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PMI's Response to CEC Staff Analysis of Proposed Efficiency Standards for Water Closets (Toilets)

Additional submitted attachment is included below.



February 5, 2025

California Energy Commission
Docket No. 22-AAER-05
715 P Street
Sacramento, CA 95814

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RE: PMI's Response to CEC Staff Analysis of Proposed Efficiency Standards for Water Closets (Toilets)

Dear Commissioners,

Plumbing Manufacturers International (PMI) appreciates the opportunity to respond to the California Energy Commission's (CEC) Staff Analysis of Proposed Efficiency Standards for Water Closets. As the leading trade association representing manufacturers of plumbing fixtures and fittings, PMI and its members are committed to innovation, environmental stewardship, and meeting the diverse needs of consumers and stakeholders, including utilities, suppliers, and policymakers.

We acknowledge the CEC's continuing efforts to address water conservation in California through efficiency standards for water closets. However, after reviewing the staff analysis and the proposed regulations, PMI has significant concerns regarding the potential unintended consequences of reducing maximum flush volumes to 1.1 gallons per flush (gpf) for single-flush toilets and 1.28 gpf/0.8 gpf for dual-flush models. Our response presents evidence-based counterpoints challenging these proposed standards and offers a more practical alternative to achieve equal or greater water savings while mitigating potential adverse effects.

Challenges with the Proposed Standards

1. Public Health Risks: Pathogen Growth and Water Quality Concerns

Further lowering water flow rates will increase the opportunities for water aging and stagnation in distribution and premise plumbing systems. Stagnant water will result in reduced disinfectant levels, promoting the growth of opportunistic pathogens such as *Legionella pneumophila* and *Pseudomonas aeruginosa*. This poses a significant risk to public health, especially in hospitals, healthcare facilities, and buildings with vulnerable populations.

- A study by Rhoads, Pruden, and Edwards (2016) highlights how low-flow systems in green buildings can elevate water age and result in microbial regrowth (p. 164). Elevated pathogen levels have been observed to increase the risk of disease transmission (Wang et al., 2017).
- "Reduced water usage induced longer stagnation times and longer stagnation times were weakly correlated with an increase in *Legionella spp.* and *Mycobacterium spp.* concentrations," as reported in "Right Sizing Tomorrow's Water Systems for Efficiency, Sustainability, and Public Health" (Whelton et al., 2022).

- The National Academies of Sciences (2020) further emphasize the link between reduced flow rates and Legionella growth, underscoring the need for robust water management strategies.

2. Premature Reduction of Flush Volume Standards

Manufacturers have incurred significant costs designing, certifying, manufacturing, replacing inventory and providing supply channels with products meeting the current 1.28 gpf standard. However, only around 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. Transitioning now to 1.1 gpf before full adoption of the existing 1.28 gpf standard risks diminishing water savings and fails to address the absence of measures to overcome resistance and encourage or require residences to take action and replace their water closets.

- Replacing the many legacy fixtures that use over 3.5 gpf offers a greater opportunity to achieve immediate water savings, especially in disadvantaged communities where over 80% of toilets do not meet current standards.
- Accelerating programs to retrofit older fixtures with compliant models could yield substantial and measurable water savings without imposing premature technical challenges or consumer costs.

3. Drainline Carry Issues in Sewer Systems

Further lowering the flush volumes of the gravity flush toilets, used extensively in both commercial and residential buildings, may compromise the transport of solid waste through the drainline, especially in multifamily complexes and commercial buildings with long pipe runs.

- The PERC 2.0 study (2016) demonstrated that reducing flush volumes below 1.28 gpf can result in frequent blockages, odor issues, and increased maintenance costs due to insufficient drainline carry.
- Residential and commercial settings face different challenges.
 - While residential fixtures benefit from supplementary water flows from showers and dishwashers, commercial systems often lack these auxiliary flows, exacerbating the risk of sewer backups.
 - Commercial installations also face the ‘demand’ to flush paper seat covers and other materials not generally found in residential settings

4. Impact on Wastewater Infrastructure

Lowering wastewater flow rates can lead to higher concentrations of nitrogen, phosphorus, and other contaminants, complicating wastewater treatment and increasing operational costs.

- According to CUWA (2017) Policy Principles, declining wastewater flows increase treatment complexity and the need for infrastructure modifications to handle more concentrated waste streams, further driving up costs and operational challenges.
- Research has shown that reduced flows result in greater sedimentation and corrosion in sewer lines, further increasing maintenance requirements (Jerome, 2016).
- The CASA (2017) Whitepaper states that “Declining system flows decrease wastewater flows and may increase pollutant and solids concentrations, which increase blockages, odors, and corrosion in pipes. This leads to increases in operation and maintenance (O&M) costs, odor complaints, and an accelerated degradation of infrastructure.”

- Utilities may face higher costs associated with upgrading systems to manage concentrated effluents and reduce exposure to sewer gases.

5. Consumer Impact from changing obligations for Manufacturers

- **Exponential R&D Demands:** Achieving further reductions in flow rate requires exponentially more research, development, and investment compared to past efficiency improvements. The aggressive timelines exacerbate these challenges, as manufacturers face significant constraints in redesigning products to meet stringent standards within a short frame, impacting benefits to consumers.
- **Higher Retail Prices:** The significant costs associated with redesigning products to meet stringent standards are likely to result in higher retail prices for consumers, potentially limiting access to newer, more efficient models. Such cost increases disproportionately impact disadvantaged communities with less disposable income.
- **Limited Choices:** The focus on meeting rigorous new standards could divert resources from broader product innovation, reducing the variety and features of available products, ultimately impacting consumer choice and satisfaction.

Proposed Alternative Approach

PMI proposes an alternative strategy for the state of California to achieve water savings equivalent to or greater than the CEC's targets without risking public health, infrastructure integrity, or consumer confidence. This strategy includes:

1. Accelerated Replacement of Legacy Fixtures

Focus on replacing non-compliant toilets using over 3.5 gpf with models meeting the existing 1.28 gpf standard.

- Analysis by MaP Testing (2024), based on the 2022 GMP Research study findings of 2.4 million legacy toilet fixtures (3.5 gpf or greater toilets) determined that replacing these legacy toilets with 1.28 gpf models could save around 14.1 billion gallons of water annually (352 billion gallons over 25 years)
- The GMP Research study (2022) found that over 26 million, 1.6+ gpf toilets are also still in use. Statewide, up to 326 billion gallons of water could be saved over 30 years simply by accelerating the replacement of these 1.6+ gpf toilets with 1.28 gpf toilets.

2. Implementation of Smart Water Systems

Incentivize the adoption of water reuse and smart plumbing systems that monitor usage and optimize efficiency.

- Advanced metering and dual plumbing systems can reduce demand while preserving infrastructure.
- Implementing predictive analytics in smart water systems can optimize water usage patterns and help identify leaks or inefficiencies early, reducing overall waste and operational costs.

3. Pilot Testing and Data Collection

Conduct field studies to assess the impact of lower flush volumes on potable water supply, drainline performance, wastewater treatment, and public health in general.

- Results from the PERC studies (2012, 2016) can serve as a baseline for evaluating the feasibility of 1.1 gpf toilets in real-world conditions.
 - A supplement to the PERC studies, covering drainline carry in pipes under flush conditions with additional media such as seat covers, quilted toilet paper, and other waste material at 1.28, 1.0 gpf would provide the industry important information about how plumbing systems (drain lines) will perform in 'real world' situations.
- Survey commercial building facilities managers to determine their experiences with 1.28 and 1.1 gpf toilets, as it relates to clogging, drainline clearing, and multiple flushing issues.
- Expand potable water supply studies to include the impact of seasonal variations in water quality and their correlation with pathogen proliferation, as demonstrated by recent research on stagnation and microbial growth in the water supply.
- To enhance understanding of system flushing requirements and their impact on water efficiency a focused study on the volume of water currently used to adequately flush potable water systems in California as recommended in the SWRCB Flushing requirements: Operational requirements for public water distribution systems (n.d.).

4. Enhanced Public Education and Outreach

Educate consumers about the benefits of adopting compliant fixtures and provide rebates to encourage participation.

- Partner with community organizations and local governments to conduct awareness campaigns about the environmental and financial benefits of replacing legacy toilets.
- Develop educational resources, including videos, webinars, and brochures, to inform consumers about rebate programs and proper installation of compliant fixtures.
- Public-private partnerships with organizations like PMI and retailers such as Ferguson, Home Depot and Lowe's can accelerate adoption.

Recognizing Potential CEC Actions

PMI acknowledges the possibility that the CEC may choose to move forward with the proposed docket regardless of the comments received. Should this occur, PMI respectfully submits the following suggestions:

- **Maintain Current Standards for Single-Flush Toilets:** Retain the current standard of 1.28 gpf for single-flush toilets.
- **Dual-Flush Toilets:** Recognize a flat flush rate of 1.28 gpf for dual-flush water closets, with a reduced flush volume of 1.1 gpf in compliance with Section 7.14 of ASME A112.19.2/CSA B45.1-2024.
- **Effective Date:** Tie the effective date of these regulations to the manufacturing date of the product rather than the sales date. PMI recommends the language: "The efficiency standards for water closets apply to products manufactured on or after December 1, 2027." This timeline allows the minimum required lead time for manufacturers and the supply chain to initiate, undertake and complete the necessary product development and deployment to supply the California market.

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PMI remains committed to collaborating with the CEC to develop balanced policies that advance water conservation while protecting public health and ensuring practical implementation for manufacturers and stakeholders.

Sincerely,



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