

Town of Marana Water Dept.

Device Giveaway Program

The Town of Marana Municipal Water Department (Marana MWD) is located in Marana, Arizona, approximately 28 miles northwest of downtown Tucson in the Santa Cruz valley. Marana MWD serves a portion of the Town of Marana. The Town of Marana's population as increased an average of 18% per year since 2000, from a population of 13,556 in 2000 to 23,520 in 2004.¹ Median household income in Marana was \$52,870 as of the 2000 census, which was higher than the statewide average of \$40,558.²

UTILITY DEMOGRAPHICS

As of September 2004, Marana MWD maintained 2,542 connections of which 2,421 were single family residential, 14 were multifamily residential, 88 were commercial, and 19 were government. The total service area of the Marana MWD is approximately 70 square miles, which includes undeveloped areas that are currently not served but will be served by Marana MWD once developed. The total service area that is currently served is approximately 11 square miles, and the population of this service area is 7,067. As of 2004, average customer water use in gallons per capita per day (gpcd) was 123.

CONSERVATION DEVICE GIVEAWAY

Devices Distributed:
 Showerhead, tap saver, tap saver deluxe, and a toilet mizer

Eligible Customers: SF, MF, ICI

Customers Analyzed: SF

Program Years: 1998 – present

Years Analyzed: May – Sep 1998

UTILITY RATE STRUCTURE AND PRICES

The Town of Marana Water Department uses a uniform rate structure with a monthly minimum of \$14.00 (includes first 1,000 gallons of water) and a commodity rate of \$2.55 per 1,000 gallons for 5/8 inch meters.

CURRENT CAPACITY AND WATER SOURCES

Currently, the capacity of existing potable water sources within the Town of Marana can provide approximately 9.2 million gallons of water per day or 10,400 acre-feet of water per year. The current source of water for the Town of Marana is groundwater from the Lower Santa Cruz portion of the Tucson Basin aquifer, Central Arizona Project (CAP) water, and reclaimed water.³

FUTURE PLANS TO MEET DEMAND

The Town of Marana plans to meet future demand by using and expanding upon current sources, and through conservation. In addition, as agriculture is retired, irrigation wells for agriculture may be reconditioned and brought to potable standards.

¹ Population Change – 2000 Census to July 1, 2004 Estimate for Arizona, Counties, and Incorporated Places. Arizona Department of Economic Security.

² U.S. Census Bureau, American FactFinder.

³ Marana General Plan, Water Resources Element.

DEVICE GIVEAWAY PROGRAM - DESCRIPTION

In 1998, 115 packets of water-saving devices, including a showerhead, tap saver, tap saver deluxe, and a toilet miser, were given to single family and multifamily residences, and businesses. Customers installed their own devices. The device giveaway program began in 1998 and has continued to the present. This analysis includes customers who received devices between May 5, 1998 and September 8, 1998.

OTHER MARANA CONSERVATION PROGRAMS

Conservation Rate Structure
Customer Service and Field Service Conservation Audits
Currently drafting an extensive array of
Water Conservation Ordinances

METHODOLOGY

Please see the General Methodology for the specific procedures and techniques used for all ECoBA analyses.

The water savings were calculated and a cost benefit analysis was performed for May 5 through September 8, 1998. Our findings refer to this time period only, not to the ongoing program. The lifespan of the devices, which is used as the period of analysis, was assumed to be five years.⁴

All quantified costs and benefits have been discounted to the first year of the analysis (1998) and inflated to 2004 dollars. The discount rate used in this analysis was 5.7%. The CPI values used in this analysis were the 2004 value of 188.9 and the 1998 value of 163.0.

There were at least 20 and no more than 115 participants during May 5 to September 8, 1998. At least three participants were not included because they moved during the period of analysis. There were 17 usable participants out of an unknown total number of participants for the time period under analysis.

All Town of Marana Municipal Water Department residential households, excluding the 17 participants included in the analysis, were used as the control group. The average yearly pre-measure water use of the participants (137,643 gallons) was lower than that of the control group (146,128 gallons). The control group includes 1,008 residences in 1997, 1,033 in 1998, 1,151 in 1999, and 1,176 in 2000.

This analysis differs from other analyses in this study in two ways. First, only July through December water use was collected and analyzed for each year. Second, instead of two years pre-measure water use data and two years post-measure water use data, there is 6 months pre-measure data (July to December, 1997) and one year post-measure data (July to December 1999 and July to December 2000).

⁴ California Urban Water Conservation Council. *Guidelines to Conduct Cost-Effectiveness Analysis of Best Management Practices for Urban Water Conservation*. Los Angeles, CA: Prepared by A&N Technical Services. September 1996.

ASSUMPTIONS

Please see the General Assumptions for the specific conditions and rules underlying all ECoBA analyses.

Household water use during the months January through June is not significantly different, on average, from water use during the months July through December.

Assumed \$75 in labor and \$25 in materials for this program.

The number of connections is an average of connections from throughout the year.

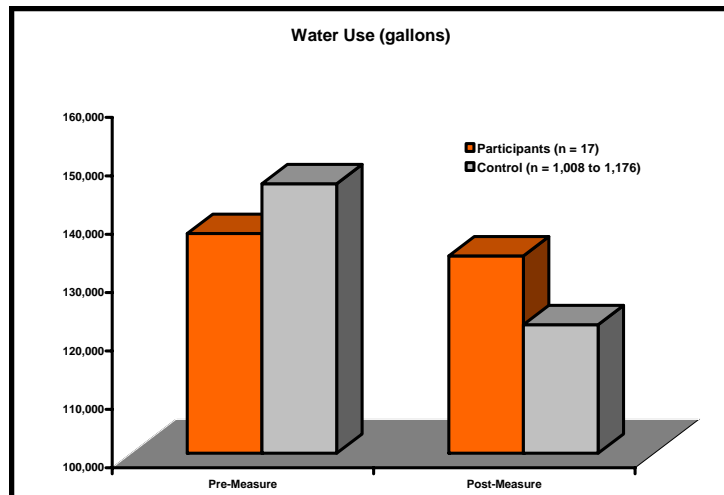
The control group is comprised of residential households other than those included in the study.

The discount rate used in this analysis was 5.7%.

The CPI values that were used in this analysis were the 2004 value of 188.9 and the 1998 value of 163.0.

The price of water used in determining the benefits to customers from reduced water bills is the variable portion of the utility's price of water, \$2.55 per 1,000 gallons.

Participants who had two or more consecutive months of no water use were included in the study.



RESULTS - WATER SAVINGS

In the first year after the 1998 showerhead and aerator giveaways, there was an increase in participant water use, relative to control group water use, of 128,424 gallons, or 7,554 gallons per participant per year (gppy) (11.0% of pre-measure water use). The second year after, there also was an increase in participant water use, relative to control group water use, of 192,323 gallons, or 11,313 gppy (16.4% of pre-measure water use). On average, relative water use increased by 160,373 gallons (0.5 AF), or 9,434 gppy (13.7% of pre-measure water use). **Over the five year assumed lifespan of the program, relative water use increased by 801,867 gallons (2.5 AF), or 47,169 gallons per participant.**

During the year before the giveaway, participant water use was 94.2% of the control group's use, and during the two years after the giveaway, their use was 109.7% of the control group's use. The participant group's water use decreased by 2.8%, whereas the control group's use decreased by 16.5%. **The resulting overall water savings attributed to this program was 13.7%.**

RESULTS - COST BENEFIT ANALYSIS

Costs and benefits listed below represent the entire lifespan of the program (five years).

- ◆ The quantified cost to the utility totaled \$116 (\$7 per participant). This includes the cost of materials, \$29 (\$2 per participant), and labor, \$87 (\$5 per participant).
- ◆ The quantified benefit to the utility was \$0.
- ◆ The quantified cost to the participants was \$0.
- ◆ The quantified benefit to the participants was -\$2,008 (-\$118 per participant), which is the increase in their water bills.
- ◆ The quantified cost to others was \$104 (\$6 per participant). This was the cost to Water CASA for providing the devices.
- ◆ The quantified benefit to others was \$0.

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Materials	\$29	Not Quantified	Not Quantified	Water bill savings	-\$2,008
Labor	\$87			Total	-\$2,008
Total	\$116				

Quantified Costs and Benefits		
Water CASA		
Costs		Benefits
Conservation Devices	\$104	Not Quantified
Total	\$104	

UTILITY PERSPECTIVE

Results of the cost benefit analysis show a net benefit (net present value) from the utility perspective of -\$116 over the five year assumed lifespan of the devices. This is a net benefit of -\$7 per participant. The quantified costs to the utility were greater than the quantified benefits

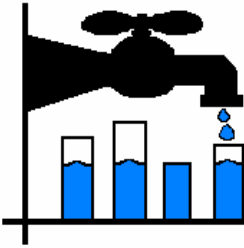
to the utility. **The cost per acre-foot of water saved from the utility perspective was -\$47.**

PARTICIPANT PERSPECTIVE

Results of the cost benefit analysis show a net benefit (net present value) from the participant perspective of -\$4,016 over the five year assumed lifespan of the devices. This is a net benefit of -\$236 per participant. The quantified costs to the participants were greater than the quantified benefits to the participants. **The cost per acre-foot of water saved from the participant perspective was \$0.**

OVERALL PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -\$4,236 from an overall perspective over the five year assumed lifespan of the devices. This is a net benefit of -\$249 per participant. The quantified costs to the participants, utility, and others were greater than the quantified benefits to the participants, utility, and others. **The cost per acre-foot of water saved from an overall perspective was -\$89.**



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Device Giveaway Program

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
<u>Present Value Costs</u>			
Costs to Utility	116	NA	116
Costs to Customers	NA	0	0
Costs to Others (Water CASA)	NA	NA	104
Total Costs	\$116	\$0	\$220
<u>Present Value Benefits</u>			
Total Water Savings	-2.5 AF	-2.5 AF	-2.5 AF
Benefits to Utility	0	NA	0
Benefits to Customers	NA	-2,008	-2,008
Benefits to Others (Water CASA)	NA	NA	0
Total Benefits	\$0	-\$2,008	-\$2,008
<u>Cost Benefit Calculations</u>			
Net Present Value (NPV) (Total Benefits - Total Costs)	-\$116	-\$2,008	-\$2,228
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	-\$47 /AF	\$0 /AF	-\$89 /AF

UNQUANTIFIED COSTS AND BENEFITS

Costs

- Customer time spent installing the devices.
- Environmental damage resulting from increased use of water.
- Disposal of old devices.

Benefits

- Increased public awareness about water conservation.
- Avoided cost of acquisition and distribution of water saved.
- Increased customer satisfaction with the utility.
- Reinforces need to conserve water and desirability of conserving.
- Customers received new fixtures.

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