

| DOCKETED | |
|-------------------------|--|
| Docket Number: | 22-AAER-05 |
| Project Title: | Appliance Efficiency Regulations for Water Closets |
| TN #: | 265683 |
| Document Title: | IAPMO Comments |
| Description: | N/A |
| Filer: | System |
| Organization: | IAPMO |
| Submitter Role: | Public |
| Submission Date: | 8/18/2025 10:59:51 PM |
| Docketed Date: | 8/19/2025 |

Comment Received From: IAPMO
Submitted On: 8/18/2025
Docket Number: 22-AAER-05

RE Docket No 22-AAER-05

Additional submitted attachment is included below.



August 18, 2025

California Energy Commission
715 P Street
Sacramento, CA 95814

RE: Docket No. 22-AAER-05

Dear Commissioners,

IAPMO appreciates the opportunity to provide comments on Docket 22-AAER-05, Appliance Efficiency Regulations for Water Closets. Our organization understands and is committed to the optimization of water use for the built environment while prioritizing the protection of public health and safety. Therefore, an effective and feasible regulation must balance those goals and be based on the most accurate research and data available.

Founded in California nearly 100 years ago, IAPMO is a model code development organization that produces the most progressive and technically advanced plumbing, mechanical and water efficiency codes in the world, including the Uniform Plumbing Code, the model code for the California Plumbing Code. Comprised of plumbing and mechanical inspectors, engineers, code officials, plumbing and mechanical installers and contractors, water and energy efficiency experts, and manufacturers of plumbing, mechanical, and building products, the industry experts of IAPMO support California's public health and safety.

Data Needed to Inform New Flush Rates

Highly efficient plumbing fixtures and fittings are installed with significantly lower flush rates than those in place when the water supply and waste piping design methodology was established long ago. To maintain safe and reliable plumbing systems for Californians, IAPMO believes that the extent and magnitude of how water efficiency impacts the water supply and waste systems needs to be more thoroughly understood. Until then, the maximum allowable water closet flush volume criteria should not be reduced below 1.28 gallons per flush (gpf) without specific research into the impact on water distribution and sanitary waste piping systems inside the built environment.

Available data reveals issues with drain clogging and transportation of solids out of the building and into the sewer with reduced flush volumes. Typically, the lower the flush volume of water closets, the more these issues are exacerbated. The Plumbing Efficiency Research Coalition (PERC) 2.0 study¹ notes a significant decrease in drainline transport performance between the 1.28 gpf and 1.0 gpf flush volumes:

It is specifically noted that "PERC does not recommend the use of 3.8 Lpf / 1.0 gpf toilets (or less) in commercial applications that have long horizontal drains and that do not provide additional long duration flows from other sources to assist with the drainline transport of solid waste."

¹ Plumbing Efficiency Research Coalition (PERC 2.0), The Drainline Transport of Solid Waste in Buildings – Phase 2.0, September 2015, Revised March 2016. https://plumbingefficiencyresearchcoalition.org/wp-content/uploads/2016/04/PERC-2-0_2-1-FINAL.pdf



The PERC 2.0 study did not account for the realities of slope deviation, junctions, and fittings which “increase the potential for mechanical blockages due to toilet paper hanging up at the junctions.” Should flush rates drop beneath that minimum recommendation, toilets certified at a maximum 1.1 gpf will need to consume even less than 1.1 gallons to ensure they comply when tested. This is because the certified maximum flush rate sets the upper limit for water use, so if the allowable minimum flush rate drops, toilets must use even less water during testing to avoid exceeding that certified maximum.

Known Public Health Risks from Insufficient Flow Rates

Additionally, there is growing concern that reduction in flow rates may be causing public health issues. As flow rates and volumes decrease, water age increases, creating the conditions for waterborne pathogen amplification to occur, and increasing the potential for waterborne-related illnesses, which can incur \$3.33 billion in direct healthcare costs². This concern of lower flow rates is noted in the National Academy of Sciences, Engineering and Medicine (NASEM) Consensus Study Report³ on the Management of Legionella in Water Systems:

Low-flow fixtures should not be allowed in hospitals and long-term care facilities because of these buildings’ high-risk occupant populations. Low-flow fixtures have been promoted to conserve water and, in some cases, energy. Because of their lower flow, however, these fixtures, primarily low flow faucets but also showers, increase water age and restrict disinfectant levels, including the disinfection provided by elevated water temperatures. As such, low-flow fixtures present a greater risk for Legionella development in the plumbing systems that feed them.

To prevent the spread of Legionella and other opportunistic plumbing pathogens, IAPMO recommends performing extensive research on the proper sizing of water and sanitary piping systems before further reducing plumbing fixture flow rates. Such studies could be performed by governmental organizations, such as National Institute of Standards and Technology (NIST), or by partnering with the technical research arms of non-governmental organizations such as IAPMO to expand on previous studies with new data related to plumbing efficiency focused on the outcomes aligned with proposed regulatory goals.

Alternative Strategies to Accelerate Water Conservation

IAPMO finds ways to optimize water use for the future while also making an impact today. Given that the current proposal would not realize water savings for decades, IAPMO encourages the CEC to collaborate with stakeholders on actions that will have immediate benefits.

- **Replacing legacy products with products that meet current requirements offers rapid savings using proven technology.** According to the Plumbing Manufacturers International’s (PMI) market penetration study³ “only ~23% of California households have purchased and installed water closets that comply with the standard established by the California Legislature in its previous 2007 mandate to lower flush volumes to 1.28 gpf.”

² Estimate of Burden and Direct Healthcare Cost of Infectious Waterborne Disease in the United States, January 2021.
<https://pubmed.ncbi.nlm.nih.gov/33350905/>

³ California Market Penetration of Water-Efficient Plumbing Products Study, 2022.
<https://www.safeplumbing.org/advocacy/saving-water/water-efficiency-studies>



- **Utilize the newest product standards**, as additional innovations can contribute to water and energy efficiency without such large risks to public health and safety. The industry has invested in developing leading standards, including the Water Demand Calculator, which the California Energy Commission adopted in September 2024 for inclusion in the 2025 California Energy Code. Other standards include ANSI/CAN/IAPMO Z1349: Automatic Water Leak Detection Devices, IAPMO IGC 330: Recirculating Shower Systems, ASSE 1086: Reverse Osmosis Water Efficiency, IAPMO IGC 241: Water Flow Shut-Off Devices, IAPMO IGC 244: Tub and Shower Flow-Reduction Systems, IAPMO IGC 261: Excess-Flow Shutoff Devices, IAPMO IGC 344: Flow Control Water Conservation Systems, and ASSE/IAPMO IGC 384: Digital Mixing Valves for Recirculating Hot Water Systems.
- **Maximize use of leak detection technology.** New research by the [Pacific Institute](#) found that an 11% reduction in water use was realized after deploying leak detection technologies, representing potentially massive savings.
- **Partner with IAPMO on research efforts** to develop a complete understanding of peak flow rates from different commercial building types, such as offices, schools, hospitals, hotels, retail, among others. As you know, there is significant potential to improve plumbing efficiency by [right-sizing](#) water supply piping systems. Leveraging the technical resources of IAPMO to explore and test the options would help produce meaningful results for state policymakers so that future regulations are as effective as possible.

Working Together to Achieve Success

IAPMO stands ready to assist CEC in pursuit of shared sustainability goals that are based on sound science. For this regulation to work well and minimize the risk of serious and unintended consequences, it must be informed by thorough research into the potential impacts on plumbing system performance and public health. Otherwise, consumers face the risks of drain blockages, reduced pathogen control, and the limitations of outdated system design methodologies.

Additionally, by leveraging existing research capacities and partnerships, CEC can examine the issues holistically and craft a regulation that will improve water conservation without negatively impacting public health and safety. The best approach will enlist immediate, proven solutions—such as replacing non-compliant legacy fixtures and adopting advanced leak detection technologies—that achieve the conservation goal of this proposal but provide measurable water savings today. We are ready to assist any way possible and should you have any questions, please feel free to contact me at david.yow@iapmo.org.

Sincerely,

A handwritten signature in black ink that reads "David Yow". The signature is written in a cursive, flowing style.

David Yow
IAPMO Director of Government Relations