



Review of MPWMD Residential Toilet Replacement Refund Program

*Prepared for
MPWMD Board of Directors*

*by
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Summary of Program

On January 11, 1997, District staff began accepting applications for toilet refunds as the residential phase of the toilet replacement refund program was implemented. Water saved by this voluntary program is used to reinforce community water conservation goals. Savings are not reused, but are set aside to reduce overall water use from the Monterey Peninsula Water Resources System (MPWRS). The MPWRS refers to the set of interconnected water resources that supply the majority in the water demand on the Monterey Peninsula area. The MPWRS includes surface water supplies in the Carmel River Basin and groundwater supplies in the Carmel Valley and Seaside Coastal areas.

During the first six months of the program, \$103,154.44 was refunded to program participants at a maximum of \$100 per toilet replaced, and permanent water savings of approximately 27.462 acre-feet (or 8,948,520 gallons) were gained for the District. Over 675 applications were approved, resulting in the replacement of nearly 1,200 toilets on the Monterey Peninsula that might not have been replaced for years.

In July 1997, the Board authorized the expansion of the toilet replacement refund program to non-residential properties. Beginning August 21, 1997, all qualifying properties within the MPWRS will be able to receive up to \$100 for every non-ultra-low flush (ULF), 1.6 gallons per flush toilet that is voluntarily replaced¹. Contributions of \$164,000 by California-American Water Company (Cal-Am) during the 1997-98 fiscal year make a total of \$264,000 available to program participants after July 1, 1997.

¹ Limited to 20 toilet refunds per site.

Program Background

In February 1996, the Board of Directors of the Monterey Peninsula Water Management District approved an Action Plan for Water Supply Alternatives. The Action Plan identified various types of water supply options that could be pursued to address water supply needs on the Monterey Peninsula following the defeat of public funding for the New Los Padres Water Supply Project by the voters in November 1995. Staff was directed to retain consultants to help update information on the feasibility and cost of various alternatives and to develop specific project proposals for detailed environmental and engineering review in the future. One alternative that was revisited was a toilet replacement refund program.

Staff's original goal was to have the refund program in place by mid or late-October 1996. In early October, it became evident that the rebate program would have an impact on several existing District laws. This necessitated an ordinance process which involves two public hearings before adoption. At their October 1996 meeting, the Board received a draft ordinance for review. The Board approved the first reading of Ordinance No. 85 in November and adopted the ordinance on December 12, 1996. Ordinance No. 85 went into effect on January 11, 1997.

Board action in the late 1980's established a successful water conservation program in the District, one part of which mandates the replacement of older inefficient toilets with new ULF models upon transfer of ownership, expansion or change of use, or when a bathroom is added. The District's conservation program also allows a credit toward the connection charge assessed for a water permit when toilets are replaced when a water permit is issued. In at least three jurisdictions, replacing older toilets as part of a permit application gives the applicant a way to obtain a permit when no water allocation is available from the overseeing jurisdiction, by allowing a jurisdiction to borrow the saved water against a future water allocation.

The toilet replacement refund program goal is to motivate owners and renters of properties that have not been required to retrofit, and are not receiving a water permit credit, to replace older toilets sooner than would otherwise occur. Water saved by the program is not reallocated, but is saved as a contribution to the District's overall water saving goal of reducing per capita water use by 15% by the year 2020. Water saved through the refund program also helps the community as it strives to maintain water use at the goal set by

the State Water Resources Control Board in its 1995 water rights decision (WR No. 95-10) against California-American Water Company (Cal-Am). Until August 21, 1997, the program is only available to single and multi-family residential customers served by a MPWRS water distribution system.

Refund Activity and Water Savings

During the first six months of the program, District staff estimates 27.462 acre-feet of water was permanently saved by the refund program. A total of 731 applications were received, and 676 applications were approved (92.5%). The District refunded \$103,154.44 for the 1,194 toilets that were replaced as a result of this program. On an average, the refund per toilet was \$86.39, although upon review of the refunds issued, it is clear that most applicants received the maximum \$100 refund per toilet. For each customer sector, the results are broken down as follows;

- ◆ In the single family residential sector, 668 applications were approved; and 1,125 toilets were replaced for an annual savings of 28.875 acre-feet or 9,408,947.6 gallons per year.
- ◆ In the multi-family residential sector, 8 applications were approved; and 69 toilets were replaced for an annual savings of 1.587 acre-feet or 517,125.5 gallons per year.

Staff intended to focus the program on apartments and other multi-family housing units. Increased permit activity and conservation requirements during the first phase of the refund program made it difficult for staff to schedule time to promote the refund program to this group. Most promotion of the program occurred during the months of January and February, when newspaper ads were placed weekly in the Monterey County Herald and its *GO!* activities insert. In June 1997, the District ran print ads in all the local papers, and Cal-Am advertised extensively on television and radio. The success of the advertising campaigns is evident by the number of toilets replaced during the months when the program was promoted.

The methods available to estimate water savings caused by toilet replacements vary considerably. A study on the conserving effect of ultra-low flush toilet rebate programs completed in June 1992 for the

Metropolitan Water District of California² (MWD) quantifies the potential water savings for retrofits. The research concluded that the mean water savings per toilet in a single family household was 28 gallons per day, and the savings in a multi-family household amounted to 44 gallons per day. On an average, multiple family toilet replacements save more water because there are more people per toilet in multiple family units. In contradiction to the MWD findings, a water conservation study completed by the Stevens Institute of Technology³ for East Bay Municipal Utility District in 1991, established a much lower water savings threshold. The average toilet replacement savings estimated in the Stevens Institute study amounted to approximately 15.3 gallons per day per household for the Monterey Peninsula, based on housing occupancy of 2.3 persons, regardless of the number of toilets replaced.

The District utilizes a modified version of the MWD factor which takes into consideration the amount of water conservation promotion and the installation of free water saving toilet dams and other devices that has occurred over the years on the Peninsula. The District uses the savings estimate of 0.023 acre-feet annually per toilet (7,495 gallons), based on the assumption that average water savings of approximately two gallons per flush occur ten times per day, per toilet. Savings factors used throughout the state vary depending on the level of previous retrofitting and conservation and on the average number of residents and types of housing. There has not been one universally accepted water savings factor established for ULF toilets.

During the process of inputting applications into the District's database, a number of records were targeted for future review. District staff has access to the Cal-Am water consumption database, making it feasible to examine pre and post-retrofit water records, and making it possible to compare the actual savings against the projected savings. Although an analysis of these accounts was attempted for this report, several variables made it difficult to quantify the actual water savings achieved. The variables were:

² Chestnutt, Thomas W. and A. Bamezai and C. McSpadden, 1992. The effect of ultra low flush toilet rebate programs. A report submitted to the Metropolitan Water District of Southern California, Los Angeles, CA.

³ Aher, Abhay and A. Chouthai and L. Chandrasekar and W. Corpening and Prof. L. Russ and B. Vijapur, 1991. East Bay Municipal Utility District Water Conservation Study, Report No. R-219. A report prepared for East Bay Municipal Utility District, Oakland, California by the Stevens Institute of Technology.

1) Cal-Am reports in units of 100 cubic feet. Each unit contains 748 gallons. Staff would expect to see savings of approximately 1.6 units (or 1,232 gallons) per month. In reading water meters for billing, Cal-Am rounds up or down to the nearest unit. In some months, this method would result in higher savings and in others the result might be lower savings. The fluctuation of up to a unit makes it difficult to determine the amount of water saved.

2) Staff had planned to compare water records of properties that replaced toilets during the winter months with the previous year's water use. The use of water consumption records from the January/February/March time-frame would normally provide a reasonable record of interior water use. Normal rainfall patterns would suspend the need for outdoor irrigation during this period. However, dry weather conditions on the Monterey Peninsula made it necessary to begin outdoor irrigation as early as February 1997. The unusually high water use on the Peninsula during the winter months may have masked water savings from toilet replacements.

3) The sample size of properties that had voluntarily replaced toilets during the early winter months was not large enough to provide an adequate estimate of water savings. Staff initially was able to identify only 20 properties that met the following criteria needed to analyze water savings:

- ◆ Replacement of toilets occurred between December 1996 and January 1997.
- ◆ The property has 2-3 bathrooms.
- ◆ Ownership of the property has not changed in at least 10 years.
- ◆ There has not been a change in the number of occupants in the past two years.
- ◆ There had not been any unusual conditions that would have resulted in more or less water use than normal during the past two years. Examples of unusual conditions include modifications to landscaping, visitors staying for an extended period of time, etc.

Upon review of the Cal-Am water records for the initial sample group, it was apparent that a larger sample was needed to provide an acceptable estimate of water savings. After adding February to the criteria for installation of new toilets, an additional 74 accounts were recently added. Most of the added properties were retrofitted in February, too late in the season to reflect mostly interior water use.

4) Cal-Am began promoting water conservation early this year by establishing a tiered rate structure whereby customers pay more for water if they use more than 16 units during a billing cycle. Later in the spring, Cal-Am began promoting water conservation to meet the SWRCB goal. Water conservation promotion will continue indefinitely.

A second review of the toilet refund program is planned for June 1998. At that review, the accounts identified this year will be compared against pre-retrofitted water use. Assuming normal rainfall conditions during the winter of 1997-98, it may be possible to identify approximate water savings achieved. However, the influence of the variables identified for this report may make it difficult to quantify savings. District staff may need to rely on existing information and studies from other areas to estimate water saved by the refund program.

A survey of the rebate recipients will be included as part of the evaluation process in 1998. Questionnaires will be mailed to the sample group in the spring. According to several reports on file at the District, staff can expect a majority of positive responses regarding the performance of the ULF toilets. For example, the Stevens Institute of Technology Report on Water Conservation in the East Bay Municipal Utilities District reported the following results from its survey of all adults in 25 properties equipped with ULF toilets:

- ◆ Fifty-nine percent were extremely pleased and thirty-five percent were usually pleased with ULF's.
- ◆ Fifty-four percent said ULF's work better than the previous toilet, and thirty-five percent said the ULF's work about the same as their original toilet.
- ◆ Ninety-five percent said ULF's provide an adequate flush for everyday use.

- ◆ Forty-two percent said ULF's clear the bowl on the first flush and fifty percent said usually clear the bowl on the first flush.
- ◆ Seventy-five percent of the population surveyed stated their family does not normally flush every time the toilet is used.
- ◆ Ninety-nine percent said they would like to keep their new ULF toilet.

Additional information on the performance of ULF toilets is available for review at the District offices. The District has also purchased reprints of the *Consumer Reports* article, Water Saving Devices, Low-Flow Shower Heads and Toilets, from the February 1995 issue of *Consumer Reports* magazine. Copies are available at the water conservation counter.

Fiscal Year 1996-97 Expenditures & Budget

The refund program budget progressed through several major revisions before adoption of the program in December 1996. The budget originally included money for advertising and marketing the program. Early in the approval process, the Board expressed concern about the costs of advertising and the administrative costs when compared against with the amount of money allocated for rebates. During October, the budget was revised to increase the rebate fund by \$64,000, making \$164,000 available for rebates during Fiscal Year 1996-97. By adjusting the rebate fund, the advertising budget was reduced and a minimum amount of funding was allotted to administer the program.

The budget for administration of the program from January through June was \$26,000. This budget designated \$12,600 for advertising, printing, postage and supplies; \$13,400 for a temporary service to research properties, input data, answer telephones, process rebates and possibly conduct limited inspections.. A full-scale marketing program was not be undertaken at that time in response to concern about costs, although limited advertising was needed to promote the program.

After six months, \$116,275.93 had been dispensed for the refund program. Payments issued after July 1, 1997 for services rendered and rebates processed between June 20, 1997 and July 1, 1997 are not included in the

following breakdown of program expenses⁴.

- ◆ Refunds totaling \$102,143.40 were processed for voluntary replacement of 1,200 toilets within the Monterey Peninsula Water Resources System.
- ◆ A temporary employment agency was paid \$10,003.00 for a refund program administrator. The employment agency was paid \$14 per hour.
- ◆ Advertising, printing and miscellaneous administrative expenses totaled \$4,129.53.
- ◆ Advertising in January, February and June cost \$2,724.81. The charges for extensive advertising in June were not available for this report..

⁴ Expenditures do not include payments for bills received after June 10, 1997. Payments made after June 15, 1997 will be deducted from the Fiscal Year 1996-97 budget; numbers were not available at the time this report was prepared.

- ◆ Printing costs for applications and program brochures amounted to \$1,330.06.

The District's Fiscal Year 1997-98 budget for the toilet replacement refund program is \$139,000. Cal-Am received Public Utilities Commission (PUC) approval in May 1997 to contribute \$164,000 to the refund account, making a total of \$264,000 available for toilet refunds in the current fiscal year. Expanding the program to the non-residential sector will increase the level of participation in the upcoming year. Adjustments to the FY 97-98 budget will be considered in January 1998.

Conclusion

During the next review of the refund program in June 1998, staff will again attempt to extrapolate the water savings resulting from toilet replacements by comparing winter water consumption from 1997-98 against water use from 1995-96 and 1996-97. A questionnaire will also be mailed to the account holders in the sample group to obtain information about water use practices and satisfaction and performance of the new fixtures.

The District's toilet replacement refund program has been successful in encouraging voluntary replacement of older toilets with ULF toilets. This achievement has resulted in permanent water savings of approximately 27.462 acre-feet annually that would have taken years to realize. By expanding and continuing the program, additional water savings will be realized that will reduce overall water use, benefiting the community by helping it achieve its goals.

NOTES:

- 1) Budget numbers came from General Ledger, Period ending 6/20/97 and includes rebates processed after July 1, 1997 that were issued during FY 96-97