

# Indian Wells Valley Water Dist.

## Conservation Rates: Increasing Block

Indian Wells Valley Water District (IWWVD) provides water to the City of Ridgecrest, California, and portions of western San Bernardino County and eastern Kern County. IWWVD serves a population of approximately 26,500. As of the 2000 Census, the median household income in Ridgecrest was \$44,971, which is lower than the statewide median of \$47,493.<sup>1</sup>

### UTILITY DEMOGRAPHICS

IWWVD's retail service area is 38 square miles. As of 2005, IWWVD had 11845 connections, 94.7% of which were residential. Of their total connections, 10,845 were single family residential, 373 were multifamily residential, 580 were commercial, 34 were fire service connections, and 13 were construction meters.

#### INVERTED BLOCK RATES

<b>Affected Customers:</b>	<b>All</b>
<b>Customers Analyzed:</b>	<b>Residential,</b>
	<b>Master Metered, Commercial, Public</b>
<b>Effective Date:</b>	<b>February 1, 2000</b>

### UTILITY RATE STRUCTURE AND PRICES

IWWVD initially adopted increasing block rates for all customers in 1992. See the following analysis of the rate changes for details.

### CURRENT CAPACITY AND WATER SOURCES

IWWVD's primary source of water is from groundwater drawn from the Indian Wells Valley Aquifer. IWWVD has a storage capacity of 14.6 million gallons.

### FUTURE PLANS TO MEET DEMAND

The population of IWWVD's service area is growing at a rate of about 2.7% per year. IWWVD plans to meet future demands through current sources, adding new wells to the system, and possibly treating brackish water and importing water.

### RATE STRUCTURE - DESCRIPTION

IWWVD adopted an increasing block rate structure for all customers on October 26, 1992. The structure was an eight-tier structure, with the highest tier including 8,000 gallons or more of bimonthly residential water use. The average bimonthly water use of residential customers was 34,492 gallons between 1998 and 2004, so for many customers rate structure was, in effect, flat. The rate at the highest tier was \$1.25 per 1,000 gallons. Customers were charged a bimonthly service fee of \$28.00 in addition to the variable charge:

The water district adopted a new, more aggressive rate structure on February 1, 2000. This is the rate structure we are analyzing for the purposes of this study. This rate increase was also an increasing block rate structure, varying by meter size instead of customer class. Customers were then charged a monthly service fee of \$11.77 for 5/8"

<sup>1</sup> US Census Bureau. FactFinder.

x 3/4" meters in addition to the variable charges. The highest tier started at 19,449 gallons per month, with average residential monthly use at 17,249 gallons per month. The rate structure was as follows:

Usage	Price
0-7,480 gallons	\$0.80 per 1,000 gallons
7,481-9,724 gallons	\$1.00 per 1,000 gallons
9,725-11,968 gallons	\$1.20 per 1,000 gallons
11,969-14,212 gallons	\$1.40 per 1,000 gallons
14,213-16,456 gallons	\$1.58 per 1,000 gallons
16,457-19,448 gallons	\$1.75 per 1,000 gallons
19,449+ gallons	\$1.93 per 1,000 gallons

The structure changed slightly again on April 1, 2003. The tiers changed and rate increases were set to increase by 3% per year from 2003 through 2006, and increases in the monthly service fee to \$13.20. This analysis does not include the 2003 changes. The new structure as of 2005 is as follows:

Usage	Price
0-3,740 gallons	\$0.79 per 1,000 gallons
3,741-7,480 gallons	\$0.99 per 1,000 gallons
7,481-11,220 gallons	\$1.22 per 1,000 gallons
11,221-14,960 gallons	\$1.48 per 1,000 gallons
14,961-18,700 gallons	\$1.78 per 1,000 gallons
18,701-22,440 gallons	\$1.98 per 1,000 gallons
22,441+ gallons	\$2.14 per 1,000 gallons

## METHODOLOGY

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

The rate change that was analyzed here was the change that became effective February 1, 2000. The methodology for this analysis is different from most of the cases in the study because no control group was available for comparison. This is because the rate structure change affected all customers. Instead of using a control group, the

### **OTHER INDIAN WELLS VALLEY CONSERVATION PROGRAMS**

**Showerhead & Aerator Giveaway Program, *ongoing***

**Public Education, *2005-present*  
Xeriscape Workshops and a  
water conservation website page.**

water savings were calculated solely from the difference in pre- and post-measure water use of residential, master metered, commercial, and public connections. The pre-measure and post-measure

time periods were two years each, January 1998 through December 1999 and January 2001 through December 2002. The average yearly water savings from the two years after the rate change was extrapolated for twenty years, the assumed lifespan of the rate change.

The customer classes analyzed were residential, master metered, commercial, and public. The water savings were calculated for each and the total of the four categories. The cost benefit analysis was performed on the total of the four categories. IWVWD's other customer

classes (construction and fire connections) were not included in the analysis.

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 6.2%. The CPI values that were used in this analysis were the 2004 value of 188.9 and the 2000 value of 172.2.

It was not possible to follow the individual customers that were present at the time of implementation of the rate change. Instead, the number of connections was used as a proxy. The number of connections varied by month. There was an average of 10,184 residential connections, 346 master metered connections, 473 commercial connections, and 90 public connections, for an average of 11,093 connections total for the period of analysis. The average number of connections over the twenty year lifespan of the rate change was 11,966, which is the value used in the cost-benefit calculations.

## ASSUMPTIONS

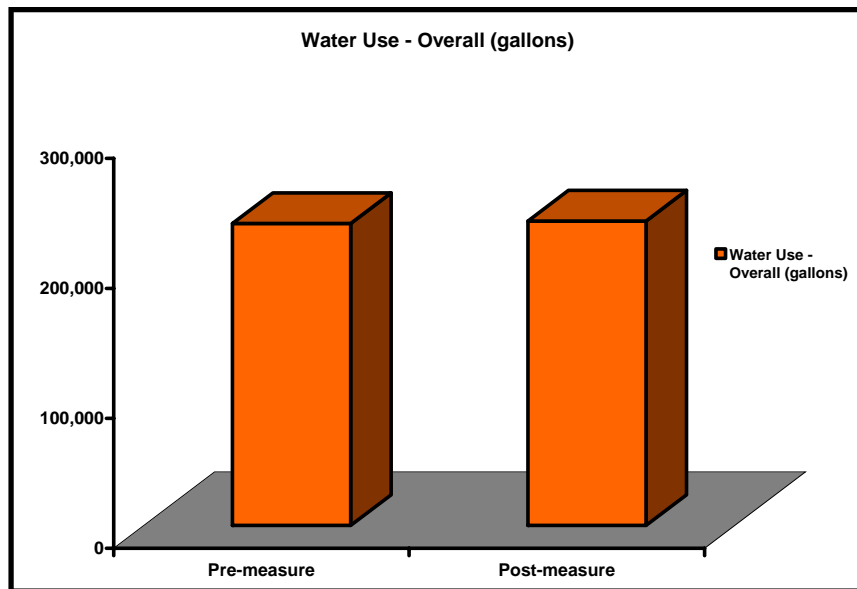
*Please see the General Assumptions for the specific conditions and rules underlying all ECoBA analyses.*

In calculating the average number of connections over the twenty year period of analysis, it was assumed that the annual growth in connections was equal to the average annual growth between 1998 and 2004.

The discount rate used in this analysis was 6.2%.

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

The calculation of water savings and any benefits derived from water savings started the date of the rate structure change, February 1, 2000.

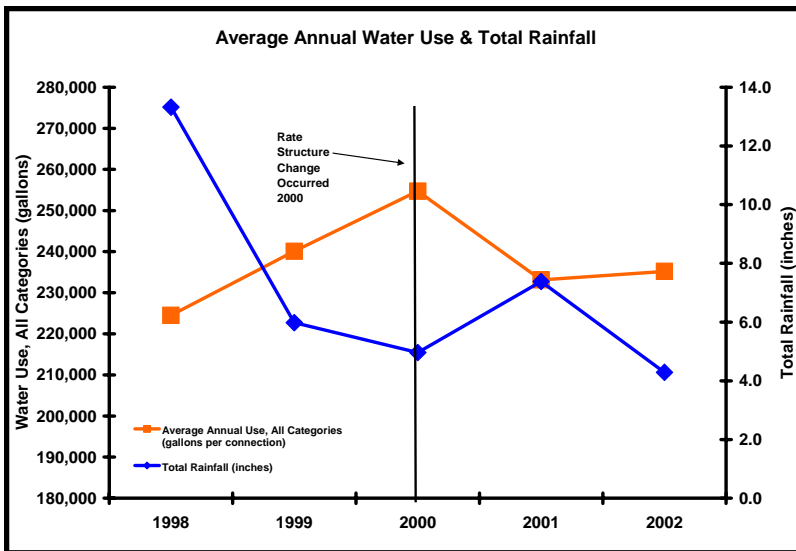


The cost to the utility was \$25,000 for a cost-of-service study preparing for the rate change.

It was assumed that from 2000 through 2002, customers' average water use fell into the 6th tier, regardless of class or meter size. The price at the 6th tier is \$1.75 per 1,000 gallons. It was assumed that from 2003 on, customers' use fell into the 5th tier, regardless of class or meter size. Price at 5th tier was \$1.67 in 2003, \$1.72 in 2004, \$1.78 in 2005, and \$1.83 in 2006 and beyond. These assumptions are based on the average monthly use of residential customers from 1998 through 2002 (17,246 gallons per month).

## RESULTS - WATER SAVINGS

For **residential** customers, during the first year after the rate change, no water savings occurred. There was an increase in participant water use of 46,875,895 gallons, or 4,603 gppy (2.3% of pre-measure water use). The second year after, no water savings occurred. There was an increase in participant water use of 73,287,239 gallons, or 7,196 gppy (3.6% of pre-measure water use). On average, no water savings occurred; relative water use increased by 60,081,567 gallons (184.4 AF), or 5,899 gppy (3.0% of pre-measure water use). **Over the twenty year assumed lifespan of the rates, no water savings occurred; relative water use increased by 1,201,631,335 gallons (3,687.7 AF), or 109,086 gallons per participant.**



For **master metered** customers, during the first year after the rate change, no water savings occurred. There was an increase in participant water use of 28,326,576 gallons, or 81,835 gppy (15.0% of pre-measure water use). The second year after, no water savings occurred. There was an increase in participant water use of 32,998,985 gallons, or 95,333 gppy (17.4% of pre-measure water use). On average, no water savings occurred; relative water use increased by 30,662,781 gallons (94.1

AF), or 88,584 gppy (16.2% of pre-measure water use). **Over the twenty year assumed lifespan of the rates, there were no water savings; relative water use increased by 613,255,615 gallons (1,882.0 AF), or 1,657,149 gallons per participant.**

For **commercial** customers, during the first year after the rate change, no water savings occurred. There was an increase in participant water use of 7,788,970 gallons, or 16,462 gppy (4.3% of pre-measure water use). The second year after, water savings amounted to 2,694,506 gallons, or 5,695 gppy (1.5% of pre-measure water use). On average, no water savings occurred; relative water use increased by 2,547,232 gallons (7.8 AF), or 5,384 gppy (1.4% of pre-measure water use). **Over the twenty year assumed lifespan of the rates, there were no water savings; relative water use increased by 50,944,636 gallons (156.3 AF), or 104,054 gallons per participant.**

For **public** customers, during the first year after the rate change, water savings amounted to 53,193,041 gallons, or 592,916 gppy (34.0% of pre-measure water use). The second year after, water savings amounted to 47,322,058 gallons, or 527,475 gppy (30.3% of pre-

measure water use). The average savings per year was 50,257,550 gallons (154.2 AF), or 560,196 gppy (32.1% of pre-measure water use). **The total water savings over the twenty year assumed lifespan of the rates was 1,005,150,991 gallons (3,084.7 AF), or 11,021,392 gallons per participant.**

For **all customers** analyzed, during the first year after the rate change, no water savings were documented. There was an increase in participant water use of 9,454,878 gallons, or 852 gppy (0.4% of pre-measure water use). The second year after, no water savings were documented. There was an increase in participant water use of 32,079,546 gallons, or 2,892 gppy (1.2% of pre-measure water use). On average, no water savings were documented; relative water use increased by 20,767,212 gallons (63.7 AF), or 1,872 gppy (0.8% of pre-measure water use). **Over the twenty year assumed lifespan of the rates, no water savings were documented; relative water use increased by 415,344,237 gallons (1,274.6 AF), or 34,709 gallons per participant.**

### RESULTS - COST BENEFIT ANALYSIS

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

- ◆ The quantified cost to the utility was \$27,425 (\$2 per participant). This includes consulting costs, \$27,425 (\$2 per participant).
- ◆ The quantified benefit to the utility was \$0.
- ◆ The quantified cost to the participants was \$0.
- ◆ The quantified benefit to participants was -\$460,127 (-\$1,702 per participant). This includes water bill savings, -\$460,127.

Quantified Costs and Benefits					
Utility			Participants		
Costs		Benefits	Costs		Benefits
Consulting	\$27,425	Not Quantified	Not Quantified	Water Bill Savings	-\$460,127
Total	\$27,425			Total	-\$460,127

#### UTILITY PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -\$27,425 from the utility perspective. 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 -\$22.**

#### PARTICIPANT PERSPECTIVE

Results of cost benefit analysis show a net benefit (net present value) of -\$460,127 from the participant perspective. This is a net benefit of -\$38 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 -\$487,551 from an overall perspective. This is a net benefit of -\$41 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 an overall perspective was -\$22.**

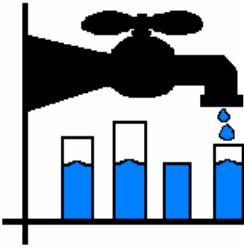
#### **UNQUANTIFIED COSTS AND BENEFITS**

##### **Costs**

- Cost of instituting rate structure.

##### **Benefits**

- Environmental benefits of reduced use of water.
- Avoided cost of acquisition and distribution of water saved.
- Increased public awareness about water conservation.
- Reinforces need to conserve water and desirability of conserving.
- Delays capital improvement projects.
- Water saved for future municipal use.



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### Results of Cost Benefit Analysis-Lifespan (20 Years)

	UTILITY	PARTICIPANT	OVERALL
<u><i>Present Value Costs</i></u>			
Costs to Utility	27,425	NA	27,425
Costs to Participants	NA	0	0
Costs to Others	NA	NA	0
<b>Total Costs</b>	<b>\$27,425</b>	<b>\$0</b>	<b>\$27,425</b>
<u><i>Present Value Benefits</i></u>			
<b>Total Water Savings</b>	<b>-1,274.64AF</b>	<b>-1,274.64AF</b>	<b>-1,274.64 AF</b>
Benefits to Utility	0	NA	0
Benefits to Participants	NA	-460,127	-460,127
Benefits to Others	NA	NA	0
<b>Total Benefits</b>	<b>\$0</b>	<b>-\$460,127</b>	<b>-\$460,127</b>
<u><i>Cost Benefit Calculations</i></u>			
<b>Net Present Value (NPV)</b> (Total Benefits - Total Costs)	<b>-\$27,425</b>	<b>-\$460,127</b>	<b>-\$487,551</b>
<b>Cost Effectiveness Analysis (CEA)</b> (Total Costs ÷ Total Water Savings)	<b>-\$22 /AF</b>	<b>\$0 /AF</b>	<b>-\$22 /AF</b>

