

Panama City Standard AWWA Water Balance and Audit FY2008

Client: **City of Panama City, FL**

In order to improve the understanding of City of Panama City's (CPC) resource balance and to ensure accountability and efficient operation, CPC wanted to complete a detailed AWWA Water Audit and Component Analysis of Real and Apparent Losses. Water Systems Optimization (WSO) was contracted to undertake this program.

A detailed top-down water audit is an exercise in which documentation is collected reviewed and verified if necessary to determine each component of water use and loss. This included:

- Analysis of system input volumes, export volumes & source and export meter testing;
- Identification and confirmation of consumption volumes
- Identification and classification of apparent and real losses
- Calculation of confidence limits for each component of the water balance
- Identification and allocation of appropriate performance indicators
- Calculation of the Economic Level of Leakage (ELL)
- Design of economically justified short and medium term water loss control program.

The problem areas and findings identified through the work undertaken by WSO included:

- The level of confidence related to the system input metering should be improved. CPC is therefore installing additional new system input meters with flow data and storage capabilities on the CPC side of the system. These meters will allow the CPC to regularly compare their system input meters against their water wholesalers input meters while also monitoring demand at their four main system input locations.

- The apparent loss analysis revealed that the small meter population, meters smaller than 2 inches, except 3/4 inch meters, are significantly under registering flow. The 5/8 inch meters contributed by far the largest portion of the total apparent loss volume. This group represents not only the lowest accuracy, but also the largest volume consumed, resulting in 90% of the total annual apparent loss volume. An economic level of apparent loss analysis showed that changing all small customer meters (except 3/4" meters) would provide a payback period of around 5 years, which is economically justified assuming a meter lifespan of 10-15 years.

- In terms of Leakage Performance Indicators (PI), the level of Real Losses is of the order of 34 gallons per service connection per day. The volume of Real Losses in gallons per connection per day (OP24) for CPC is below the 25th percentile for a data set compiling the water audit results of several North American water utilities. This PI indicates a good performance by CPC in managing Real Losses.

- Using the IWA Infrastructure Leakage Index (ILI) performance indicator, the physical loss situation in CPC is only 1.9 times higher than the achievable minimum with well maintained infrastructure in above average condition, and with intensive active leakage control using international "best practices".

- The calculation of the ELL revealed that proactive leak detection is a viable short term leakage mitigation tool to be completed. The economic optimum leakage intervention frequency is every 27 months and is estimated to achieve Real Loss reductions of around 76MG/year.