

# City of Peoria Utilities Dept.

## Residential Audit Program

The City of Peoria Utilities Department (CPUD) serves the City of Peoria, northwest of Phoenix in Maricopa County, Arizona. As of the 2000 Census, median household income in the City of Peoria was \$52,199, which is higher than the statewide median of \$40,558.<sup>1</sup>

### UTILITY DEMOGRAPHICS

As of 2004, the City of Peoria Utilities Department had approximately 37,700 connections. Of these connections, 35,522 were single family residential, 590 were multifamily residential, 1,285 were commercial, 320 were irrigation, and 41 were flood irrigation connections.

The City's total service area is 165 square miles. The population of this service area is approximately 125,600. As of 2004, the City of Peoria's gross water use was 7.4 billion gallons with a total utility water use of 188 gallons per capita per day (gpcd).<sup>2</sup>

<b>SINGLE FAMILY AUDIT PROGRAM</b>	
Type of Program:	Audit
Indoor or Outdoor:	Both
Eligible Customers:	SF
Customers Analyzed:	SF
Program Years:	2002- present
Years Analyzed:	2002

### UTILITY RATE STRUCTURE AND PRICES

The City of Peoria uses a base rate that depends on the service line size. As of January 2004, the monthly base rate for residential customers with 5/8"-3/4" meters is \$14.05, which includes 1,000 gallons of water. The volume charges are as follows:

Usage	Price
2,000 - 5,000 gallons	\$1.48 per 1,000 gallons
6,000 - 10,000 gallons	\$2.67 per 1,000 gallons
11,000 - 25,000 gallons	\$3.21 per 1,000 gallons
26,000 + gallons	\$3.82 per 1,000 gallons

### CURRENT CAPACITY AND WATER SOURCES

As of 2004, the City of Peoria's water sources were comprised of Central Arizona Project (CAP) water, which originates from the Colorado River, local groundwater and Salt River Project (SRP) water, which comes from the Salt and Verde Rivers. Peoria has joined with the City of Glendale in their Pyramid Peak Water Treatment Plant, which treats Colorado River Water. Peoria operates its own Greenway Water Treatment Plant, which treats Salt and Verde River water.<sup>3</sup> The City's maximum production is 69 MGD. Peoria also recharges effluent produced at its Beardsley Road Water Reclamation Facility as well as CAP water at the Agua Fria and Hieroglyphics Recharge Projects. In addition, effluent produced at the Jomax Water Reclamation Facility is directly reused in decorative lakes and for landscape irrigation.

<sup>1</sup> U.S. Census Bureau: American Fact Finder.

<sup>2</sup> City of Peoria Utilities Department: Water Report 2005

<sup>3</sup> City of Peoria Utilities Department: Water Division Quick Facts

### **FUTURE PLANS TO MEET DEMAND**

In the future, the City will fully utilize its SRP and CAP supplies and may utilize the Central Arizona Groundwater Replenishment District (CAGR) as a replenishment agent if needed. Peoria's other plans to meet future demands include expanding its use of recovered recharge and direct water reuse, doubling the capacity of its Greenway Water Treatment Plant from 16 MGD to 32 MGD, building an additional CAP water treatment plant, continuing their water conservation efforts, and purchasing additional water supplies.

#### **OTHER PEORIA CONSERVATION PROGRAMS**

**Xeriscape/Landscape Conversion Rebates, July 2003-present**

**Conservation Rates, 1990-present**

**Leak Detection Service for Customers, 1997-present**

**Public Education, 1997-present**

**Conservation Ordinances, 1998-present**

### **AUDIT PROGRAM - DESCRIPTION**

Since 2002, the City of Peoria has offered an indoor/outdoor audit service to their customers. Upon request, a City employee will investigate leaks, meter accuracy, irrigation system function, and other water use as appropriate. The employee will make recommendations on reducing water use and provide conservation literature. The extent of the audit varies depending on the needs of the customer. The audits in this analysis are regular audits as described above.

In addition, assisted self-audits or partial regular audits are available for both indoor and outdoor water use. The city provides a Complete Guide to Home Water Management to customers who would like to perform a self-audit.

### **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 participated in the audit program during 2002. The findings refer to this year only, not to the ongoing program. The lifespan of the audits, which is used as the period of this 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.

The population studied for this analysis was comprised of participants who received an audit during 2002. There were 83 usable participants out of a total of 208. Sixty percent, or 125, of the participants were unusable during this year because there was not complete water consumption data for all years of the analysis.

All City of Peoria single family residential customers that were not participants in this analysis were used as the control group. Participant pre-measure water consumption was 165,416 gallons while control pre-measure water consumption was 130,049 gallons. For the audit program, the control group consisted of 32,038 households in 2000, 33,377 in 2001, 34,144 in 2002, 35,298 in 2003, and 37,832 in 2004.

## ASSUMPTIONS

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

The number of single family connections used in the analysis (to form the control group) is from December of the year in question.

Assumed \$20/hour in labor at 2.5 hours per audit.

Participant pre-measure water use was 13,274 gallons. Therefore, they fall into the category of 11,000 – 25,000 gallons, with a price per 1,000 gallons of \$3.38 in 2003 and \$3.21 in 2004 and beyond.

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

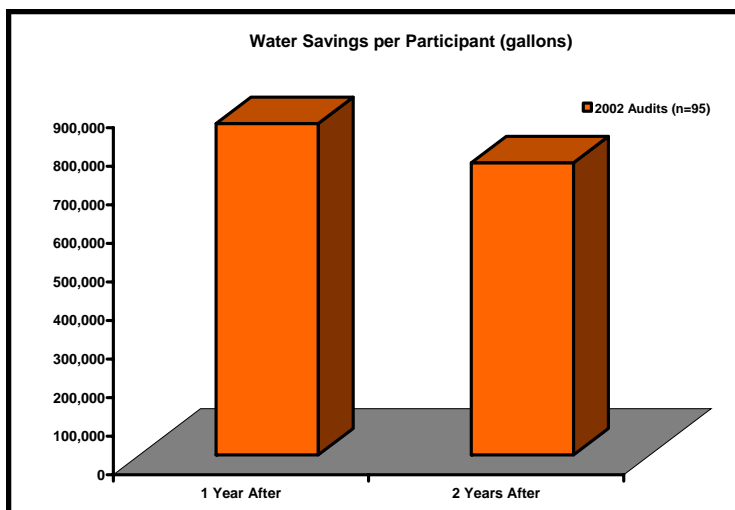
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The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2002 value of 179.9.

## RESULTS - WATER SAVINGS

In the first year after the 2002 audit program, water savings amounted to 859,461 gallons, or 10,355 gallons per participant per year (gppy) (6.3% of pre-measure water use). The second year after the audit program, water savings amounted to 757,740 gallons or 9,129 gppy (5.5% of pre-measure water use). The average savings per year was 808,600 gallons (2.5 AF), or 9,742 gppy (5.9% of pre-measure water use). **The total savings over the five year assumed lifespan was 4,043,002 gallons (12.4 AF), or 48,711 gallons per participant.**

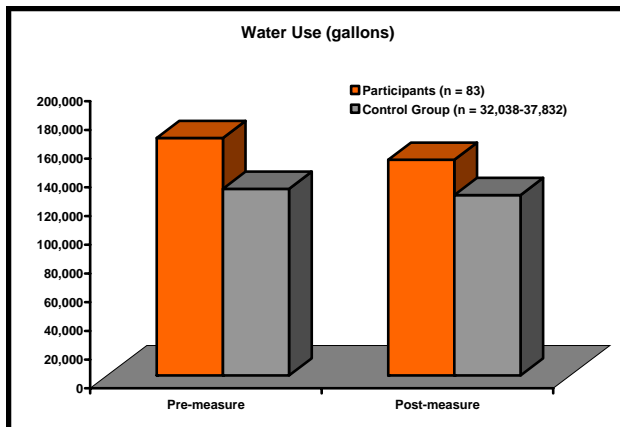
During the two years before participating in the audit program, participants' water use was 127% of the control group's use, on average. During the two years after participating in the program, their water use was 120% of the control group's use, on average. The participants' water use decreased by 9.1% from pre-measure to post-measure, whereas the control group's use decreased by 3.4%. **The resulting overall water savings attributed to this program was 5.7%.**



## 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 \$4,532. This includes the cost of labor, \$4,358, and materials, \$174. This is a cost of about \$55 per participant, with a cost of \$53 per participant for labor and \$2 for materials.
- ◆ The quantified benefit to the utility was \$0.
- ◆ The quantified cost to the participants was \$0.
- ◆ The quantified benefit to the participants due to water bill savings was \$12,119. This is a benefit of \$146 per participant.



### UTILITY PERSPECTIVE

Results of the cost-benefit analysis show a net benefit (net present value) of -\$4,532 from the utility perspective. This is a net benefit of -\$55 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 \$365.**

### PARTICIPANT PERSPECTIVE

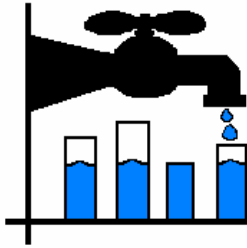
Results of the cost-benefit analysis show a net benefit (net present value) of \$12,119 from the participant perspective.

This is a net benefit of \$146 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 \$7,587 from an overall perspective. This is a net benefit of \$91 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 an overall perspective was \$365.**

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
Labor	\$4,358	Not Quantified	Not Quantified	Water Bill Savings	\$12,119
Materials	\$174			Total	\$12,119
Total	\$4,532				



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### Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
<i><u>Present Value Costs</u></i>			
Costs to Utility	4,532	NA	4,532
Costs to Customers	NA	0	0
Costs to Others	NA	NA	0
<b>Total Costs</b>	<b>\$4,532</b>	<b>\$0</b>	<b>\$4,532</b>
<i><u>Present Value Benefits</u></i>			
Total Water Savings	12.41 AF	12.41 AF	12.41 AF
Benefits to Utility	0	NA	0
Benefits to Customers	NA	12,119	12,119
Benefits to Others	NA	NA	0
<b>Total Benefits</b>	<b>\$0</b>	<b>\$12,119</b>	<b>\$12,119</b>
<i><u>Cost Benefit Calculations</u></i>			
Net Present Value (NPV) (Total Benefits - Total Costs)	-\$4,532	\$12,119	\$7,587
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	\$365 /AF		\$365 /AF

### UNQUANTIFIED COSTS AND BENEFITS

#### Costs

- The customers' time spent with the auditor.

#### Benefits

- Financial savings on sewer bills for participants.
- Avoided cost of acquisition and distribution of water saved.
- Environmental benefits of reduced use of water.
- Increased public awareness about water conservation.
- Water saved for future municipal use.
- Improved public relations for the utility.
- Utility avoids the cost of developing new water sources.
- Utility avoids the costs of constructing new storage facilities.

