DEVICE GIVEAWAY
CASE NARRATIVES

PAGES

Community Water of Green Valley
Device Giveaway Program

Community Water Company of Green Valley (CWCGV), a cooperative water utility, is one of five water utilities that serve the town of Green Valley located in the Santa Cruz Valley of Southern Arizona. As of 2003, the town's population was approximately 18,700.[1] The median household income as of the 2000 census was $40,213. [2]

UTILITY DEMOGRAPHICS

As of 2003, CWCGV had approximately 9,800 connections, 49.8% of which were residential. Of their total connections, 4,866 were single family residential, 4,672 were multifamily residential, 233 were commercial, 16 were government, and 11 were construction. CWCGV provides service to a population of 15,500 and currently maintains 10,817 connections. CWCGV's total service area is eight square miles. As of 2004, CWCGV's customer water use for the utility as a whole, in gallons per capita per day (gpcd), was 142.

DEVICE GIVEAWAY PROGRAM

Eligible Customers:	**SF, MF**
Customers Analyzed:	**SF**
Program Years:	**1992 to present**
Years Analyzed:	**1995, 1996, 1997**

UTILITY RATE STRUCTURE AND PRICES

CWCGV has a uniform price structure. The minimum monthly charge for 5/8" meters, which account for the majority of the utility's connections, is $12.50 and includes 2,000 gallons of water. Customers pay $1.07 for every 1,000 gallons over 2,000 gallons. This rate structure has been in place since 1987, with no subsequent rate increases.

CURRENT CAPACITY AND WATER SOURCES

CWCGV depends solely on groundwater and maintains and operates four wells. The company has a current storage capacity of five million gallons.

FUTURE PLANS TO MEET DEMAND

The population within CWCGV's service area is growing at 6% per year. CWCGV plans to meet future demand with current capacity and water sources, and by implementing water conservation measures. CWCGV, in conjunction with other utilities, is studying the possibility of using Central Arizona Project (CAP) water in Green Valley.

DEVICE GIVEAWAY PROGRAM - DESCRIPTION

In 1992, CWCGV began distributing free conservation packets with two low-flow showerheads, two faucet aerators, and one low-flow faucet fixture. The packets are primarily given to customers upon request. However, CWCGV also gives them away once per year at the local county fair. The conservation packet giveaway is an ongoing program.

[1] Arizona Department of Commerce: Green Valley Community Profile.
[2] U.S. Census Bureau: Profile of General Demographic Characteristics 2000.

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OTHER COMMUNITY WATER COMPANY CONSERVATION PROGRAMS

Public Education, ***continuous***
CWCGV has sponsored workshops on a variety of outdoor water conservation topics and publishes monthly water saving tips in the local newspaper.

METHODOLOGY

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

The analysis includes only single family households that received water conservation kits during the years 1995, 1996, and 1997. The water savings were calculated and a cost benefit analysis was performed for the years 1995, 1996, and 1997. The findings refer to these three years only, not to the ongoing program. The lifespan of the conservation devices, which is used as the period of analysis, was assumed to be five years.[3]

All quantified costs and benefits have been discounted to the first year of the analysis (1995) and inflated to 2004 dollars. The discount rate used in this analysis was 7.3%. The CPI values that were used in this analysis were the 2004 value of 188.9 and the 1995 value of 152.4.

The population studied for this analysis was comprised of all participants who received a water conservation kit during 1995, 1996, and 1997. There were 23 usable participants out of 32 total in 1995, 21 out of 31 in 1996, and 13 out of 22 in 1997, for a total of 57 usable participants out of 85. Thirty-three percent, or 28, of the possible participants were unusable because they appear to have moved during the period of the analysis or there was insufficient raw data.

All CWCGV single family residential households that were not program participants and were from districts similar to the participants' were used as the control group in this analysis. There were a total of 25,039 single family residences in the control group, which includes 3,342 customers in 1993, 3,449 in 1994, 3,540 in 1995, 3,599 in 1996, 3,657 in 1997, 3,686 in 1998, and 3,766 in 1999. The average pre-measure annual water use of the participants (66,743 gallons) was lower than the weighted average pre-measure water use of the control group (72,166 gallons).

ASSUMPTIONS

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

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

[3] Pekelney, D.M. et al. *Guidelines to Conduct Cost-Effectiveness Analysis of Best Management Practices for Urban Water Conservation.* California, 1996.

The control group is comprised of single family residential households served by Community Water Company that are characteristically comparable to program participants (Districts 2, 4, 7, 12, 13, 16, 18, and 32).

The discount rate used in this analysis was 7.3%.

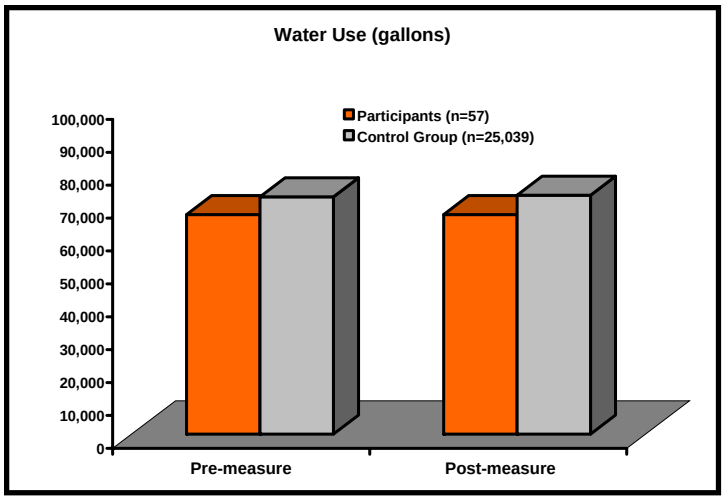
The CPI values that were used in this analysis were the 2004 value of 188.9 and the 1995 value of 152.4.

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. $1.07 per 1,000 gallons was used throughout the analysis (including future years).

Participants who had two or more consecutive months of no water use were not included in the study.

RESULTS - WATER SAVINGS

In the first year after the 1995 showerhead and faucet aerator giveaways, there was an increase in participant water use, relative to control group water use, of 214,355 gallons, or 9,320 gallons per participant per year (gppy) (14.2% 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 110,832 gallons, or 4,819 gppy (7.3% of pre-measure water use). On average, relative water use increased by 162,594 gallons (0.5 AF), or 7,069 gppy (10.8% of pre-measure water use). **Over the five year assumed lifespan of the 1995 device giveaway, no water savings occurred; relative water use increased by 812,969 gallons (2.5 AF), or 35,346 gallons per participant.**



The first year after the 1996 showerhead and faucet aerator giveaways, the water savings was 193,801 gallons, or 9,229 gppy (12.1% of pre-measure water use). The second year after, the water savings was 104,031 gallons, or 4,954 gppy (6.5% of pre-measure water use). The average water savings per year was 148,916 gallons (0.46 AF), or 7,091 gppy (9.3% of pre-measure water use). **The total water savings over the five year assumed lifespan of the 1996 device giveaway was 744,579 gallons (2.3 AF), or 35,456 gallons per participant.**

The first year after the 1997 showerhead and faucet aerator giveaways, the water savings was 78,562 gallons, or 6,043 gppy (11.3% of pre-measure water use). The second year after, the water savings was 46,044 gallons, or 3,542 gppy (6.6% of pre-measure water use). The average water savings per year was 62,303 gallons (0.19 AF), or 4,793

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gppy (9.0% of pre-measure water use). **The total water savings over the five year assumed lifespan of the 1997 device giveaway was 311,515 gallons (1.0 AF), or 23,963 gallons per participant.**

Total water savings for the three years studied was 58,007 gallons, or 1,018 gppy (1.5% of weighted pre-measure water use) during the first year after and 39,243 gallons, or 688 gppy (1.0% of weighted pre-measure water use) during the second year after the device giveaway. **The total water savings over the five year assumed lifespan of the conservation devices was 243,125 gallons (0.75 AF), or 4,265 gallons per participant.**

During the two years before participating in the showerhead and faucet aerator giveaway program, participants' water use was 92.5% of the control group's use, on average. During the two years after participating in the program, their water use was 91.9% of the control group's use, on average. The participants' water use decreased by 0.1% from pre-measure to post-measure, whereas the control group's use increased by 0.6%. **The resulting overall water savings attributed to this program was 0.7%.**

RESULTS - COST BENEFIT ANALYSIS

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

1995 DEVICE GIVEAWAY

- The quantified cost to the utility was $143. This includes the cost of conservation devices, $143. This is a cost of $6 per participant.
- The quantified cost to participants was $0.
- The quantified benefit to the utility was $0.
- The quantified benefit to the participants was -$881. This reflects the value of water bill savings, -$881. This is a benefit of -$38 per participant.

1995 Quantified Costs and Benefits					
Utility			**Participants**		
Costs		**Benefits**	**Costs**	**Benefits**	
Conserva-tion Devices	**$143**	**Not Quantified**	**Not Quantified**	**Conservation Devices**	**$0**
				Water Savings	**-$881**
Total	**$143**			**Total**	**-$881**

UTILITY PERSPECTIVE - 1995

Results of cost benefit analysis show a net benefit (net present value) of -$143 from the utility perspective. 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 not calculated, as there were no water savings.**

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PARTICIPANT PERSPECTIVE - 1995

Results of cost benefit analysis show a net benefit (net present value) of -$881 from the participant perspective. 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 not calculated, as there were no water savings and no quantified costs to the participants.**

OVERALL PERSPECTIVE - 1995

Results of cost benefit analysis show a net benefit (net present value) of -$1,024 from an overall perspective. The quantified costs to the participants and utility were greater than the quantified benefits to the participants and utility. **The cost per acre-foot of water saved from the overall perspective was not calculated, as there were no water savings.**

1996 DEVICE GIVEAWAY

- The quantified cost to the utility was $121. This includes the cost of conservation devices, $121. This is a cost of $6 per participant.
- The quantified cost to participants was $0.
- The quantified benefit to the utility was $0.
- The quantified benefit to the participants was $752. This reflects the value of water bill savings, $752. This is a benefit of $36 per participant.

1996 Quantified Costs and Benefits					
Utility				Participants	
Costs		Benefits		Costs	Benefits	
Conservation Devices	$121	Not Quantified		Not Quantified	Conservation Devices	$0
					Water Savings	$752
Total	$121				Total	$752

UTILITY PERSPECTIVE - 1996

Results of cost benefit analysis show a net benefit (net present value) of -$121 from the utility perspective. 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 $53.**

PARTICIPANT PERSPECTIVE - 1996

Results of cost benefit analysis show a net benefit (net present value) of $752 from the participant perspective. The quantified costs to the participants were less than the quantified benefits to the participants. **The cost per acre-foot of water saved from the participant perspective was $0 as there was no quantified cost to the participants.**

OVERALL PERSPECTIVE - 1996

Results of cost benefit analysis show a net benefit (net present value) of $631 from an overall perspective. The quantified costs to the participants and utility were less than the quantified benefits to the

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participants and utility. **The cost per acre-foot of water saved from the overall perspective was $53.**

1997 DEVICE GIVEAWAY

- The quantified cost to the utility was $70. This includes the cost of conservation devices, $70. This is a cost of $5 per participant.
- The quantified cost to participants was $0.
- The quantified benefit to the utility was $0.
- The quantified benefit to the participants was $293. This reflects the value of water bill savings, $293. This is a benefit of $23 per participant.

1997 Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Conservation Devices	$70	Not Quantified	Not Quantified	Conservation Devices	$0
				Water Savings	$293
Total	$70			Total	$293

UTILITY PERSPECTIVE - 1997

Results of cost benefit analysis show a net benefit (net present value) of -$70 from the utility perspective. 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 $73.**

PARTICIPANT PERSPECTIVE - 1997

Results of cost benefit analysis show a net benefit (net present value) of $293 from the participant perspective. The quantified costs to the participants were less than the quantified benefits to the participants. **The cost per acre-foot of water saved from the participant perspective was $0 as there were no costs to the participants.**

OVERALL PERSPECTIVE - 1997

Results of cost benefit analysis show a net benefit (net present value) of $223 from an overall perspective. The quantified costs to the participants and utility were less than the quantified benefits to the participants and utility. **The cost per acre-foot of water saved from the overall perspective was $73.**

ALL YEARS

- The quantified cost to the utility was $334. This includes the cost of conservation devices, $334. This is a cost of $6 per participant.
- The quantified cost to participants was $0.
- The quantified benefit to the utility was $0.
- The quantified benefit to the participants was $164. This reflects the value of water bill savings, $164. This is a benefit of $3 per participant.

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UTILITY PERSPECTIVE - ALL YEARS

Results of cost benefit analysis show a net benefit (net present value) of -$334 from the utility perspective. 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 $447.**

PARTICIPANT PERSPECTIVE - ALL YEARS

Results of cost benefit analysis show a net benefit (net present value) of $164 from the participant perspective. The quantified costs to the participants were less than the quantified benefits to the participants. **The cost per acre-foot of water saved from the participant perspective was $0 as there were no quantified costs to the participants.**

ALL YEARS	Quantified Costs and Benefits					
Utility				Participants		
Costs		Benefits		Costs	Benefits	
Conservation Devices	$334	Not Quantified		Not Quantified	Conservation Devices	$0
					Water Savings	$164
Total	$334				Total	$164

OVERALL PERSPECTIVE - ALL YEARS

Results of cost benefit analysis show a net benefit (net present value) of -$170 from an overall perspective. The quantified costs to the participants and utility were greater than the quantified benefits to the participants and utility. **The cost per acre-foot of water saved from the overall perspective was $447.**

UNQUANTIFIED COSTS AND BENEFITS

Costs

- Cost of participants installing the devices
- Cost to CWCGV of managing the program
- Landfill deposit of old devices

Benefits

- Financial savings on sewer bills for participants.
- Avoided cost of acquisition and distribution of water saved.
- Environmental benefits from reduced water use
- Increased public awareness about water conservation
- Increased energy savings from reduced hot water use
- Participants received new fixtures

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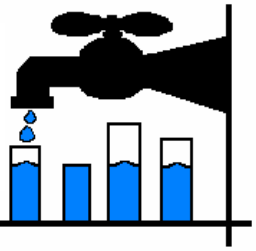
Community Water of Green Valley
Device Giveaway Program



1995

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	143	NA	143
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	$143	$0	$143
Present Value Benefits			
Total Water Savings	-2.49 AF	-2.49 AF	-2.49 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	-881	-881
Benefits to Others	NA	NA	0
Total Benefits	$0	-$881	-$881
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$143	-$881	-$1,024
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	-$57 /AF	0 /AF	-$57 /AF

1996

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	121	NA	121
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	$121	$0	$121
Present Value Benefits			
Total Water Savings	2.29 AF	2.29 AF	2.29 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	752	752
Benefits to Others	NA	NA	0
Total Benefits	$0	$752	$752
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$121	$752	$631
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	$53 /AF	$0 /AF	$53 /AF

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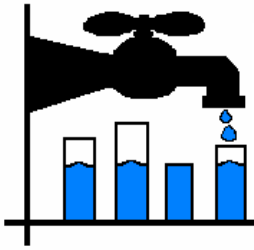

Community Water of Green Valley
Device Giveaway Program

Results of Cost Benefit Analysis-Lifespan (5 Years) **1997**

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	70	NA	70
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	$70	$0	$70
Present Value Benefits			
Total Water Savings	0.96 AF	0.96 AF	0.96 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	293	293
Benefits to Others	NA	NA	0
Total Benefits	$0	$293	$293
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$70	$293	$223
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	$73 AF	$0 /AF	$73 /AF

Results of Cost Benefit Analysis-Lifespan (5 Years) **ALL YEARS**

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	334	NA	334
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	$334	$0	$334
Present Value Benefits			
Total Water Savings	0.75 AF	0.75 AF	0.75 AF
Benefits to Utility	0	NA	0
Benefits to Customers	NA	164	164
Benefits to Others	NA	NA	0
Total Benefits	$0	$164	$164
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$334	$164	-$170
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	$447 /AF	$0 /AF	$447 /AF

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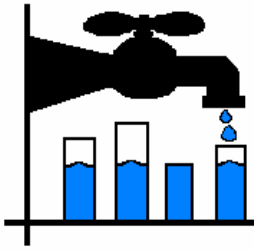

Flowing Wells Irrigation Dist.

Device Giveaway Program

Flowing Wells Irrigation District (FWID) is a municipality which serves an area just northeast of I-10 and Miracle Mile in Tucson, Arizona. Between 15,000 and 16,000 people reside in the area served by FWID. In general, the population served by the District tends towards single family residences, mobile home parks, apartment complexes, and light industrial use.

UTILITY DEMOGRAPHICS

FWID currently maintains approximately 3,294 connections. Residential customers account for 85.9% of total connections. The utility currently serves 2,498 single family residential users, 330 multi-family residential users, 403 commercial users and 63 industrial users. The service area encompasses an area of 5 square miles.

UTILITY RATE STRUCTURE AND PRICES

The monthly base rate varies according to meter size, and includes 1,000 gallons of water. Most residential connections have ¾ inch meters, with a base rate of $5.25 per month. The commodity rate is $1.08 for every 1,000 gallons in excess of the base amount regardless of meter size.

FWID also has a seasonal rate, effective May through October. Customers whose summer use exceeds their winter average plus 10% will be assessed a summer surcharge of $0.45 per 1,000 gallons in addition to the commodity rate. The winter use is calculated using November through April water use.

CONSERVATION DEVICE GIVEAWAY

Devices Distributed:	**Showerheads, faucet aerators, literature**
Eligible Customers:	**SF, MF**
Customers Analyzed:	**SF**
Program Years:	**2000-2003**
Years Analyzed:	**2000, 2001**

CURRENT CAPACITY AND WATER SOURCES

FWID's water source is groundwater. They have a maximum pumping capacity of 8 million gallons per day (mgd) and a storage capacity of 4.5 million gallons. Peak daily use is approximately 4.5 mgd.

FUTURE PLANS TO MEET DEMAND

FWID's service area is built-out, with a 0% population growth rate. The District plans to meet future demand within the service area by first utilizing its current capacity and water sources. They also plan to use their Central Arizona Project allocation (4,354 AF/year) for recharge.

DEVICE GIVEAWAY PROGRAM - DESCRIPTION

From October 2000 to October 2003, Flowing Wells Irrigation District distributed showerheads and faucet aerators as a part of its conservation program. During this device giveaway program, FWID distributed 200 conservation packets each year. The packets were

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distributed to single and multi-family residential users and contained one low-flow showerhead, one kitchen aerator, and two bathroom aerators as well as conservation literature from Water CASA. The packets were distributed door-to-door or given to property managers. It is unknown how many of the devices were installed.

OTHER FLOWING WELLS IRRIGATION DISTRICT CONSERVATION PROGRAMS

Conservation Rates/Surcharge Fees, *2001*
The surcharges are effective during the summer (May-October). Starting in November 2003, the District also began an annual rate increase based on the difference between the previous year's revenues and the upcoming year's expenses. All customers are affected by the rate increases and surcharge fees.

Indoor/Outdoor Audits, *2000-2003*
Each month a total of ten customers with the highest usage in their classification were selected to receive a contact letter and a water use questionnaire. Those customers who responded and requested, received a customized packet of water conservation information and a follow-up letter offering a free water audit of their home and property.

METHODOLOGY

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

The analysis includes only single family households that received conservation device packets during the years 2000 and 2001. The water savings were calculated and a cost benefit analysis was performed for the years 2000 and 2001. The findings refer to these two years only, not to the ongoing program. The lifespan of the conservation devices, which is used as the period of analysis, was assumed to be five years.[1]

All quantified costs and benefits have been discounted to the first year of the analysis (2000) and inflated to 2004 dollars. The discount rate used in this analysis was 6.0%. The CPI values that were used in this analysis were the 2004 value of 188.9, and the 2000 value of 172.2.

The population studied for this analysis was comprised of all participants who received conservation packets during 2000 and 2001. There were 154 usable participants out of 200 total participants in 2000, and 141 out of 200 in 2001, for a total of 295 usable participants out of 400. Twenty-six percent, or 105, of the possible participants were unusable because they moved during the period of analysis.

All FWID single family residential households that were not participants in this analysis were used as the control group. However, the weighted average pre-measure water use of the participants (142,654 gallons) was higher than the weighted average pre-measure use of the control group (134,858 gallons).

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[1] Pekelney, D.M. et al. *Guidelines to Conduct Cost-Effectiveness Analysis of Best Management Practices for Urban Water Conservation.* California, 1996.

- For 2000 device giveaways, the control group consisted of 2,147 households in 1998, 2,150 in 1999, 2,154 in 2000, 2,166 in 2001 and 2,203 in 2002.

- For 2001 device giveaways, the control group consisted of 2,173 households in 1999, 2,180 in 2000, 2,192 in 2001, 2,229 in 2002, and 2,230 in 2003.

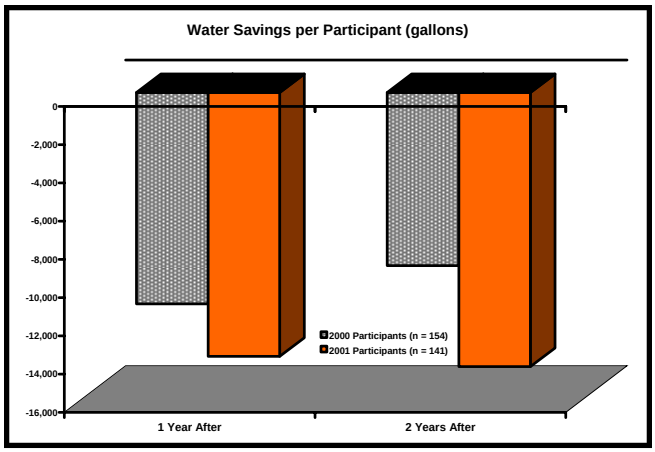
ASSUMPTIONS

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

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

The labor costs for the analysis were calculated assuming 6 hours of labor per year at $15/hour.

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 at the participants' average level of consumption (11,888 gallons per month). The prices were $0.95 per 1,000 gallons in 2000 to 2002, $1.00 per 1,000 gallons in 2003, and $1.08 per 1,000 gallons in 2004 and on.



Participants who had two or more consecutive months of no water use were not included in the study.

The discount rate used in this analysis was 6.0%.

The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2000 value of 172.2.

RESULTS - WATER SAVINGS

In the first year after the 2000 device giveaways, no water savings were documented. There was an increase in participant water use, relative to control group water use, of 1,702,928 gallons, or 11,058 gallons per participant per year (gppy) (8.2% of pre-measure water use). The second year after the device giveaways, no water savings were documented. There was an increase in participant water use, relative to control group water use, of 1,394,342 gallons, or 9,054 gppy (6.7% of pre-measure water use). On average, no water savings were documented; relative water use increased by 1,548,635 gallons (4.8 AF), or 10,056 gppy (7.5% of pre-measure water use). Over the five year assumed lifespan of the conservation devices, no water savings were documented; relative water use increased by 7,743,174 gallons (23.8 AF), or 50,280 gallons per participant.

The first year after the 2001 device giveaways, no water savings were documented. There was an increase in participant water use, relative to control group water use, of 1,946,037 gallons or 13,802 gppy (9.1%

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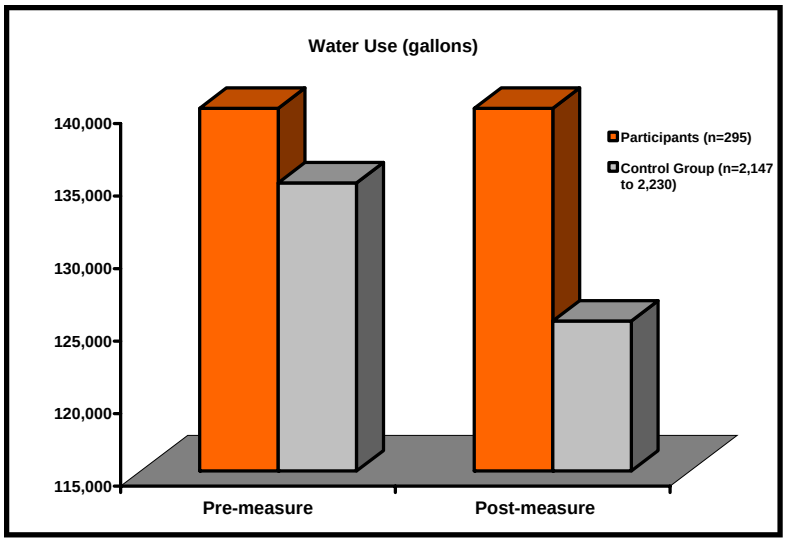
of pre-measure water use). The second year after the device giveaways, no water savings were documented. There was an increase in participant water use, relative to control group water use of 2,022,141 gallons or 14,341 gppy (9.5% of pre-measure water use). On average, no water savings were documented; relative water use increased by 1,984,089 gallons (6.1 AF) or 14,072 gppy (9.3% of pre-measure water use). Over the five year assumed lifespan, no water savings were documented; relative water use increased by 9,920,445 gallons (30.4 AF) or 70,358 gallons per participant.



No water savings were documented for the two years studied. There was an increase in participant water use, relative to control group water use, of 3,648,965 gallons, or 12,369 gppy (8.7% of weighted pre-measure water use) during the first year after and 3,416,483 gallons, or 11,581 gppy (8.1% of weighted pre-measure water use) during the second year after the device giveaways. The total increase in relative water use over the five year assumed lifespan of the conservation devices was 17,663,618 gallons (54.2 AF) or 59,877 gallons per participant.

During the two years before the device giveaway program, the participant group's water use was 105.8% of the control group's water use, on average. During the two years after the replacement program, the participant group's water use was 115.3% of the control group's water use, on average. The participant group's water use increased by 1.3% whereas the control group's water use decreased by 7.1%. **The resulting overall water savings attributed to this program was -8.4%.**

RESULTS - COST BENEFIT ANALYSIS

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

2000 DEVICE GIVEAWAYS

- The quantified cost to the utility was $99. This includes the cost of labor, $99. The cost per participant was $0.64.
- The quantified benefit to the utility was $0.
- The quantified cost to the participants was $0.
- The quantified benefit to the participants was -$7,218. This includes water bill savings, -7,218. This is a benefit of -$47 per participant.
- The quantified cost to others was $583. This includes the cost to Water CASA to provide the devices, $583. This is a cost of $4 per participant.
- The quantified benefit to others was $0.

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[2] The Water Conservation Alliance of Southern Arizona was a non-profit funding source, providing the Flowing Wells Irrigation District with conservation devices for distribution.

UTILITY PERSPECTIVE - 2000

Results of cost benefit analysis show a net benefit (net present value) of -$99 from the utility perspective. This is a net benefit of $0.64 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 not calculated, as there were no water savings.**

PARTICIPANT PERSPECTIVE - 2000

Results of cost benefit analysis show a net benefit (net present value) of -$7,218 from the participant perspective. This is a net benefit of -$47 per participant. The quantified costs to the participants were greater than the quantified benefits to the participant. **The cost per acre-foot of water saved from the participant perspective was not calculated as there were no water savings.**

2000 Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Labor	$99	Not Quantified	Not Quantified	Water Bill Savings	-$7,218
Total	$99			Total	-$7,218

2000 Quantified Costs and Benefits		
Water CASA		
Costs		Benefits
Conservation Devices	$583	Not Quantified
Total	$583	

OVERALL PERSPECTIVE - 2000

Results of cost benefit analysis show a net benefit (net present value) of -$7,900 from an overall perspective. This is a net benefit of -$51 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 not calculated as there were no water savings.**

2001 DEVICE GIVEAWAYS

- The quantified cost to the utility was $93. This includes the cost of labor, $93. The cost per participant was $0.66.
- The quantified benefit to the utility was $0.
- The quantified cost to the participants was $0.
- The quantified benefit to the participants was -$9,480. This includes water bill savings, -$9,480. This is a benefit of -$67 per participant.
- The quantified cost to others was $503. This includes the cost to Water CASA to provide the devices, $503. This is a cost of $4 per participant.
- The quantified benefit to others was $0.

UTILITY PERSPECTIVE - 2001

Results of cost benefit analysis show a net benefit (net present value) of -$93 from the utility perspective. This is a net benefit of $0.66 per

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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 not calculated as there were no water savings.**

PARTICIPANT PERSPECTIVE - 2001
Results of cost benefit analysis show a net benefit (net present value) of -$9,480 from the participant perspective. This is a net benefit of -$67 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 not calculated as there were no water savings.**

OVERALL PERSPECTIVE - 2001
Results of cost benefit analysis show a net benefit (net present value) of -$10,076 from an overall perspective. This is a net benefit of -$71 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 not calculated as there were no water savings.**

DEVICE GIVEAWAYS - BOTH YEARS

- The quantified cost to the utility was $192. This includes the cost of labor, $192. The cost per participant was $0.65.
- The quantified benefit to the utility was $0.
- The quantified cost to the participants was $0.
- The quantified benefit to the participants was -$16,161. This includes water bill savings, -$16,161. This is a benefit of -$55 per participant.
- The quantified cost to others was $1,086. This includes the cost to Water CASA to provide the devices, $1,086. This is a cost of $4 per participant.
- The quantified benefit to others was $0.

2001 Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Labor	$93	Not Quantified	Not Quantified	Water Bill Savings	-$9,480
Total	$93			Total	-$9,480

2001 Quantified Costs and Benefits		
Water CASA		
Costs		Benefits
Conservation Devices	$503	Not Quantified
Total	$503	

UTILITY PERSPECTIVE - BOTH YEARS
Results of cost benefit analysis show a net benefit (net present value) of -$192 from the utility perspective. This is a net benefit of $0.65 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 not calculated as there were no water savings**.

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PARTICIPANT PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -$16,161 from the participant perspective. This is a net benefit of -$55 per participant. The quantified costs to the participants were greater than the quantified benefits. **The cost per acre-foot of water saved from the utility perspective was not calculated as there were no water savings.**

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Labor	$192	Not Quantified	Not Quantified	Water Bill Savings	-$16,161
Total	$192			Total	-$16,161

Quantified Costs and Benefits		
Water CASA		
Costs		Benefits
Conservation Devices	$1,086	Not Quantified
Total	$1,086	

OVERALL PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -$17,439 from an overall perspective. This is a net benefit of -$59 per participant. The quantified costs to the participants, utility, and non-profit funding sources were greater than the quantified benefits to the participants, utility, and non-profit funding sources. **The cost per acre-foot of water saved from the utility perspective was not calculated as there were no water savings.**

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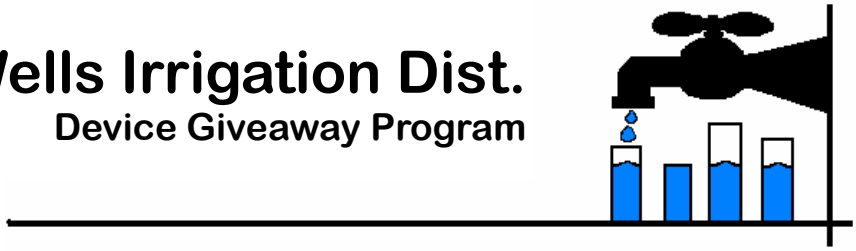
Flowing Wells Irrigation Dist.

Device Giveaway Program



2000

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	99	NA	99
Costs to Participants	NA	0	0
Costs to Others (Water CASA)	NA	NA	583
Total Costs	$99	$0	$682
Present Value Benefits			
Total Water Savings	-23.76 AF	-23.76 AF	-23.76 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	-7,218	-7,218
Benefits to Others	NA	NA	0
Total Benefits	$0	-$7,218	-$7,218
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$99	-$7,218	-$7,900
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	-$4 /AF	$0 /AF	-$29 /AF

UNQUANTIFIED COSTS AND BENEFITS

Costs

- **Customer installation of device.**
- **Disposal of old devices.**
- **Environmental damage resulting from increased water use.**

Benefits

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

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Flowing Wells Irrigation Dist.

Device Giveaway Program

2001

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	93	NA	93
Costs to Participants	NA	0	0
Costs to Others (Water CASA)	NA	NA	503
Total Costs	$93	$0	$596
Present Value Benefits			
Total Water Savings	-30.44 AF	-30.44 AF	-30.44 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	-9,480	-9,480
Benefits to Others	NA	NA	0
Total Benefits	$0	-$9,480	-$9,480
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$93	-$9,480	-$10,076
Cost Effectiveness Analysis (CEA)) (Total Costs ÷ Total Water Savings)	-$3 /AF	$0 /AF	-$20 /AF

ALL YEARS

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	192	NA	192
Costs to Participants	NA	0	0
Costs to Others (Water CASA)	NA	NA	1,086
Total Costs	$192	$0.00	$1,278
Present Value Benefits			
Total Water Savings	-54.21 AF	-54.21 AF	-54.21 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	-16,161	-16,161
Benefits to Others	NA	NA	0
Total Benefits	$0	-$16,161	-$16,161
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$192	-$16,161	-$17,439
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	-$4 /AF	$0 /AF	-$24 /AF

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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.

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DEVICE GIVEAWAY PROGRAM - DESCRIPTION

In 1998, 115 packets of water-saving devices, including a showerhead, tap saver, tap saver deluxe, and a toilet mizer, 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.

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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.

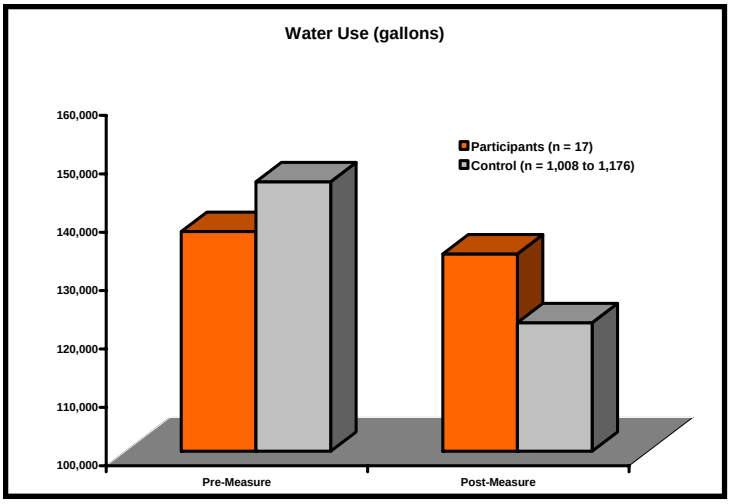
The control group is comprised of residential households other than those included in the study.

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%.**

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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	$116			Total	-$2,008

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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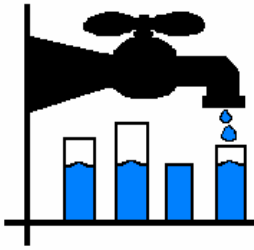

Town of Marana Water Dept.

Device Giveaway Program

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
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
Present Value Benefits			
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
Cost Benefit Calculations			
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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Oro Valley Water Utility

Device Giveaway Program

Oro Valley Water Utility (OVWU) serves the Town of Oro Valley, which is located in northern Pima County, six miles north of the Tucson city limits. Median household income in Oro Valley was $67,562[1] as of the 2000 census, which was higher than the statewide average of $40,558.

UTILITY DEMOGRAPHICS

OVWU provides service to an area of 31.5 square miles encompassing a population of approximately 32,000. As of November 2003, OVWU served 14,247 single family residential connections, 1,096 multifamily residential connections, 205 commercial, 292 industrial, 334 irrigation, and 55 other types of connections. As of 2004, the utility's total water use in gallons per capita per day (gpcd) was 200, and their residential use was 119 gpcd.

DEVICE GIVEAWAY PROGRAM

Devices Distributed:	**Showerheads, faucet aerators**
Eligible Customers:	**SF, MF**
Customers Analyzed:	**SF**
Program Years:	**2000 – present**
Years Analyzed:	**Jan – June 2002**

UTILITY RATE STRUCTURE AND PRICES

OVWU employs a tiered rate structure. Effective November 2003, the base rate for 5/8" meters, most of the utility's connections, is $12.30 and does not include any water. Single family residential usage charges are as follows:

Usage	Price
≤10,000 gallons per month	$1.92 per 1,000 gallons
10,001-25,000 gallons per month	$2.55 per 1,000 gallons
>25,000 gallons per month	$3.25 per 1,000 gallons

CURRENT CAPACITY AND WATER SOURCES

The storage capacity was not reported, however, OVWU has a 100 year assured water supply as required by law.

FUTURE PLANS TO MEET DEMAND

The population within OVWU's service area grew 7.2% per year, on average, between 2000 and 2004.[2] The utility plans to meet future demand with current capacity and sources, as well as by implementing water conservation measures and using reclaimed water. A new groundwater preservation fee is also in place. Starting August 2005, OVWU started using reclaimed water for some turf and golf courses, with plans to move all golf courses to reclaimed water use.

[1] U.S. Census Bureau, CenStats Databases.
[2] *Population Change – 2000 Census to July 1, 2004 Estimate for Arizona, Counties, and Incorporated Places*. Arizona Department of Economic Security.

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DEVICE GIVEAWAY PROGRAM - DESCRIPTION

In October 2000, OVWU began giving away free showerheads and aerators to residential customers both by request and at the Greater Oro Valley Arts Council Art & Jazz Festivals. The program is also mentioned occasionally in the OVWU newsletter.

METHODOLOGY

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

The analysis includes only single family households that received devices between January and June 2002. The water savings were calculated and a cost benefit analysis was performed for January to June 2002. 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.

All quantified costs and benefits have been discounted to the first year of the analysis (2002) and inflated to 2004 dollars. The discount rate used in this analysis was 4.5%. The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2002 value of 179.9.

Since two complete years of pre- and post-measure water use could not be acquired for this analysis, water use data for the participants was acquired from 18 months before the program and 18 months after the program for all households that were residing there for that full period. The pre-measure period includes July 2000 to December 2001, and the post-measure period includes July 2002 to December 2003.

OTHER ORO VALLEY CONSERVATION PROGRAMS

Water Audits, *March 2003-present*
OVWU conducts single family outdoor water audits. The audits are free and the program is aimed at high-usage customers.

Conservation Ordinances, *March 2003-present*
The OVWU and its commission have also developed a Water Conservation and Use Restriction Ordinance.

The population studied for this analysis was comprised of all participants who received the devices between January and June 2002. There were 37 usable participants out of an unknown total during the six month period under analysis.

All OVWU single family residential households that were not participants in this analysis were used as the control group. The number of households in the control group was 12,572 for July to December 2000, 13,140 for January to December 2001, 13,729 for July to December 2002, and 14,063 for January to December 2003. The average yearly pre-measure water use of the participants (111,362 gallons) was lower than that of the control group (116,842 gallons).

ASSUMPTIONS

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

Assumed $20 per year in labor and $60 per year in advertising for this program.

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

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

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Advertising	$63	Not Quantified	Not Quantified	Water bill savings	$938
Labor	$10				
Total	$275			Total	$938

Quantified Costs and Benefits		
Water CASA		
Costs		Benefits
Conservation Devices	$202	Not Quantified
Total	$202	

The discount rate used in this analysis was 4.5%.

The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2002 value of 179.9

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 at the level of consumption of the participants. Since the average monthly water use of the participants was below 10,000 gallons, the price of $1.90 per 1,000 gallons was used for 2003 and $1.92 per 1,000 gallons was used for 2004 and beyond.

Participants who had two or more consecutive months of no water use were not included in the study.

RESULTS - WATER SAVINGS

In the 18 months after receiving the devices, the water savings amounted to 159,396 gallons, or 4,308 gallons per participant[3] (2.6% of pre-measure water use). The average savings per year was 106,264 gallons, or 1,436 gallons per participant per year (gppy) (2.6%). **The total savings over the five year assumed lifespan was 531,321 gallons (1.6 AF), or 14,360 gallons per participant.**

During the 18 months before participating in the device giveaway program, the participant group's water use was, on average, 95.3% of the control group's use. During the 18 months after, the participant group's water use was 93.0% of the control group's use, on average. The participant group's water use increased by 5.5%, whereas the

[3] This value approximates the water savings per packet of devices, as each customer received only one packet.

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control group's use increased by 8.1%. **The resulting overall water savings attributed to this program was 2.6%.**

RESULTS - COST BENEFIT ANALYSIS

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

- The quantified cost to the utility was $74. This cost includes the cost of advertising, $63, and labor (assembling the newsletter advertisement), $11. This is a cost of $2 per participant, including $1.70 for advertising and $0.30 for labor.
- The quantified cost to the participants was $0.
- The quantified cost to others was $202 ($5 per participant). This was the cost to Water CASA for providing the devices.
- The quantified benefit to others was $0.

UTILITY PERSPECTIVE

Results of the cost benefit analysis show a net benefit (net present value) of -$73 from the utility perspective over the five year assumed lifespan of the devices. This is a net benefit of -$2 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 $45.**

PARTICIPANT PERSPECTIVE

Results of the cost benefit analysis show a net benefit (net present value) of $938 from the perspective of the participant. This is a net benefit of $25 per participant. The quantified costs to the participants were less 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 the cost benefit analysis show a net benefit (net present value) of $663 from an overall perspective. This is a net benefit of $18 per participant. The quantified costs to the participants, utility, and others were less than the quantified benefits to the participants, utility, and others. **The cost per acre-foot of water saved from the overall perspective was $169.**

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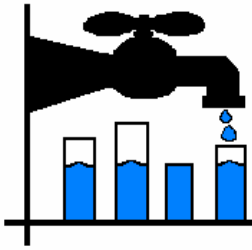

Oro Valley Water Utility
Device Giveaway Program

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	74	NA	74
Costs to Participants	NA	0	0
Costs to Others (Water CASA)	NA	NA	202
Total Costs	$74	$0	$275
Present Value Benefits			
Total Water Savings	1.63 AF	1.63 AF	1.63 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	938	938
Benefits to Others	NA	NA	0
Total Benefits	$0	$938	$938
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$74	$938	$663
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	$45 /AF	$0 /AF	$169 /AF

UNQUANTIFIED COSTS AND BENEFITS

Costs
- Cost of installing new devices.
- Landfill disposal of old devices.

Benefits
- Financial savings on sewer bills for participants.
- Avoided cost of acquisition and distribution of water saved.
- Reduced energy bills for participants.
- Environmental benefits of reduced use of water.
- Increased public awareness about water conservation.
- Reinforces need to conserve water and desirability of conserving.
- Improved public relations for the utility.
- Participants received new water-saving devices.

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Thornton Water Res. Div.

Showerhead Exchange Program

The City of Thornton Water Resources Division (TWRD) is located in Thornton, Colorado, approximately 10 miles north of downtown Denver. As of March 31, 2005, the population served by TWRD was 127,832, where 111,002 reside inside the city and 16,830 reside outside the city. Median household income was $54,445 as of the 2000 census, which was higher than the statewide average of $47,203.[1]

UTILITY DEMOGRAPHICS

As of May 2005, TWRD maintained 34,259 connections of which 94.3% were residential. Of their total connections, 30,377 were single family residential, 1,937 were multifamily residential, 628 were ICI, and 1,317 were irrigation accounts, including city parks. In addition to providing water to individual retail customers, TWRD provides 2.0 million gallons per day (mgd) of treated water to the City of Westminster. TWRD's total service area is 19 square miles. As of 2004, average customer water use in gallons per capita per day (gpcd) was 142 for all customers and 129 for residential customers.

SHOWERHEAD EXCHANGE

Eligible Customers:	**SF**
Customers Analyzed:	**SF**
Program Years:	**2003 – present**
Years Analyzed:	**2003**

UTILITY RATE STRUCTURE AND PRICES

As of 2004, the domestic inside-city monthly service charge is $2.46 for a 5/8 x 3/4 inch meter and the outside-city charge is $3.69 per month. TWRD has an increasing block rate structure. The four-tier structure categorizes rates by determining how much a customer uses relative to their Average Winter Consumption (AWC) and their Monthly Outdoor Allowance (MOA)

Usage	Price	
	INSIDE CITY	**OUTSIDE CITY**
0 gallons - AWC	$3.00/1,000g	$4.50/1,000g
> AWC, up to AWC + MOA	$3.00/1,000g	$4.50/1,000g
> AWC + MOA, up to AWC + 2xMOA	$4.50/1,000g	$6.75/1,000g
> AWC + 2xMOA	$9.00/1,000g	$13.50/1,000g

CURRENT CAPACITY AND WATER SOURCES

Currently, the capacity of existing raw water storage from reservoirs is 26,594 acre-feet. Their treated water storage capacity is 27 mgd. TWRD has two water treatment plants that have a combined capacity of 65 mgd. TWRD's primary water sources are Clear Creek and the South Platte River.

FUTURE PLANS TO MEET DEMAND

The City of Thornton's growth rate has decreased from 5.0% in 2002 to 3.8% in 2004. The city's plans to meet future demand through a number of different actions. They plan to continue use of current

[1] U.S. Census Bureau, American FactFinder.

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capacity and sources, implement a planned surface water supply project from the Cache la Poudre River basin, expand storage and treatment facilities, continue conservation efforts, purchase and exchange additional water rights, and develop water reuse projects.

SHOWERHEAD EXCHANGE - DESCRIPTION

On May 17, 2003, the Showerhead Exchange Program began, which offers Niagara 2.0 gallon per minute (gpm) showerheads to single family customers whose homes were built before 1994. Customers are allowed to exchange up to two showerheads. The program is advertised in billing inserts, on TWRD's website, on television ads, at festivals, and in TWRD's quarterly magazine.

OTHER THORNTON CONSERVATION PROGRAMS
Toilet Rebates, ***May 1, 2003 - present***
Washing Machine Rebates, ***May 1, 2003-present***
Tiered Conservation Rates, ***effective May 15, 2003***
Public Education, ***May 2002-present***
Water Conservation Ordinances, ***various start dates***

During the time of the showerhead exchange program, especially from 2002 to 2004, the area was experiencing a drought and there was ongoing water conservation campaigns to mitigate the effects of the drought. However, a major snowstorm in March 2003 improved TWRD's water supply situation. Another important measure taking place during the period of the showerhead exchange program was the utility-wide transition from a flat rate structure to a conservation rate structure in May 2003.

METHODOLOGY

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

The analysis includes only single family households that received showerheads between May 17 and December 31, 2003. The water savings were calculated and a cost benefit analysis was performed for this time period. Results refer to this time period, not to the ongoing program. The lifespan of the showerheads, which is used as the period of analysis, was assumed to be five years.

All quantified costs and benefits have been discounted to the first year of the analysis (2003) and inflated to 2004 dollars. The discount rate used in this analysis was 3.6%. The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2003 value of 184.0.

Since two complete years of pre- and post-measure water use could not be acquired for this analysis, water use data for the participants was acquired from 18 months before the program and 18 months after the program for all households that were residing there for that full period. The pre-measure period includes January 2002 to June 2003, and the post-measure period includes January 2004 to June 2005.

The population studied for this analysis was comprised of all participants who received showerheads between May 17 and December 31, 2003. There were 127 usable participants out of 322 total participants during the period under analysis.

All TWRD single family households, including the participants, were used as the control group. The average annual pre-measure water use of the participants (103,894 gallons) was lower than that of the control group (107,839 gallons). The number of control group connections varied by month, from a minimum of 20,148 to a maximum of 24,532.

ASSUMPTIONS

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

The 2003 CPI value, 184.0, and the 2004 CPI value, 188.9, were used in this analysis.

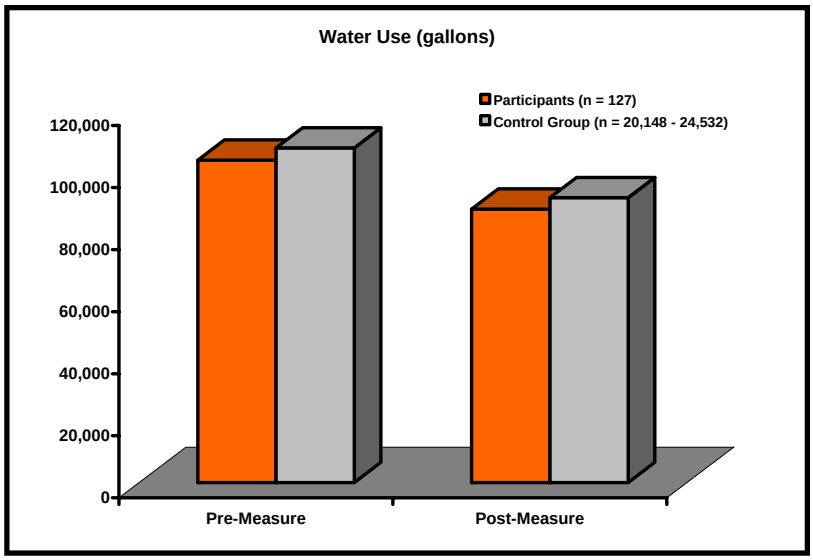
Participants who participated in any other conservation program during the period of analysis were not included in the study.

Participants who had two or more consecutive months of no water use were not included in the study.

Any participants that had 11 to 13 months of usage per year were included in the study.

The control group consisted of all single family residential connections, including participants.

The percentage of showerhead exchange program participants who lived inside the city was 95%. However, it was assumed that 100% of participants lived inside the city, thus Inside-City rates apply for all cost benefit analysis calculations.



Since all participants were assumed to reside inside the city, Outside-City connections were not included in the control group.

It was assumed that average participant water use falls into tier 1 or 2 of the increasing block rate structure implemented in 2003.

RESULTS - WATER SAVINGS

During the 18 months after participating in the showerhead program, water savings amounted to 64,248 gallons or 506 gallons per participant (0.3% of pre-measure water use). The average annual water savings was 42,832 gallons, or 337 gallons per participant per year (gppy) (0.3% of pre-measure water use). **The total water savings over the five year assumed lifespan was 214,158 gallons (0.66 AF), or 1,686 gallons per participant.**

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During the 18 months before participating in the showerhead program, the participant group's water use was, on average, 96.3% of the control group's use. During the 18 months after, the participant group's water use was 95.9% of the control group's use, on average. The participant group's water use decreased by 15.2%, whereas the control group's use decreased by 14.9%. **The resulting overall water savings attributed to this program was 0.3%.**

RESULTS - COST BENEFIT ANALYSIS

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

- The quantified cost to the utility was $1,546 ($12 per participant). This cost includes advertising, $91 ($1 per participant), devices, $532 ($4 per participant), and labor, $922 ($7 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 $594 ($5 per participant), which includes water bill savings.

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Advertising	$91	Not Quantified	Not Quantified	Water Bill Savings	$594
Devices	$532				
Labor	$922				
Total	$1,546			Total	$594

UTILITY PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -$1,546 from the utility perspective over the five year assumed lifespan of the devices. This is a net benefit of -$12 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 $2,352.**

PARTICIPANT PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of $594 from the perspective of the participant. This is a net benefit of $5 per participant. The quantified costs to the participants were less 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 -$952 from an overall perspective. This is a net benefit of -$7 per participant. The quantified costs to the participants and utility were greater than the quantified benefits to the participants and utility. **The cost per acre-foot of water saved from the overall perspective was $2,352.**

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Thornton Water Res. Div.
Showerhead Exchange Program

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
Present Value Costs			
Costs to Utility	1,546	NA	1,546
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	$1,546	$0	$1,546
Present Value Benefits			
Total Water Savings	0.66 AF	0.66 AF	0.66 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	594	594
Benefits to Others	NA	NA	0
Total Benefits	$0	$594	$594
Cost Benefit Calculations			
Net Present Value (NPV) (Total Benefits - Total Costs)	-$1,546	$594	-$952
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	$2,352 /AF	$0 /AF	$2,352 /AF

UNQUANTIFIED COSTS AND BENEFITS

Costs
- **Disposal of old devices.**

Benefits
- **Financial savings on sewer bills for participants.**
- **Avoided cost of acquisition and distribution of water saved.**
- **Reduced energy bills for participants.**
- **Environmental benefits of reduced use of water.**
- **Increased public awareness about water conservation.**
- **Reinforces need to conserve water and desirability of conserving.**
- **Improved public relations for the utility.**

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