

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

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).

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.

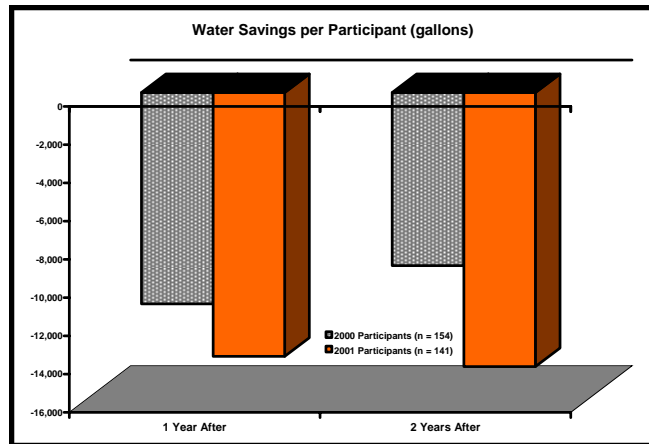
The labor costs for the analysis were calculated assuming 6 hours of labor per year at \$15/hour.

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.

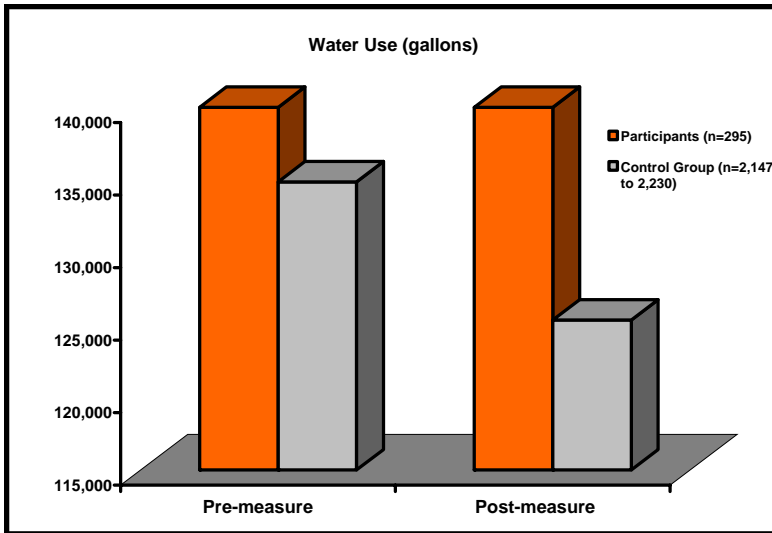


RESULTS - WATER SAVINGS

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%

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.

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

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.**

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

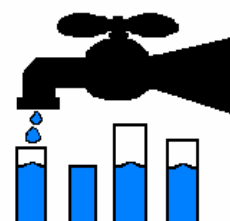
Quantified Costs and Benefits		
Water CASA		
Costs		Benefits
Conservation Devices	\$1,086	Not Quantified
Total	\$1,086	

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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2000	Results of Cost Benefit Analysis-Lifespan (5 Years)		
	UTILITY	PARTICIPANT	OVERALL
<u>Present Value Costs</u>			
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
<u>Present Value Benefits</u>			
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
<u>Cost Benefit Calculations</u>			
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

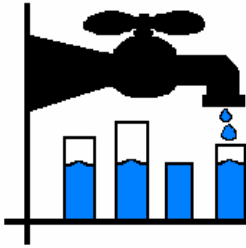
UNQUANTIFIED COSTS AND BENEFITS

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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2001		Results of Cost Benefit Analysis-Lifespan (5 Years)		
	UTILITY	PARTICIPANT	OVERALL	
<u><i>Present Value Costs</i></u>				
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	
<u><i>Present Value Benefits</i></u>				
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	
<u><i>Cost Benefit Calculations</i></u>				
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	
<u><i>Present Value Costs</i></u>				
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	
<u><i>Present Value Benefits</i></u>				
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	
<u><i>Cost Benefit Calculations</i></u>				
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	

