



....a dialogue for California's water conservation community

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A message from the Executive Director....

It is with deep sadness that I wish to honor here the memory of Peter Scott Silva, a dedicated landscape water conservation professional who for many years chaired the Landscape Committee for the California Urban Water Conservation Council. Scott, as he was known to many of us, was passionate about many things – water conservation certainly being one of them. An early proponent of the new technology of ET controllers, Scott was always looking for new and innovative ways to save water on the landscape. His recent passing is a great loss for us all.

Mary Ann Dickinson

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- **Major Toilet Fixture Testing Program**
Seattle Public Utilities and East Bay Municipal Utility District have contracted with the National Association of Home Builders Research Center to conduct performance tests on up to 50 residential and commercial (tank-type) toilet fixtures. Results are due this Summer.
- **Testing of Wall-Mounted Commercial Flushometer Toilet Fixtures**
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The T5 Flushmeter may be one of the most revolutionary devices available to the water conservation professional. Production of this device is about to begin.
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Full Details

1. Evaluation of Residential Hot Water Distribution Systems

Various hot water distribution systems are now being marketed for residential applications. This project is an element of the Synergistic Water Heating Technologies Program of the California Energy Commission's Public Interest Energy Research (PIER) Program. It is being performed by the Oak Ridge National Laboratory (ORNL) in support of the Davis Energy Group (DEG), the prime contractor on the project. It is scheduled to be completed by the end of 2002.

The overall objective of this project is to evaluate and report on the performance and economics of various domestic hot water distribution systems that can increase the energy-efficiency of delivering hot water in California residences. There are significant opportunities to improve the energy and water efficiency of residential hot water distribution systems through the use of alternative technologies and practices. While the greatest opportunities occur in new construction, improvements can also be made in existing hot water distribution systems.

Specific objectives that define project tasks are:

- Simulate potential water and energy savings, perform cost-benefit analyses, and identify market barriers of alternative new systems
- Simulate potential water and energy savings, perform cost-benefit analyses, and identify market barriers to maintenance, repair, and retrofit modifications of existing systems

The result of this project will be to provide the target audience of homeowners, homebuilders, systems suppliers, municipal code officials and utility providers (both electric and water/sewer) with a neutral, independent, third party, cost-benefit analysis of alternative hot water distribution systems for use in California. The results will enable these stakeholders to make informed decisions regarding which system is most appropriate for use.

The benefit of the various alternative systems and options is based on an analysis of utility cost savings. Ten California cities are being used in the analysis to reflect the range of water, sewer, electricity, and natural gas costs. The cities are: Davis, Fairfield, Fresno, Gilroy, Sacramento, San Bernardino, San Diego, San Jose, Stockton, and Tracy. These cities were chosen to represent the climatic and utility costs variations within the state.

ORNL and DEG will evaluate seven different housing configurations. For example, characteristics of the new housing types to be evaluated are:

- House #1 - Three Bedroom, Two Bath, Single Story, Single Family, 2010 ft²
- House #2 - Four Bedroom, 2.5 Bath, Single Story, Single Family, 3080 ft²
- House #3 - Four Bedroom, Three Bath, Two Story, Single Family, 2811 ft²
- House #4 - One Bedroom, One Bath, Apartment, 580 ft²
- House #5 - Two Bedroom, Two Bath, Apartment, 960 ft²

Similarly, representative existing residence types (1960s/1970s construction practices) to be evaluated include:

- House #6 - Three Bedroom, Two Bath, Single Story, Single Family, 1100 ft²
- House #7 - Four Bedroom, 2.5 Bath, Two Story, Single Family, 1960 ft²

The following alternative hot water distribution scenarios will then be evaluated for new construction and existing housing and the impact upon energy and water use (and associated costs) and initial installation cost of each case will be determined:

New construction housing

- Install recirculating pump(s) and controls (e.g. Metlund system) in an otherwise representative system for single-family detached residences.
- Replace the representative system with a continuously recirculating system for single-family detached residences.

- Replace the representative system with a multi-pipe manifold (parallel pipe) system for all representative residences.

Existing housing

- Upgrade an existing functional system with the installation of a recirculating pump and controls (e.g. Metlund system).
- Replace an existing non-functional (due to calcification or corrosion failures) representative system in kind. Evaluate the impact of the various alternative pipe materials and the addition of insulation.
- Replace an existing non-functional (due to calcification or corrosion failures) representative system with a multi-pipe manifold (parallel pipe) system for representative residences.

For further information on the study, contact:

John Koeller
(CUWCC representative on the Project Advisory Committee)
714-777-2744
koeller@earthlink.net
OR

Mark J. Berman
Davis Energy Group, Inc.
Tel. 530-753-1100, ext.14
mjberm@davisenergy.com

2. Incentives for Industrial Customers

Legacy Chiller Systems is offering industrial customers an incentive to update their existing "once-through" cooling with a recirculating system. Legacy offers the customer and the water utility the ability to track actual water consumption (and water savings) in real time via its wireless web-enabled monitoring system. Check out this website -

<http://www.legacychillers.com.bcentralhost.com/waterConservation.htm>

For further information on the technology and the customer rebates, contact:

Mr. Martin P. King
Vice President, Environmental Solutions Group
Legacy Chiller Systems, Inc.
1-877-988-5464
email: mking@legacychillers.com



1. Major Toilet Testing Program Underway

Seattle Public Utilities has contracted with NAHB Research Center in Maryland to perform a series of measurements and performance tests on approximately 42 new toilet fixtures. A large majority of the fixtures being tested have been purchased at retail outlets such as Home Depot and Lowe's or through authorized distributor channels. Testing is now underway and will likely be completed by July 2002.

Note: The NAHB Research Center is a not-for-profit subsidiary research arm of the National Association of Home Builders (NAHB).

In addition, the East Bay Municipal Utility District (EBMUD) has joined with Seattle as a co-sponsor of the testing effort and will be adding some unique prototype and production fixtures to those selected by Seattle with designed flush volumes of less than 1.6-gallons. EBMUD has also contracted for the Research Center to perform flapper replacement tests on all of those fixtures using traditional flappers to measure flush volumes after the original flapper is replaced with a standard after-market flapper.

The purpose of the research is essentially four-fold: (1) to evaluate the Research Center's "Performance Index" test protocol as a viable indicator of fixture performance; (2) to develop a database of physical and performance data on the selected fixture models and identify correlations between design characteristics and performance; (3) to develop and provide consumer information on product performance that would aid consumers in making purchase choices; and (4) evaluate some unique and "cutting edge" fixtures that are not yet widely available.

While most of the selected fixtures are normally found in residential settings, a few of those in the test program are pressure-assist tank fixtures usually installed in commercial applications. No flushometer-valve fixtures are included in the test program.

Two of each fixture model are being tested for:

- "Out of the box" flush volume (fixture assembled and installed according to manufacturer's instructions)
- Flush volume after flapper replacement with a standard or "universal" after-market flapper

- Performance of the toilet fixture measured by the Research Center's Performance Index Test Protocol

In total, Research Center will complete testing on between 90 and 100 toilet fixtures (45 to 50 different models). For further information on Seattle's and EBMUD's participation, including a list of fixtures, contact:

David Broustis
Seattle Public Utilities
206-684-4150
david.broustis@ci.seattle.wa.us

Mike Hazinski
East Bay Municipal Utility District
510-287-1802
mhazinsk@ebmud.com

For a copy of the test protocol or for information on individual fixtures, contact:

John Koeller
714-777-2744
koeller@earthlink.net

To contact the project manager at the Research Center, contact:

Bob Hill
National Association of Home Builders Research Center
301-430-6244
bhill@nahbrc.org

To visit the Research Center website and learn more about their mission, their capabilities, and their current programs, go to:

www.nahbrc.org

2. Performance Testing of Wall-Mounted Flushometer Toilets

Eight manufacturers offer 1.6-gallons-per-flush (gpf) 4-bolt wall-hung (siphon-jet) toilet bowls in the US market. The University of Washington (UW), in conjunction with Seattle Public Utilities, is pilot testing one bowl from each manufacturer in one of their buildings to: (1) document potential water savings to the UW and (2) determine if significant performance differences exist between the bowls.

Representatives for all eight manufacturers provided samples for the test project and installation in an existing rest room was performed by UW plumbers. The eight bowl models being studied are:

American Standard "Afwall" #2257
Briggs "Sultan" #7780
Crane "Placidus" #3446
Eljer "Signature" #111-2105
Gerber "Ultra Flush" #25-030
Kohler "Kingston" #K-4330
Mansfield "Model 1300"
Toto "CT 708"

All toilets were tested using the same Sloan Gem II 1.6-gpf piston style flushometer valve which had been previously tested to document an average flushing volume of 1.65 gpf. Static line pressure ranged from 35 to 38 psi. Test media and purpose are-

Test #1 - Toilet paper: increasing lengths of paper to test evacuation
Test #2 - Seat protectors: front hanging to test evacuation
Test #3 - Seat protectors: back hanging to test evacuation
Test #4 - Tofu blocks: single block to test clogging
Test #5 - Brine: test for complete water exchange

Tests for all toilets are being repeated at higher static pressures. Tests are also to be conducted with various models of flush valves to document variation in flush volumes and compatibility with selected bowls.

Testing is being conducted for Seattle Public Utilities by Roger van Gelder, P.E., an independent consultant. For further information on this needed work on flushometer toilets, contact Mr. van Gelder as follows:

Roger van Gelder
Seattle Public Utilities
Tel. 206-615-1257
roger.vangelder@ci.seattle.wa.us

3. Production to Begin Soon on the T5 Flushmeter

In February 2001, attendees at the AWWA Mid-winter Conference in Portland heard about the development of a flush volume meter that was being used by Bill Gauley, Veritec Consulting, on a study in Canada (see WaterLogue Volume 1, No. 5 for a description of the study). Bill developed four prototypes of this device for his own exclusive use on his study for the Canada Mortgage and Housing Corporation. Upon learning of the device's capabilities and ease of use, I urged Bill to consider the possibility of producing more of them, because I knew that they would be very useful to

water utilities' conservation programs. Later, Bill agreed to bring the device to the AWWA Water Sources Conference in Las Vegas for a demonstration.

At the conference he explained its function to the water conservation experts. Later, I was able to use the device to measure the normal flush volume of an installed Toto fixture (in this case, it came in at exactly 6.0 liters), the flush volume if the fixture's handle was held down until the flush was completed (8.4 liters), and the entire contents of the tank (13.2 liters), all within two minutes.

This device is ideal for on-premises audits/surveys where the auditor needs to measure either old or new toilet installations. It eliminates the need for wrenches, buckets, meters, rulers, and all the other stuff commonly used to measure (frequently inaccurately) flush volumes of installed toilets. In Canada, Veritec has used the device to measure the flush volume of several hundred toilets installed in multi-family dwellings, all within a very short period of time.

More importantly, however, through the use of this meter, Veritec has found that many newly installed 6-liter fixtures are flushing well above the 1.6-gpf maximum. Download a summary (PDF file) of their study at this page by clicking on "Summary Report":

<http://www.cwwa.ca/toilet.htm>

With the Canadian water utilities discovering that, in some cases, fixtures are flushing "out of the box" at volumes in excess of the maximum, it is likely that the same type of investigation in our area would disclose that certain toilet fixtures were likewise flushing above the maximum. Therefore, this meter may prove to be of real benefit to those agencies funding toilet replacement programs by enabling inspection personnel to verify the real flush volume of newly-installed fixtures.

For further information on the meter, including technical specifications and how the meter can be applied to water conservation programs, go to Bill Gauley's website:

<http://www.t5flushmeter.com/index.html>

Or contact Bill at:
Veritec Consulting
Tel. 905-696-9391, ext. 102
bill.gauley@sympatico.ca

Check it out and contact his organization if you are interested.

4. CUWCC Requests ASME Standards Committee to Address Flappers

On March 12, 2002, the CUWCC submitted a letter to the American Society of Mechanical Engineers (ASME) A112 Plumbing Standards Committee, formally requesting that the Committee address the problem of toilet flapper identification and marking. This request is an outgrowth of flapper replacement studies previously completed by the Metropolitan Water District of Southern California and a current flapper study sponsored by EBMUD at the NAHBRC (see Item 1 above).

The Committee, through a special Project Team, is presently addressing flapper durability (in chemicals). The CUWCC has requested that, once this work is complete, the "Project Team turn its attention to the development of a marking system that can bring order to the chaotic aftermarket for replacement flappers."

Bits and Pieces - Links of Special Interest

- **Consumers Reports® on "50 Ways to Save Water"**

http://www.consumerreports.org/main/detailv2.jsp?CONTENT%3C%3Ecnt_id=154833&FOLDER%3C%3Efolder_id=18151&bmUID=1021299997799

- **Tankless Water Heaters**

<http://www.reevesjournal.com/CDA/ArticleInformation/coverstory/BNPCoverStoryItem/0,3813,73595,00.html>

- **Scottish water and how it is used**

http://www.pmengineer.com/CDA/ArticleInformation/features/BNP_Features_Item/0,2732,72904,00.html

- **Cutting edge technology in toilets and urinals**

http://www.pmengineer.com/CDA/ArticleInformation/features/BNP_Features_Item/0,2732,28999,00.html

- **Development of standards for toilets in the U.K. - from 1847 to 2001....a fascinating story from John Swaffield -**

http://www.pmengineer.com/CDA/ArticleInformation/features/BNP_Features_Item/0,2732,21637,00.html

- **The biological composting toilet system from Aquatron in Sweden utilizes ordinary toilets**

<http://www.aquatron.se/start.us.html>

- **Green Building and L.E.E.D in the Pacific Northwest**

"While much of the focus of mechanical and electrical designers over the past few years has been on controlling energy operating costs, a shift in emphasis to controlling water costs can be expected as the decade unfolds." Read about projects in the Pacific Northwest in "Taking the L.E.E.D. in Water Conservation" at:

(Inactive link – no substitute)

- **Showering habits in the U.S.**

What is your showering habit? Two minutes or twenty? See what this study by Moen had to say-

http://www.kbdn.net/cgi-bin/hse/search.cgi?url=http://www.kbdn.net/INDUSTRY-TRENDS-bathrooms/CONSUMER-BUYING-TRENDS-baths/2002/022002_Consumer-Buying-Trends-1.asp;geturl=d+highlightmatches+gotofirstmatch;terms=%22Shower+habits%22-firstmatch

(Click on "Shower Habits Revealed" on the right side of your screen.)

More from the same organization about trends in bathrooms.... read about "Spa Bathrooms" and "Super Showers"....a step backward from water conservation -

http://www.kbdn.net/cgi-bin/hse/search.cgi?url=http://www.kbdn.net/PRODUCTS-plumbing-kitchen/092001_Product-Trend-Report_DDarzin.asp;geturl=d+highlightmatches+gotofirstmatch;terms=showers-firstmatch

Next time in the WaterLogue....

- An exciting new product about to be introduced into the consumer marketplace, the correct approach to dealing with the ongoing battle: "bowl cleaners vs. toilet flappers"
- Three field studies have now been completed that measured the water savings from dual-flush toilet fixtures....a report on those savings measurements
- A look at free ridership in toilet fixture replacement programs in California
- Half-gallon urinals