

Conservation Plan 2014-2021

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1. A Little History to Start

There has been “180-degree turn from the early ‘90’s to the present on what perception people have of San Antonio and water. Before, we were highly criticized for not planning our water future. Now, every time somebody speaks about the proper way to plan for water, the proper way to conserve water, San Antonio is always mentioned.”

– State Representative Robert Puente, San Antonio – March 11, 2003 – San Antonio Express-News.

For over a century the Edwards Aquifer has supplied San Antonio with pure spring water. In the early ‘90’s the Federal courts and the State legislature established limits on our only water supply. After years of regional intractability and indecisiveness, the community united to address critical water supply issues. Water conservation was immediately identified as a way to address both short and long term water needs. So, how does a community change from water careless to water careful in a few short years? It wasn’t any one thing but the synergy that comes from the excitement of a new agency, (The San Antonio Water System created in 1992), a worthy goal, adequate funding and a community that has enthusiastically joined the Conservation Team.

2. Purpose of this Report

San Antonio Water System (SAWS) utilizes water conservation as one of its water management strategies to ensure that the water needs of our community are met now and in the future. The 2012 Water Management Plan details the population projections, demand projections and drought of record scenarios that were used to assess long-term water needs. Water conservation targets for the time period of 2012 through 2020 were set as part of that planning process.

There are two state required conservation plans; one to the Texas Commission on Environmental Quality (TCEQ) and one to the Texas Water Development Board (TWDB). These reports cover the time period of 2014-2019 and focus on the compilation of detailed water planning data and on outlining conservation targets expressed in gallons per capita per day. There is not an extensive narrative required for either state report that would assist the reader in understanding the strategic decisions being considering in setting targets, or in strategies used to meet the targets.

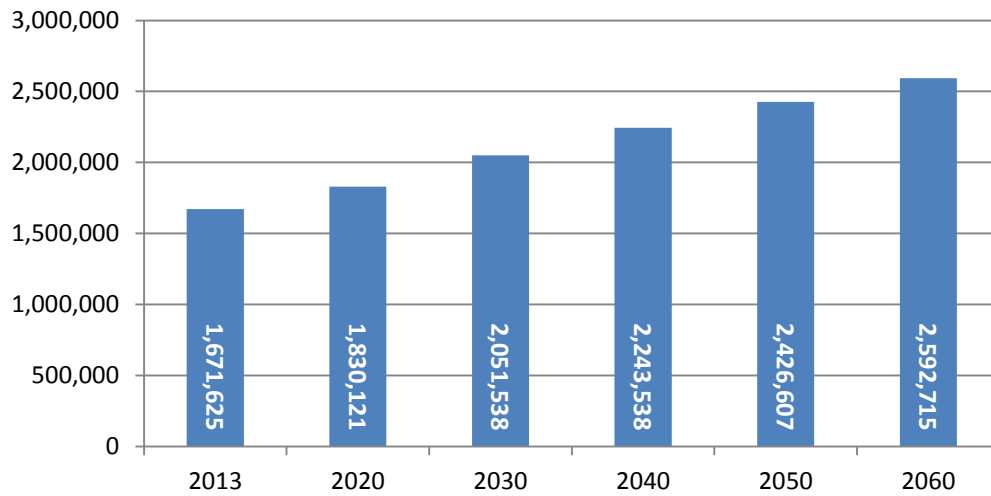
In 2012 SAWS made the unique strategic choice to focus on “dry year per capita goals” in the 2012 Water Management Plan, which was presented to City Council on November 14, 2012 and adopted by the SAWS Board of Trustees on December 4, 2012. This report will provide historical context for that choice, data on prior water conservation efforts of SAWS, and explanation of the strategic choices that inform diverse conservation programs. During the next five years conservation efforts will keep San Antonio on track to meet its 2012 water management goals and provide inexpensive supplies that are critical to the SAWS mission of providing sustainable, affordable water service to the community.

3. San Antonio Water System Customer Use Patterns

San Antonio is currently the 7th largest city in the United States and uniquely positioned atop one of the most prolific aquifers in the world. The geographical location of San Antonio results in weather prone to both intermittent flooding and extended dry periods. Water drawn from the Edwards Aquifer (San Antonio’s primary source of water) requires no treatment and is easily produced and distributed from wells positioned in different areas of the community. However, utilization of Edwards water is highly regulated through the Edwards Aquifer Authority as part of an extensive Habitat Conservation Plan to preserve endangered species associated with the aquifer fed springs and cave system. There are time periods when SAWS has an excess of water supply needed for the community and time periods when curtailed permits and drought reduce the Edwards supply by up to 44%. The combination of rapidly growing population, a growing economy, prolonged drought periods and decreased water source permits has required San Antonio to be innovative in its approach to water planning. Details of efforts to utilize technology and water supply expansion can be found in the 2012 SAWS Water Management Plan.

SAWS provides water and wastewater services to over 1.6 million residents and supports a thriving, diverse economy. Top economic drivers include healthcare, military installations, hospitality, a strong housing market and industrial manufacturing. With the diverse job opportunities available, it is no surprise that the number of customers served by SAWS is expected to grow 1.8% to 2% per year.

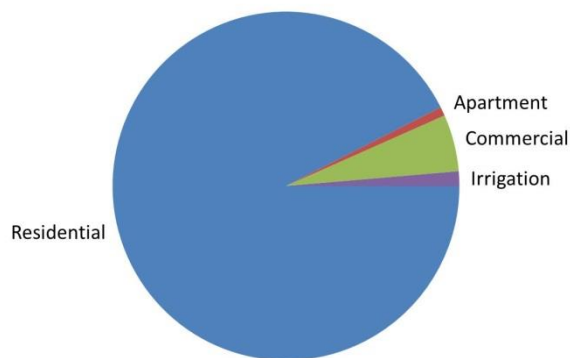
Figure 1: Service Area Population Growth Estimates from SAWS 2012 Water Management Plan



In recent years the SAWS annual water production has ranged from a high of 261,344 acre feet in 2011 and a low of 236,667 acre feet in 2013. Water is distributed to approximately 478,000 customer meters over a geographic area covering nearly all of Bexar County and small portions of adjacent counties (934 square mile service area). Residential meters make up the majority of the customer accounts (Figure 2). The water sales by volume reflect that commercial and industrial customers require significant amounts of water for their operations (Figure 3).

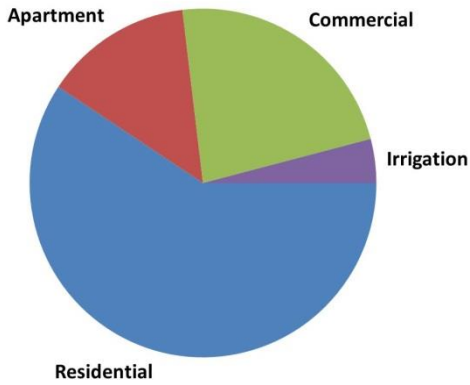
Commercial use accounts make up only 5% of SAWS meters but their operations are significant requiring the use of 23% of SAWS water sold by volume.

Figure 2: Types of Metered Customers in SAWS Service Area



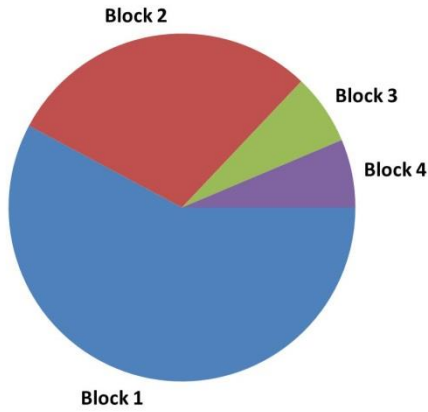
Account Type	# of Meters	% of Meters
Residential	442,395	93%
Commercial	25,215	5%
Apartment	3,991	1%
Irrigation	6,463	1%

Figure 3: Percent of Water Sold to Types of Metered Customers



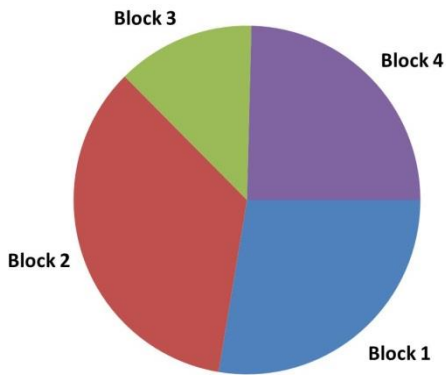
Account Type	Million Gallons	% of Meters
Residential	35,068	59%
Commercial	13,498	23%
Apartment	8,164	14%
Irrigation	2,408	4%

Figure 4: Residential Bills Ending in SAWS Rate Blocks for 2013



Rate Block	Gallons of Use	% of Bills
1	0 – 5,985	58%
2	5,986 – 12,717	29%
3	12,718 – 17,205	7%
4	17,206+	6%

Figure 5: Residential Bills – Gallons Sold by SAWS Block Range for 2013



Rate Block	Gallons of Use	Million Gallons	% of Gallons
1	0 – 5,985	9,686	28%
2	5,986 – 12,717	12,245	35%
3	12,718 – 17,205	4,513	13%
4	17,206+	8,624	24%

Water use increases significantly during summer months. Cool season consumption produces a pumping pattern that averages about 180 million gallons per day. In contrast, the peak months of July and August have an average of about 252 million gallons per day (Figure 5). Water use is also significantly influenced by rainfall. Summer water production will fall by up to 80 million gallons per day for several days after a saturating summer rain event (Figure 6). Summer production patterns are also influenced by drought restrictions when they are in place. Use of spray irrigation is prohibited on weekends during all stages of drought restrictions. This results in a clear seven-day pumping pattern throughout the year with reduced production on weekends (Figure 6).

Figure 6: Average Pumping Levels 2007-2014

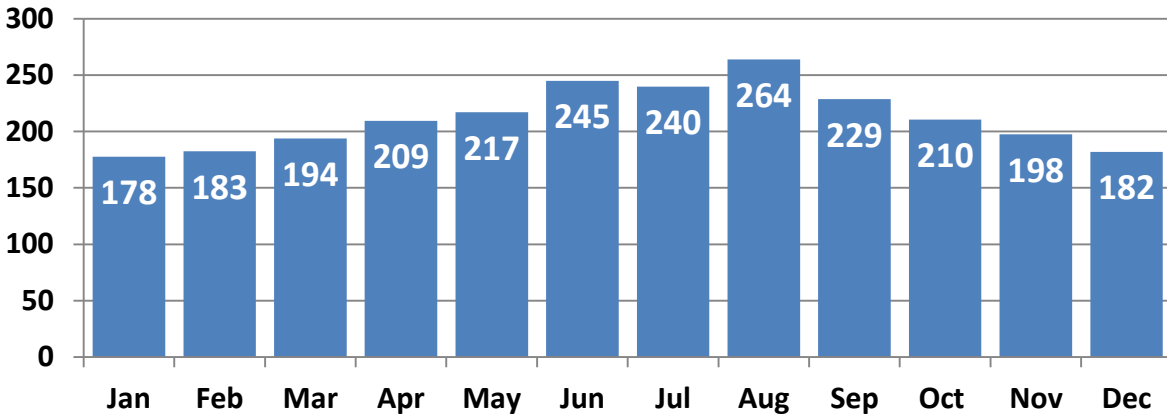
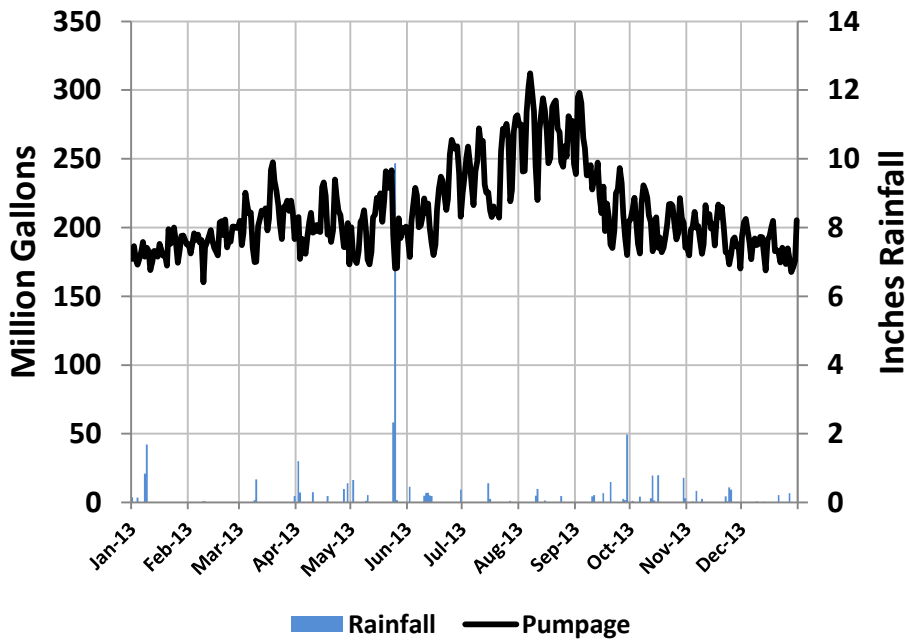


Figure 7: 2013 Daily Pumping During Once Per Week Drought Restrictions



Emerging Residential Water Use Patterns

The two areas of biggest residential conservation opportunities are reducing landscape irrigation water use and educating customers to help them identify and repair leaks. Peaking patterns are driven by landscape watering. Changes in the habits, water application methods, and plant choices of those who irrigate aesthetic landscapes can result in significantly reduced peak demand. Lower peak production lessens the need for drought restrictions and new firm supplies.

Indoor Water Use Patterns

Successful indoor retrofits combined with plumbing codes have steadily decreased indoor consumption patterns in San Antonio. Recent participation in the AWWA WRF Residential End Use Study and Demand

14% of single family home indoor use is consumed by leaks.

Hardening Study indicated that the SAWS service area has achieved near market saturation of high efficiency toilets in residential homes (DeOreo, 2012). As with most cities in the study, San Antonio still has gains to make in encouraging homeowners to find and repair leaks. On average 14% of indoor usage is still wasted on unrepaired leaks in homes. It is important to note that this average includes 3% of households with large leaks losing up to 189 gallons per day. This 3% of households account for 31% of all of the household water lost to leaks.

Outdoor Water Use Patterns

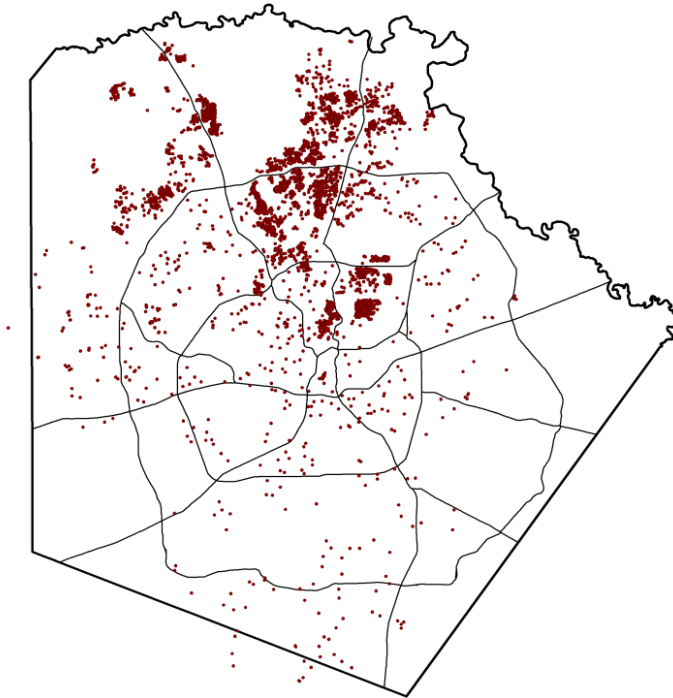
Outdoor water use patterns have shifted in recent years. In 2011 a comparison of winter consumption against summer consumption suggested that up to 48% of annual water production was related to landscape watering. During the past several years this same analysis indicates a reduced production volume during peak summer months. In 2013 only 16.9% of water produced was related to landscape consumption. There are many factors that may have influenced this trend. Weather has been less severe than it was in 2011, but this does not explain all of the change. Production during dry months has been less than historical averages during similar weather periods. The average residential bill during August of 2011 was approximately 12,500 gallons per month. In contrast during a similarly dry August month in 2014 was approximately 9,000 gallons per month. This indicates that a larger trend is in place. Drought regulations, improved irrigation efficiency and scheduling and changing landscape design preferences have all likely contributed to the declining outdoor water use trend. It is unknown how water use patterns will change once drought restrictions are lifted. SAWS customers have been limited to once per week irrigation usage since 2011. Water usage has declined for the past three years without restrictions becoming more rigorous. The restrictions lessened slightly in 2013 allowing one more hour for use of spray irrigation on assigned watering days. The question that remains is whether customers will return to using spray irrigation on multiple days per week once the drought restrictions end. Having programs in place that lessen the perceived need to irrigate often will help to mitigate this risk.

Across the country, much of the pattern of discretionary water use is driven by a relatively small number of customers who use automatic irrigation generously. Outdoor water use among residential customers is highly variable with some customers watering often and many choosing to forgo all supplemental landscape water use. This is part of a larger national trend reflected in the 2012 AWWA Residential End Use Study. On a national level 30% of homeowners never apply any water to their landscapes. Of those who do apply water, 38% do it exclusively by hand-held hose.

In San Antonio approximately 30% of residential customers have automatic irrigation systems. That percentage is anticipated to increase every year if current home builder trends remain. New homes are often coming with automatic irrigation as a standard amenity. This is important because irrigation systems correlate with higher landscape use. Homes that have automatic irrigation systems use 50% more water annually and 70% more water during summer peak months compared to homes without

automatic irrigation. A review of all residential bills shows that on an annual basis only 5% of residential water customers exceed 17,205 gallons of water per month (the highest current billing tier). However, during summer months up to 20% percent of bills may include water use at this higher level. The location of the highest water use homes overlaps with higher priced home values and presence of an automatic irrigation system at the home (Figure 7).

Figure 8: 2013 Top 1 Residential Percent Water Bills



New Homes and Irrigation

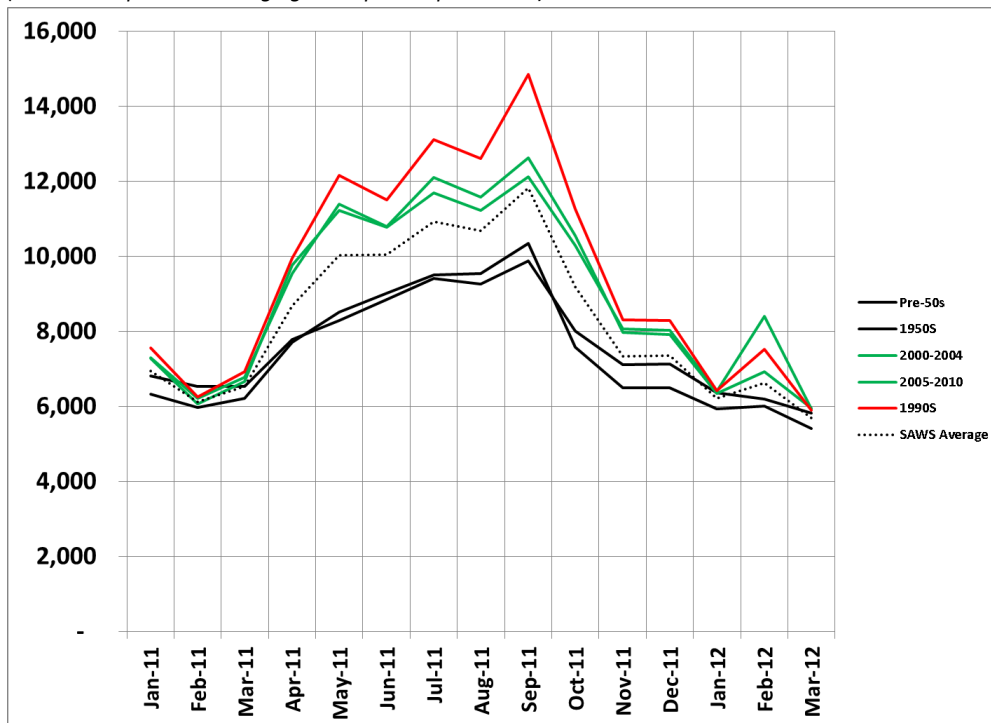
Because many new homes are coming standard with automatic irrigation, this presents a significant challenge to reducing peak demand. Irrigation water use in these homes is high enough to overwhelm the savings from efficient indoor fixtures. New homes use more water on an annual basis despite having modern, water efficient fixtures (Figure 8). It is not uncommon for buyers to move into their first new home and be surprised a month later by the amount of their water bill. Fortunately many homeowners and new home builders are receptive to education regarding water efficient landscaping. The Greater San Antonio Builders Association is a longtime partner in facilitating conservation programs to the local builders and developers. Homes with irrigation will be a focus of the next 5-10 years working through the neighborhood associations and with local home builders through the Greater San Antonio Builders Association to improve irrigation efficiency and beautiful water saving landscapes.

Residential Water Use Patterns by Age of Housing Stock

The highest water use homes (Figure 8) were built in a period of the 1990s. These homes are characterized by larger grass dominated lots with poorly designed aging irrigation systems. During SAWS irrigation consultation appointments it has been observed that these aging systems are less likely to be zoned appropriately for the landscape design and are very prone to leaks. It is not surprising that they have the highest peak and highest overall water usage pattern. It is concerning that the newest housing stock is not much lower despite lot sizes trending to smaller with less grass, indicating that education and change agent programs such as our coupons are needed to guide homeowners and builders to better landscape management.

Figure 9: Residential Water Use Patterns by Age of Housing Stock

(Numbers represent average gallons per bill per month)



Commercial & Industrial Water Use

The commercial accounts billing code includes restaurants, apartments, hotels, resorts, shopping centers, and office buildings. Industrial accounts include technical manufacturing, data centers, food processing, and more.

Many of the older commercial buildings in the SAWS service area utilized retrofit incentive programs to replace high flow toilets, urinals, faucets and showerheads. Approximately 140,000 commercial fixture retrofits took place over a 12 year period. There has also been excellent participation in commercial and industrial custom rebate programs over more than a decade, with a wide range of businesses changing water use processes in favor of better efficiency.

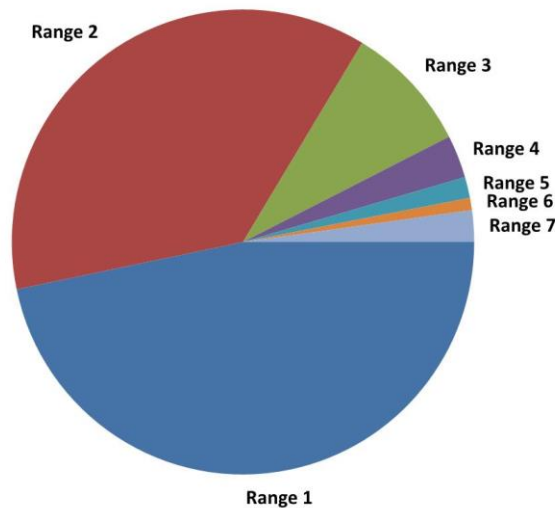
In 2014, a record number of commercial and industrial customers applied for custom rebates for water efficiency projects. Efficiency retrofits and innovations in partnership with businesses accounted for nearly 20% of permanent water savings in 2014. Incentive amounts paid through the custom incentive program are less than half the cost of new water supplies being acquired through the newest SAWS construction projects.

Efficiency retrofits and innovations in partnership with businesses accounted for nearly 20% of permanent water savings in 2014

Landscape Use at Commercial Locations

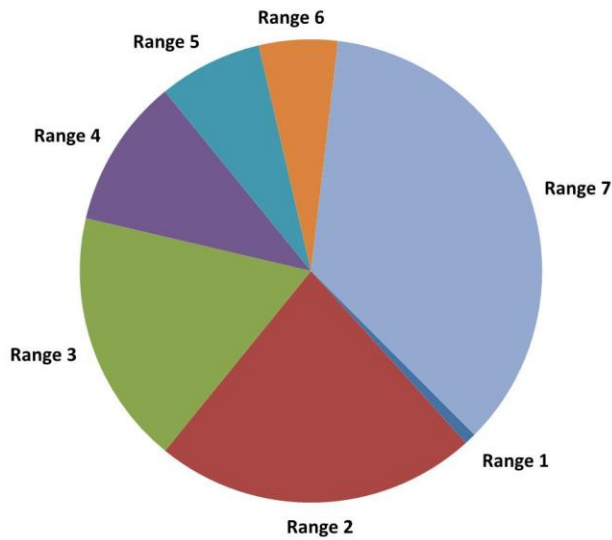
There are approximately 10,000 accounts charged for irrigation water in the SAWS system. Of the 10,000, approximately 6,000 of these accounts have dedicated landscape irrigation meters that have been required on new construction since 1999. The size of the irrigation systems supported by these meters is highly variable (Figure 9). Collectively these accounts utilized a little over 2.4 billion gallons of water in 2013. Like landscape irrigation at residential homes, the consumption through these accounts varies greatly with weather. A comparison of consumption from the wet year of 2007 to the dry year of 2008 showed an increase of 50% in water sold to landscape irrigation accounts.

Figure 10: Percent of Irrigation Bills at Different Consumption Levels (gallons)



Range	Gallons of Use	% of Bills
1	0 - 5,236	47%
2	5,237 - 50,000	37%
3	50,001 - 100,000	9%
4	100,001 - 150,000	3%
5	150,001 - 200,000	1%
6	200,001 - 250,000	1%
7	250,000+	2%

Figure 11: Gallons of Irrigation Billed at Different Consumption Levels



Range	Gallons of Use	Million Gallons	% of Gallons
1	0 - 5,236	20	1%
2	5,237 - 50,000	543	23%
3	50,001 - 100,000	429	18%
4	100,001 - 150,000	252	10%
5	150,001 - 200,000	175	7%
6	200,001 - 250,000	132	5%
7	250,000+	858	36%

Irrigation Check-Ups Required by Ordinance

It is not surprising that water use from irrigation accounts varies greatly with weather and with implementation of drought restrictions. There is also a wide range of practices among commercial landscapes with some choosing no supplemental irrigation use and others using significant amounts of water each month. The variation can reflect that landscape appears as a top priority to attract customers or conversely that the business does not wish to expend resources on an aesthetic landscape. Regardless of the priority placed on landscape, it is important that the irrigation systems be well maintained to avoid water waste. Sites with many irrigation zones and spray heads can easily lose over a million gallons in a month to irrigation maintenance challenges. For this reason all large locations (over five acres in size or using over one million gallons per year) are required to submit irrigation efficiency reports to SAWS annually. There are approximately 2,000 accounts that meet this requirement. Collectively these accounts used over 3.7 billion gallons of water in 2013.

SAWS conservation staff administers the requirement for the irrigation efficiency reports required by city ordinance since 2006. The reports facilitate conservation efforts in several ways. A clear benefit is ensuring that large systems receive maintenance and repair attention at least once per year. The reports also provide valuable contact information for efficient communication regarding water waste reports that otherwise take extensive research to find a local person who is empowered to repair

irrigation at a commercial property. The reports also encourage efficient water management at large sites where property managers may lack the horticulture background to help them assess consumption and landscape water bills. Report information is helpful in assessing when monthly bills are higher than expected due to leaks or excessive irrigation scheduling. Lastly the reports provide valuable information that can be used to calculate conservation incentives for efficiency upgrades.

4. SAWS 2012 Water Management Plan and Conservation

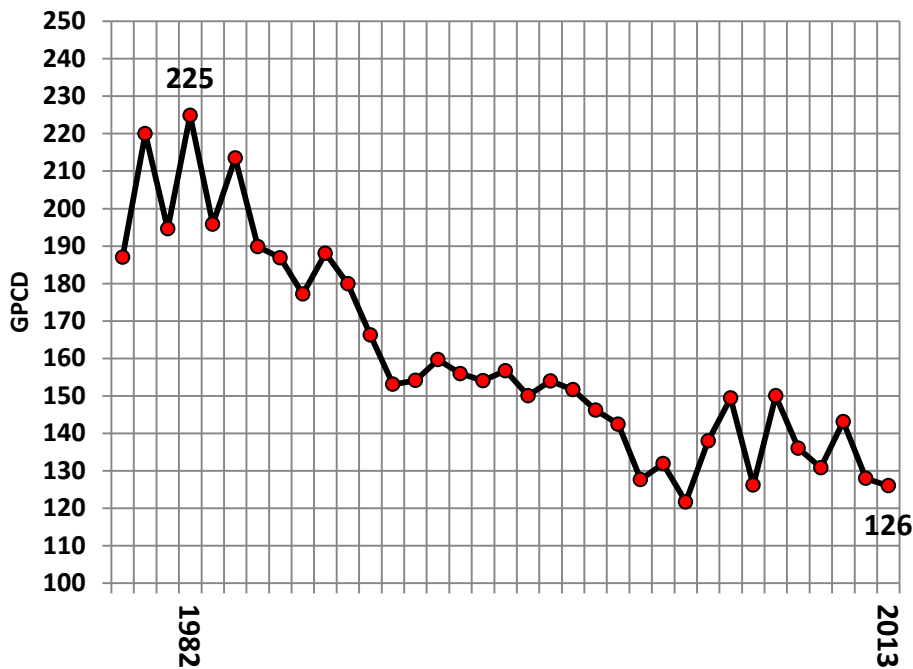
Estimating Future Water Needs:

One of the most challenging aspects of long-term water supply planning is estimating the water need in the future. Census data and national trends indicate that more people will be living in the San Antonio community in the future. In the past few decades San Antonio has experienced significant growth in economic sectors that include industrial manufacturing, data management centers and health research and services. A fundamental assumption of water planning is that San Antonio will need more water to meet the needs of new business and new citizens and that San Antonio will meet a portion of these future water needs through continued conservation programs.

Gallons Per Capita Per Day or GPCD

Gallons per capita per day (GPCD) is a metric used to estimate the relative use of water for our total population. It is calculated by dividing all of the water produced against the entire population of the community. In this way the calculation encompasses residential needs, health and human safety needs and economic uses of water. GPCD is multiplied by the future estimated population to estimate how much water will be needed in future decades. These calculations are revisited at least every five years. In planning scenarios water conservation is built into the plans by estimating how much per capita consumption can be reduced over time. As per capita is reduced, the total future water need is reduced relative to population growth. This reduction in per capita does not eliminate the need for more water (2012 SAWS Water Management Plan).

Figure 12: Total Gallons per Capita Trend



Managing Through Dry Times

Per capita use in San Antonio has shown a declining trend for the past twenty years (Figure 10). Because homeowners and businesses are using water more efficiently, we are able to serve more people with less water. It is a concern that water use fluctuates more with sharp increases in per capita during the driest years. There are several potential causes of this fluctuation. Automatic irrigation systems drive some of the increased use during dry periods because they facilitate applying large amounts of water to landscape quickly. Homes with in-ground watering systems use 70% more water during summer months than other homes. Because more homes and businesses are being built with irrigation on the property, this dry year peaking trend is likely to continue without efforts to moderate it.

“It is a concern that water use fluctuates more with sharp increases in per capita consumption during the driest years.”

A contrast of dry and wet years helps to illustrate the dramatic differences in demand that develop with changes in temperature and precipitation. The summer of 2007 was unusually wet with a total annual rainfall of 47.25 inches. The result was a significant demand reduction even during summer months with peak production barely hitting 200 million gallons per day. The following summer of 2008 was warmer and drier. The daily pumping increased rapidly in the spring beyond 250 million gallons per day. Rain events in July dropped production rapidly again, but summer production remained higher than the prior year.

Figure 13: Wet Year Daily Pumping 2007

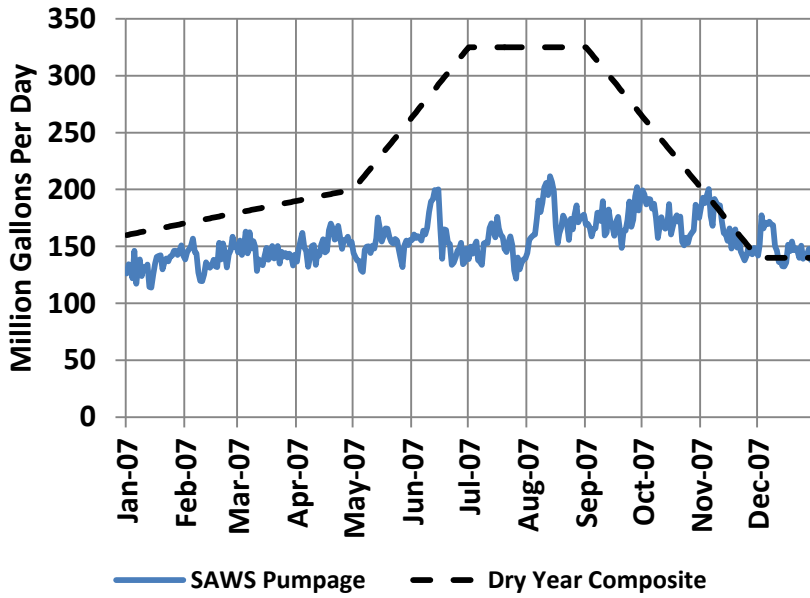
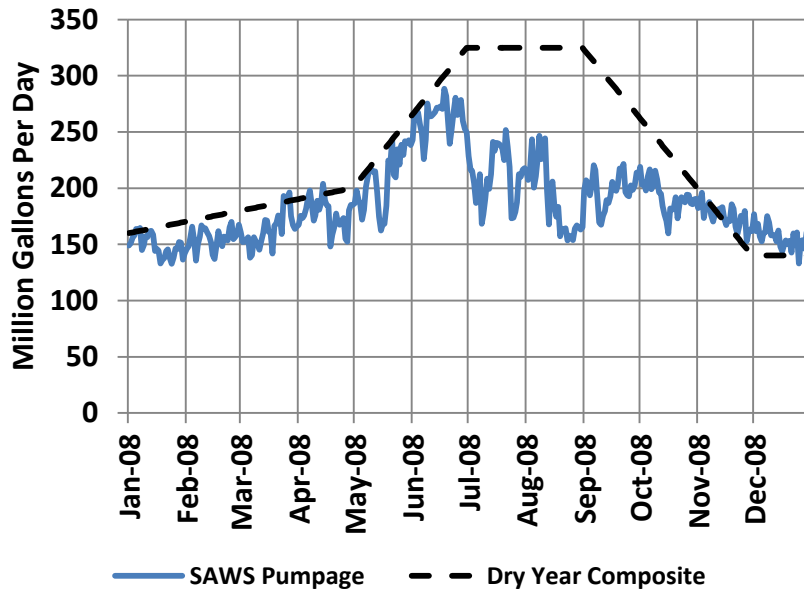


Figure 14: Dry Year Daily Pumping (Without Drought Restrictions) 2008

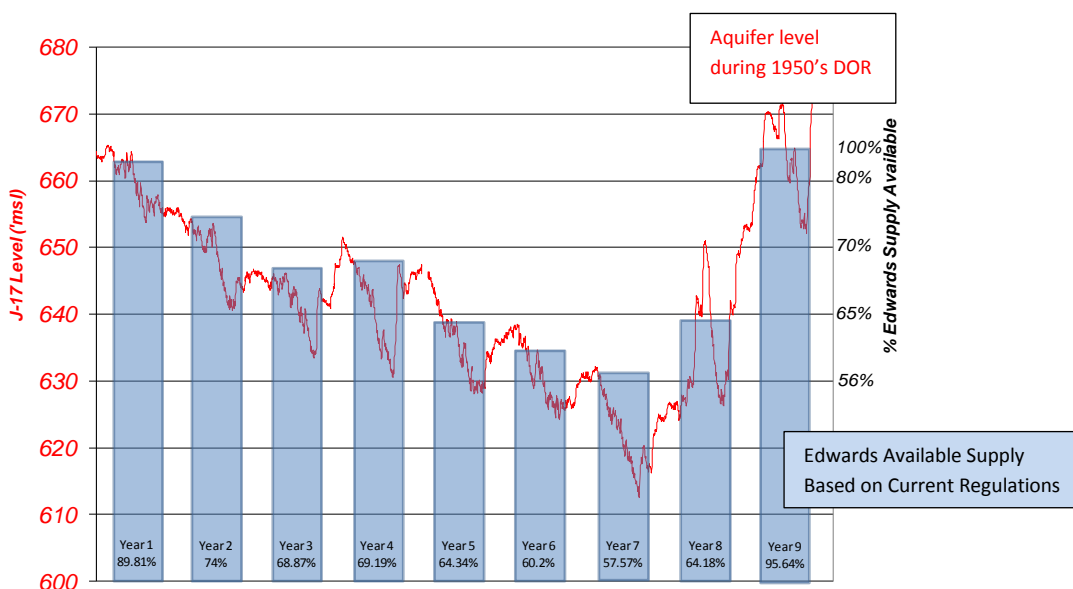


5. Drought Management vs. Long Term Conservation Goals

Planning for Drought

A primary focus of SAWS water planning is ensuring an adequate supply of water regardless of future weather conditions. To assess this need, a drought of record (DOR) planning scenario is used based on the nine year drought experienced in the region from 1950 to 1958. If an extended drought were to repeat in modern times, the current regulatory circumstances would reduce Edwards Aquifer available supplies to the levels shown in Figure 15. While months long drought periods have been common during the past twenty years, multiple year droughts have been rare until recently. 2013 was the third consecutive year of reduced supply in the San Antonio region, with aquifer levels starting lower in 2014 than they have been since 1955. The rigorous nine year planning scenario used by SAWS for planning purposes has helped ensure that SAWS is prepared to withstand long drought conditions. The current drought also highlights the need to continue a diverse water management strategy that includes conservation, drought demand management and the addition of firm supplies.

Figure 15: Edwards Aquifer Supplies Available During Drought of Record



Drought Demand Management

Drought Demand Management is considered a distinct and separate activity from long-term permanent water conservation. Long-term savings programs use education, incentives and year-round regulations to achieve permanent changes in water use. Conservation programs are also aimed at all types of water use. In contrast, drought demand management is a temporary activity designed to make an immediate reduction in peak demand water usage. Required changes in how landscape water is applied cause the most immediate impact on total production. Implementation of drought regulations is coordinated through the SAWS Conservation Department when conditions require immediate changes in water consumption.

The Conservation Department is tasked with coordination of education and enforcement activities associated with drought demand management. These activities are described in CH 34 – of the City of San Antonio Ordinance. The SAWS administrative processes for these efforts are further described in the SAWS Drought Demand Management Operations Guide.

By 2020 SAWS will have acquired 16,500 acre feet (53.7 million gallons) of drought firm supply through peak conservation savings.

Education on drought demand management focuses on ensuring that all customers understand the drought regulations for how discretionary water may be used during defined drought periods. Coordination of enforcement with the San Antonio Police Department and San Antonio Municipal Courts ensures that there is an effective deterrent for ignoring the rules.

Resources necessary to manage effective education and enforcement include temporary administrative staff and part-time police officers who are authorized to file municipal citations. The costs for these resources are drawn from the annual Conservation Department budget. Long-term savings programs are reduced in proportion to the drought demand costs in order to keep total department costs within the annual budget.

Drought regulations may influence customer interest in education and incentive programs offered for long-term water conservation. However, the savings from drought restrictions are not considered part of the long-term conservation goals. Savings from programs designed to meet long-term goals should hold regardless of drought conditions. Drought demand management regulations along with regulations geared toward long-term water savings for the San Antonio region can be found at www.saws.org/conservation.

Long-Term Conservation Goals

The long-term conservation goals through the year 2020 for San Antonio Water System were adopted in the 2012 Water Management Plan. The 2012 Water Management Plan goals focused on reduction of per capita use during hot, dry periods. The recent patterns of increased use during these periods highlighted the strategic value of programs that result in decreased landscape use. The 2011 per capita of 143 was set as a starting dry-year per capita with a goal of decreasing this steadily through the end of the planning period of 2020 (Table 1).

Table 1: Acre Feet Water Savings Goals from 2012 Water Management Plan

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Cumulative Savings	1,644	3,335	5,070	6,852	8,679	10,552	12,471	14,435	16,445
Annual Savings	1,644	1,690	1,736	1,782	1,827	1,873	1,919	1,964	2,010

The savings included in the 2012 Water Management Plan are intended to be permanent demand reductions that are treated as a supply in SAWS water planning. Because these savings are yielded

through changes in peak discretionary usage, they reflect a unique “drought firm supply.” Total water saved since the beginning of the SAWS conservation program in the 1980s is greater than all current non-Edwards originating sources combined and at a much lower cost. The total yield within the next eight years of the plan is the equivalent of a significant water supply project. The investment required to acquire savings as a drought firm supply is less per acre foot than the cost of recent capital projects for firm supplies.

6. Strategies to Save

There are three primary strategies deployed by the conservation department to achieve long-term per capita reductions; 1) education and outreach, 2) financial incentives and 3) reasonable regulation. The specific programs within each of these strategies changes annually, but a mix of these three strategies has been a consistent part of the successful SAWS water conservation strategy for many years.

Education & Outreach

Focused research from the 2004 Texas Water IQ campaign underscored the importance of water literacy in motivating people to save water. Citizens who are unaware of the source of their drinking water are unlikely to be motivated to use it more carefully. In contrast, having an understanding of community water challenges and a pride in water efficiency motivates individuals to use water carefully and to find ways to reduce their usage.

SAWS seeks to build on the water literacy of the San Antonio community each year by reaching large numbers of them with personalized conservation education. Each year a combination of SAWS staff programs and presentations combined with those of our contracted conservation partners reaches over 100,000 individuals.

The use of electronic media to interact with our citizens is expanding. A conservation e-newsletter, interactive GardenStyleSA website, Facebook, Twitter and other strategies are also used to enhance water literacy.

Financial Incentives

There are a variety of ways that SAWS policies and programs enhance the financial benefits of saving water. SAWS uses a conservation-oriented rate structure that charges more for high levels of use. The SAWS rate structure also directs a small portion of top tier rate revenue into a residential conservation fund and a small portion of each commercial meter into a commercial conservation fund. The conservation funds are utilized for a range of conservation activities that include staff, education materials, and conservation rebates.

Reasonable Regulation

The San Antonio conservation ordinance has been described as “the most comprehensive in the nation” by the Alliance for Water Efficiency because it encompasses efficiency requirements for many water uses. These have all been negotiated with impacted stakeholders. Professional organizations including builders, landscapers, irrigators, plumbers, power-washers, pool-builders car wash owners and others have helped to set reasonable efficiency standards that reduce water use in each sector while

preserving economic vitality. A copy of the City of San Antonio ordinances impacting water efficiency can be found at www.saws.org/conservation.

7. Conservation Investment

The consistency of SAWS progress in water conservation over many years is in large part a credit to the strategic decision to include dedicated conservation revenues in the SAWS rate structure. Having conservation revenues tracked in the Comprehensive Annual Financial Report (CAFR) every year has highlighted the unique SAWS dedication to conservation as a long-term water strategy.

Just one year after San Antonio Water System was created the residential rate structure set aside approximately nine cents per dollar of the top tier revenue for water conservation. These funds were used to hire the first water conservation staff and funded the first conservation programs.

In 1997 commercial customers under the leadership of the San Antonio Manufacturers Association requested that a portion of each commercial meter fee be dedicated to commercial conservation in a restricted fund. This practice has continued since then and has provided funding for the staff and incentives that drive efficiencies in the commercial use of water.

As the SAWS service population has changed over time, the investment per person has remained between \$3-\$4 per capita (Table 2).

Table 2: Per Capita Conservation Investment

Year	2006	2007	2008	2009	2010	2011	2012
Operating Expense	\$4,599,653.56	\$4,904,258.09	\$5,047,252.30	\$5,799,248.89	\$5,078,586.03	\$5,068,312.55	\$5,217,163
Service population	1,200,413	1,223,115	1,243,189	1,262,035	1,283,087	1,300,689	1,650,000
Op. Exp. per Person	\$3.83	\$4.01	\$4.06	\$4.60	\$3.96	\$3.90	\$3.16

8. Effective Application of Conservation Strategies

Education & Outreach Includes Community Input

A cornerstone of SAWS conservation planning has been a commitment to citizen involvement in the process. This is accomplished through active networking among professional organizations that represent stakeholders, attendance at community meetings, and through a formal Community Conservation Committee.

The Community Conservation Committee

The Community Conservation Committee (CCC) was established in 1994 to provide input to conservation staff and the SAWS trustees regarding the implementation of conservation strategies. The group is comprised of no less than 16 and no more than 25 members who are appointed by the SAWS trustees. The group meets monthly with conservation staff at least ten times each year.

Professional Associations

It is impossible to list all of the specialty stakeholder organizations that have worked with the SAWS Conservation Department in recent years. Each has been invaluable in providing feedback on industry trends, program design and on ensuring that regulations are both reasonable and effective. Some of the organizations that have been particularly active include:

- Greater San Antonio Builders Association
- San Antonio Irrigation Association
- San Antonio Manufacturers Association
- Texas Nursery Landscape Association
- Southwest Car Wash Association
- San Antonio Apartment Association
- Green Industry Alliance
- Plumbing, Heating and Cooling Contractors Association
- International Car Wash Association
- Texas Turf Irrigation Association
- Association of Pool and Spa Professionals

Partner Organizations Expand Conservation Impact

Water conservation has many champions in San Antonio. There are organizations passionate about related topics that include water conservation information. Groups dedicated to teaching the community about sustainable gardening specific to our region are critical. Programs that save water often also provide habitat for wildlife or preserve open spaces that add to community health. SAWS has formalized some of the partnerships with like-minded organizations to maximize the benefits of educating the public together. Some of our most active partner organizations include:

- Bexar County Master Gardeners
- Gardening Volunteers of South Texas
- Mitchell Lake Audubon

- San Antonio Botanical Society
- Alamo Area Master Naturalists
- Green Spaces Alliance
- Build San Antonio Green
- San Antonio Parks & Recreation Department
- Native Plant Society
- Bexar County AgriLife Extension Service
- Texas A&M San Antonio
- University of Texas San Antonio
- Alamo Area Colleges EcoCentro
- Trinity University

Regional and National Conservation Partners

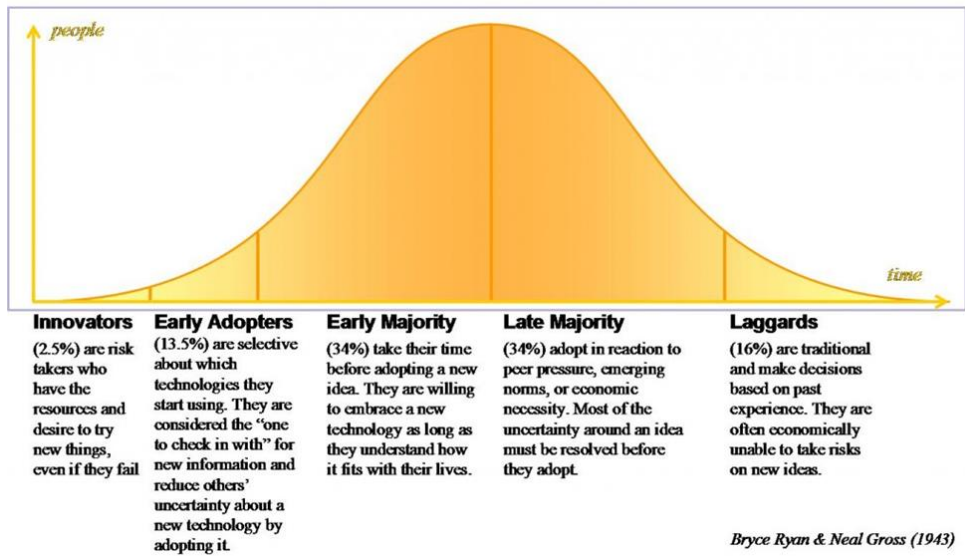
SAWS also works with national and state organizations focused on water conservation. These provide ways to share program ideas, technology information and evaluation results.

- The Alliance for Water Efficiency
- Water Conservation Advisory Council
- Conservation & Reuse Division of Texas AWWA
- EPA WaterSense

Effective Incentives, Not Rewards

SAWS conservation incentives are designed to accelerate behavioral, process and equipment changes that lead to lower water use over time. The Roger's Innovation Adaption graph (Figure 11) illustrates how a population of people will include those who quickly adopt new practices or technology and those who will wait for information or financial assistance. An ideal incentive provides just enough assistance to entice more water users to engage in change that they would not otherwise have made. SAWS conservation incentives, combined with education, help overcome the hesitation of the early and late majority who otherwise would not make a change. Incentives are not intended as rewards for prior adoption of conservation efforts. For this reason program design includes requirements that customers engage with a program proactively in order to earn incentives. Rebates are not given retroactively for actions taken in the past.

Figure 16: Roger’s Theory of Innovation Adaptation



Programs for Every Customer

Broad participation in community water conservation efforts helps build and sustain a community conservation ethic. Incentive and education programs are crafted to provide ways for many different customers to contribute to long-term peak reductions.

Low-income neighborhoods have water use patterns demonstrating that nearly all water usage is within the home. Programs like leak repair education, fixture retrofit assistance and leak repair address this challenge.

Landscape incentive programs are marketed to residential and commercial customers who have high water landscape water use. The more water a customer uses currently, the greater the savings are when their habits, technology or plant material are changed.

It is expected that modest water users will participate in some landscape improvement programs. The gains from these customers include changing the accepted aesthetic in our community and cultivating enthusiastic leaders within neighborhoods. Program marketing is aimed at increasing the participation of higher water users and increasing awareness among customers who do not naturally gravitate to conservation programs.

“The new WaterSaver Landscape Recognition program will highlight customers who have attractive landscapes they manage with very little supplemental water.”

San Antonio is fortunate to have a significant number of customers who have transformed their landscapes and have achieved maximum water savings. Many of these customers are eager to share their success. The new WaterSaver Landscape Recognition program will highlight customers who have attractive landscapes that they manage with little supplemental water. The conservation leaders who have acted first to save water are an excellent resource for neighbors who may be reluctant to make a

change. The recognition program will help identify conservation leaders and provide ways for them to showcase beautiful, water-efficient landscapes.

Reasonable Regulation: When the Water Efficient Way Becomes the Only Way

When does a water-saving behavior, business practice or type of equipment become “the way we do things in San Antonio?” The answer depends on factors that include cost, ease of adaptation and acceptance among the target group.

In San Antonio there has often been a natural progression from education, to providing incentives until the community decides that the water efficient technology or method is the only way. Dental vacuum equipment provides an excellent example. Older equipment that was common years ago used water to cool the engines resulting in astounding daily water use at all dental offices. As new oil-cooled equipment entered the market, SAWS staff worked to educate dentists on it and provided incentives to retrofit. As the new equipment came down in cost and was proved reliable, there was support for an ordinance requiring that only non-water cooled dental vacuum systems be sold in San Antonio. This progression from education to incentive to regulation accelerated the adoption of the technology and

“In San Antonio there has often been a natural progression from education, to providing incentives until the community decides that the water efficient technology or method is the only way.”

set an even playing field among dental offices that are all expected to use the more efficient equipment. This same evolution has been followed regarding standards for irrigation systems, for swimming pools, and for operation of cooling towers. Each time a new regulation is considered, there is extensive stakeholder interaction to ensure that the measure achieves the desired savings at a reasonable cost.

9. Indoor Off Peak Retrofits and Programs

Programs that accelerated the retrofits of high water fixtures in homes and commercial buildings were an enormous success in San Antonio. Over 500,000 residential and commercial toilets were replaced during a twelve year period saving millions of gallons of water. The impact was so great that the need for expanded sewage treatment capacity was eliminated. Today San Antonio Water System serves 67% more customers but treats less sewage than it did twenty years ago.

Fixture retrofit programs reached a point where data analysis suggested near saturation. Both residential and commercial fixture retrofit programs have been ended. The budget dollars previously invested in fixture retrofits are being used for expanded landscape and irrigation programs. Low income plumbing assistance programs are still offered and include a free efficiency retrofit if high flow fixtures are found. Finding high flow fixtures is becoming increasingly rare even in low-income neighborhoods.

Incentive dollars are also still used for equipment retrofits under the custom rebate program. Industrial and commercial customers who retrofit high water use equipment may apply for a rebate that places a custom rebate on the water saved. Savings measures that reduce the base rate every month of the year

often provide excellent savings at a low cost. Incentives for base rate savings are still offered, but the investment is less than for efforts that address peak discretionary demands.

Leaks & Maintenance

There will always be a need to educate the public about home maintenance to prevent and manage leaks inside homes and businesses. The 2011 Residential End Use Study research conducted in San Antonio estimated indoor leaks as accounting for 14% of indoor water use due to high water losses at a small number of homes in the study. SAWS will continue to educate the public on maintenance of the most common indoor home leaks that include toilets, water softeners, ice makers, and faucets. Educational videos provide instruction on how to replace the seals found on high efficiency toilets and brochures illustrate how to address faucet and shower leaks. EPA WaterSense “Fix a Leak Week” promotions offer an opportunity to increase awareness about the need for regular detection and repair. Customers can also call the Conservation Department at 704-SAVE for a free phone conservation consultation that talks them through how to trouble shoot the most likely source of their indoor leaks.

“EPA WaterSense Fix A Leak week promotions offer an opportunity to increase awareness about the need for regular leak detection and repair.”

10. 2014-2020: Changing Program Focus to Address Peak Demand

Peak Use Programs vs. Off Peak Programs

Peak demand water that is available during droughts is more valuable to SAWS than water available at other times. Programs that reduce discretionary water use during peak demand time periods have a higher value to the water system. This is why incentives for peak demand programs are higher. However, there is still value in off peak demand programs that reduce water usage year-round. Conservation incentives can be provided at the reduced indoor rate and if they are effective at achieving permanent water conservation.

What Helps Reduce Peak Usage?

Landscape water usage varies more with weather than any other consumption purpose. Absent regulation, as weather gets hotter and drier, customers use more water to manage their landscapes. This can be mitigated by:

- Using plants in landscapes that thrive with minimal application of supplemental water.
- Ensuring that the amount of water used is not excessive to maintain plant health.
- Ensuring that the application of water is done efficiently and without waste.

New Applications of Conservation Strategies for Peak Reduction

The three strategies used to achieve peak reduction goals are education, incentives, and reasonable regulation.

Monthly conservation workshops cover diverse topics such as Make and Take Rain Barrels, Landscape Remodeling, and Xeric Herbs.

1) Education and Outreach for Peak Reduction

Programs that increase customer understanding of San Antonio's unique climate, seasons, soils and plant palette result in water savings. Newcomers to our region may have little or no experience with South Texas landscape options. Many of our customers have never managed irrigation systems and struggle to understand the irrigation controller at their home. Our programs provide research-based information based on real-time weather conditions, and inform people regarding best practices for keeping landscapes thriving.

Because customer landscape design, watering habits and interests are highly variable, there is not a one size fits all approach to landscape education. SAWS deploys a diverse range of tools to reach customers with landscape and watering advice. The annual target is to reach over 120,000 customers with direct conservation education delivered either face to face or to a verified e-mail address. Some of the tools used to reach this target include:

- **Conservation Consultations:** Specialized staff visit homes to review landscape and irrigation practices. They educate the homeowner, document irrigation water use and suggest improved irrigation settings. Consultations are linked to incentive programs used by residential and commercial customers. The adjustment of the irrigation settings by SAWS Conservation Consultants provides the highest yield of peak savings of any single program.
- **GardenStyleSA.com & E-Newsletter:** This new website provides attractive content that is updated weekly reflecting real-time seasonal changes in landscapes. The new content is packaged in a weekly e-newsletter which includes evapotranspiration based watering advice. Content is linked to incentive and education programs. Subscriptions to the e-newsletter and visits to the website are growing steadily with a user profile reflecting the target audience for outdoor programs.
- **Community Education Events:** SAWS hosts two large landscape themed community education events annually. Staff also participates in events with related environmental themes. Volunteers from partner organizations provide SAWS education materials at events SAWS staff cannot attend.
- **Neighborhood Conservation Workshops:** High water use neighborhoods offer a unique opportunity to work with homeowner associations and garden clubs. Half day WaterSaver Workshops are offered within these neighborhoods on weekends. The events may be staffed by either SAWS paid staff or SAWS volunteer partners.
- **Neighborhood Consultation Sweeps:** The highest water use neighborhoods are excellent targets for Conservation Consultation Services. Some of the schedule is dedicated to neighborhood focus periods when homeowners are encouraged to sign up for a consultation while SAWS staff will be working exclusively in their neighborhood. This

reduces driving time for staff, improves scheduling, and allows staff to spend more time at homes where it is needed. Consultations completed in target neighborhoods yield higher average savings than ones scheduled other ways.

- **Conservation Workshops:** Partnerships with trained volunteer organizations have expanded conservation workshop opportunities. Texas AgriLife, Master Gardeners, Gardening Volunteers of South Texas, Botanical Society and Mitchel Lake Audubon organizations all offer conservation education for the public in partnership with San Antonio Water System. Topics covered in these workshops include diverse subjects such as Make and Take Rain Barrels, Landscape Remodel, and Xeric Herbs for the Garden. A listing of current workshops can be found at: <http://www.saws.org/Conservation/calendar/>.

2) Incentives Aimed at Peak Reductions

Incentive Calculations

Incentive calculations have changed to reflect the enhanced strategic value of reduced peak water usage. In 2012 SAWS trustees authorized using annual conservation budget dollars to provide incentives that acquire savings at \$1,100 per acre feet of peak saved using up to ten years of saved water for the calculation. Programs that save equal amounts of water each month of the year will receive lower incentives amounts using this formula than programs where most of the savings is in the summer months.

Incentive calculations review consumption during the six hottest months of the summer. For indoor programs where savings is the same every month, this is a simple calculation that takes exactly half of the annual savings into account. For programs focused on outdoor landscape reduction, up to 75% of the savings may take place during the six hottest months of the summer. The amounts paid for outdoor programs will tend to be higher as a result. The examples below illustrate how this works.

Example: Indoor Retrofit

Average Monthly summer or winter savings: 5,000 gallons/month
Annual Savings: 60,000 gallons
Summer six months peak savings: 30,000 gallons
Peak Acre Feet Contribution: .092 acre feet
Maximum Rebate at \$1,100/acre foot: **\$1,012**

Example: Outdoor Irrigation Management

Winter Monthly savings: 4,000 gallons
Summer Monthly Savings: 6,000 gallons
Annual Savings: 60,000 gallons
Summer Six months peak savings: 48,000 gallons
Peak Acre Feet Contribution: .147 acre feet
Maximum Rebate at \$1,100/acre foot: **\$1,617**

Note: SAWS is not required to provide the maximum incentive allowed for each saving opportunity. Many program incentives will provide savings at a lower cost/acre foot. Custom rebate policies can be found at www.saws.org/conservation.

New Outdoor Program Incentive Options

Rebates, free materials, and instant coupons all generate excitement among SAWS customers. Each incentive is designed to entice customers to take a new water saving action. Customers must apply for incentives before they make retrofits or changes and are not eligible for reimbursement otherwise.

The newest incentives are aimed at overcoming barriers to making landscape and irrigation changes. Coupons for landscape materials are aimed at “starter gardeners” who crave guidance and simple options as they remove grass over time. Irrigation efficiency rebates upgrade older systems that will get a better result with less water. Custom incentives can be used with our highest water users to address the desire for comprehensive water saving projects. Custom rebates are also applied to rainwater and on-site reclaim systems that sustain plant material without potable water.

Custom rebates are also applied to rainwater and on-site reclaim systems that sustain plant material without potable water.

Planned New Programs:

- Residential WaterSaver Recognition Program
- Residential Custom Incentives for Targeted High Users
- Custom Incentives for Large Property Landscape/Irrigation Changes
- GardenStyleSA.com Design Center
- How to Workshops for Coupons
- Custom Commercial Rebates for Large Landscapes
- Custom Conservation Analysis & Reports

3) Reasonable Regulations Aimed at Peak Reduction

The process of reviewing reasonable regulations as a mechanism to save water is ongoing. When ideas for new regulations are raised for consideration, the first step is to consider who would be impacted, potential benefits, potential costs, and what interested parties exist. Research and discussions are pursued thoughtfully to achieve maximum effect.

In 2006 a comprehensive landscaping ordinance was passed that included support from key stakeholders including the Greater San Antonio Builders Association. The measures included ensuring that adequate soil is used under grass, that home buyers may choose WaterSaver landscape options, and that drought tolerant grass is used for new construction. The research and stakeholder review of the measures took place over a period of several years.

Today there are new technologies being proposed as standard to raise the bar again on irrigation efficiency. The certification standards for car washes have been an enormous success, introducing the potential for codifying the voluntary measures for all new car wash operations. These and other measures will require a detailed analysis and discussion with impacted stakeholder groups. The goal is to identify reasonable measures that save water but do not impede business or quality of life.

11. Program Evaluation

Evaluation Approach:

Each program investment is designed to achieve a conservation goal. The goal is drafted based on best available data regarding current water use and on any results from research. While the estimates are useful, they must be verified as sound through review of actual water use data. This is easiest for indoor or commercial programs where water use patterns are predictable from one month to the next or when a sub-meter can be installed to measure the exact usage of particular water usage. Case studies outlining evaluation of commercial and indoor conservation programs can be found at www.saws.org/Conservation/CaseStudies.

Documents outlining evaluation of several conservation programs can be found at www.saws.org/conservation/casestudies.

Evaluation of outdoor programs is challenging because season, heat, precipitation, and drought regulations may greatly influence landscape water use. Simple pre- and post-program comparisons may be completely invalid if there was a significant change in any of these variables.

There are several strategies used to counter the challenge of multiple outdoor usage variables.

- 1) Pre- and Post- Comparisons for Similar Months of the Year
- 2) Comparison to Control Group
- 3) Pre- and Post- Comparisons from One Year to the Next

Example: Residential Outdoor Conservation Consultation

Savings from conservation consultations are best observed when comparing water use patterns during pre-consultation years against post-consultation years. Approximately 1,000 home consultations were examined in the latest effort to calculate savings from the program. All of these consultations were completed in 2012. There was not a change in drought restrictions during the years evaluated. The summer peak consumption pattern of the households was relatively similar in years prior to the consultation service. The two years after the consultation service show a distinct change with both winter average and summer peak reduced.

Figure 17: 2012 Conservation Consultation Customers Average Monthly Consumption 2007 - 2014

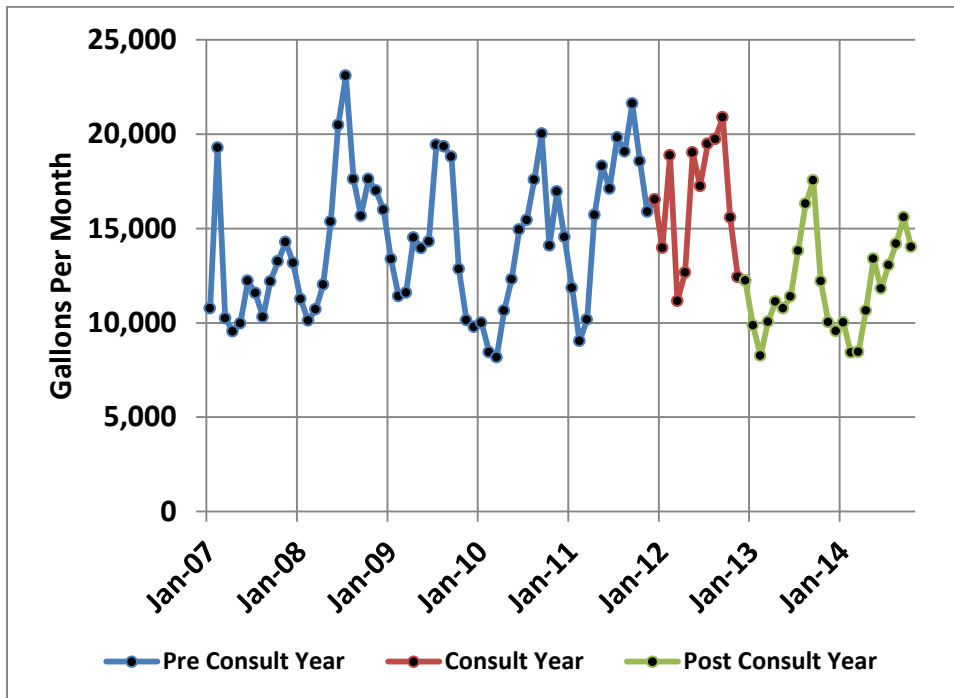
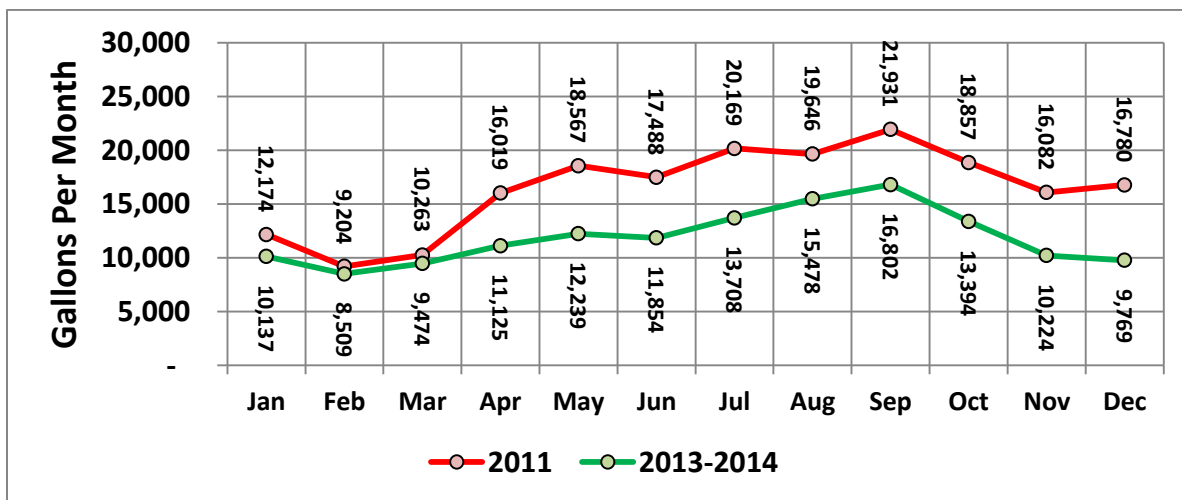


Figure 18: 2012 Conservation Consultation Customers Average Monthly Consumption for Pre and Post Consultation Years



Prior to having a conservation consultation, the average consumption includes several summer peaks close to 20,000 gallons per month. After receiving a consultation, the summer peak drops from above 21,500 gallons to around 17,500 gallons in 2013. This peak drop in consumption for the 1-month high is also seen in the average bill for the year. In 2011, the average bill for this group was about 16,000 gallons per month. In 2013, it dropped to around 12,000 gallons per month, and is on pace to do the same for 2014.

We use an average savings of approximately 4,000 gallons per month in savings for the program. About 60% of the total savings for the consultation occurs in the summer months. Consultations achieve an astounding 5,200 gallons per month of savings during the summer. The estimate will be reviewed again as new data from the consultations comes in.

Consultations achieve an astounding 5,200 gallons per month of savings during the summer

Annual Savings Assessments

A water savings plan is formulated as part of the annual budget and planning process. The plan ensures that there is sufficient funding and staffing to yield the savings required for each year of the Water Management Plan.

Program results are assessed each year. Each program has a unique savings profile. Participation in each program is tracked and an amount of water saved is assigned to each unit of participation.

Some programs have firm savings numbers attached to them based on many years of tracking. Conservation consultation results fall into this category. Annual program evaluations have led to increased savings per consultation. Consultations reported in 2013 (Table 3) are listed separately by services focused only on irrigation, both irrigation and indoor, indoor only, and top 1% users. The savings metrics verified through evaluation have been different for each type of consultation. This detailed evaluation effort has led to changes in the consultation services offered and to more marketing of the consult services to our highest residential users.

The custom rebates for commercial customers also have firm savings because each project is tracked carefully for effectiveness before the rebate check is issued. The amount of water saved through custom rebates varies greatly each year. New opportunities in this program category are expected in the next few years as pilot programs have helped staff clarify reasonable incentive amounts for new efforts such as landscape and irrigation changes.

New programs may not have verified savings yields because there has not been a full calendar year to assess the water use pattern. There are estimates of savings for new programs such as the landscape coupons. The savings from these programs will be adjusted over time.

In 2013 the total peak savings target was 1,690 acre feet. The permanent peak savings achieved in 2013 was 1,524 acre feet. The shortfall from goal can be attributed to the need to divert over \$350,000 from the 2013 budget to drought demand management. Enforcement activities included hiring part-time conservation officers, interns and temporary staff who managed the education and enforcement required during drought. Significant savings from enforcement activities have been documented through a variety of evaluations, but the savings are not considered permanent because the rules are only in place during drought conditions.

Table 3: 2013 Conservation Peak Savings

Program	Participation	Annual Savings per Unit	Annual Base Savings	Annual Peak Savings
Residential WaterSaver Landscape Coupon	1,400	4,000	5,600,000	3,640,000
Residential WaterSaver Patioscape Coupon	300	4,000	1,200,000	780,000
Swimming Pool Filter Rebate	23	20,000	460,000	299,000
Commercial WaterSaver Irrigation Consultation	70	924,000	64,680,000	42,042,000
Residential WaterSaver Irrigation Consultation	900	25,200	22,680,000	14,742,000
Residential WaterSaver Indoor and Irrigation Consultation	425	48,000	20,400,000	13,260,000
Large Property Annual Irrigation Checkup	1,500	120,000	180,000,000	117,000,000
Consultations Top 1% Residential	100	192,000	19,200,000	12,480,000
Commercial Irrigation Design Rebate	23	116,400	2,677,200	1,740,180
Residential Irrigation Design Rebate	160	70,500	11,280,000	7,332,000
Residential WaterSaver Landscape Rebate	80	27,996	2,239,680	1,455,792
Commercial Custom Rebate	14	varies	72,078,241	46,850,857
Residential WaterSaver Home Indoor Consultation	75	22,800	1,710,000	855,000
Commercial Washright	98	38,438	3,766,924	1,883,462
Commercial Toilets	1,871	19,469	36,426,499	18,213,250
Residential Toilets	10,948	12,500	136,850,000	68,425,000
Showerhead and Aerator Distribution	12,537	10,850	136,026,450	68,013,225
Residential Plumbers to People	510	58,744	29,959,440	14,979,720
Residential Conservation MakeOver	1,849	27,500	50,847,500	25,423,750
Commercial Audit	23	varies	74,294,028	37,147,014
Total Gallons Saved			798,081,934	496,562,249
Total Acre-feet Saved			2,449	1,524*

*During 2013 there was significant diversion of conservation budget and staff time to drought demand activities. Had the staff time and funds been spent on permanent programs there would have been approximately 300 acre feet of additional peak savings.

Although drought enforcement savings are not included in the permanent savings metrics, it is assumed that drought regulations have an impact on water use. Customers may use spray irrigation only once per week and anecdotal evidence of community reaction to this indicates that many will continue the habit once restrictions lift.

12. More Information

How to Get Updated Conservation Information:

SAWS reports annual savings and per capita calculations to the Texas Water Development Board (TWDB). Staff also compiles detailed summaries of the number of people reached with conservation education, incentive program participation, and regulatory measures taken. These results are shared with the Community Conservation Committee (CCC) each year and are available for public review as well. The public is welcome at monthly CCC meetings and may view agendas of the CCC at [http://www.saws.org/who we are/community/ccc/](http://www.saws.org/who_we_are/community/ccc/). Information on programs and outcomes can also be obtained by calling the SAWS Conservation Department at (210) 704-SAVE.

Long-Term Conservation Plans

SAWS updates its Water Management Plan often. Changes in planned supplies, population patterns and demand patterns make it prudent to revisit the assumptions in plans frequently. It is expected that the 2012 Water Management Plan will be reviewed during 2015. At that time there will be a review of water conservation targets extending beyond 2020.