

# Water Conservation in Florida

## FSAWWA Water Conservation Committee

*Making Water Conservation and Reuse Happen in St. Johns River Water Management District*

*Don Brandes, SJRWMD*

Projections of water demand through 2020 and the results of groundwater flow models based on those projections indicate that future demand cannot be met in some areas by traditional fresh groundwater sources. Optimum use of water

resources can reduce the need for future water supply source development and treatment facility construction. Therefore, efficient water use must be one of the first considerations when planning to meet future water demands.

Using a combination of regulatory power, technical assistance, and financial assistance, the St. Johns River Water Management District has proactive programs to require, promote, and facilitate the reuse of

reclaimed water and the conservation of water of all qualities.

SJRWMD policy is to implement water conservation and reuse to the maximum extent feasible in accordance with Florida's objective to encourage and promote water conservation and reuse. Therefore, all SJRWMD programs pertaining to water conservation and reuse, including all pertinent regulatory requirements, planning, coordination efforts, and funding programs, are applied district wide. This policy includes designation of the entire district as a Water Resource Caution Area for the purpose of requiring reuse feasibility studies by DEP during the wastewater treatment facilities permitting process.

### *Regulations*

Chapter 40C-2, FAC, SJRWMD's water use permitting rule, requires conservation as a part of all consumptive use permits and the reuse of reclaimed water where feasible. All consumptive use permit (CUP) applicants must meet the following requirements:

All available water conservation measures must be implemented unless it is not economically, technically, or environmentally feasible.

When reclaimed water is readily available, it must be used in place of higher-quality water sources unless it is not economically, environmentally, or technically feasible.

The lowest acceptable quality water source, including reclaimed water, must be utilized for each consumptive use. To use a higher quality water source an applicant must demonstrate that the use of all lower quality water sources will not be economically, environmentally, or technically feasible.

An audit of the amount of water passing through the applicant's production and treatment facilities, transmission lines, and distribution system using the district's water audit must be submitted. The audit includes all existing production, treatment, and distribution systems accessible to the applicant for a period of at least 12 consecutive months within the three-year period preceding the application submittal.

An applicant is required to perform a meter survey and to correct the water audit to account for meter error, if the initial unaccounted-for water is 10% or greater based on the results of the initial water audit. The purpose of the survey is to determine a potential correction factor for metered water use by testing a representative sample of meters of various ages. The survey also helps to determine the appropriateness of a meter change-out program.

An applicant whose water audit shows

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### ***SJRWMD Conservation from Page 4***

greater than 10% unaccounted-for water use, must complete a leak detection evaluation. Based on the evaluation, an applicant may choose to implement a leak detection program or develop an alternative plan of action to address water use accountability and submit a new water audit. If the subsequent audit shows greater than 10% unaccounted-for water, the applicant must implement a leak detection and repair program.

A meter replacement program is required for those applicants whose small and medium meter survey indicates that a group or type of meters is not 95% accurate.

A customer and employee water conservation education program must be implemented to include the following elements:

- Televised water conservation public service announcements.
- Provide water conservation videos to local schools and community organizations.
- Construct, maintain, and publicize water efficient landscape demonstration projects.
- Provide water conservation exhibits in public places such as trade shows, festivals, shopping malls, utility offices, and government buildings.
- Provide/Sponsor water conservation speakers to local schools and community organizations.
- Provide water conservation articles and/or reports to local news media.

- Display water conservation posters and distribute literature.
- Provide landscape irrigation audits and irrigation system operating instructions to local small businesses and residents.
- Establish a water audit customer assistance program that addresses both indoor and outdoor water use.

The applicant must submit a written proposal and implement a water conservation promoting rate structure, unless it can be demonstrated that the cost of implementing such a rate structure is not justified because it will have little or no effect on reducing water use. In the event that the applicant has a water conservation promoting rate structure in effect, the applicant must submit a written assessment of whether modification would make the rate structure more effective.

When an audit and/or other available information indicates that there is a need for additional water conservation measures in order to reduce a project's water use to a level consistent with projects of a similar type, or when an audit and/or other information indicates that additional significant water conservation savings can be achieved by implementing additional measures, other specific measures will be required by the district, to the extent feasible, as a condition of the permit.

In addition to requiring specific water conservation measures and reuse where fea-

sible, the SJRWMD CUP program also provides incentives for implementing conservation and reuse through extended permit durations and exemption from restricted outdoor irrigation hours for reclaimed water.

### ***Non-Regulatory Efforts***

The amounts of conservation and reuse in SJRWMD far exceed that which is required by specific permit conditions because of active non-regulatory efforts. SJRWMD provides financial assistance to local governments, utilities, and other major water users through several cost sharing funds, including SJRWMD ad valorem tax monies, state appropriations, and special federal appropriations. Approximately \$6 million have been allocated through these programs since their inception in 1996. Alternative water supply projects funded usually involve reuse of reclaimed water, stormwater, or recycled irrigation water. Most financed projects have involved reuse.

The Alternative Water Supply Construction Cost Sharing project provides up to 50% cost sharing for the payment of capital and infrastructure costs of alternative water supply systems. Alternative water supply sources include water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses, as well as supplies of stormwater, or brackish or salt water, that have been treated in accordance with appli-

cable rules and standards sufficient to supply the intended use.

SJRWMD also has funds set aside to share up to 50% of the cost of reuse feasibility studies and conservation projects. These funds often are used to assist consumptive use permittees meet requirements for performing reuse feasibility studies. In addition, it has pursued and acquired federal funding through EPA for alternative water supply development projects that may be used to pay up to 55% of projects costs.

SJRWMD provides technical assistance to local governments, utilities, and other major water users for assessing conservation and reuse needs and opportunities and for planning the development of conservation and reuse programs.

SJRWMD maintains a data base concerning domestic wastewater treatment and reuse on its Geographic Information System (GIS) and uses it to identify and assess reuse opportunities and to match potential reclaimed water users with suppliers. Information stored in the data base includes treatment facility location, capacity, and flow; existing reuse quantities and types; and locations of reuse distribution systems and large individual reuse sites. These data are combined with information from other SJRWMD data bases, including political boundaries, hydrography, roads and highways, and selected land uses and covers, for electronic and visual analysis.

SJRWMD coordinates with local governments, state agencies, and other groups to promote conservation and reuse. Such activity includes participation in the State Reuse Coordinating Committee, composed of DEP, PSC, HRS and the five water management districts; regular meetings with DEP staff to promote reuse opportunities and facilitate reuse, and coordination with DEP, PSC, and HRS staff on specific projects.

No single approach can bring about all needed water conservation, but this comprehensive program can produce major reductions in fresh groundwater use that will save it for essential potable uses and reduce the need to develop new sources for a rapidly growing urban population. ■

### *Regional Conservation Planning: Details, Details*

*Dave Bracciano & Damann Anderson*

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**R**apid growth and economic development of the Tampa Bay area have resulted in an increase in the predicted future water demand of the

area and have warranted a proactive approach to conserving water and identifying potential new sources. Tampa Bay Water and its member governments (Hillsborough, Pasco, and Pinellas Counties, and the cities of Tampa, St. Petersburg, and New Port Richey) have worked cooperatively to complete a comprehensive analysis of the current and future demand, demand management options, supply sources, and facility capacities.

The first initiative to develop a comprehensive planning document, completed in 1994, resulted in the Resource Development Plan (RDP), which included water demand projections and an analysis of the existing water supply sources and facility capacities (Law Environmental, 1994). On the basis of the RDP, Tampa Bay Water adopted the Master Water Plan (MWP) in December 1995, which included aggressive demand management, new supply sources, developmental alternatives, and possible increases in existing facility capacities. The Master Water Plan was shown to be able to meet the predicted future demand of the region.

The Master Water Plan included an aggressive demand management/conservation component with goals to reduce overall demand by 10 MGD in 2000 and an additional 7 MGD by 2005.

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The Regional Water Supply Demand Management Plan (DMP), developed in June 1997, explored the opportunities of reducing future demand by improving efficiencies in existing and future water use in the region. The DMP provided Tampa Bay Water and its member governments a means to coordinate the ongoing conservation efforts with SWFWMD from a regional perspective. Additional efforts were initiated to formulate a Demand Management Implementation Plan (DMIP) to identify specific Best Management Practices (BMPs) that could be used by member governments to reduce water demand consistent with or exceeding the Master Water Plan goals. During this process application, software (AQUATrak) was also developed to facilitate strategic planning for implementation of selected BMPs from a local government and regional perspective.

On May 14, 1998, the Northern Tampa Bay New Water Supply and Groundwater Reduction Agreement was incorporated among Tampa Bay Water, its member governments, and SWFWMD. In it the parties agreed to cooperate to develop new water supply and reduce pumpage from specific existing wellfields by using financial assistance from SWFWMD. The agreement also requires Tampa Bay Water and its member governments to continue to plan, coordinate, develop, con-

struct, and implement conservation and reclaimed water projects in accordance with the responsibilities assigned to them in the Interlocal Agreement. Additionally, the agreement required Tampa Bay Water to provide an annual report on the status of conservation and demand management projects.

According to the agreement, SWFWMD, in conjunction with the appropriate basin boards, intends to continue to collectively fund approximately \$9 million per year for conservation and reclaimed water projects. The collective funding, expected to be continued for ten years, should provide funds to Tampa Bay Water and other local governments in Hillsborough, Pasco, and Pinellas Counties on a 50/50 cost sharing basis. The agreement also requires SWFWMD to undertake its best efforts to secure resolutions from all appropriate basin boards indicating their intent to collectively continue funding for "conservation and reclaimed water projects that effectively reduce potable water use." Subsequently, resolutions were secured confirming the basin boards' intention to do so.

#### *Partnership Conservation Guidelines (PCG)*

The purpose of formulating the Partnership Conservation Guidelines (PCG) was to develop a mutually agreed-upon

process between Tampa Bay Water and SWFWMD by which the specific elements of the Demand Management Plan could be implemented in a timely and cost-effective manner in accordance with the 'conservation and reuse' goals of the Partnership Agreement. This document will also provide an annual evaluation of the water conservation potential remaining in the region and its cost effectiveness.

Completed in 1998, the PCG provided a list of prioritized conservation BMPs that could be implemented by the member governments to effectively reduce potable water use. The conservation BMPs were previously developed and reviewed through a committee-based selection process. Default water savings and costs were provided through local and national literature reviews. Many of the default values were actually provided in reports conducted by member government utilities.

The PCG also provided the member governments and SWFWMD a method to compare the cost effectiveness of individual BMPs at varying implementation rates and developed a Conceptual Regional Plan using only "rebates" and "surveys." Reclaimed water projects and water use ordinances were not considered in the conceptual plan since these are member-specific BMPs and should be evaluated by each member independently. It was as-

sumed in the conceptual plan that water use ordinances would evolve during the first five-year implementation period and become effective in the second five-year plan.

On December 14, 1998, the Tampa Bay Water board of directors unanimously approved the acceptance and submittal of the PCG to SWFWMD. It will be provided to SWFWMD annually each November.

The Tampa Bay Water board of directors also approved creation of a new work group comprised of member governments, SWFWMD, and Tampa Bay Water personnel to compile conservation programs that would be implemented by member governments to meet or exceed the goals of the Master Water Plan. Additionally the board approved a schedule for the work group to complete a Regional Five-Year Conservation Plan by June 1999 for submittal to SWFWMD.

### *Regional Five-Year Plan*

The Conservation Plan Work Group, comprised of representatives of member governments and SWFWMD along with Tampa Bay Water staff, met twice per month from January through May to compile member-government five-year conservation plans. Each plan was developed through member government input and compiled into one document. The draft *Compilation of Member Government Five-Year Conservation Plans*, provided to the Tampa Bay Water board of directors in June, are expected to be submitted to SWFWMD following Board acceptance in July.

According to the plan, regional savings of up to 25.7 MGD could occur in an average demand year by the end of the five-year period. This assumes that (1) the estimated savings are achieved for all program elements; (2) implementation occurs as planned; (3) current water use and population projections hold; and (4) savings are accrued over the life of the plan. Approximately 9 MGD would be saved in an average year by the end of FY 2000. Based on current Tampa Bay Water population and average demand projections, the lowering of average annual demand by the end of 2000 and 2004 would meet or exceed the existing Master Water Plan goals.

According to member government actual and projected five-year water conservation plans, the region would save approximately 9.2 MGD by the end of FY 2000 and 25.7 MGD by the end of FY 2004. The projections assume that default savings, contained in the AquaTrak demand management program, are achieved for all best management practices. The default savings values are based on national, regional, and local conserva-

tion program data (where available). Potable water savings resulting from reclaimed water use account for 15.2 of the 25.7 MGD saved by the end of FY 2004.

Since the original demand projection made in the Master Water Plan did not include the National Energy Policy Act of 1992 and future demand projections did, the goal was to determine if overall average demand would be below the 10 and 7 MGD demand reductions. These proposed reductions, combined with water savings associated with the act, result in demand estimates that can meet Master Water Plan goals. The Partnership Agreement includes the conservation goals set forth in the Master Water Plan. Thus, the lowering of average annual demand by the end of FY 2000 and FY 2004 can also meet or exceed the conservation goals set forth in the Partnership Agreement.

Although not considered a portion of the five-year conservation plan to quantifiably reduce future demand, education and public awareness five-year plans were included as a separate portion of the report. Education programs have been developed successfully by many members and are generally targeted toward specific age groups and/or sectors of the population. Generally, these programs offer specific curricula, a mechanism to measure knowledge increase, and change in water use habits.

Public awareness programs also provide education to the public but are generally not quantifiable in nature. They reach a broad population base and are developed to keep issues in front of the public. No predefined curriculum materials are generally developed and mechanisms to measure their effectiveness are much more broad and non-quantifiable than education programs.

These non-quantifiable member programs are an integral part of the five-year conservation plan and have been successful and necessary to stimulate interest and awareness of conservation programs by the public.

The compilation of member government five-year conservation plans will be updated annually through member government input and will be provided to the Tampa Bay Water board of directors, for its acceptance, prior to submittal to SWFWMD. ■

### *UPDATE: The Bill to Eliminate Current Plumbing Efficiency Standards*

*Kathy Foley, SWFWMD*

**D**uring the legislative session last year, proposed legislation (HR 859) called for the repeal of the plumbing efficiency standards of the

National Energy Policy Act (NEPA). The move was in response to reports of customer dissatisfaction with the initial toilets manufactured to meet the NEPA efficiency requirements. The bill was removed from the consideration of the House Commerce Subcommittee on Energy and Power by its sponsor, Rep. Joseph Knollenberg (R-MI), but it has returned as HR 623 for the 1999 session. As with its predecessor, support for HR 623 appears to be growing.

Admittedly, there were problems related to toilet drain-line blockages and customer dissatisfaction with the initial models of ultra-low flow (ULF) showerheads and toilets. As with any new product, improved technology and response to customer complaints have resulted in higher-quality, higher-performance products. Customer satisfaction is currently high, according to participant feedback in the toilet rebate programs in SWFWMD. A survey of participants in St. Petersburg's toilet replacement program indicate that 98% of the participants were satisfied with their ultra-low-volume toilets. Since 1992, SWFWMD has assisted local utilities in the distribution of nearly 54,500 ultra-low volume toilets, and 498,000 plumbing retrofit kits (including water-efficient showerheads, faucet aerators and other items). The programs, which cost SWFWMD and cooperating local governments a combined \$14.7 million, yield a savings of 6.5 million gallons of potable water per day. If the question is do they work, the answer is yes.

The repeal of NEPA would have a negative impact on the water resources in SWFWMD in three major ways. First, in a worst-case scenario, its repeal could potentially trickle down to regional and local levels, leading to the dissolution of plumbing codes due to the lack of "teeth" in national requirements, which could in turn impede efforts of conservation planning. For example, a significant part of the achievable water-savings identified in the Demand Management Plan of Tampa Bay Water, which supplies water to most of the Tampa Bay area, comes from the natural replacement of plumbing fixtures due to the enforcement of NEPA and the regulations it has inspired.

A second potential impact is the public's perception that water-efficiency is no longer a national concern. This perception may negatively affect participation in future conservation efforts.

A third concern is the possibility that the removal of such requirements will enable foreign manufacturers to gain inroads to the industry with less efficient models, forcing local manufacturers to lower their efficiency standards as well. This opens the door for the installation of



higher-volume fixtures in all new development, undermining the efforts of the water management districts, local governments and water suppliers.

Last year, water agencies, local governments, and plumbing manufacturers across Florida and the nation responded to the proposed legislation with adamant disagreement and pleas for reconsideration. During the 1998 Session, the bill had 33 co-sponsors; three from Florida. Unbelievably, HR 623 has 80 co-sponsors, including six from Florida. Visit the AWWA Website, Government Affairs page, for updates. ■

### *Piloting the Future: Innovating Water Conservation Programs*

*Kathy Foley, SWFWMD*

Since 1989, cooperatively funded water conservation programs in SWFWMD have typically included toilets and plumbing fixture rebates. Those programs have been extremely successful, saving 7 MGD so far, and are expected to continue, since they have virtually been the cornerstone of measurable water conservation programs, and there is still customer demand for such programs. The plumbing programs cannot continue forever, however, thanks to national legislation and local codes that require ultra-low volume plumbing fixtures in all new and redevelopment.

With the potential impending penetration of the utility customer base with efficient plumbing fixtures, water conservation programs must find a different target. Curbing industrial, commercial, and institutional (ICI) water uses, as well as outdoor water uses have, in the past, been left to regulation through water management district permitting and water restrictions. In the past few years, some innovative ICI and outdoor pilot water conservation programs have been implemented in SWFWMD.

### *Outdoor Water Use: Irrigation*

In SWFWMD it is estimated that as much as 30 to 50% of the water use of public supply accounts is for landscaping purposes. The AWWARF Residential End Use Study (Draft, December 1998) revealed that, in Tampa, 30% of the residential water use is for outdoors. A considerable opportunity for outdoor water conservation appears to exist; the question is, how should it be addressed. On the regulatory side, the SWFWMD and its local governments enforce year-round, two-day-per-week irrigation restrictions, and significant resources are used to provide education about efficient and appropriate landscaping and irrigation. Incentives had not been proposed in the past

due to the variability of landscaping and irrigation options, but the time for innovation has come. Three types of efforts are underway to address measurable outdoor water conservation.

One is the Landscape Water Budget Pilot Project, which tests the hypothesis that an annual water allocation may be more effective at achieving water savings than the irrigation restrictions currently instituted.

Providing incentives for the purchase and installation of automatic rain shut-off devices is a recently utilized tool in three of SWFWMD's local governments. This type of program recognizes that, while a 1991 state law exists, requiring these devices be installed on all new in-ground irrigation systems, (1) it is not typically enforced, and (2) a loophole exists in the language, making the on-off switch on the clock acceptable under the letter of the law, although not the intent. In order to allocate funds toward rain sensor projects, SWFWMD requires the cooperating local utility to have in place an enforced code requiring automatic rain shut-off devices on all new, or re-designed, automatic irrigation systems. The Public Utilities Department in Hernando County instituted the pilot program, co-funded by SWFWMD in 1996. The program offered billing cred-

its to 169 participants, and was able to save about 6.2 MGD. Since then, the cities of Safety Harbor and Punta Gorda have initiated similar programs in their service areas.

This program, *Xeriscape your Landscape, St. Petersburg!*, is planned for the coming fiscal year. St. Petersburg plans to offer customers a rebate for designing an appropriate landscape for their irrigation capabilities, soil conditions, and other relevant site characteristics. Another rebate will be provided to customers who implement the design and/or make appropriate modifications to their irrigation system. During the pilot phase of the program, customers with high outdoor water use and an existing irrigation system using potable water will be eligible to participate. Before receiving the rebate, it must be verified that the landscape design, plant establishment and irrigation system modifications are in accordance with Florida Yards and Neighborhood standards. Sites will be monitored, and water use measured, for 18 months. If the pilot is successful, St. Petersburg may expand the program.

### *ICI Water Uses*

It is difficult to address industrial, commercial and institutional water uses be-

cause they're so diverse. While only about 5% of the customer base on public utilities in the Tampa Bay Area is ICI, they use about 35% of the water. In 1994 SWFWMD worked with those utilities and sponsored a program to determine the potential for water conservation. The water use of 26 businesses throughout the area was evaluated, and it was determined that an average of 26% of the water use (a collective 80 MGD) could be saved through water efficiency measures.

With a customer base which is nearly 50% ICI, the Tampa water department in cooperation with SWFWMD implemented a pilot program to offer water use evaluations to its significant (25,000 gpd or more) water customers and rebates as an incentive. To participate in the program, ICI customers agree to implement any water conserving measure that provides a financial payback of one year or less to the company. The customer may receive a rebate to implement some of the measures that carry a longer payback period. ■

*FSAWWA Water Conservation Committee's Awards for Excellence - 1999*

*Norman Davis, Chair, FSAWWA Conservation Committee*

The Water Conservation Committee, reporting to FSAWWA's Technical & Education Council, is responsible in an advisory capacity regarding conservation issues. It sponsors the annual Water Conservation Awards for Excellence Program and conferred seven awards this year at the Florida Water Wise Council's H2Options Workshop on April 23, as follows:

***City of Tampa - Conservation Measure: Large Utility***

The "Water Resource Public Service Announcement Project" involves and educates Dowdell Middle Environmental Technology Magnet School students and families. The innovative and comprehensive project fits in well with the school's core curriculum. Seventh-grade students (135) use a nationally-recognized environmental education curriculum to investigate local water resource issues. The outcomes of the issue investigations are community action projects that promote the protection and conservation of water resources. The community action projects are the PSAs that are shown on Tampa's television channel during April and May each year. An award ceremony honors and awards each student (45) that carries out the PSA production phase of the project. A new component this year includes student-developed brochures designed to increase awareness of water conservation.

***Sarasota County - Demonstration Project: Large Utility***

In December 1998 Sarasota County in-



augurated a creative and innovative effort. A county transit bus, covered in vinyl depicting a water conserving landscape with enlargements of native, drought-tolerant plants, took to local streets.

For the last eight years bus advertising has been recognized as one of the most efficient forms of outdoor advertising. Transit systems plan their routes to go where the people are and typically travel an average of one hundred miles or more per day. Exterior bus wrap advertising exposes every demographic group each day and every hour that the bus is in service. It is a win-win situation for utilities in reduced advertising costs as well as for Sarasota County Area Transit, because it becomes a revenue source.

The design was done by Utilities staff and then sent to a company specializing in bus wraps. A special county rate was charged to promote the concept of bus advertising. It cost just \$3000 for the water conservation portion on one side of a bus.

***Village of Wellington - Leak Detection Program: Medium Utility***

The Village of Wellington's Water Conservation Committee designed its Toilet Leak Detection Program to be a basic way to inform its 12,000 customers of the consequences of having a leaking toilet - water waste resulting in higher utility bills. A flier was designed to be simple to understand, and allow for placement of a packet of leak detection tablets, and addressing for bulk mailing. The Committee utilized volunteers to fold and staple the fliers, involving high school students, the local Boy and Girl Scouts, and employees. After the initial mailing, additional tablets are available at the Customer Service counter.

***Village of Wellington - Rebate/Fixture Retrofit Program: Medium Utility***

Of the many different public awareness programs the Village of Wellington has initiated over the years, the one receiving the most positive feedback was the Non-Potable Water Irrigation System Rebate Program. Since lawn irrigation is the primary culprit for excessive water consumption, the village adopted a program that would help utility

customers conserve water. Specifically, the program is a matching grant to be used for the purpose of encouraging and assisting residents in the conversion of an existing potable water irrigation system to a non-potable water irrigation system and to aid in the delay of the expansion of the water treatment plant.

***Hillsborough County - Public Education: Large Utility***

In 1998 the Hillsborough County Water Department's Water Conservation Team made great advances in its public education efforts. The goal was to make the community more aware of the stresses on its water resources and how the department is taking an active role in the protection of its water resources.

The first aspect of the efforts is to reach the school-age children of Hillsborough County. Participation in the Theatre Arts Project has reached 50,000 elementary school children about water conservation annually. Another program, Water Wonders, consists of in-school presentations on water conservation and focuses on things the children can do to save water.

The second aspect is to reach the adult community through home irrigation audits, irrigation classes, and participation in com-

munity events throughout the county as a means to distribute conservation literature.

***City of Plant City - Reclaimed Water Program: Small Utility***

Having embarked on the "Reclaimed Water Path" some two years ago, Plant City found itself in a position to step back and evaluate its program, and to look to the future potentials for maximizing utilization of water resources. With this in mind, the city obtained a 50-50 matching grant from SWFWMD, and hired an engineering consultant to conduct the evaluation. The study resulted in the quantification and prioritization of the potential reuse customers based on a cost effectiveness matrix. The report has become a valuable tool for targeting limited resources, for pursuing construction grants from the District, and for development of the city's 6-year Capital Improvements Program.

***SWFWMD - Public Education: Water Management District***

The public is exposed to water conservation messages through various media and programs, but a different program was needed, one that would engage people and take them from the "hearing and understanding" stage to the "doing and teaching" stage. The Community Water Counselor Program was developed to teach neighborhood representatives the hands-on techniques of indoor and outdoor water conservation. Returning home, they would teach these techniques to their neighbors, thus becoming the community's water counselor. ■



# Is ICI Coming Of Age?

Fred Bloetscher



Articles on water conservation have recently begun focusing on the potential water savings to be derived from institutional, commercial, and industrial customers (the ICI component of water use). Significant experience has occurred in Texas, Arizona, California, and Colorado, especially in looking at industrial process of cooling towers and in retrofit projects to schools and other institutional enterprises. The question now is: what is the potential for savings to be derived in south Florida, and how will utilities go about performing this function?

## South Florida Water Conservation

In south Florida, 50 to 60 inches of rain fall each year. The problem is that 70 percent of it comes during the summer season, which is when the number of residents is the least and water usage is lowest. As the weather cools and the seasonal visitors return to Florida water demands increase. It becomes especially acute during the dry months of April and May. The result is that only a few months of the year when the rainfall exceeds the evapotranspiration rate.

To compound the problem, drainage systems have been designed to direct the excess summer rainfall to the ocean. Thus, south Florida has a management problem - not a water supply problem - in retaining water, which makes it difficult to convince people of the need for water conservation efforts.

Water conservation efforts become necessary as aquifer levels drop. The entirety of south Florida is dependent on rainfall for recharge of the Biscayne and Tamiami aquifers. The result is that during abnormally dry seasons, or in areas of high demand, the aquifer levels drop precipitously, causing wells to go dry and saltwater intrusion to move inland.

The focus on addressing water conservation issues in south Florida has been irrigation usage. Depending on the affluence of the community, between 30 and 60 percent of total water consumption goes to irrigation use, and that doesn't include private wells for lawn irrigation, which are common. In many areas this quantity is falsely lowered through residents having separate irrigation wells, an especially acute problem in older areas along the coast. Residential usage constitutes a majority of the irrigation demand, as most south Florida communities do not have significant industrial or commercial bases. As a result, because many communities are retirement or seasonal visitor-oriented, ICI users constitute less than 10 percent of the total flows within the jurisdictions. Obviously exceptions exist, but because less than 10 percent of the flows are ICI type uses, the focus of the utilities has not been on conservation for these entities.

## Traditional Water Concerns

The focus of utilities is to provide safe and reliable drinking water at an affordable price. At the same time, efforts are made not to waste the resource. However, throughout Florida, water sources are generally inexpensive. Conservation becomes an issue to customers when the water supply expansion comes at a cost significantly higher than the cost to currently produce water. For instance, utilities that need to use more western wellfields, which have higher color, or need to draw on the brackish Floridan water system, immediately incur higher treatment costs for new water supplies. It is to their benefit to continue to use Biscayne water from the current wellfields and to offset increases in demand for water conservation efforts.

To offset small increases and water demands or water supply

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problems during drought periods, utilities have typically imposed restrictions under certain conditions. In addition, most utilities have low-flow fixture requirements in building codes and, because of the drought from 1989 to 1991, most car washes have converted to recycle systems.

Pursuit of irrigation usage reductions through the use of reclaimed water and system regionalization has the potential to eliminate competition with potable water resources by golf courses and other utilities. In addition, utilities have pursued aquifer storage and recovery and similar projects in an effort to attempt to store excess water during the wet months so that it may be retrieved during the dry months.

## ICI Concepts

Potential for savings is often driven by the processes of the entity. It is a fairly simple task to determine who is most apt to have the greatest potential for reductions in water usage. Institutional, commercial, and industrial customers will typically be in the upper echelon of the total water consumption. Running a sort of the top 100 or so customers by water consumption will often identify the majority of ICI-type customers. While retirement or seasonal communities may not have significant numbers of ICI users, there are instances of a few large users that should be targets for potential ICI methods.

The recent evaluation of a Motorola facility in one south Florida community derived a savings of over six million gallons of water per year through adoption of process modifications and total water use reductions.

## How ICI Programs Should Be Pursued

Once a utility identifies its largest ICI facilities, there needs to be a good understanding of each site's water uses to identify efficient water conservation opportunities, given that in industrial areas the processes can vary significantly.

Persons conducting the water audits should understand the basic functions of the building processes. It is necessary to understand for each operation how water is utilized, what it is utilized for, and what results occur. In many cases results are driven by chemicals or minerals that occur as part of the process and are generally regulated under the utility's industrial pre-treatment program.

Information that should be gathered in preparation for a good water use review include the following:

1. The site location.
2. The use including the size of the facility.
3. Number of employees.
4. Water utilization.
5. Plumbing plans.
6. Operational issues, such as flushing of processes.
7. The number of plumbing fixtures.
8. Operational issues that may occur throughout the day that may contribute to spikes in water utilization.
9. Hours of operation.
10. The water use profile, delineating domestic versus process versus cooling versus irrigation usage.
11. Total water and power bills over the past several years.

The on-site survey must utilize the above information to identify water usage by fixture, the water quantity actually

delivered, the amount of time that the fixture is utilized during the day and the quantity each time, and all the potential areas for alternative water supply (such as the use of reclaimed water for irrigation or cooling water).

Water use surveys have been performed extensively in Texas and have provided the following information:

	<b>Restrooms</b>	<b>Cooling and heating</b>	<b>Food service</b>	<b>Land-scaping</b>	<b>Other</b>
Hospitals	40%	13%	8%	5%	34%
Office Buildings	45%	20%	10%	25%	
Schools	40%	20%	10%	25%	
Restaurants	15%	20%	60%	5%	
Hotels	29%	14%	24%	14%	19%

It is obvious that retrofits for restrooms may generate significant savings, as can the efficiency for cooling and heating systems and the conversion to alternative water supplies for landscaped irrigation. Total water savings for any of these types of facilities may be insignificant when compared to the overall utilities goals but become significant in combination. The Texas data also indicate that only 44% of the customers surveyed actually implemented the changes voluntarily without financial incentives.

Manufacturing opportunities are much more varied, as the type of manufacturing that occurs creates significant disparities in the amount of process water used. For instance, paper mills use significant quantities of water; however, recycled-paper mills use only a tenth of the water that production facilities for new, unrecycled paper require. In many areas encouragement can be provided for the conversion to recycled paper where the market may exist, thereby decreasing production as well as water billing costs. The biggest savings for Motorola was process-related.

### **ICI Issue**

Providing services to gain ICI savings is often expensive, especially for small jurisdictions. However, many larger jurisdictions have industrial pretreatment compliance technicians who are currently going to the high water users. These technicians are skilled at understanding piping systems and understand the total process. In many cases, industrial pretreatment programs have schematic drawings for water and wastewater systems for each facility. By understanding the type of process involved in the enterprise and looking at the resulting usage, the technicians can often identify the type of plumbing fixtures and the process uses that may be modified. Use of technicians with these skills combines the two utility efforts into one visit.

### **Conclusions**

As we move more and more toward water conservation efforts, it is in the best interest of utilities to begin to look at industrial, commercial, and institutional customers for potential water savings. While irrigation will remain the focus of most utilities in south Florida for the near future, utilities should begin running a sort of customer records to determine the top 50 to 100 customers. These customers should be approached to determine if there is a potential for water savings. Nearly all of them will be ICI enterprises.

Some may have limitations in providing savings, while others may find benefits. In many cases industrial processes cannot be encouraged to change simply to save a few thousand dollars per year in water bills; however, they may be able to modify their entire processes, as the Motorola plant did, to achieve significant production savings at the same time. This motivation is one which utilities and the entities should strive to achieve together.