

Castle Rock Utilities Dept.

Water Wiser Class Program

The Town of Castle Rock Utilities Department's (TCR) service area is in the town of Castle Rock, located in Douglas County, Colorado, midway between Denver and Colorado Springs. TCR serves a population of approximately 35,000 people. As of the 2000 census, the median household income for the town of Castle Rock was \$64,138, which is higher than the statewide median of \$47,203.¹

UTILITY DEMOGRAPHICS

As of July 2005, TCR maintained 10,689 connections, of which 94% were residential. Of the total connections, 9,715 were single family residential, 292 were multifamily residential, 371 were commercial, 169 were irrigation, 30 were churches and schools, and 103 were municipal buildings and parks. TCR's total service area is approximately 33 square miles. As of 2004, average residential water use in gallons per capita per day (gpcd) was 168.4.

WATER WISER CLASSES

Eligible Customers: Single Family Residential
Customers Analyzed: Single Family Residential
Program Years: 2002-present

UTILITY RATE STRUCTURE AND PRICES

TCR has an increasing block rate structure. The monthly base rate for water service to a single family residential connection is \$11.80 per month. The price per unit of water is as follows:

Usage	Price
0 - 5,000 gallons	\$2.24/1,000g
5,001 - 15,000 gallons	\$3.13/1,000g
Over 15,000 gallons	\$5.01/1,000g

CURRENT CAPACITY AND WATER SOURCES

TCR has a water delivery system comprised of about 30 operational wells located throughout Castle Rock, which can produce a maximum of 13.2 million gallons per day at full pumping capacity. Additionally, there are 13 active reservoirs capable of storing more than 22 millions gallons of water.

About 96% of Castle Rock's water is pumped from the Denver Basin that contains four principal deep groundwater aquifers: the Arapahoe, Denver, Dawson, and Laramie-Fox Hills. The remaining 4% comes from shallow alluvial wells.²

FUTURE PLANS TO MEET DEMAND

TCR service area is growing at a rate of 12% per year. TCR plans to meet its future water needs by continuing the use of its deep ground aquifers, by exploring other surface water sources, by expanding facilities through increased well drilling, and through conservation.

¹ US Census Bureau. FactFinder.

² Castle Rock's Water, Town of Castle Rock.

WATER WISER CLASSES - DESCRIPTION

Since 2002, TCR has offered Water Wiser water conservation classes to teach its customers how to irrigate efficiently, to share information on low water use plants, and to discuss the town's water situation. Residents who participate in the class are exempt from TCR's

mandatory watering restrictions. They must take the class each year to be exempt from the watering restrictions and to be a part of the Water Wiser program.

OTHER CASTLE ROCK CONSERVATION PROGRAMS

Irrigation Timer Rebate Program, *start date unknown*
Mandatory Water Restrictions, *1985-present*

"every-third-day/specific hours" watering program,
May 1 through September 30.

Landscape Regulations, *July 2003-present*
requires all non-residential, residential and multifamily building have landscape designs approved by the Town.

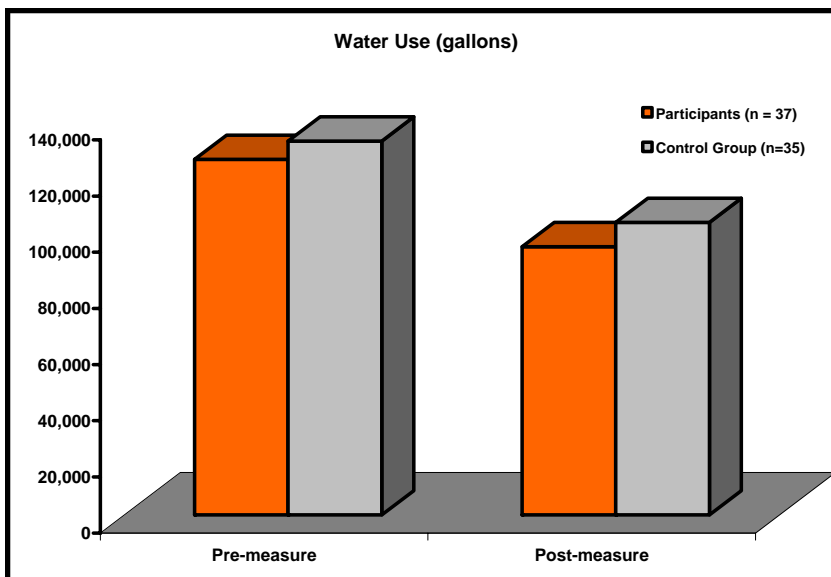
METHODOLOGY

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

The analysis includes only single family customers that participated in the Water Wiser Classes during 2003, held on May 24 and July 19. The water savings were calculated and a cost benefit analysis was performed for 2003. The findings refer to 2003 only, not to the ongoing program. The lifespan of the conservation classes, 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 (2003) and inflated to 2004 dollars. The 2003 discount rate used for this analysis was 3.6%. The Consumer Price Index values used in this analysis were the 2004 value of 188.9 and the 2003 value of 184.0.

The participant population studied for this analysis was comprised of customers who attended the Water Wiser classes in May and July of 2003. Fifty-five customers attended the class during this time period. Of those 55 participants, 37 customers were usable for this



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analysis. Sufficient raw data was not available for 18 program participants (33%).

The control group was comprised of Castle Rock single family residential households who lived nearby those customers participating in the Water Wiser classes, with similar lot sizes. The control group consisted of 35 households. The average pre-measure annual water use of the participants (126,568 gallons) was less than that of the control group (133,129 gallons).

ASSUMPTIONS

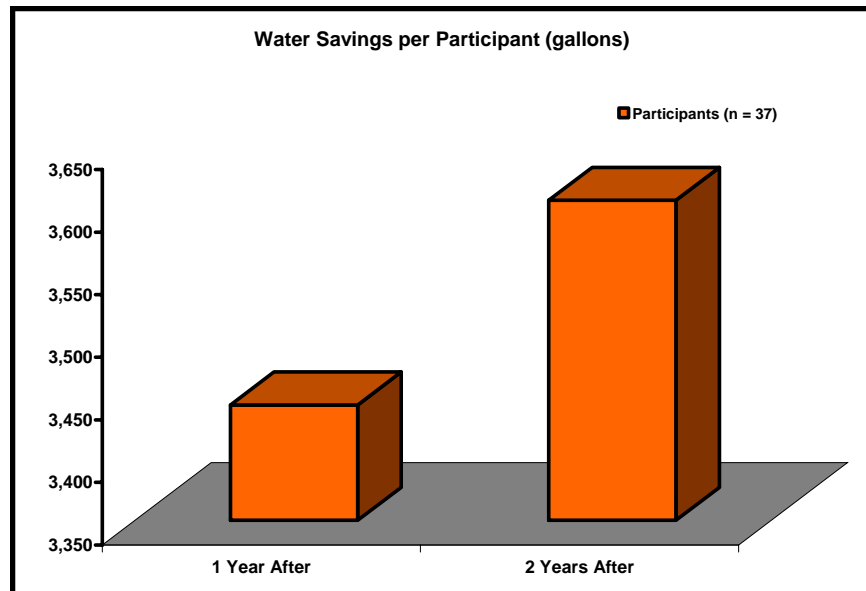
Please see the General Assumptions for the specific conditions and rules underlying all ECoBA analyses.

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

The 2003 discount rate of 3.6% was used in this analysis.

The control group consisted of single family households located nearby those who participated in the Water Wiser classes.

The value of the water saved was calculated by multiplying the amount of water saved per fiscal year by the average of the price of water from throughout the fiscal year, from the second tier (\$2.86 per 1,000 gallons in 2002/2003, \$2.97 per 1,000 gallons in 2003/2004, and \$3.08 per 1,000 gallons in 2004/2005, and \$3.19 per 1,000 gallons in 2005/2006 and beyond).



RESULTS - WATER SAVINGS

The first year after the Water Wiser classes, the water savings amounted to 127,360 gallons, or 3,442 gallons per participant per year (gppy) (2.7% of pre-measure water use). The second year after the classes, the water savings amounted to 133,411 gallons or 3,606 gppy (2.9% of pre-measure water use). Average savings per year was 130,386 gallons or 3,524 gppy (2.8% of pre-measure water use). **Total savings over the five year assumed lifespan was 651,930 gallons (2.0 AF) or about 17,620 gallons per participant.**

During the two years before the Water Wiser classes, the participant group's water usage was 95.1% of the control group's usage, on average. During the two years after the Water Wiser classes, the participant group's water usage was 91.7% of the control group's

usage, on average. The participant group's water use decreased by 24.5%, whereas the control group's use decreased by 21.8%. **The resulting overall water savings attributed to this program was 2.7%.**

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 \$1,027 (\$28 per participant), which includes printed materials, advertising, labor, and rain gauges.
- ◆ The quantified benefit to the utility was \$0.
- ◆ The quantified cost to participants was \$0.
- ◆ The quantified benefit to participants was \$1,947 (\$53 per participant), which includes water bill savings.

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs	Benefits	
All Costs	\$1,027	Not Quantified	Not Quantified	Water Bill Savings	\$1,947
Total	\$1,027			Total	\$1,947

UTILITY PERSPECTIVE

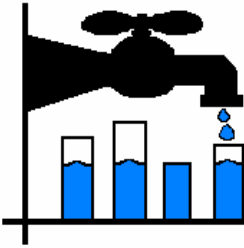
Results of cost benefit analysis show a net benefit (net present value) of -\$1,027 from the utility perspective. This is a net benefit of -\$28 per participant. The quantified costs to the utility were greater than the quantified benefits to the utility. **The cost per acre-foot of water saved from the utility perspective was \$513.**

PARTICIPANT PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of \$1,947 from the participant perspective. This is a net benefit of \$53 per participant. The quantified costs to program 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 \$920 from an overall perspective. This is a net benefit of \$25 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 \$513.**



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Results of Cost Benefit Analysis-Lifespan (5 Years)

	UTILITY	PARTICIPANT	OVERALL
<u>Present Value Costs</u>			
Costs to Utility	1,027	NA	1,027
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
Total Costs	\$1,027	\$0	\$1,027
<u>Present Value Benefits</u>			
Total Water Savings	2.0 AF	2.0 AF	2.0 AF
Benefits to Utility	0	NA	0
Benefits to Participants	NA	1,947	1,947
Benefits to Others	NA	NA	0
Total Benefits	\$0	\$1,947	\$1,947
<u>Cost Benefit Calculations</u>			
Net Present Value (NPV) (Total Benefits - Total Costs)	-\$1,027	\$1,947	\$920
Cost Effectiveness Analysis (CEA) (Total Costs ÷ Total Water Savings)	\$513 /AF	\$0 /AF	\$513 /AF

UNQUANTIFIED COSTS AND BENEFITS

Costs

- Participant's time spent in classes.

Benefits

- Financial savings on sewer bills for participants.
- Avoided cost of acquisition and distribution of water saved.
- Environmental benefits of reduced water use.
- Increased public awareness about water conservation.
- Reinforces need to conserve water and desirability of conserving.
- Program participants were exempt from watering restrictions.
- Water saved for future municipal use.

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