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Time to replace California's remaining old water-wasting "legacy" toilets

Over the past 20+ years, California water providers and their customers have done a great job replacing old water-wasting toilets (3.5 and more gallons per flush) with new models that perform better and use less water. However, the "job" is not yet complete. We conservatively estimate that over 4 million of these old toilets still remain in homes and apartments throughout the state. Without passing any new laws or regulations, without adopting any code changes, and without the arduous processes that sometimes typify state government, immediate action can be undertaken in 2015 to complete the replacement "job". Replace those water wasters now with new high-efficiency toilets (HETs) and achieve immediate potable water use reductions amounting to about 100,000 acre-feet per year. See the attached summary for further detail.

Disclaimer: The author of the attached summary has no financial or other interest in the companies that would provide the suggested replacement services, nor any such interest in the manufacturers or products that might be involved in a replacement program.

Additional submitted attachment is included below.



California Legacy Toilet Replacement Program

By John Koeller, P.E.

Although many toilet replacement programs have been successfully implemented in California in the past 25 years, there still remains a remnant of water-wasting 'legacy' models, i.e., those toilet models with flush volumes of 3.5, 5.0, and 7.0 gallons per flush (gpf). According to the 2005 Potential Best Management Practices study by the California Urban Water Conservation Council¹, there were about 8.7 million of these older non-efficient toilets still installed in California residences in 2005². Assuming that figure has been halved by 2013 through normal replacement and water utility conservation programs, it means that about 4.3 million legacy toilets still exist in residential dwellings today (many of which are likely installed in low income dwellings, particularly apartments).

The 'Legacy Toilet Replacement Program' initiative would replace remaining non-efficient toilets in the state with High-Efficiency Toilets (HETs) compliant with AB715. To the extent funding is made available for such an aggressive program, this is where significant indoor water savings (and related energy savings) can be achieved in the short-term without relying upon changes to codes or standards.

Attachment A provides a rough analysis of the potential short-term savings using CASE report and other data. The predicted annual water savings from replacing the 4.3 million Legacy toilets amounts to approximately four times the CASE proposal's estimated savings from toilets. And, with a well-executed program, these savings would occur in a much shorter time span.

¹ California Urban Water Conservation Council, 2005. "Potential Best Management Practices (PBMP) Report: High Efficiency Plumbing Fixtures – Toilets and Urinals", Prepared by Koeller and Company.

² The estimate of 8.7 million non-efficient residential toilets is consistent with the statement in the CASE report, "Toilets & Urinals Water Efficiency, CASE Initiative for PY 2013: Title 20 Standards Development, Analysis of Standards Proposal for Toilets & Urinals Water Efficiency", dated July 29, 2013 (docketed July 29, 2013), page 22, which states "The study found that about 67 percent of the installed toilets met the existing federal efficiency standard, having rated flush volumes of 1.6 or less." The remainder of 33 percent (of 24.6 million total) amounts to 8.1 million non-efficient residential toilets.

REPLACING NON-EFFICIENT LEGACY TOILETS IN CALIFORNIA

Target: replace 4.3 million existing Legacy toilets flushing at 3.5, 5.0 gpf and above.

- 4.3 million toilets serve an estimated 6.65 million people¹.
- That population flushes 4.76 times per day² = 31.7 million flushes per day
- Assumed average savings per flush = 2.4 gallons (3.5 & 5.0 reduced to 1.28)
- Overall savings = 2.4 x 31.7 million flushes = 76 million gallons per day = 233 Acre-Feet (AF) per day
- 365 days x 233 AF/day = 85,100 Acre-Feet per Year (AFY) = 27,700 Mgal/yr
- 25-year life of the fixtures³: 25 x 85,100 AFY = 2,130,000 Acre-feet saved over the life of the 4.3 million replacement toilets.

It should be noted that, on an annual basis, water savings (and energy savings) from this program are 4 times the savings forecasted in the CASE proposal.

Historically, four program types have been used in the past 20 years to achieving toilet replacements in the residential sector: rebates, voucher redemptions, free distribution, and direct installation. Each program type possesses distinct advantages and characteristics; these are summarized in the table on the following page, the most expensive approach being direct installation wherein the customer benefits from a fully installed free toilet. Recent direct install programs in Southern California have cost the water utilities about \$220 per fully installed toilet. The other three program types are less expensive because the responsibility for toilet installation rests with the customer/homeowner.

Estimated program costs per AF of water savings are summarized in this table for each of the four types.

Program types and water savings

	<i>Rebate</i>	<i>Voucher</i>	<i>Distribution</i>	<i>Direct Installation</i>
Replace toilets	4.3 million legacy toilets			
Implementation cost per replaced toilet	\$120	\$140	\$165	\$220
Total program cost for 4.3 mil replacements (\$mil)	\$516	\$602	\$710	\$946
Total water savings	2.130 million AF			
Program cost per AF saved	\$242	\$283	\$333	\$444

A combination of program types is required to effectively reach all demographics in the state. We estimate the development and implementation of such programs could begin in 2014 and, with aggressive marketing and outreach, could achieve 70 percent replacement within four years.

¹ "Toilets & Urinals Water Efficiency, CASE Initiative for PY 2013: Title 20 Standards Development, Analysis of Standards Proposal for Toilets & Urinals Water Efficiency", dated July 29, 2013 (docketed July 29, 2013), Table 5.3: 37.3 million population – 24.1 million residential toilets; equals 1.55 persons per residential toilet.

² ...Ibid, Table 5.3: Flushes per person per day: 4.76; It should be noted, however, that the generally reported national average is 5.1 flushes per person per day.

³ ...ibid, page 21: "...product lifetime of 25 years..."