

Oro Valley Water Utility

Audit 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 \$67,562¹ 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.

AUDIT PROGRAM	
Indoor / Outdoor Eligible Customers:	Both SF
Customers Analyzed:	SF
Program Years:	March 2003 – present
Years Analyzed:	Jan – Dec 2003

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.

AUDIT PROGRAM - DESCRIPTION

OVWU's audit program is offered free to all of its customers. They provide indoor and outdoor water audits. OVWU advertises the program in newsletters, billings and on their website. Participation is upon

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.

request of the customer, however staff are also trained to assist customers and recommend an audit where necessary. A checklist of questions is used to narrow down the focus of the audit.

METHODOLOGY

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

The analysis includes single family households that received audits between July and December 2003, and 14 who received audits in May and June 2003. The water savings were calculated and a cost benefit analysis was performed for July through December 2003. Our findings refer to this time period only, not to the ongoing program. The lifespan of the audits, 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.

OTHER ORO VALLEY WATER UTILITY CONSERVATION PROGRAMS

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

Device Giveaway, 2000-present
Residential customers can request free showerheads and aerators.

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 audits between May and December 2003. There were 56 usable participants out of a total 81 during the period under analysis. Of the 81 participants, 25 had moved or had incomplete consumption data for the period of 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 varied, but ranged from 14,369 to 16,099. The average annual pre-measure water use of the participants (176,488 gallons) was higher than that of the control group (121,472 gallons).

ASSUMPTIONS

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

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.

The price of water used in determining the benefits to customers from the first tier of utility's price of water (\$1.92 per 1,000 gallons in 2004 and \$1.98 per 1,000 gallons in 2005 and beyond).

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

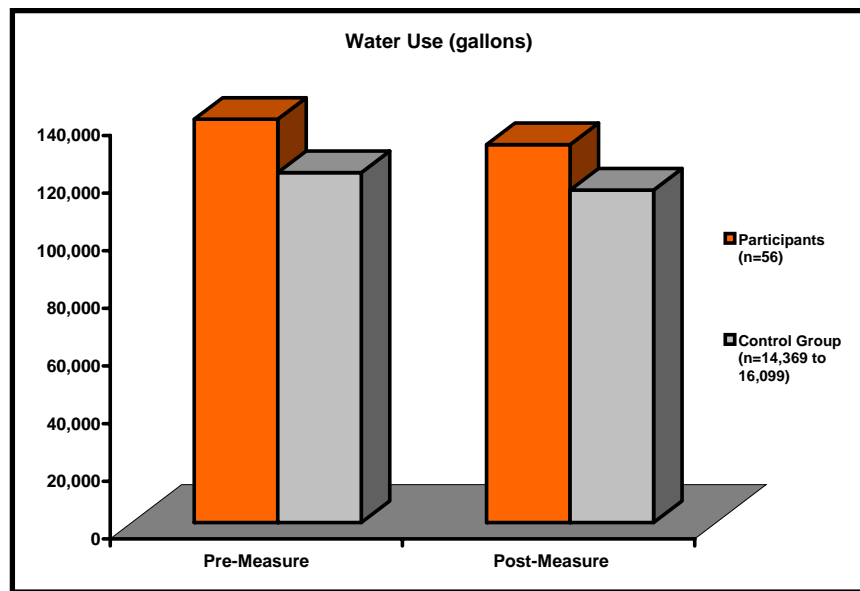
The cost was assumed to be \$55 per audit.

RESULTS - WATER SAVINGS

In the 18 months after receiving the audits, the water savings amounted to 3,065,176 gallons, or 54,735 gallons per participant (20.7% of pre-measure water use). The average savings per year was 2,043,451 gallons, or 36,490 gallons per participant per year (gppy) (20.7% of pre-measure water use). **The total savings over the five year assumed lifespan was 10,217,254 gallons (31.4 AF), or 182,451 gallons per participant.**

During the 18 months before participating in the device giveaway program, the participant group's water use was, on average, 145.3% of the control group's use. During the 18

months after, the participant group's water use was 113.7% of the control group's use, on average. The participant group's water use decreased by 25.7%, whereas the control group's use decreased by 5.0%. **The resulting overall water savings attributed to this program was 20.7%.**



RESULTS - COST BENEFIT ANALYSIS

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

- ◆ The quantified cost to the utility was \$3,162, which includes the cost of labor (\$56 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 \$18,580 (\$332 per participant). This benefit reflects participant water bills savings.

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Labor	\$3,162	Not Quantified	Not Quantified	Water bill savings	\$18,580
Total	\$3162			Total	\$18,580

UTILITY PERSPECTIVE

Results of the cost benefit analysis show a net benefit (net present value) of -\$3,162 from the utility perspective over the five year assumed lifespan of the audits. This is a net benefit of -\$56 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 \$101.**

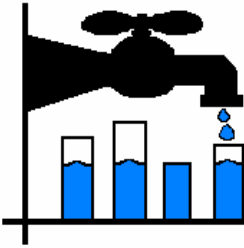
PARTICIPANT PERSPECTIVE

Results of the cost benefit analysis show a net benefit (net present value) of \$18,580 from the perspective of the participant. This is a net benefit of \$332 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 \$15,418 from an overall perspective. This is a net benefit of \$275 per participant. 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 \$101.**

UNQUANTIFIED COSTS AND BENEFITS
<p>Costs</p> <ul style="list-style-type: none"> • Customers’ time spent during the audit. <p>Benefits</p> <ul style="list-style-type: none"> • 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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Audit Program

Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
<u>Present Value Costs</u>			
Costs to Utility	3,162	NA	3,162
Costs to Participants	NA	0	0
Costs to Others (Water CASA)	NA	NA	0
Total Costs	\$3,162	\$0	\$3,162
<u>Present Value Benefits</u>			
Total Water Savings	31.36 AF	31.36 AF	31.36 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	18,580	18,580
Benefits to Others	NA	NA	0
Total Benefits	\$0	\$18,580	\$18,580
<u>Cost Benefit Calculations</u>			
Net Present Value (NPV) (Total Benefits - Total Costs)	-\$3,162	18,580\$	\$15,418
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	\$101 /AF	\$0 /AF	\$101 /AF

