



**KUB**

**pace10**

**Partners Acting for a Cleaner Environment**  
**A 10-year Program to Improve Our Waterways**

**FIVE-YEAR UPDATE**

Wastewater improvement program reduces sewer overflows more than 70 percent.

## PACE 10: Five-Year Update

*KUB wastewater improvement program reduces sewer overflows more than 70 percent.*

Sewer overflows and aging wastewater system infrastructure have been growing concerns across our nation for years. This report details how KUB's PACE 10 (Partners Acting for a Cleaner Environment) program has helped decrease the number of sewer overflows in our area by more than 70 percent since its launch in October 2004.

Many utilities, like KUB, are under federal Consent Decrees (CDs) to make system improvements. KUB's CD was entered into the federal court record on February 11, 2005, soon after the PACE 10 launch. The CD settled outstanding sanitary sewer overflow (SSO) issues with local, state, and federal agencies and environmentalists. It also required enhanced or new programs, which were rolled into PACE 10.

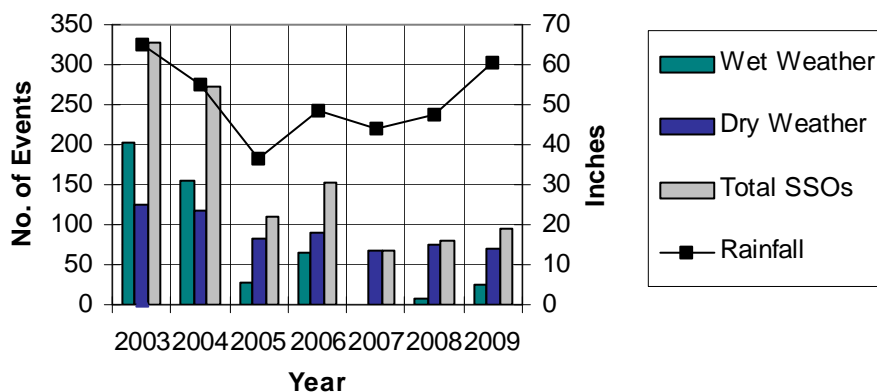
The \$530 million, ten-year PACE 10 wastewater system improvement program accelerated KUB's existing efforts to clean up area waterways and meet increasingly strict regulatory requirements. It has also significantly improved wastewater treatment plant performance to help ensure compliance during peak wet weather flows. Substantial modifications required to two of KUB's plants will increase total spending by about \$100 million by June 30, 2021.

On average, KUB went from spending \$1 million a month on wastewater system improvements before PACE 10 to \$1 million a week under the accelerated program. Capital expenditures to date total \$250 million. KUB had to more than double wastewater rates to fund the mandated improvements. [See Appendix A: *Wastewater System History and Rates for more detail.*]

### PACE 10 by the Numbers

- 70-plus percent reduction in overflows
- \$1 million a week invested; compared to \$1 million a month before PACE 10
- 145 miles of sewer lines rehabilitated/replaced
- 3,380 manholes rehabilitated/replaced
- 7,000 lower laterals replaced during construction
- 2,600 customer-owned laterals repaired through Private Lateral Program
- 4 storage tanks constructed [22 MG total storage]
- 2 peak flow tanks under construction to help control flow to plant
- 67 CD deliverables submitted to EPA on time

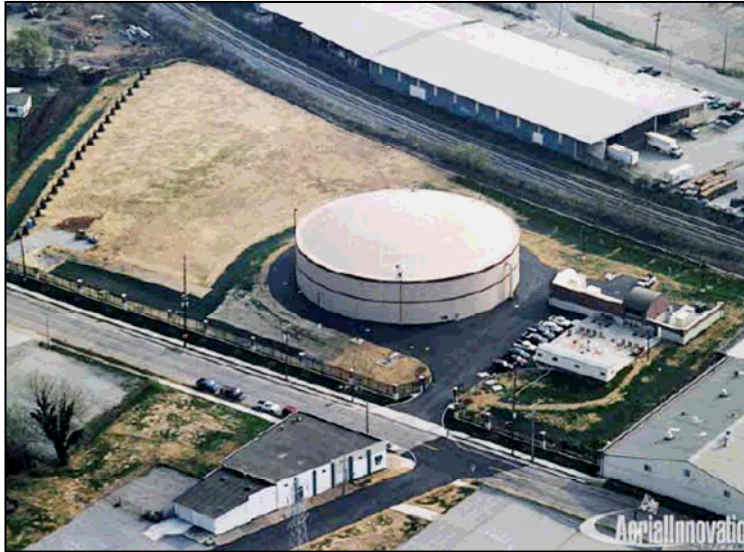
### Sanitary Sewer Overflow Trend: 2003 Through 2009



KUB's highest SSO numbers were in 2003, when rainfall reached a record high. As KUB completed early PACE 10 projects, SSOs began to trend down. (The 2006 spike was due to a single extraordinary rainfall event.) Rainfall in 2009 approached the 2003 high, and although SSOs went up, they were still significantly lower than in a similar rainfall year before PACE 10.

## **Projects Include Maintenance, Replacement/Rehabilitation, and Storage**

PACE 10 projects under way throughout Knoxville and Knox County include a mix of ongoing maintenance programs, replacement and rehabilitation projects, and wet weather wastewater storage. KUB has completed more than 55 projects, replacing or rehabilitating over 145 miles of sewer lines (over 10 percent of the total system miles) and building four wet weather wastewater storage tanks with 22 million gallons of total storage. And two more peak flow tanks are under construction to help the main treatment plant control flow during heavy rain events.



**Wet weather wastewater storage tanks, like the one off Sixth Avenue, help prevent sewer overflows during high rainfall events. The tanks hold excess water until the flow in the pipes decreases, then release the water back into the system.**

KUB to assume the role of regulator for customers. Under the PLP, for example, KUB must inspect customers' laterals (pipes that connect property to the sewer) to ensure that they do not allow extraneous water into the system. Broken laterals can overload KUB's sewers with rainwater and contribute to overflows. Leaking laterals can also pollute area waterways. *For more on the grease or lateral programs, see the appendices attached to this report or visit [www.kub.org](http://www.kub.org).*

## **Public Input Important for PACE 10**

In addition to working to reduce SSOs and help improve area waterways, PACE 10 also includes public information and input components. KUB established the PACE 10 Partners Council in December 2004 to let the community have a voice throughout the program. The council is made up of people from various professions and backgrounds. Members give KUB their feedback and community input to help enhance every aspect of the program.

KUB's Web site also includes a wealth of information about PACE 10 and a Public Document Repository that stores all the deliverables submitted under the CD. Some deliverables include a window for public comment through a form on the Web site. Customers may send comments to KUB anytime at [PACE10@kub.org](mailto:PACE10@kub.org).

Management, Operations, and Maintenance (MOM) programs include Continuing Sewer System Assessment, Infrastructure Rehabilitation, Gravity Line Preventive Maintenance, Grease Control, and Private Lateral Inspection/Enforcement. *[For more detail on these programs, see KUB's Annual MOM Progress Report on [www.kub.org](http://www.kub.org) under the Public Document Repository.]* The assessment program helps set priorities for maintenance, rehabilitation, and replacement projects.

The Grease Control and Private Lateral Program (PLP) components of MOM require

## What's to Come?

Under the CD, KUB has until June 30, 2016, to complete all covered collection system improvements. All required treatment plant upgrades must be completed by June 30, 2021.

KUB will continue condition-based monitoring of all assets and flow monitoring to help direct projects in the collection system. The target will be to replace or rehabilitate 1.5 to 2 percent of the system annually.

The focus for the wastewater plants will be on treatment capacity optimization during peak wet weather flow events. KUB will add chemically-enhanced and biologically-enhanced high-rate clarification systems to help ensure that wastewater meets all discharge requirements during periods of heavy rainfall/high flows.

The two additional storage tanks under construction will add 12 million gallons of wet weather storage capacity and help control peak flows into the plant. The tanks will store excess water while volume in the pipes is high, then release it back into the collection system as flows subside.

### KUB Continues to Make Improvements, Seek Public Input

KUB is committed to being a good steward of the wastewater system. Even after the CD requirements are met, KUB will continue to follow and refine our MOM programs to help ensure we are best serving our customers and protecting our environment.

## Wastewater System Facts

<b>Customers:</b>	68,314
<b>Service Area:</b>	248 square miles
<b>Treatment Plants:</b>	4
<b>Storage Tanks:</b>	4
<b>Peak Flow Tanks:</b>	2 under construction
<b>Lift Stations:</b>	64
<b>Manholes:</b>	30,000
<b>Sewer Mains:</b>	1,320 miles
<b>Rated Capacity:</b>	66 million gallons a day
<b>Treated Water:</b>	14.8 billion gallons
<b>Average Flow:</b>	40.61 million gallons a day
<b>Average Monthly Residential Bill:</b>	\$45.33
<b>Average Daily Cost:</b>	\$1.49

We welcome your questions or comments about KUB, PACE 10, the CD, or the wastewater system. Here are some ways you can provide input, request a speaker, or get more information:

<b>E-mail:</b>	<a href="mailto:PACE10@kub.org">PACE10@kub.org</a>
<b>Request a speaker:</b>	<a href="http://www.kub.org/wps/portal/communityevents">http://www.kub.org/wps/portal/communityevents</a>
<b>KUB Web site:</b>	<a href="http://www.kub.org">http://www.kub.org</a>
<b>Consent Decree:</b>	<a href="http://www.kub.org/wps/portal/pdr">http://www.kub.org/wps/portal/pdr</a>
<b>PACE 10:</b>	<a href="http://www.kub.org/wps/portal/pace10">http://www.kub.org/wps/portal/pace10</a>
<b>Can the Grease:</b>	<a href="http://www.kub.org/wps/portal/canthe grease">http://www.kub.org/wps/portal/canthe grease</a>
<b>Private Lateral Program:</b>	<a href="http://www.kub.org/wps/portal/privatelateralprogram">http://www.kub.org/wps/portal/privatelateralprogram</a>

## Appendix A: Wastewater System History and Rates

Knoxville voters transferred the wastewater system to KUB from the City of Knoxville in a 1986 referendum. KUB began operating the system in 1987.

The system needed major improvements to be able to serve our growing area. KUB focused on three major initiatives:

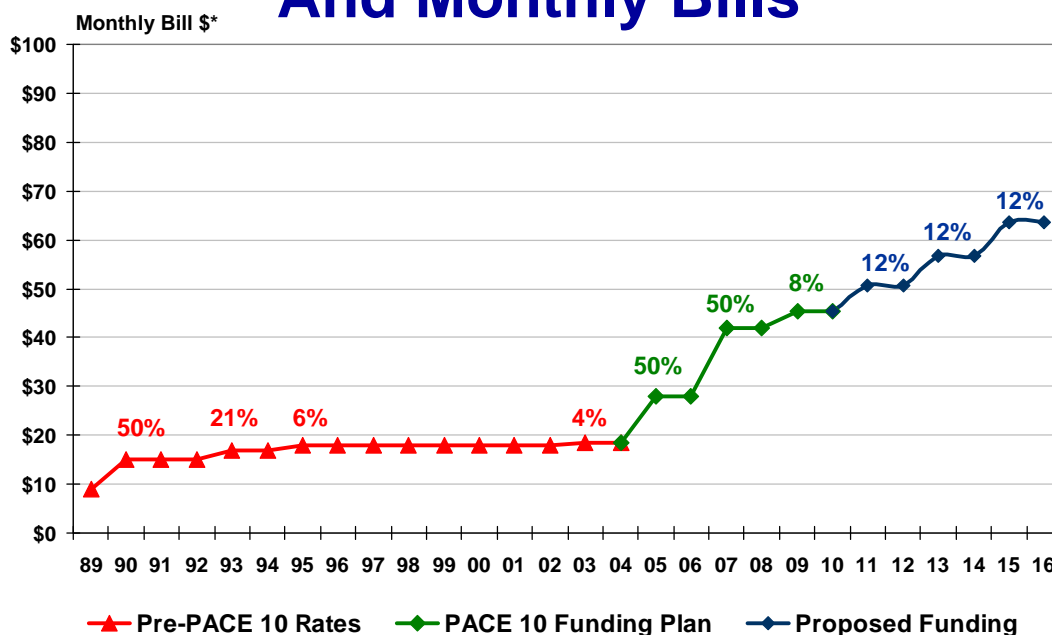
- Upgrading treatment plants (major upgrades completed in the early 1990s)
- Eliminating combined storm sewer and sanitary sewer (completed 1998)
- Inspecting, rehabilitating, and upgrading the collection system (ongoing)

From 1987 to starting PACE 10 in October 2004, KUB doubled wastewater rates from what they were under the City to fund more than \$140 million in system improvements. KUB's funding plan balanced needed improvements with concern for what customers could afford.

In December 2004, KUB reached a comprehensive agreement with the Department of Justice, the U.S. Environmental Protection Agency, the Tennessee Department of Environment and Conservation, the Tennessee Clean Water Network, and the City of Knoxville to address sanitary sewer overflows (SSOs) on KUB's wastewater system. The Consent Decree (CD) was entered into the federal court record on February 11, 2005.

The CD required that KUB increase the pace of improvements. The need to meet regulatory mandates to eliminate SSOs by 2016 tripled KUB's wastewater system budget needs and required significant rate increases. Customers saw 50 percent wastewater rate increases to fund the accelerated pace of improvements in April 2005 and January 2007. KUB raised rates 8 percent in 2009, and plans several 12 percent increases through 2016 to fund PACE 10.

## Impact on Wastewater Rates And Monthly Bills



\* Based on Monthly Use of 6 CCF

## Appendix B: Private Lateral Program

Under the Federal Consent Decree (CD), KUB must operate a Private Lateral Program to ensure that customers properly maintain their laterals to keep extraneous water out of the sewer system. Stormwater that enters laterals can overload sewers and contribute to overflows. KUB must also fund a \$2 million grant\* program to help low-income customers make required lateral repairs.

- In August 2005, KUB began notifying homeowners with private laterals that need repair. [A lateral is the customer-owned pipe that connects to KUB's sewer.]
- As required under the CD, KUB
  - Inspects private laterals and identifies defects or prohibited connections, like roof downspouts, sump pumps, or other stormwater sources.
  - Informs property owners of any defects, the process to follow, and the potential availability of financial aid
  - Ensures the property owner corrects the problem
  - Terminates water service to the property if the problem isn't corrected in 120 days.



**Prohibited downspout connections can overload sanitary sewers with stormwater and contribute to overflows.**

KUB contracted with the Knoxville-Knox County Community Action Committee (CAC) to administer the required \$2 million grant program and a voluntary \$2 million no-interest loan program. KUB voluntarily funded the loan program to help more low-income customers repair their private laterals.

### Private Lateral Program Statistics 2005–2009

Total Lateral Inspections:	6,677
Lateral Defect Packets Sent:	2,611
Total Laterals Repaired:	2,332
Total Aid Applications:	883 sent / 685 submitted
Total Approved Aid Applications:	557 grants and 35 loans

*\* This project [Grant Program] was undertaken [by KUB] in connection with the settlement of a civil enforcement action taken by the United States for violations of the Clean Water Act.*



Inspection crews use remote-control cameras (left) to inspect customers' laterals for defects like breaks or loose joints (right) that allow extraneous water to enter the sewer system.

## Appendix C: Grease-Related Overflows Down 90 Percent From 2005

Cooking grease that enters KUB sewers is a major cause of overflows in our environment and messy, costly sewage backups into homes and businesses. Since 2005, KUB has achieved an overall 90 percent decrease in grease-related overflows, thanks to increased Grease Control Program (GCP) efforts.

The GCP consists of three primary elements:

- Routine inspections of food service facilities (FSFs)
- Grease-related overflow response
- Can the Grease, an education program for residential customers

KUB initiated the GCP for FSFs that cook or process food in 2002. The GCP enforcement response guide was approved in 2005, and KUB increased enforcement actions in 2006 to bring FSFs in compliance with program requirements.

Under the Grease Permitting Program, all FSFs must be inspected periodically and obtain a Grease Control Permit annually if they prepare food. KUB evaluates FSFs based on the risk they potentially pose to the wastewater system. Each facility is rated on the size and maintenance of its grease-control equipment and its grease-pumping and recordkeeping practices. FSFs have installed more than 400 grease traps over the last five years to prevent grease from entering the collection system.

The majority of grease-related overflows in the KUB system occur in residential areas. That's why KUB also offers a Can the Grease education program for residential customers to teach them to properly dispose of grease in the trash – not down the drain.

When an overflow occurs, KUB initiates a Grease Investigation that includes making field inspections and sending information to residential customers to tell them how to properly dispose of grease. The packet includes a heat-resistant oven bag and instructions on how to use any metal can to “Can the Grease.”

### Can the Grease to Protect Your Plumbing and Our Environment

Don't risk messy, costly sewage backups into your home. Pour grease in the trash, not down your drain.

#### It's easy to make your own grease can:

- Use any empty metal can. (Don't use plastic, which may melt)
- Insert a disposable heat-resistant oven bag.
- Place the can on a stable surface, and carefully pour grease into it.
- **Caution:** Hot grease can cause burns. Allow grease to cool slightly before pouring, and do not use the liner without the can.
- Toss the used oven bag in the trash, insert a new bag, and keep using the can to protect your plumbing and our environment.

