Case Study

Town of Swink

Infrastructure Improvements to Metering and Distribution System

2005

$1.3 million

Town Information

Approx. Population Served

670

Approx. Number of Connections

300 (all but three are ¾-inch)

Project Summary

The Town of Swink utilizes a two water source system, drawing soft water from deep, non-tributary aquifers; and hard water from shallow, surface influenced sources. Given that the shallow hard-water sources are more economical to produce but more expensive to treat to potable drinking water standards, the Town chose to develop and maintain a dual-water system, utilizing the hard water for non-contact indoor use (i.e., toilets) and outdoor irrigation, whereas the soft water was treated and distributed to residents and other potable water users in a separate system. Although new construction will utilize potable water for all indoor uses, past construction practices maintain the dual piping system.

Prior to 2005, which is when the Town, overwhelmed with real and apparent water losses in both the hard and soft water delivery systems, decided to upgrade the distribution systems, service lines and customer metering, the Town employed a service charge for hard water (not based on amount used) and a flat rate for soft water. Hard water service was unmetered. Soft water service was metered; however the Town strongly suspected that both systems were substantially inefficient. Non-revenue water for the soft water system averaged nearly 30% from 2001 to 2003, with only a small portion (< 1%) of the non-revenue water attributed to authorized unbilled uses (e.g., hydrant flushing and street cleaning).

Project Components

100% mechanical meters on soft water system switched to electromagnetic meters (i.e., mag meters) with radio read transmitters for drive by data collection and installed new mag meters on all customer hard water service lines. Also, 80% of the combined distribution system was replaced including a substantial number of non-working hydrants and leaking service lines on both water delivery systems.

Project cost the Town approximately $1.3 million which was funded through grants and loans from CRWA and DoLA. The Town has also raised water rates to fund the debt service costs.

Project Benefits

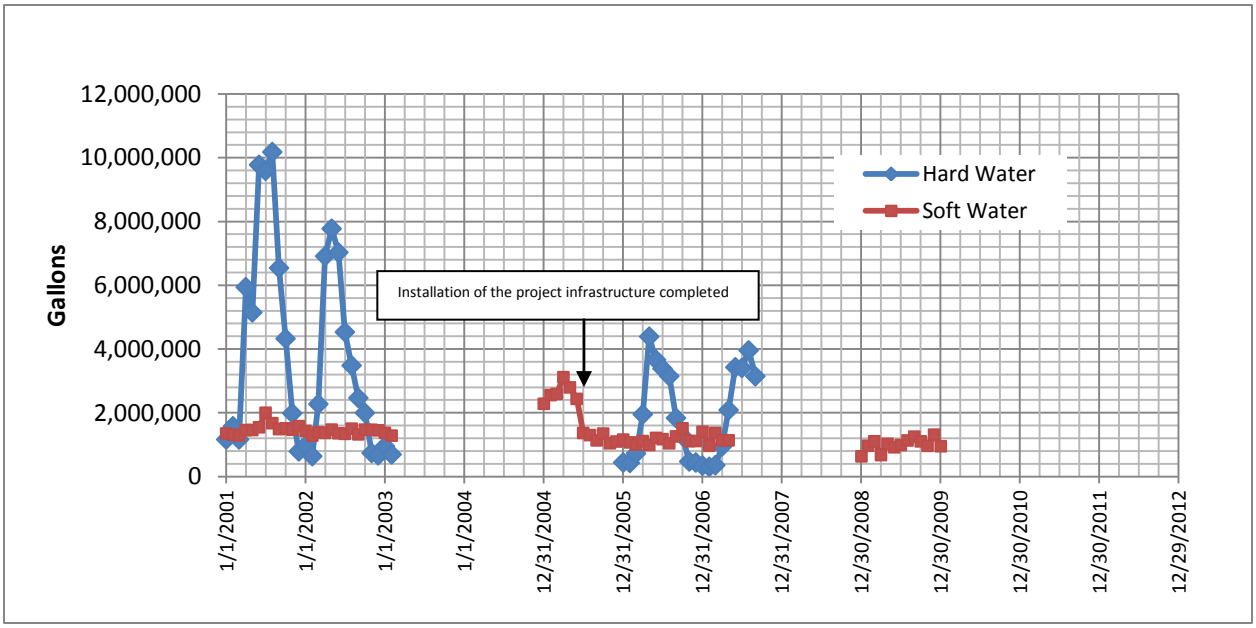
Metering technology has significantly reduced man-power required to collect customer use data allowing staff to be reassigned to more preventative maintenance programs that have decreased leaks and decreased distribution system related water quality problems. New PM programs include directional flushing of the potable water distribution system, testing of valves and hydrants, better maintenance of records and documentation of leaks, meter replacement and maintenance activities. Town was able to increase the PM program while reducing overhead by reducing FTEs on staff.

Water meter reading used to take 8 hours and now takes 40 minutes and the data collected is more accurate and so are the billings, due to the link between the meter reading device and the billing software.

Staff also has been less stressed by the past demands related to responding to and repairing water leaks. The Town had to respond to up to 3 leaks a week, causing staff "burn out" and carrying with it, high overtime costs. Repairs are now much easier, leaks occur much less often, and scheduled staff is substantially less reactive, which in turn helps retain staff.

Water use and water loss have been substantial reduced as a result of the infrastructure improvement project. As shown below, water production in both the hard and soft water systems has decreased since project installation (April 2005). Table 1 summarizes the changes in water use for both systems based on monthly water production rates.[1]

Figure 1 – Hard and Soft Water Production Rates Observed 2001 through 2009



[1] Seasonal hard water use over the summer months was used instead of monthly averages; whereas monthly use of wintertime hard water use and both winter and summer time soft water use was used to illustrate the beneficial impact of the project.

Table 1 – Change in Water Production Before and After Infrastructure Project Installed

Hard Water Production (gallons)						
pre-April 2005			post-April 2005			Percent Reduction
Winter	1,290,980	per month	Winter	438,875	per month	66%
Summer	41,851,080	per season	Summer	19,434,200	per season	54%
Soft Water Production (gallons)						
pre-April 2005			post-April 2005			
Winter	1,388,492	per month	Winter	1,134,200	per month	18%
Summer	1,512,200	per month	Summer	1,174,444	per month	22%

The water production reductions measured by the Town are directly related to the installation of the new infrastructure, in that population changes over the period of record (i.e., 2001 through 2009) decreases by a total of about 2%; whereas the water production rates drop nearly 60% for the hard water system and approximately 20% for the soft water system. The difference directly correlates to water losses in both systems. Prior to 2005, non-revenue water for the soft water system averaged about 30%. It is now between 4 and 6% annually.

In addition to the improved water efficiency, the Town has realized substantial savings with respect to avoided energy costs for both pumping and treating water that was lost prior to being delivered to customers.