

The 2003 Environmental Protection Agency (EPA) Drinking Water Survey documented a 20-year infrastructure need of \$10.98 billion for North Carolina. According to a recent study by the NC Rural Economic Development Center, Inc, North Carolina's water systems have a documented funding need in excess of \$2.5 billion over the next five years with over \$4.5 billion of additional water infrastructure investment needs through year 2030. These funds are needed to replace aging facilities, comply with mandated Safe Drinking Water Act (SDWA) regulations and boost economic development. Although the outbreaks of waterborne caused sickness is at or near zero, remarkably due to water supply challenges, water quality degradation and tightened regulations, the number of drinking water systems with regulatory violations is on the rise. The American Society of Civil Engineers (ASCE) supports an increased state role in the funding of needed drinking water infrastructure. If funding needs are not met, the state risks reversing the improved public health and economic gains that have been realized over the past years.

A Grade of C+ is assigned to this component of the state's infrastructure.

BACKGROUND

North Carolina is currently growing at a rate to soon become the 8th most populous state by 2010. North Carolina has about 7,000 public water systems that serve water to approximately 5.5 million people or about 70% of the states population. Most of the larger systems are owned and operated by municipalities and counties.

The water supply (reservoirs, rivers, wells and interconnections) is the life blood of our state and a critical link along with conservation to our sustained drinking water infrastructure. In 2002, after consecutive drought seasons, over 90 systems were placed under mandatory water restrictions and many others agreed to voluntary conservation measures. Even now that drought conditions are a recent memory, still the groundwater underlying the eastern part of the state is in danger of becoming contaminated from saltwater intrusion due to fresh water over pumping. This recent strain on our state's groundwater has caused the regulation of withdrawal and a delineation of a Capacity Use Area encompassing over 15 counties aimed at the reduction of groundwater use. A Capacity Use Area is an area of regulated groundwater withdrawal.

Our state is diverse in many areas from ecology and geology, to economic status and the ability of our public water

systems to maintain their status quo. About half of North Carolina's water systems serve 2,500 people or less and 70% serve fewer than 5,000. That means that about 375 of the state's systems serve less people than typically contained in three to four large subdivisions in an urban area. This means that the smaller systems must charge significantly higher rates than the larger systems to offset the absence of large economies of scale.

Unfortunately, the rural and sometimes poverty stricken portions of the state know the harsh reality of paying an average utility bill (water and wastewater service) above the state defined High Unit Cost threshold of 1.5% of local median household income. Reportedly, the EPA's current measure of affordability is a system wide average of 4.5% of median household income. Therefore, North Carolina defines a target rate significantly lower than those recommended nationally by the EPA. What this means is that North Carolina providers collect smaller amounts for their utility (water and wastewater) service and without state supported funding the required and mandated water supply and treatment improvements within these smaller systems will either go uncompleted or be completed via private funding. This in turn will serve to make water service even less affordable to low-income residents.

CONDITIONS

In 2006, The North Carolina Rural Economic Development Center completed an initiative to collect detailed information about water systems statewide and document the current and the future capital improvement needs of over 530 of the larger public water systems (Water 2030 Initiative). This survey identified approximately \$7.64 billion in required funding over a 25-year period. Most of these public systems have aging water distribution systems and treatment plants and are also being driven to utilize new water sources that may require more advanced treatment.

For example, if a water system was developed during the textile mill boom days and pre WWII years, it was most likely constructed of unlined cast iron pipe. Cast iron is a durable and structurally strong material that holds up well to external corrosion and soil settlement. However, over time the corrosive natural of water can pit and break down the cast iron material from the inside causing reduction in main capacity and increased leaks. If the industry average service life for this type of pipe is 50 years, then all pipes installed prior to the 1950's have exceeded their average service life and are in need of replacement.

Additionally, during WWII and the years immediately following, a majority of water pipes being installed were

constructed of Asbestos Cement (AC) material due to the iron and steel needs of the war effort. These pipes traditionally provide good internal resistance to corrosion and deterioration, but become brittle and readily subject to failure from physical forces. Water system staff and third party construction crews must take extreme precautions when tapping new services or working on or around these type of mains. Airborne asbestos has been documented to be a carcinogen and poses a health risk outside of water system integrity.

All systems regardless of the water main material experience leaks. Typically, the older more brittle materials will experience more leaks due to wearing at fittings, inconsistency with years of service tapping and construction related upsets. Some small systems loose as much as 20% of their total treated water. Systems statewide lose an average of 11% of treated water annually to leaks and other means and the amount lost is labeled "unaccounted for". This unaccounted for water is an amount loss that generates no revenue as well as results in wasted time, money and treated water. The statewide average of 11% total is approximately 35 billion gallons of treated water that is lost each year; enough to supply the entire Charlotte-Mecklenburg region for a full year.

POLICY/FUNDING

Historically, numerous federal and state programs have provided funding assistance to help offset the rising cost of water infrastructure. These programs are aimed at addressing an array of differing needs from improving public health and water quality to furthering economic development. The level of funding available through these programs has been decreasing in recent years. Additionally, the increasing and ever changing regulations imposed on public water supply systems can easily and sometimes unexpectedly deplete a system's budget in absence of governmental assistance. The U.S. EPA has the primary regulatory authority over drinking water systems and was once a primary source of funding, but since about 1990 these grant/loan funds have been limited and reduced. The decline in these funding sources coupled with the increased

demand for safe, efficient drinking water infrastructure calls into question the role of the state. State contributions to infrastructure financing are becoming more important. Most recently, the State of North Carolina made available \$800 million of grant and loan funds financed through general obligations bonds. These funds led to remarkable improvements in drinking water systems in 97 of the state's 100 counties. These funds have been exhausted and we now face a period of record low funding for needed drinking water improvements.

Private loans from banks and other private lending institutions has become the largest single source of capital investments for public water construction projects. These loans take several

forms, including general obligation bonds, revenue bonds, special obligation bonds, tax increment bonds, and installment or lease-purchase debt. Based upon financial data charted for years 1995 through 2005, private loans accounted for 70% of

total financing of water and wastewater projects. Conversely, because of poor bond ratings, approximately 60% of N.C. local governments cannot qualify for most private infrastructure lending programs.

GRADE

The overall grade for North Carolina's drinking system is a C+.

The grade is comprised of the following:

- C for North Carolina's drinking water system's ability to match their required system improvements with available funds.
- C+ for North Carolina's drinking water system's physical condition and current need to reduce the system wide treated water loss thereby reducing overall water related expense.
- C- for North Carolina's drinking water systems ability to meet their funding needs without state subsidy.

RECOMMENDATIONS

- The North Carolina Section of the American Society of Civil Engineers (ASCE) encourages the Governor, the State Legislature and public to support long-term funding of water infrastructure projects that would enable the state to reduce the individual system's funding gap and assist the state's water systems in continuing to serve the public health and support economic development. This funding support will enable the planning and construction of projects needed to maintain and/or improve the current levels of service and provide the additional capacity necessary for future economic growth.
- The overall reduction of "unaccounted for water" should be the focus of each utility and customer to reduce the drain on water and financial resources. A statewide initiative should be implemented to educate and assist utilities on ways to reduce their "unaccounted for water". Incentives and/or recognition to those systems that expedite a leak detection program and consistently document the reduction of leaks and the eradication of un-metered services should be provided.
- Engage the state's utilities managers in developing sound and equitable rates that are based upon the need for repairs and replacement of capital infrastructure, while at the same time implement a public education campaign to help our state's citizens recognize and accept rates that can support life cycle asset management funding. Typically, utilities charge at or below the actual cost to pump the raw water, treat to potable standards, distribute the treated water, train and competitively pay staff, and have available funds to maintain and upgrade their system. Competition for the states existing water supplies will dictate new technology and larger more regional systems. Treatment is becoming more advanced and will require more highly trained staff and additional operation and maintenance (O&M) funds. The goal for each water system must be to become self sufficient and achieve a "sustainable utility" rate structure. The ASCE supports utility rates that encourage water efficiency, which will reduce drinking water consumption and demand on a limited supply. This will help ensure our continued statewide economic growth and extend the life of our limited water resources.

SOURCES

North Carolina Rural Economic Development Center, Water 2030 Initiative, February 2006

2003 EPA Drinking Survey

2006 Report Card for Pennsylvania's Infrastructure