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20,000 High Efficiency Toilets in 2007 & Counting

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San Antonio Water System

Our water. Our future.

OVERVIEW

1. TOILET CENSUS DATA

2. WATER SAVINGS

3. PROGRAM OPTIONS

4. COST/BENEFIT ANALYSIS

San Antonio Water System

Conservation Works

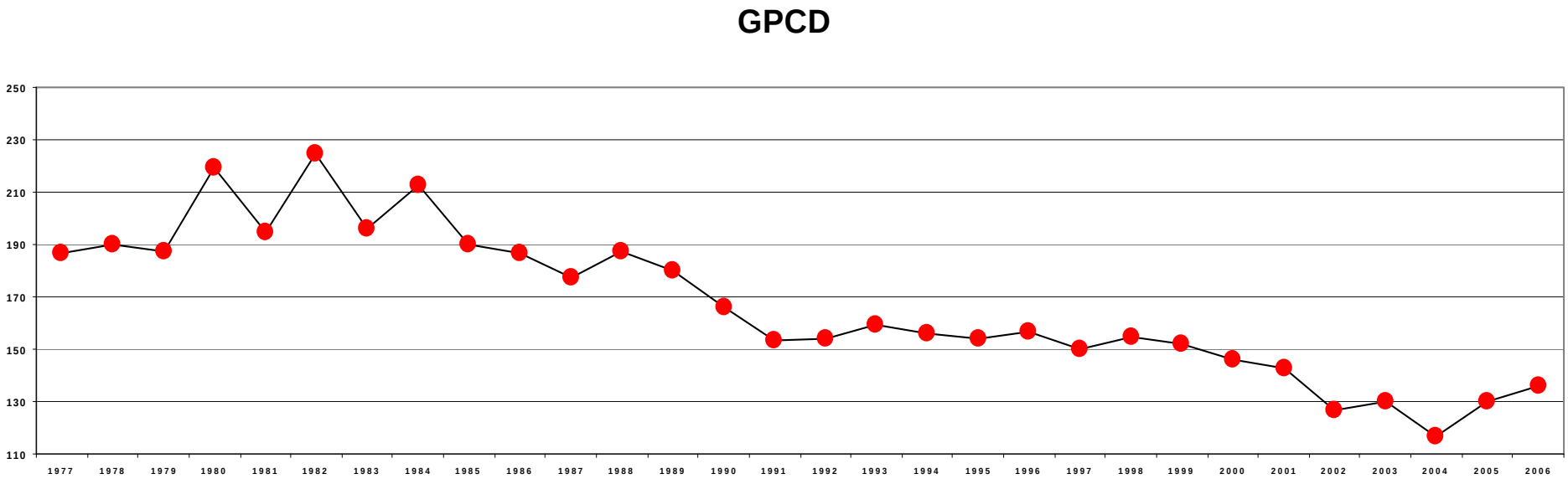
Since the San Antonio Water System began it's aggressive conservation programs per capita water use has dropped from 225 GPCD in 1982 to a low of 136 GPCD in 2006.

Current goal is 116 GPCD by 2016

San Antonio Water System

Gallons Per Capita Per Day (GPCD)

GPCD = Total Gallons Pumped/Service Population



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CONSERVATION DIRECT PROGRAM GOALS

SERVICE POPULATION – 1.28 MILLION

1 GPCD REDUCTION = 1,434 ACRE FEET OR 467 MILLION GALLONS

Direct Conservation Goals can best be achieved through the identification and development of partnerships, aimed at cost effectively reducing water consumption while maintaining or improving quality of life for the residential customer, and maintaining or improving productivity for the commercial customer.

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Where Do We Start?

“DON’T LOOK IN THE TREES WHEN THERE IS A WHOLE LOT OF GOOD FRUIT ON THE GROUND!”

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Toilet Census Data

WaterSense estimates there are currently 222 million residential toilets in the United States. This estimate is based on an assumed one-to-one ratio of toilets to bathrooms.

In addition to the existing stock, approximately 10 million new toilets are sold each year for installation in new homes or replacement of aging fixtures in existing homes.

Residential toilets account for approximately 30 percent of indoor residential water use in the United States—equivalent to more than 2.1 trillion gallons of water consumed each year.

Toilet Census Data

GPF	# of Toilet (Millions)	# of Toilets Replaced Given 10% Replacement	Savings Per Flush by Switching to HET (gpf)
5.0	67	6.7	3.72
3.5	33	3.3	2.22
1.6	122	12.2	0.32
Total	222	22.2	___

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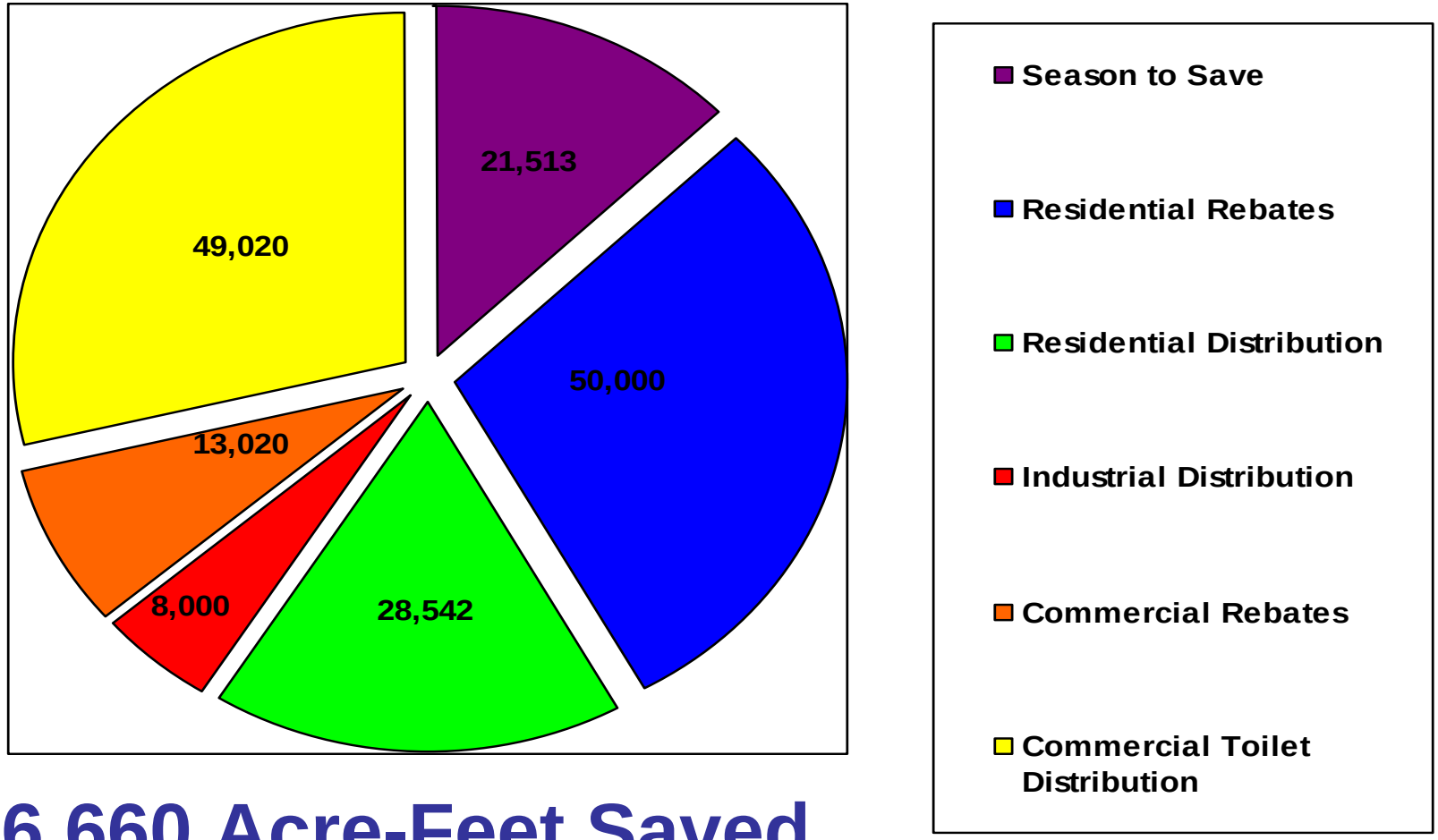
Calculating Potential Savings

- Flushes per Person per Day = **6**
- HET Gallons per Flush = **1.28**
- Savings per Flush = **2.97**
  - (5gpf +3.5gpf) / 2 = 4.25 – 1.28
- Persons per Household = **2.7**
- Days per Year = **365**
- Toilets per Household = **1.5**

Calculating Potential Savings

- Flushes/Day = **6 x 2.7 = 16.2**
- Savings/Day = **16.2 x 2.97 = 48.11 Gallons**
- Savings/Year = **365 x 48.11 = 17,560 Gallons**
- Savings/Toilet = **17,560/1.5 = 11,707 Gallons**

170,000 Toilets Replaced Since 1994



6,660 Acre-Feet Saved

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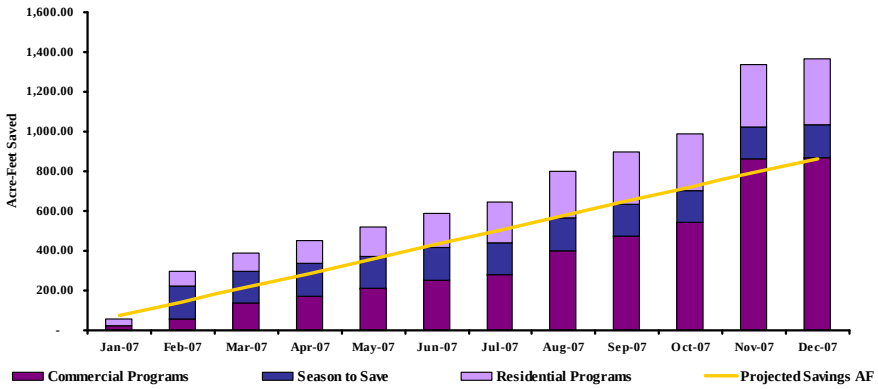
COMMERCIAL AND RESIDENTIAL TOILET PROGRAMS - 2007

Monthly Performance



Performance Data

Unit: Acre-Feet per Year

	Total	Commercial	Season to Save	Residential
Jan-07	57.14	25.45	0.00	31.69
Feb-07	240.10	33.64	163.40	43.06
Mar-07	91.32	75.64	0.00	15.68
Apr-07	65.30	38.90	0.00	26.40
May-07	63.67	35.97	0.00	27.70
Jun-07	72.39	43.20	0.00	29.19
Jul-07	55.88	25.39	0.00	30.49
Aug-07	151.42	121.47	0.00	29.95
Sep-07	97.20	72.47	0.00	24.73
Oct-07	95.87	67.99	0.00	27.88
Nov-07	345.74	320.43	0.00	25.31
Dec-07	28.83	7.65	0.00	21.18
	1364.86	868.20	163.40	333.26
Year to Date	**1365**			
Goal	**865**			
% of Goal	**158%**			

Program Description

Goals: 2007 Direct Program Goal = 1,433 Acre-Feet (1 GPCD)
Annual Objectives: 16,900 Toilet Retrofits
865 Acre-feet Saved in 2007

Year-to-Date Accomplishments: 28,247 Toilet Retrofits
28.83 Acre-Feet Saved in December 2007
1365 Acre-Feet Saved in 2007
158% of Total Goal Accomplished in 2007

Contracts: Cost Containment Engineering: $125,000 (Exp. 12/31/07); Ferguson Enterprises: $500,000 (Exp. 12-31-07); Morrison Plumbing: $1,250,000 (11/1/08); J.R.'s Plumbing: Share of $600k (6/21/07); ARAM Plumbing: Share of $600k (6/21/07); Quartermoon Plumbing: Share of $600k (6/21/07)

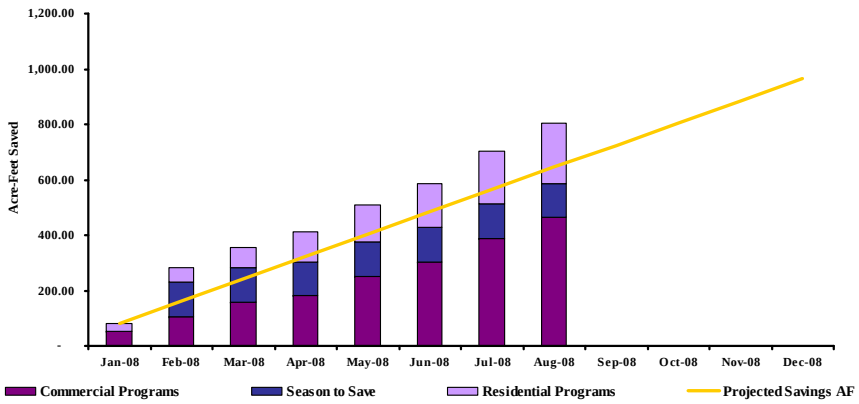
Problem/Opportunity/Threat Analysis

Commercial Programs finished at 145% of goal for 2007	Audited database and processes. Identified discrepancies and accounted for uninspected product.	Verna Cyr	31-Dec-07
Kick the Can finished at 278% of goal for 2008	Reduce expenditures in other areas and continue to process applications the same day they are received.	Caroline Gonzales	31-Dec-07
Season to Save finished at 161% of goal for 2007	4,500 Toilets Distributed February 10	Brandon Leister	31-Dec-07

San Antonio Water System

COMMERCIAL AND RESIDENTIAL TOILET PROGRAMS - 2008

Monthly Performance



Performance Data

Unit: Acre-Feet per Year

	Total	Commercial	Season to Save	Residential
Jan-08	79.35	53.89	124.42	25.46
Feb-08	284.40	51.80		28.83
Mar-08	71.36	50.90		20.46
Apr-08	55.96	23.30		32.66
May-08	96.93	69.55		27.38
Jun-08	77.02	53.12		23.90
Jul-08	117.44	87.17		30.27
Aug-08	99.69	73.19		26.50
Sep-08				
Oct-08				
Nov-08				
Dec-08				
Year to Date	**882.15AF**			
Goal	967 AF			
% of Goal	**91%**			

Program Description

Goals: 2008 Direct Program Goal =
Annual Objectives: 21,500 Toilet Retrofits
965 Acre-feet Saved in 2008

Year-to-Date Accomplishments:
17,134 Toilet Retrofits
99.69 Acre-Feet Saved in **Aug** 2008
882.15 Acre-Feet Saved in 2008
91% of Total Goal Accomplished thru **Aug** 2008

Contracts: Ferguson Enterprises: $500,000 (Exp. 12-31-08); Morrison Plumbing: $1,250,000 (11/1/08); J.R.'s Plumbing: Share of $600k (6/21/08); ARAM Plumbing: Share of $600k (6/21/08); Quartermoon Plumbing: Share of $600k (6/21/08)

Problem/Opportunity/Threat Analysis

Commercial Programs		Brandon Leister	31-Dec-08
Kick the Can		Caroline Gonzales	31-Dec-08
Season to Save		Brandon Leister	31-Dec-08

Department: Conservation

San Antonio Water System

Owner: E. Wilcut

San Antonio Residential Toilet Potential

- SAWS Conservation Planners have calculated that there are more than 140,000 high-flow toilets remaining within the SAWS Service Area.
- Those 140,000 Toilets represent approximately 1.6 Billion Gallons or 5,000 Acre Feet per Year in Potential Water Savings

Program Options

- Rebates
- Distribution
- Low-Income
- Community Based Efforts
- Non-Profit Installs
- For Profit Installs

Rebates

- Credits offered as a result of Purchasing a low-flow or HET Toilet
- Do Not Guarantee a High Quality Product
- Difficult to Verify
- Flapper Issues – 2002 NAHB Study
- Often Involve Free Riders
  - Surveys conducted in San Antonio have shown that approximately 80% replaced their toilets because they broke

Distribution

- Distribution of High Quality Product to Qualifying Customers
- Allows the Utility or District to Set the Standards
- Warranty Period – Ensures the product will remain in good working condition for many years
- Large Purchases Can Result in Lower Costs with Greater Savings
- Reduces Free Riders
- Shared Buying Power Option with Other Utilities

Community Based

- Puts Conservation at the Grass Roots Level
- Increases Awareness
- Reaches areas of the Community that are otherwise very difficult to reach
- Provides a “Win/Win” situation for the Utility and the Non-Profit Organization
- Acts as a Catalyst for other programs

Low-Income & Non-Profit Installations

- Low Income Homeowners
- Public Schools
- Public Housing
- Helps to reach a sector of the customer base who may not be able to afford the product and/or the cost of installation

For Profit Installations

- Where they Make Sense Based on Cost/Benefit Analysis
- Often will create interest and awareness where it may be overlooked because of the cost of water
- Generates Partnerships and Opportunities

Watersaver Hotel Program

The Challenge:
San Antonio hosts more than 21 million leisure and business visitors yearly. The overall impact of the hospitality industry on the local economy is about $9 billion a year.

In the past 10 years the hospitality industry has grown 85%. According to the Convention & Visitors Bureau, San Antonio has 5 of the Top 10 tourist attractions in Texas and is aggressively seeking to host more conventions in the future.

Currently, more hotels are being developed in San Antonio than any other city nationally. Wise water use is not likely to be at the forefront of a visitors' concern, but it is a sizeable area of water use targeted for conservation.

The Solution:
The Watersaver Hotel program is a comprehensive approach to water conservation in this important commercial sector in San Antonio.

It is important to emphasize the long term cost benefits the hotel would realize and in turn the benefit of water savings for the San Antonio community. SAWS assists participating hotels with rebates and fixtures to accomplish many of these requirements.

WaterSaver Hotel Requirements:

• Restrooms must be equipped with high-efficiency toilets, showerheads and aerators which can be accomplished through a SAWS program

• Kitchens must use certain spray valves and dishwashing technology available through SAWS

• Have a voluntary "Linen/Towel Exchange" program and run their laundries efficiently. Rebates may be available for new laundry technologies.

• Have landscapes using efficient irrigation and appropriate plantings with rebates available for design upgrades and consultation on appropriate plant selection.

Case Study:
Hilton Palacio del Rio

A study by the American Hotel & Lodging Assn. found that the average hotel consumes about 209 gallons of water per occupied hotel room each day—almost as much as the 243 gallons consumed by the typical U.S. household.
With rising water and sewer rates, as well as increasing prices of the energy required to heat water, there is a large and growing opportunity for hoteliers to reduce their operating costs and environmental impact through an energy-efficiency program that includes a focus on water management.

Through a partnership with SAWS, the Hilton Palacio Del Rio has undertaken a series of modifications aimed at reducing its overall water consumption. The Hilton, built in 1968, is one of many hotels prominently located downtown along San Antonio's famed Riverwalk.

Project Summary

Retrofits
•525 High Efficiency Toilets
•616 Faucets
•479 Showerheads
•15 Water-cooled ice machines

Year Water Savings
•14,174,518 gallons or 43.5 acre-feet per year.

Total Project Cost
•$167,320.50

Total Annual Hotel Energy and Water Savings
•$126,000.00 per year

San Antonio Water System

Cost Benefit Analysis

- Sea World of Texas
- 309 Toilets
- 2.5 Million Guests per Year
- Project Cost = $83,430.00
- Expected Life = 10 Years
- Gallons Saved = 9.5 Million Gallons/Year
- Gallons Saved over Life of Project – 95 Million Gallons or 292 Acre-feet
- Cost per Acre-foot = $286.00/AF

Cost Benefit Analysis

- HET – Distribution Program
  - Price per Unit = **$90.15**
  - Expected Life = 10 Years
  - Gallons Saved/Year = **11,707 Gallons**
  - Gallons Saved over Expected Life = **117,070**
  - Acre Feet Saved = **.36**
  - Cost/Acre Foot = $90.15/.36 = **$250.00/AF**

Types of Toilets

Maximum Performance of Toilet Fixtures - MAP

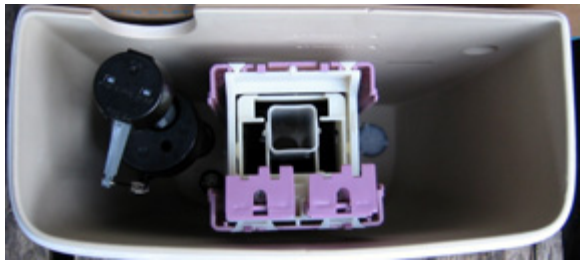
- Rates Toilets on Flushing Efficiency 250-1000
- http://www.ci.westminster.co.us/articles/toiletlist.pdf

Caroma Dual Flush Toilet

- The Caroma Dual-Flush Toilet operates at an average flush of .96 gallons per flush as compared to the 1.6 gallons per flush associated with a standard low-flow toilet.
- The Caroma Dual-Flush toilet is categorized as a high-efficiency toilet and achieves an additional 40% savings over a standard low-flow toilet.
- 4-Inch Trap Way
- Wash Down Technology

Caroma Dual-Flush Toilets

caroma
AUSTRALIA



COST/BENEFIT ANALYSIS

In conducting a cost/benefit analysis, one must determine a cost per unit of water saved. That cost is based on a variety of factors that determine the viability of the option.

For the Conservation Planner, the cost benefit analysis is based on the cost per acre-foot of water saved, as compared to the cost per acre-foot for other water sources.

For the Homeowner, the cost benefit analysis is based on the water and/or energy savings, convenience, and cost.

For the Business owner, the cost benefit analysis is based on productivity, water and/or energy savings, a return of no more than three to five years.

SUCCESS IS BEST ACHIEVED WHEN PROGRAMS ARE DEVELOPED THAT WORK FOR BOTH THE CONSERVATION PLANNER AND THE CUSTOMER

conservation
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