



November 10, 2014

Commissioner Andrew McAllister
California Energy Commission
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California Energy Commission

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Mr. Harinder Singh
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Dear Commissioner McAllister, Mr. Singh and Mr. Ngo:

The Alliance for Water Efficiency and Plumbing Manufacturers International both filed comments in the CEC Appliance Efficiency Pre-Rulemaking, Docket 14-AAER-1, on Title 20 Plumbing Standards. Both sets of comments supported the staff recommendation. One specific issue raised in the Alliance for Water Efficiency's comments is the potential for pathogen growth where there are extremely low fixture flow rates in premise plumbing systems.

While we support the desire of the California Energy Commission to improve the efficiency of plumbing standards in California, we urge that any new standards be based on proven performance of fixtures in the field. This concept of "proven performance" includes the achievement of the efficiency goals set in the standard, demonstrable cost-effective product performance, and avoidance of related critical issues such as unintended impacts on public health and safety. Our concern on the public health question comes from observations of the consequences of extremely low flow rates on total building systems and the difficulty of maintaining the disinfection residual in drinking water necessary to protect public health.

The Water Research Foundation has undertaken scientific research that clarifies what is known about this issue in green buildings, specifically addressing the issue of pathogen growth in end-

use premise plumbing fixtures. Unfortunately, the report on Project 4379 will not be publicly released until early 2015. However, in view of the importance of your upcoming regulatory proceeding, the Foundation has graciously consented to share a preliminary draft of the report's conclusions. Attached is a draft of the final report which is not meant for general circulation, but is provided as a pre-publication version specifically for CEC's consideration. It identifies what is known and not known about this emerging issue of legionella and pathogen growth in efficient premise plumbing systems. We have also attached a one-page excerpt of some of the relevant issues.

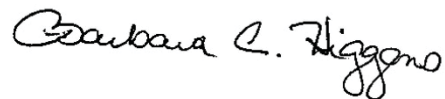
Should you have any questions about the project report or its conclusions, we recommend that you contact John Whitler of the Foundation at JWhitler@waterrf.org for further information.

We stand ready to provide whatever information or assistance you may need for this important regulatory proceeding. Please feel free to contact us.

Sincerely yours,



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Excerpts from Water Research Foundation Report 4379: State of the Science and Research Needs for Opportunistic Pathogens in Premise Plumbing

- As more water conservation-specific devices enter the market, despite being NSF/ANSI certified for different health criteria, similar concerns are likely to arise. Fundamental research will be necessary to understand and resolve these problems before such devices can be used with confidence. Results/Conclusions, pg. xxv
- Opportunistic premise plumbing pathogens (OPPPs) are now the leading cause of water borne disease in developed countries (CDC, 2011). Section 3.2.1, pg. 11
- The effects of continuous versus intermittent flow, regardless of overall water age, and the effects of high versus low flow rate are unclear. Section 3.6.1.4, pg. 49
- Adding another layer of complexity, intermittent high and low flow could further alter how microorganisms grow and are released from biofilms. Clearly, studies examining stagnation versus flow, and high versus low flow rate, have shown contradictory results thus far. There is a need for more research in this area to help explain these discrepancies. Section 3.6.1.4, pg. 50
- While achieving water conservation is an important and noble goal, for reasons that are not yet clear – perhaps because of lower flow or specific components of these devices, these devices may pose a health concern to some individuals. Section 3.6.2.2, pg. 52
- The low flow through water-reducing faucets is linked to low pressure and an increased stagnant volume of water in the pipes leading to the tap. This could provide ideal growth temperatures (35oC) for *Legionella* spp. And *Pseudomonas aeruginosa* (Halabi et al, 2001). The reduced flow and pressure could be incapable of providing enough water volume or turbulence to properly flush and “clean” the faucet (Chaberny and Gastmeier, 2004; Yapicioglu et al, 2011), which has implications for biofilm attachment and release rates that are not well understood. Section 3.6.2.3, pg. 52