess spatial distribution and capacities of facilities to support the land use plan.

**A cooperative vision.** Wisconsin's comprehensive planning law does not mandate that local plans remain consistent with the regional plan, so SEWRPC cannot achieve its plans purely by mandate. Should a municipality disregard the regional land-use plan in such a way as to risk the realization of intended environmental benefits, it is possible that state or federal regulators would use their regulatory authority to compel the municipality to reconsider its action. However, SEWRPC prefers to see private landowners and conservation groups cooperate to bring its planning vision to pass. SEWRPC remains committed to a long-term planning vision in which its superior work and attempts at persuasion result in eventual recognition of the merits of their plans and their ultimate implementation, albeit perhaps with some modification over time. Moreover, it believes that developing and executing a regional plan remains the best way to bring together local, state, and federal agencies to improve management of regional water resources.

## **Minneapolis – St. Paul** *Metropolitan Council*

**Demographics.** The Metropolitan Council (Council) serves the Twin Cities metropolitan area of east central Minnesota. It plans for and provides select services in seven Minnesota counties covering 2,970 square miles of land. The region is home to 188 cities and townships. The 2000 Census recorded the region's population as 2,642,056. The region's major urban centers are Minneapolis and St. Paul. The seven-county population is projected to grow to more than 3,500,000 in 2030.

The Twin Cities metropolitan area is endowed with three rivers, hundreds of lakes, and deep aquifers. Municipalities and towns draw water from its rivers, reservoirs and groundwater wells. On average, 28 inches of annual precipitation recharge these resources, although ongoing growth beyond the central city water system is generating concern about the limitations of aquifers and wells to sustain this growth. The region's leaders believe that high-quality water is a necessary ingredient to sustain industry, commerce, agriculture, the quality of life sought by skilled workers, and tourism.

**Birth of the Council and its water management role.** Water pollution problems played an important role in the formation and evolution of the Metropolitan Council. Suburban growth during the 1950s and 1960s depended heavily on septic tanks that contaminated household wells. The severe pollution caused the Federal Housing Administration to consider cease issuing mortgages for homes that were built without connections to a centralized wastewater treatment system. Local leaders recognized that the region's water pollution and transportation problems, which transcended more than 200 jurisdictions, could not be solved by the established governments. In 1967, the Minnesota state legislature established the Metropolitan Council to coordinate planning and development in order to address the region's problems. In 1969, the Metropolitan Sewer Board was established, consolidating 33 of the region's facilities under the management of one entity. Between 1974 and 1994, a series of state laws and acts gradually consolidated policymaking, land-use planning, water supply and areawide water quality management planning, and other services into the Council's hands; in 1994, the Council and the wastewater utility were integrated. The wastewater division, Environmental Services, now directly manages the region's wastewater treatment operations in eight facilities.

Minnesota's legislators and state environmental regulators have also broadened the Metropolitan Council's role in planning the uses of, cleaning, and protecting the region's water resources. State law requires the Council to develop a water resources plan to achieve state and federal water quality standards. The State has also issued mandates for water supply plans and pollution load plans. Under state law, local governments help contribute to regional water management by creating plans that do not conflict with the Council's metropolitan system plans.

The Metropolitan Council's ownership and management of regional wastewater infrastructure is the basis for its central role in regional water management. The Council's ongoing work to advance regional water management includes convening a Water Supply Advisory Committee. In preparing the Twin Cities Area Water Supply Master Plan, the Council intends to consolidate technical information, establish an institutional framework for long-term coordination, and



promote interconnection projects to increase the reliability, security and cost-effectiveness in the region's 121 communities that use 106 separate systems.

### *Structure and Organization*

**Membership.** Minnesota's Governor appoints and Minnesota's Senate confirms the Council Chair and the sixteen Council members, who represent sixteen districts that contain equal populations. The entire Council meets once monthly in public. Each Council Member serves on two of four standing committees: Community Development, Environment, Management, and Transportation. These committees hold two meetings each month. Council members may also serve on specially created or short-term citizen advisory committees formed to address particular policy questions. The Environment Committee executes the Council's legal work such as authorizing real estate purchases, reviewing citizen petitions, awarding contracts, and holding hearings.

**Funding.** In 2005, almost 95% of the Council's revenue consisted of federal and state funds and the Council's charges for wastewater and transportation services. In 2004, Environmental Services, one of the four operating divisions, generated nearly 90% of its revenues from municipal wastewater charges and almost 9% of its revenues from industrial wastewater charges. In 2005, the Council reported that Environmental Services produced \$180,309,500 in revenue and made \$107,161,987 in expenditures.

**Staffing.** Council members and Metropolitan Council Environmental Services (MCES) staff collaborate to advance regional water management. The Council's planning efforts establish guidelines for ensuring that the region's water resources are available to support growth and are used with care and equity. The Council's planners create policies and programs to reduce pollution of the region's waters and to minimize costs of maintaining effective water supply and wastewater treatment systems.

The Council's water management policies and practices are developed and executed by MCES staff. These 680 employees carry out water supply planning, water resources assessment and management, watershed management coordination, river and lake monitoring, wastewater treatment, permitting, research and development, biosolids management, metering, pollution prevention, and billing.

**A major service role.** The leadership that the Council provides in regional water management emanates from the **wastewater service system** it operates. Although each municipality in the region owns its sewage collection system, MCES owns and operates a network of interceptors and treatment plants. Its responsibility to protect a system essential to the health and economy of the region gives the Council **authority to reject local plans** that have potential adverse effect on this system. Moreover, the revenue that the wastewater services generate (and that state and federal grants supplement) allow MCES to carry out an array of functions such as water quality testing and management of watershed programs.

**Integrated planning.** The Council's role as the metropolitan planning organization for the region and its responsibilities to plan for the region's future growth also influence its regional water management strategies. In 2004, the Council adopted its 2030 Regional Development

Framework, a guide to its policies on land use, transportation, housing, and natural resources. In 2005, the Council adopted its 2030 Water Resources Management Policy Plan. The land-use policies in the former inform and are integrated with the water policies in the latter. The responsibility for water management in the Metropolitan Council is divided between the council's appointed Members and the council's employees that provide regional services. The Council's regional water management plans include water supply, surface water, and wastewater.

### ***Regional Water Management Policies, Practices, and Programs***

The Council's **water supply planning** is undertaken to maintain a regional water supply that is sufficient, uncontaminated, and conserved. Although the Council itself does not operate as a water supplier, it nevertheless attempts to prevent problems arising from population growth in areas lacking sufficient resources; water losses from draught or impervious surface expansion; and aquifer contamination. To these ends, the Council updates the regional water supply plan and reviews local water supply plans; creates subregional task forces to assist communities facing water supply shortages; promotes conservation efforts and development practices that protect the region's water supply; and develops a framework to coordinate regional and subregional water supply planning and management.

The Council supports regional water management by coordinating and cooperating with its local governments and state agencies. State law requires the Council to develop both short and long-term plans for water use and supply in the Twin Cities metropolitan area. State statutes give Council the role of evaluating local plans for consistency with Council and State Department of Natural Resource requirements. Minnesota has also authorized the Council to research the region's water supply and to develop demonstration projects for its conservation. Fulfilling these mandates allows the Council to understand water supply issues in a regional way that isolated communities cannot, making it possible for communities to work together to guarantee efficient water supplies and to establish interconnections to sustain and to conserve water resources. The Council's publication "2004 Water Demand and Planning in the Twin Cities Metropolitan Area" – an update to the long-term water supply plan – demonstrates comprehensive knowledge of water supplies in terms of the number of suppliers and per capita water use throughout the region; the array, quality, and reliability of water sources of municipal suppliers; conservation issues; and types of programs that can sustain the region's ample and high-quality water supply. The Council initiated an investigation of the correlation of the various water conservation programs of the region's municipalities and their residential per capita water demand, which if developed more fully, could indicate which programs best conserve water and reduce costs of providing it.

The success of the Council's long-term water supply planning will depend in part on establishing funding mechanisms to advance water supply research and projects that benefit both individual communities and region. The Council intends to create institutions to support this work and is leading efforts to create a framework with the Metropolitan Water Supply Advisory Committee. The Council encourages communities to work together to develop water resources to increase economic and resource efficiencies as well as to implement more environmentally sound water use practices. The Council is also investigating how it can contribute to the region's water supply by finding uses for its treated wastewater effluent.

The Council's **surface water management** work is undertaken to reduce non-point source pollution of the region's rivers, lakes and streams. Council leaders believe that protecting water quality and reducing stormwater runoff will continue to support the region's economy and quality of life. The Council measures its efforts by assessing whether water leaving the metropolitan area is as clean as the water entering the metropolitan area and by being in compliance with state and federal regulations. To maintain and to improve water quality, the Council: monitors water quality in lakes, rivers, and streams; provides technical assistance to its partners in instituting best management practices; and reviews an array of local and watershed plans as well as environmental permits to ensure that communities meet their pollution reduction requirements. MCES review of local plans means that the plans will not only control surface water inside municipalities but that these plans will also work towards – and not conflict with or undermine – regional goals.

**Cooperation with watershed organizations.** Much of this surface water management work takes place in conjunction with organizations outside of the Council. State-authorized watershed management organizations (of which there are 14 in the metropolitan area) prepare surface water management plans to protect water quality, establish uniform local policies and controls, prevent erosion, promote groundwater recharge, and minimize capital expenditures necessary to correct flooding and pollution problems. State laws require local communities' plans to meet the standards set by watershed management organizations. The Minnesota Pollution Control Agency also has water quality standards for each river or stream in the area, which allows water quality tests to identify which streams need attention to meet pollution discharge limits, especially Clean Water Act TMDL calculations. But the state has also made the Council responsible for establishing target pollution loads that assess current pollution levels in watersheds entering the Mississippi, Minnesota, and St. Croix Rivers and the future water quality goals that ensure the metropolitan area is not adversely affecting waters that run through it. In this work, the Council collaborates with local and state bodies to reduce non-point source pollution of wetlands, lakes, streams, and rivers.

The Council's most important water management role is operating the **metropolitan wastewater collection and treatment systems** that support the region's ongoing development. The Council's planning efforts are essential to investing \$3.7 billion over twenty-five years to maintain, replace and expand facilities. Conducting this work on a regional scale allows efficient building and operations for decades into the future.

The Council focuses on cost-effective expenditures and investments that accomplish the most with available regional funding. For example, the Council has found that inflow and infiltration into its system are undermining its efficiency; as a result, the Council has established a surcharge-funded program to help communities reduce the amount of water leaking into the wastewater system and to recover the costs of the water that continues to do so. In addition, the Council has established criteria to bring rapidly growing rural areas into its system, even as it has continued to help monitor private wastewater systems subject to the state pollution control agency's rules. A second surcharge, known as the Service Availability Charge, is levied when a municipality issues a building permit for new construction or renovation that will increase demands on the wastewater system. This one-time fee both provides revenue to MCES and informs planners where development is occurring.

MCES operates eight wastewater treatment plants that treat 300 million gallons of wastewater each day carried through 600 miles of regional interceptors collecting wastewater from 2.5 million people in 103 communities. MCES also treats wastes from septic tanks and smaller wastewater facilities in the region. In providing these services, MCES's compliance rate with its state and federal water quality permits is 99%. The Council's capital improvement program for the system involves maintaining existing infrastructure, expanding system capacity, and improving the quality of the system with new treatment technologies and processes. The \$3.7 billion that the Council will spend on an inflation-adjusted annual basis equals the spending levels for the previous 25 years. Projected capital investment includes 55% for maintenance, 42% for growth, and 3% for quality improvements. However, capital investments are not expected to cover potential regulatory changes or the inflow and infiltration programs. The capital improvements derive primarily from general obligation bonds; debt service will increase through 2010 when grants expire and metropolitan funding reaches 100%.

**Setting inflow limits.** Given the extent and complexity of this system, the Council strives to protect it and to enhance its efficiency. Reducing the infiltration of groundwater and the inflow of precipitation is among the Council's priorities to maximize the system's capacity to serve the region's ongoing growth. The Council decided not to add capacity to accommodate inflow and infiltration, but instead to require communities to eliminate excessive inflow beyond their planned peak-hour capacity. The Council demands that communities plan to reduce or to maintain this problem at an acceptable level and provides technical guidance to do so. Communities will study their problem as well as prepare schedules to improve their systems. The Council's Surcharge Program, beginning in 2007, will collect funds to assist communities that need revenue to solve their problems; the amount charged to each local government will be based on how much water it is permitting to infiltrate the wastewater system. Moreover, after 2013, the Council will ask the state Pollution Control Agency to **deny sanitary sewer extensions** to communities that do not resolve the issue to limit future wastewater services. In addition, the Council will institute charges to defray the costs of handling this infiltration and inflow into the system. The Council also has policies to decommission interceptors that do not benefit the region; to continue striving for near-perfect compliance with its permits as well as to reduce phosphorus and mercury pollution; to treat seepage waste trucked to its facilities; to maintain wastewater rates that allow MCES to meet regulatory requirements; to repair infrastructure; and to create capacity for planned growth.

To maintain regional water quality in places where its infrastructure does not reach, the Council **reviews rural community plans** for private wastewater treatment. In most instances, the Council checks whether plans conform to state Pollution Control Agency rules. Although the Council does not provide financial support to failing systems, it can connect a failing private system to the metropolitan system if capacity is available and the community can cover the cost. MCES is committed to treating all septage that originates inside the metropolitan area (and, in some instances, outside the metropolitan area) in order to protect regional water quality. The Council has set the charge for treating this septage at a level that reflects the actual cost of the service.

The Council also funds and conducts **water quality research** that helps it assess the effectiveness of its wastewater treatment and quality of incoming water supply. This research extends beyond monitoring to confirm effluent discharge (although that takes place, too) and also

tracks regional trends. The Council's river monitoring network consists of 70 sites, and 19 of them are used routinely. MCES researchers have studied whether pollution reduction is result of particular mitigation programs or of environmental processes like sedimentation which shifts but does not eliminate an environmental problem. Council research indicates that point-source control and decreasing levels of total ammonium nitrogen, 5-day biochemical oxygen demand, total Kjeldahl nitrogen, fecal coliform and nitrate plus nitrite nitrogen followed implementation of the 1972 Clean Water Act. Spending \$350 million to upgrade the Metro Plant and to separate combined sanitary and storm sewers has reduced overflows. This ongoing research identifies pollution problems and keeps them on the Council's agenda. The respected monitoring capabilities of MCES have led the state Pollution Control Authority to contract some work with the Council.

### *Decision-Making Processes for Regional Water Management*

**A prominent land-use policy role.** Council members recognize that, like transportation policy, wastewater system investment and services shape growth and its environmental impact. The Council's decision making and policies regarding its wastewater services are based upon the different types of areas in the region. The Council **classifies urban and rural areas and their local governments** in the regions as: Developed Communities, cities where more than 85% of land is developed; Developing Communities, cities where 60% of new housing and 40% of new jobs will occur; Rural Growth Centers; Diversified Rural Communities; Rural Residential Areas; and Agricultural Areas. These distinctions allow the Council to set different policies for different areas as well as to work with local communities to develop or to preserve land. These distinctions also allow the Council to set priorities for wastewater system investments. The Council sees these priorities as maintaining current infrastructure; reducing excessive inflow and infiltration; providing additional capacity; and, supporting growth in Developing Areas and Rural Growth Centers.

**Regional-local interaction.** Although the 2030 Plan establishes the Metropolitan Council's policies for 25 years, frequent analyses and exchanges with local communities occur. The Council updates its regional water supply plan every ten years by evaluating existing and expected water use and supply, assessing water supplies throughout the metropolitan area, and considering alternatives means to meet demands. The Council's long-term plans are not rigid, but instead subject to continual updates as new needs and problems become apparent. The Council's planning and collaborative roles support the region's effort to keep its competitive advantage and to limit future water problems.

For example, Council establishes subregional task forces to deal with particular water supply problems and participates in projects that bring together officials from all levels of government. The Southwest Metropolitan Groundwater Work Group convenes to find ways to meet water demands efficiently while minimizing adverse impacts to other communities and natural resource bases. The informal forum for sharing information and discussing plans led to agreements between the state and local suppliers as well as plans to share some supplies that may lead to ongoing long-term cooperation. This group's success became a model for the Northwest Metropolitan Water Supply Work Group, which meets to address water supply in another rapidly growing area. The Council's also participates in Technical Advisory Committee that coordinates the resources of a city and county along with the expertise of state and watershed district officials

to address potential impacts of a municipal well field on private wells and a trout stream. State health, pollution, and resource officials as well as Council and city officials coordinate to protect Mississippi River water that is a supply source for many municipalities.

The Council believes that the water leaving its area should be of the same quality as the water arriving in the area. To achieve this goal, the Council has combined the control of point and non-point pollution sources into a single policy. The Council views local plans that lack local surface water management plan and a stormwater-erosion-sediment control ordinance as incomplete because these plans could affect the Council's system plan. The Council insists that all local plans must meet the Council's system plan so that the Minnesota Pollution Control Agency will permit all planned Council projects.

MCES plans regarding **wastewater service extension** take into account present and anticipated conditions. Each treatment site is assessed for its capacity to meet possible effluent discharge limits for its capacity to serve future residential and commercial development. Cost-effective service is advanced by considering existing and future interceptor capacities and configurations. Planning also takes into account plant acquisition and construction, especially in rural growth centers. The Council is able to develop these plans because local land-use planning is required to be consistent with the Council's long-range plans as well as MCES communities remain in the system. The comprehensive planning and regular updates allow MCES to make new infrastructure available two years prior to its planned need. Bringing water planning into the same entity as wastewater treatment allows system managers to anticipate better where system capacity will diminish – and need attention. The Council has also established criteria for building new plants in urbanizing areas that cannot be feasibly connected to existing interceptor systems that include a wastewater flow of 500,000 gallons per day and a satisfactory program to eliminate inflow and infiltration. In addition, the Council has policies and processes for acquiring treatment plants in rural growth centers based on necessary space to expand a plant and adequate effluent discharge options as well as the local government's commitment to plan for future growth. However, the Council's policy is also not to own and operate treatment plants in rural areas that do not desire growth; there are currently 16 in the region. The Council avoids wastewater investments in areas designated for Agricultural Preservation.

The long term planning process also allows the Council to develop strategies to expand its system with attention both to the needs of local communities and to the needs of the entire region. The orderly extension of service and integration of non-MCES infrastructure takes place in stages based on previous plans. Potential service areas are mapped in relationship to existing MCES service areas, non-MCES facilities, and areas targeted for future MCES plant construction. The latter two are conception areas dependent upon discussions with local communities, counties, and feasibility studies.

To address the problems that **infiltration and inflow** posed to the MCES system, a task force was formed. Chaired by Council Member Russ Susag, fifteen public works officials of local communities met monthly to discuss and formulate reduction strategies. MCES staff provided data and information as well as facilitated and supported the task force's work. The recommendations and conclusions were arrived at by consensus of the members of the Task Force. Task Force meetings were open to the public, and meeting information such as data, agenda, and minutes was available to all communities through the Council website. Questions

discussed included: regional versus local liability for sanitary sewer overflows; the appropriate level of service from regional government; goals for communities with excessive infiltration and inflow; and, regional grant programs. The Task Force worked towards consensus to formulate the implementation strategies recommended to the Council.

While the Council plays an increasingly important role in managing the region's water, the region's watershed management organizations also exercise some authority managing storm water problems and remedying non-point pollution problems. As local units of government that develop and execute plans approved by the Minnesota Board of Water and Soil Resources, **watershed management organizations have the ability to assess an ad valorem levy** on all properties in the watershed. In the Twin Cities area, the organizations have low tax rates to build up reserves to carry out projects. For example, the Mississippi Watershed Management Organization completes projects in piecemeal fashion as city roads are replaced and redesigned to slow storm water. Some organizations also obtain permitting powers for development, allowing them to guide what areas are selected for new buildings. However, most organizations remain in an advisory role that monitors city work to ensure completion.

Reinforcing all of these partnerships is the Council's **role in approving local plans**, an authority of the Council delineated by state statute. The Council has elaborated its 1967 mandate to coordinate "orderly and economical development" into its 2004 Framework goals of: collaborating with regional partners; maximizing the effectiveness of infrastructure and service investments; enhancing transportation choices and increasing the safety and efficiency of regional travel; and preserving natural areas and resources for future residents. By state statute, the Council reviews local plans and assesses whether they conform to system plans, are consistent with council policies, and are compatible with the plans of adjacent governments. Conformity of plans is also based on maintenance of the wastewater system to eliminate infiltration inflow as well as on meeting requirements for local surface water management plans. Consistency is determined by planning and development of trunk lines and lateral interceptors, linking of local land uses to local and regional wastewater systems, and demonstrating other planning requirements. Compatibility requires addressing concerns raised by adjacent governments. MCES guides local communities to plan and to manage collection systems appropriately. However, if MCES believes that a local plan endangers the wastewater system's abilities to meet its permit requirements, it can require changes.

**Still a partnership effort.** Regional water management in the Twin Cities metropolitan area is collaborative work. The Metropolitan Council is the leader to the extent that its responsibility for reviewing local water supply, surface water management and wastewater plans gives it unrivaled perspective on how water can be managed more efficiently and effectively throughout the region. The Council's authority to protect its wastewater interceptors and treatment facilities endow it with a regulatory power over water quality and to some extent land use and development. However, the Metropolitan Council does not control all aspects of regional water management. State legislators have given the Council a number of statutory responsibilities, but state government officials establish many of the water quality goals for the region. The Minnesota Department of Health remains critical in implementing the Safe Drinking Water Act. The region's watershed management organizations, comprised of local officials, are also critical to the planning process. Local governments own sewage collection systems and run water supply systems. Even as the Council positions itself to lead the Twin Cities metropolitan area in

increasingly coordinated water supply planning with the participation of local and state officials, the Council recognizes the need to work with communities and counties outside the Twin Cities metropolitan area, along with state regulators, to advance water supply planning for the region. Local variability and innovation persist even as the Metropolitan Council encourages communities to seek more cost-effective and higher quality water management. Moreover, as urban development continues, the region's relationship with surrounding counties will likely change. The Council already tracks development in the 12 counties adjacent to the current metropolitan area.



## Conclusion

Taken together, the four benchmark cases indicate that regional water management does not aggregate all entities that manage water into a single functional body. In no instance does one entity conduct all of the legislating, managing, planning, and regulating of flood control, stormwater control, wastewater treatment, water supply, and watersheds. The four cases also indicate that the most basic element in initiating regional water management requires bringing representatives and leaders from a variety of levels of government, utilities, and environmental and business interests together to discuss regional matters and to introduce regional perspectives into their organizations. Furthermore, new relationships among entities to advance water policy goals have not completely resolved and eliminated all water problems in any benchmark region.

The experiences of all four regions show that decisions about water management and land use constantly interrelate. Ongoing decentralization pushes development beyond planning areas and forces ongoing revision of regional boundaries and the scope of regional water problems. Several benchmark partners explained that if water resource management is not tied to land-use planning, it becomes difficult to improve water quality. Municipal planners may be more interested in creating a larger tax base, but water management planning must be incorporated from the outset. For this reason, regional water management relies in part on some means of ensuring that local plans are consistent with regional plans.

One significant trend across regions was the consolidation of wastewater treatment plants, regardless of whether one entity managed the system or not. Although governments in the Metropolitan North Georgia Water Planning District will construct six new wastewater treatment plants and expand thirty-nine existing plants, they will retire 61 plants. Overall, the number of small plants will fall from 102 to 48. In southeastern Wisconsin, over the past two decades, the number of public treatment plants fell from 62 to 48. In the Twin Cities metropolitan area, there were 33 plants in 1969; 14 plants in 1980; 11 plants in 1990; and, 8 plants in 2000. And northeastern Ohio can also benefit from the efficiencies of integrating more communities into the regional sewer district's system if the financial problems of Cleveland's antiquated sewer system can be resolved.

The array of arrangements in these regions shows that a regional water management system may take different forms. The system can vary from a system of planning and administration that seeks out efficiencies to a system that provides services. Substantial savings and efficiencies can accrue if an entity can provide leadership in planning and integrating transportation and water infrastructure development. However, bundling these functions also can lead to budget squabbles over reserve funds.

Funding availability has greatly affected these benchmark regions' accomplishments. NOACA set out to advance regional water management with its initial Clean Water Act 208 funding but, without ongoing state or federal funding, accomplished less in subsequent years than desired. Remedial Action Plans for regional watersheds have continued to improve that region's waters in the absence of a powerful, centralized water management entity. On the other hand, the revenue generated by wastewater treatment services in the Minneapolis–St. Paul region for the Metropolitan Council, along with other Council funds, has created an entity capable of addressing an array of regional water quality issues. To a certain degree, the accomplishments of

these two entities reflect the different environmental cultures of the regions. But in each case, the amount of money invested in regional water management has influenced the extent of the planning and programming aimed at improving regional water quality.

In the 1970s, three of these regions, like many others across the country, designated entities as Areawide Water Quality Planning Agencies under the Federal Clean Water Act. As a result, they have had, for 30 years, experts developing detailed plans to secure and to advance varying degrees of regional collaboration. They are also well positioned to make use of any federal grants or loans on the horizon. In southwestern Pennsylvania, no local entity has taken on this responsibility, and the management of water resources remains uncoordinated. Especially if Congress decides to make a new round of federal investment in clean water, it would be unfortunate if southwestern Pennsylvania remains unprepared to address its problems on a region wide basis.