CREATING AN INTEGRATED PLAN FOR LONG-TERM WASTEWATER MANAGEMENT FOR 16 METROPOLITAN COUNTIES: GROUND-BREAKING COLLABORATION AMONG UTILITIES

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Abstract. Population and wastewater flows are expected to nearly double in the Metropolitan Atlanta region during the next 30 years. The assimilative capacity of most streams is already maximized, which will require high levels of treatment technology at wastewater treatment plants throughout the region. To address long-term wastewater management options and costs, the Metropolitan North Georgia Water Planning District (District) facilitated a cooperative process among 16 counties to produce a 30-year plan. The wastewater plan recommends consolidation of many small treatment facilities by 2030 to reduce costs, improve performance, and replenish water supplies. The Plan is integrated with the District's long-term plans for water supply and watershed management, and represents the first comprehensive regional approach to balancing long-term uses of water resources.

INTRODUCTION

Population within the 16-county Metropolitan North Georgia Water Planning District is projected to increase from 4 million in 2000, to nearly 7 million by 2030. The corresponding quantity of wastewater to manage during this timeframe is expected to increase from nearly 500 million gallons per day to 978 million gallons per day.

Existing wastewater management throughout the District can be characterized by individual jurisdictions providing their own services, interconnected with other jurisdictions on an as needed basis. In the District today, there are 233 wastewater treatment facilities, of which 103 are publicly owned. The majority of the publicly owned facilities have advanced levels of treatment, and regularly produce better effluent quality than required by permits.

Approximately 21 percent of the wastewater generated in the District currently goes into septic systems. While septic systems serve fewer than 10 percent of the housing units in densely populated counties, they handle between 40 and 90 percent of housing units in District counties that are growing and developing rapidly. Septic tanks can cause pollution if they are sited in poorly drained soils and if they are not maintained. Septic tanks are also considered a consumptive water use, with implications that could bear upon water availability in the future.

Many of the streams receiving wastewater discharges are not meeting water quality standards. The concern over water quality and the ability to permit additional wastewater discharges triggered the need to look at the long-term options and costs facing the District. The over-arching intention of the Plan was to lay-out a strategy for ensuring adequate wastewater capacity as the metropolitan area continues to grow.

WASTEWATER PLANNING ISSUES

Wastewater management issues of special concern in the District included:

- Dependence upon small headwater streams and lakes that are reaching their assimilative capacity.
- Need to double the quantity of flow returned to the already-constrained surface waters; and
- Public understanding, confidence, and support of facilities, programs and costs for providing exceptional wastewater management systems.

Specific issues considered in the planning process are summarized below.

Reliance on Surface Waters for Multiple Uses. Water use in the metropolitan Atlanta area predominately relies upon headwater streams and reservoirs. The surface waters are used for drinking supplies, recreation, wastewater assimilation, fisheries and as source waters for downstream communities.

Limited Assimilative Capacity vs. Need for Returns. Many of the heavily used streams within the District have nearly reached their capacity for receiving additional wastewater discharges. The limitations have triggered the

use of land application systems and other consumptive uses of treated flows. To meet future water demands, the return of treated wastewater to water supply sources for reuse will be a more sustainable practice.

TMDLs and Non-point Source Pollution. Non-point source pollution is the major cause of water quality impairment in the District, and the focus for most watershed control strategies. The success of the non-point source control strategies may influence future wastewater treatment requirements, especially concerning nutrients, metals, and temperature.

Nutrient Standards for Lakes. The Georgia Environmental Protection Division (EPD) established standards for phosphorus and nitrogen for the major lakes in Georgia, including the two major reservoirs within the District, Lake Lanier and Lake Allatoona. The standards relate to the assimilative capacity of the water bodies, and the wasteloads will be shared by point and non-point sources.

Stream Temperatures. Increased volumes of discharges from wastewater treatment plants could affect the temperature of the receiving streams. However, it is also recognized that stormwater also has pronounced effects on stream temperatures. The challenge is to determine the appropriate approach for managing wastewater-related temperature issues in the context of the effects that occur from stormwater.

Proximity of Discharges to Water Supply Intakes. Greater quantities of flow will be discharged from wastewater treatment plants in the future to the same streams and lakes that supply drinking water. This places greater need for highly reliable treatment facilities, real-time flow and water quality monitoring, and communications protocol.

Efficient and Effective Infrastructure. There are more than 230 wastewater treatment facilities in operation within the 16-county District. Approximately 130 are privately owned, and 103 are publicly owned. Most of the plants treat less than 1-million gallons per day, and less than 10-percent of the total volume of flow produced in the District. To serve additional flows in a manner that is highly reliable and cost effective will lead toward larger public treatment facilities, and consolidation of many small, aging treatment facilities.

Consumptive Use. The wastewater plan addressed consumptive water losses from septic systems, land application systems and exporting water through interbasin transfers.

Water Supply Needs for Indirect Potable Reuse. When the wastewater plan was integrated with the water supply planning, it became apparent that indirect potable reuse will become a critical component of the District's water supply after 2030. This is because the demand for water supply will exceed the region's available supplies sometime after this date. One of the few ways to increase supply is to recycle water through indirect potable reuse.

WASTEWATER MANAGEMENT FACILITY RECOMMENDATIONS

The long-term plan anticipates a future of high performance treatment facilities that produce reusable water. The plan recommends more intensive management of public wastewater collections systems and privately owned septic systems. Additional future treatment capacity will focus on larger facilities and growing areas.

The plan includes the following specific recommendations:

Consolidation of wastewater treatment plants. Fewer, larger facilities reduce costs and improve performance and reliability. Many small facilities are recommended to be phased out of service as they exhaust their useful lives and new facilities providing high levels of treatment become available. The consolidation will reduce the number of treatment plants in the District from 103 to 48 during the next 30 years. The 48 plants include six new strategically located facilities in growth areas. Some facilities will become centralized, serving expanded areas and multiple jurisdictions.

Integration of reclaimed water into the solution. Returning flow to local streams and water supply lakes will preserve resources for communities in and downstream from the District. Reclaimed water will become an increasingly valuable resource as the region faces the constraints of existing supplies.

Return flow to the Chattahoochee River. The Chattahoochee River Basin extends far downstream from the District. Downstream communities also rely on the supplies and quality of this important state resource. It is crucial, therefore, to return reclaimed water to the river. The long-term plan is to return at least 58 percent of water supply withdrawals back to the Chattahoochee River.

RECOMMENDATIONS FOR MANAGING SEPTIC TANKS

Several of the District counties will continue to rely upon septic tanks for wastewater management, especially those

that have decided to develop more slowly. Septic systems have been proven to be an environmentally sound method for onsite wastewater treatment when properly designed, sited, constructed and maintained. When they are not, they can become a source of groundwater and surface water contamination, as well as a public health hazard. The wastewater plan includes several recommendations for managing septic systems.

Improve siting, design, and construction requirements. Existing regulations address minimum requirements for septic systems. The plan recommends that local governments establish additional requirements to avoid future problems. Two key recommendations are to establish minimum lot size requirements for placement of septic systems, and to require that residential systems be sized to accommodate garbage disposals.

Improve maintenance requirements. The most effective method for extending the useful life of a septic system is to pump the settled solids out of the tank before failure occurs. The plan recommends that local governments establish requirements for septic system owners to pump their tanks every five years.

Establish a septic system database. Currently there is no formal management program in place for septic systems after installation. The plan recommends several measures for tracking the performance and management of septic systems, including establishing a septic system database.

Establish a policy for private wastewater systems in each jurisdiction. During the planning process, several local governments requested the long-term plan address the appropriate role for private treatment facilities. The District plan recommends that each county develop specific policies for establishing private systems, and address how the private systems will eventually be connected to larger, public systems.

RECOMMENDATIONS FOR WASTEWATER COLLECTIONS SYSTEMS

Like many other sewer systems in the country, the sewer systems in the District face many challenges. Some of the challenges are attributed to aging infrastructure, while others are attributed to maintenance, operational and management issues. These challenges result in intermittent problems throughout the District, such as sanitary sewer overflows and pipe breaks. The wastewater plan recommends that all sewer system operators in the District establish wastewater collection system inspection and maintenance programs. The minimum elements of the program include:

- Adequate capacity
- Proper operation of components
- Reduction or elimination of overflows, spills, and bypasses
- Development of a grease management program

These elements are consistent with the sewer system requirements of the NPDES permit program.

IMPLEMENTATION

Long-term wastewater management involves taking actions to meet short-term, long-term and ongoing needs and goals. The District plan will be implemented over time by local governments, the District, and the State. The plan details the capital projects and non-capital programs specific to each county, with an implementation timeline. The plan recommends that progress on the most critical actions be monitored and reported to the District by the local jurisdictions. The District will be able to assess whether the wastewater plan is accomplishing its intended goals by tracking key performance measures. The performance measures also serve as tools for EPD to evaluate the District's progress in achieving its goals and objectives.

CONCLUSION

The Long-term Wastewater Management Plan defined consolidated treatment facilities, the need for inter-jurisdictional collaboration, and key improvements for managing septic and sewer systems. It represents the first regional long-term planning effort to develop a wastewater management strategy for 16 metropolitan counties. The Plan was approved by the District participants in September 2003, and is premised upon equitably sharing the water resources of the District and efficiently providing needed future services.

REFERENCES

Long-term Wastewater Management Plan, Metropolitan North Georgia Water Planning District, 2003.

Water Supply and Water Conservation Plan, Metropolitan North Georgia Water Planning District, 2003.

District-wide Watershed Management Plan, Metropolitan North Georgia Water Planning District, 2003.