October 15, 2012

Jim McGowan, Executive Director
California Building Standards Commission,
2525 Natomas Park Drive, Suite 130
Sacramento, California 95833

Subject: 2013 CALIFORNIA GREEN BUILDING STANDARDS CODE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 11

E-mail Address: CBSC@dgs.ca.gov

Dear Mr. McGowan:

On behalf of Plumbing Manufacturers International (PMI), we are submitting the following comments in response to the 45-day public notice and comment period for the California Green Buildings Standards Code, California Code of Regulations Title 24, Part 11.

PMI is the leading national and technical trade association of plumbing products manufacturers in the United States. Our 32 manufacturers and allied members include many of the well-known companies selling plumbing products in the United States for decades. Our collective group of manufacturers is responsible for at least 90% of all the fixtures and fittings sold in the U.S. market.

PMI is a strong advocate for the efficient and safe use of water, a commitment that is evident in our longstanding partnerships with the US Environmental Protection Agency's (EPA) WaterSense Program and with organizations such as the Alliance for Water Efficiency. We also advocate for public health and safety and product performance, as well as the harmonization of the requirements of plumbing codes and standards.

Plumbing Manufacturers International (PMI) appreciates the opportunity to provide feedback to the proposed changes to the CALGreen regulations. We understand the need to continuously improve all processes and would like to provide the following response to these proposed changes.

PMI is the voluntary, not-for-profit national trade association of manufacturers of plumbing products serving as the Voice of the Plumbing Industry. Member companies of PMI produce a substantial quantity of the nation's plumbing products. (See footnoted membership roster.) On the list you will note a number of California plumbing product manufacturers: Fisher Manufacturing, Fluidmaster, Inc. and Pfister as well as several with a presence there: BrassCraft

Manufacturing (A Masco Company), Elkay Manufacturing, Sloan Valve Company, TOTO USA and T & S Brass and Bronze Works, Inc. Directly or indirectly, all PMI members sell their products in California.

On behalf of our Members, PMI offers the following specific comments with regard to the proposed regulations:

1. Division 4.3. - **2013 Mandatory Levels**

Our partnership with the US EPA on the voluntary WaterSense program to address water conservation concerns has contributed to the successful implementation across the United States. PMI recognizes the proposed CALGreen changes and supports the 2013 mandatory levels in Division 4.3 that mirror the goals set in the WaterSense program. These goals were developed with consumer research and data from plumbing product manufacturers.

2. Table A4.303.1. - **Levels of Water Efficiency**

PMI is concerned about the inclusion of seemingly arbitrary *voluntary* levels of water efficiency noted in section A4.303.1. Our concern is based on the absence of consumer usability data that would show the viability of these voluntary levels. In our discussions with the Housing and Community Development staff over the last year we understood that our inputs to the draft language of this revision of CALGreen would be seriously considered. In spite of our inputs, this draft continues to propose the arbitrary voluntary levels that will produce unintended consequences for those local jurisdictions relying on the noted voluntary recommendation in the CALGreen standard. We would ask that the voluntary levels be deleted for several reasons.

The data presented in Table A4.303.1 is inaccurate and does not predict the actual baseline amount of water to be expected in real life. It presents a simplistic calculation based upon the assumption that flow rates always occur at the maximum rated flow for faucet and showerhead products. We know this not to be true, and present information below in support of real data (see appendix). The Industry's information is that the durations and number of uses per day in this table are inaccurate. Based upon a number of studies conducted by Aquacraft Engineering on behalf of the US EPA (2005) and the American Water Works Association (1999), one might try to base the baseline calculation on a gallons per day basis. However, actual water use varies significantly based upon human behavior. For this reason, even if the regulaltion utilizes gallons per day as the baseline data to normalize for duration and frequency, a reliable prediction of real savings to compare to the baseline must reflect the fact that people do not open their faucets full most of the time. Trying to use a performance method to predict savings is just too complicated to be reliable.

a. Lavoratory Faucets

Home Water Use data developed by PMI suggest from the frequency/flow rate histogram that the average flow rate over the conservation phase of the study, where lavatory faucets were restricted to 1.5 gpm, was actually 1.2 gpm. The number of uses/capita/day average was 18.4 at an average time of 0.21 minutes/use: (1.2 x 18.4 x 0.21 = 4.6 gallons/capita/day average. The

formula in the CALGreen table would calculate 1.8 x 4 x 1 = 7.2 gallons/capita/day average, which significantly overstates the baseline value.

b. Kitchen Faucets

For kitchen faucets, the number of uses/capita/day was 3.4, at 0.24 minutes per use. Based upon the 2.2 gpm units in the study, the average flow rate per use was 1.36 gpm: 1.36 x 0.24 x 3.4 = 1.1 gallons/capita/day. The CALGreen table baseline is: 1.5 x .25 x 3 = 1.125 gallons/capita/day, which is not a significant difference from the PMI Home Water use data.

c. Showers

For showers, the CALGreen table baseline is: 2.0 x 8 x 1 = 16 gallons/capita/day. The PMI Home Water use data indicates that for a 2.5 gpm showerhead limit, the average flow rate in use was about 2.3 gpm, or about 92% of full flow. For a 2.0 gpm showerhead, we could likewise assume a real flow rate of 1.84 gpm on average. Using the CALGreen table's assumptions of 1 shower/person/day and the 8 minute shower, the baseline should actually be: 1.84 x 8 x 1 = 14.72 gallons/capita/day.

d. Consumer Research to Determine Real Requirements

PMI is aware that a lower flow rate limit will result in water savings. A prescriptive approach is much simpler from both a design and inspection/enforcement standpoint, but is also likely to provide error in predicting real savings. PMI is very concerned with a prescriptive approach that leads to lower and lower flow rate restrictions without taking into account that one of the reasons people do not always open faucets full is because they do not need all that water to accomplish the task at hand. We have seen that when people use a 2.2 gpm lavatory faucet they were only using 1.6 gpm. We have also seen when people use a 1.5 gpm lavatory faucet, they tend to operate it in a fully open position. Continuing to rachet flow rates down further is likely to result in consumer frustration and consumer replacement of aerators with higher flow rate units or worse yet, consumer removal of flow rate limiting parts. For this reason, in the future it would be very wise to conduct some consumer research, as the US EPA did with WaterSense flow rates on showerheads, to determine what their real requirements are for the tasks that they need to do.

3. Appendix A4, specifically Table A4.303.2. – **Voluntary Measures**

PMI"s third comment concerns voluntary measures in Appendix A4, specifically Table A4.303.2. Providing a voluntary flow rate schedule for adoption by various townships and municipalities throughout California creates a mulitude of issues from an enforcement and manufacturers' standpoint, most significantly:

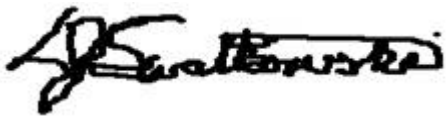
1 – It is nearly impossible to create products for an individual town that will only be sold in that town. Conversely, the same issue exists with products coming into individual towns from nearby sources.
2 – As lower flow rates continue to be regulated, secondary issues requiring pressure balance and thermostatic valves to prevent scalding and measures to address infrastructure waste pipe clogging need to be accounted for.
3 – The missing piece in this draft proposal is the need for consumer research. The attached

charts are a snapshot of real world consumer usage and have been used in the development of voluntary standards such as WaterSense.

In conclusion, PMI believes it is important that the appendix on voluntary flow rate standards be removed from the 2013 CalGreen draft regulations.

PMI would like to thank the California Housing and Community Development Focus Group for the opportunity to participate and comment on these proposals.

Sincerely,



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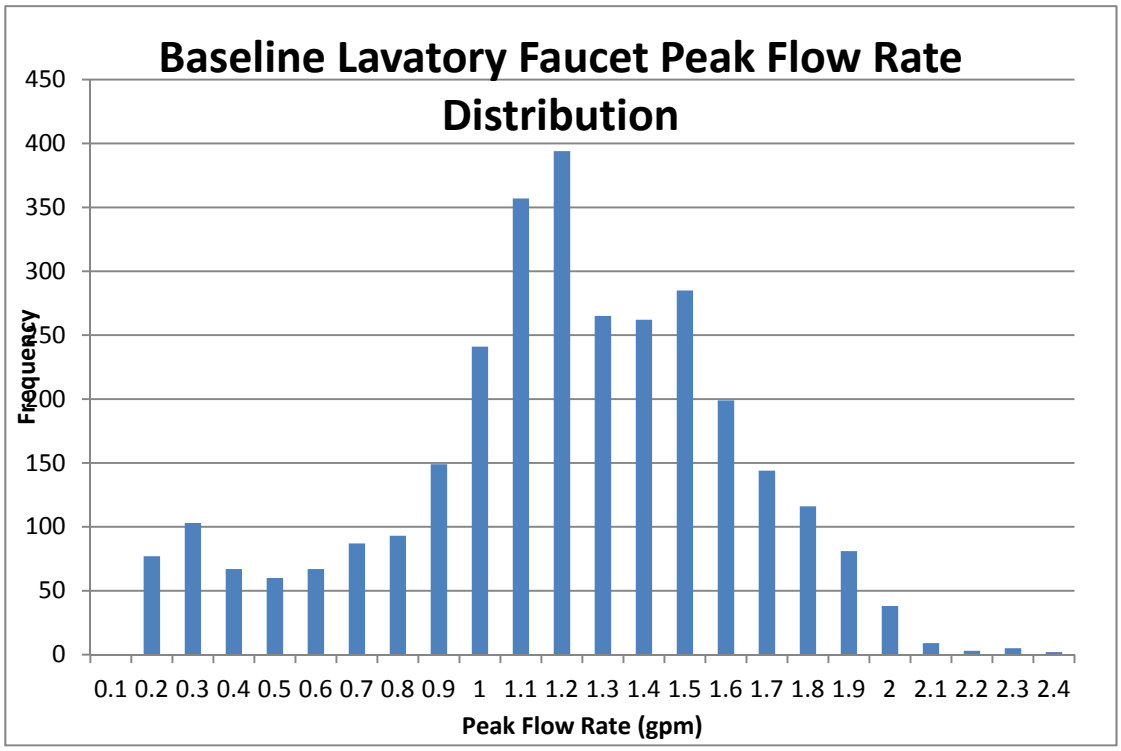
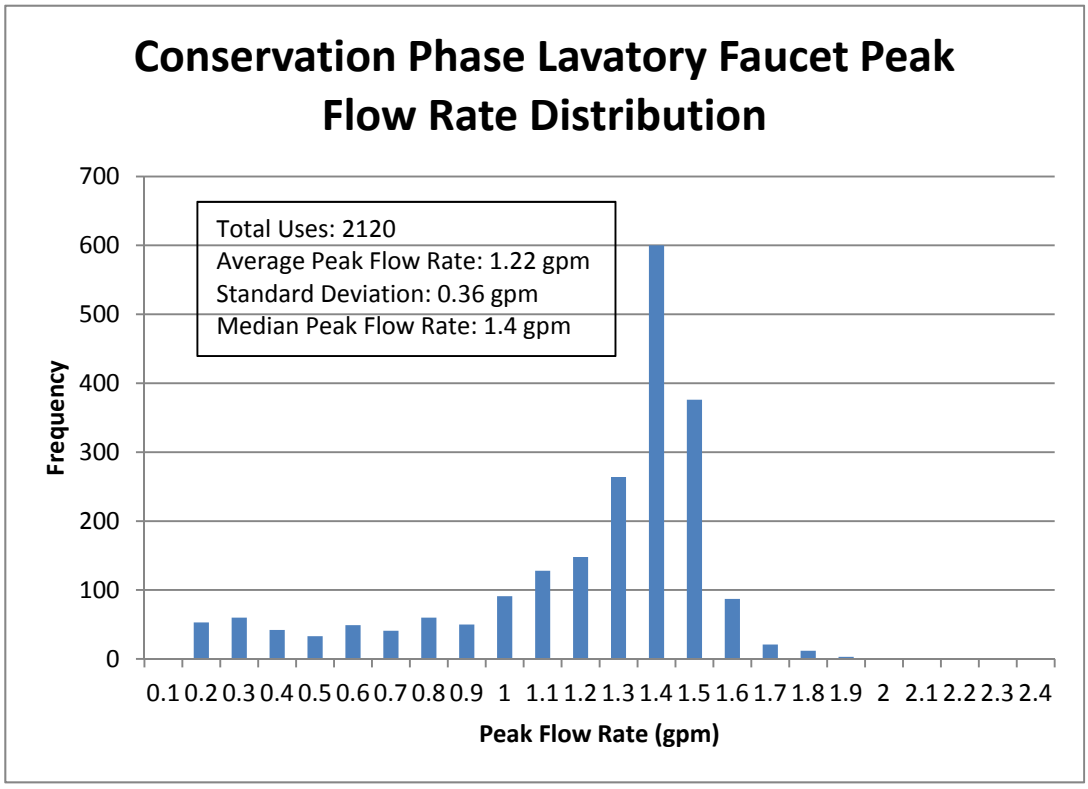
American Standard Brands, Inc. * Amerikam, Inc. * Bradley Corporation * BrassCraft Mfg. Co. * Chase Brass & Copper Company * CSA International * Delta Faucet Company * Dornbracht Americas * Duravit USA * Elkay Manufacturing Company * Fisher Manufacturing Company * Fluidmaster, Inc. * Gerber/Danze Plumbing Fixtures LLC * Hansgrohe, Inc. * IAPMO * InSinkErator * Kohler Company * KWC America, Inc. * Lavelle Industries * LSP Products * Moen Incorporated * Mueller Brass Company * NEOPERL, Inc. * Pfister * Sloan Valve Company * Speakman Company * Symmons Industries Inc. * T & S Brass and Bronze Works, Inc. * TOTO USA * VitrA USA * Water Pik * WCM Industries, Inc.

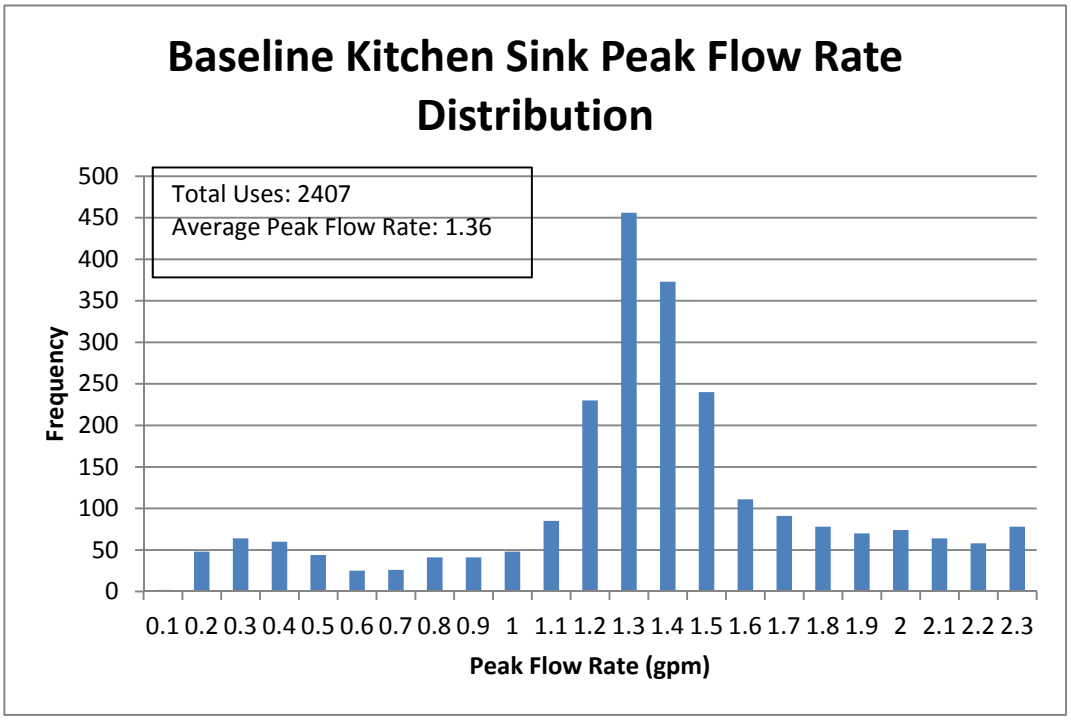
**APPENDIX**

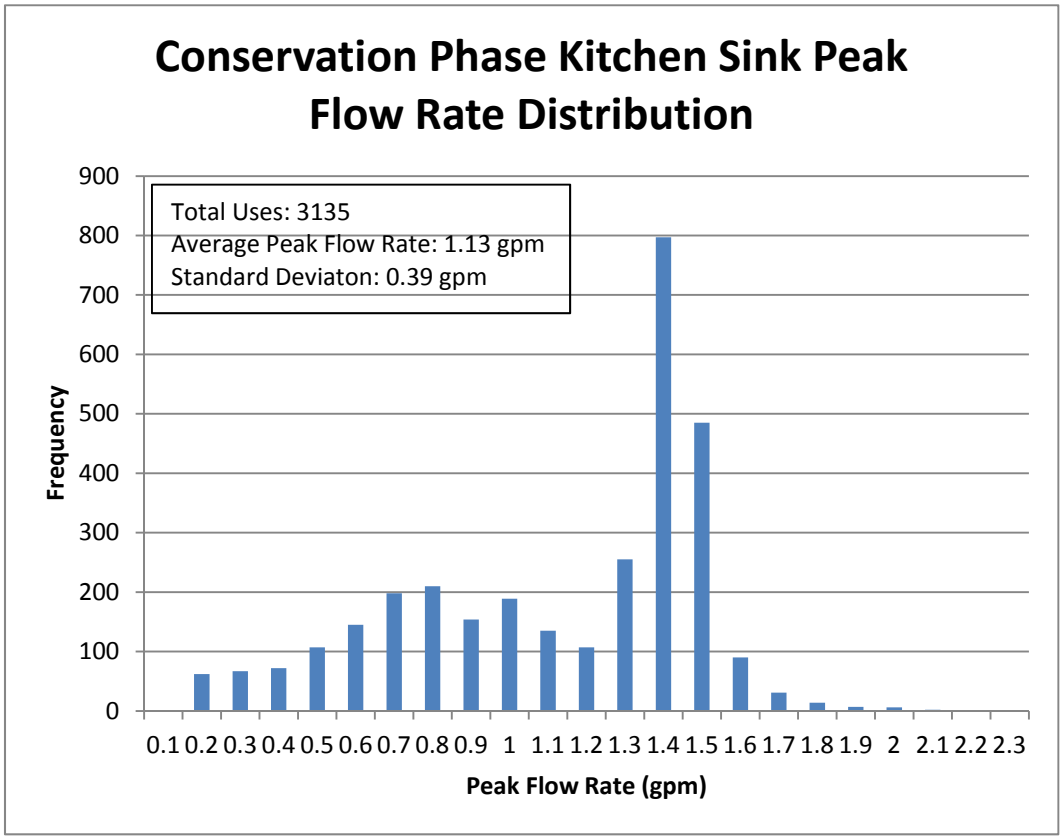

Baseline Lavatory Faucet Peak Flow Rate Distribution
Frequency
450
400
350
300
250
200
150
100
50
0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2 2.1 2.2 2.3 2.4
Peak Flow Rate (gpm)


Conservation Phase Lavatory Faucet Peak Flow Rate Distribution
Total Uses: 2120
Average Peak Flow Rate: 1.22 gpm
Standard Deviation: 0.36 gpm
Median Peak Flow Rate: 1.4 gpm
Frequency
700
600
500
400
300
200
100
0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2 2.1 2.2 2.3 2.4
Peak Flow Rate (gpm)

**Source: IAPMO**

## APPENDIX



**Source: IAPMO**

Below we present two histograms. The first plots flow rate versus frequency for the California Single Family study, released earlier this year, and conducted by Aquacraft Engineering under a contract funded by the California Department of Water Resources. The study involved data taken from some 700 homes spread among a number of municipal jurisdictions across the state. The second shows the distribution of flow rates from showers across the same study. Note that the ages of homes vary in the study, and that there were obviously some showerheads that were older and manufactured during time periods when standard flow rates were higher. Nevertheless, the average peak flow rate is 2.14 gpm in a study where 79% of the showerheads were made to a 2.5 gpm specification.

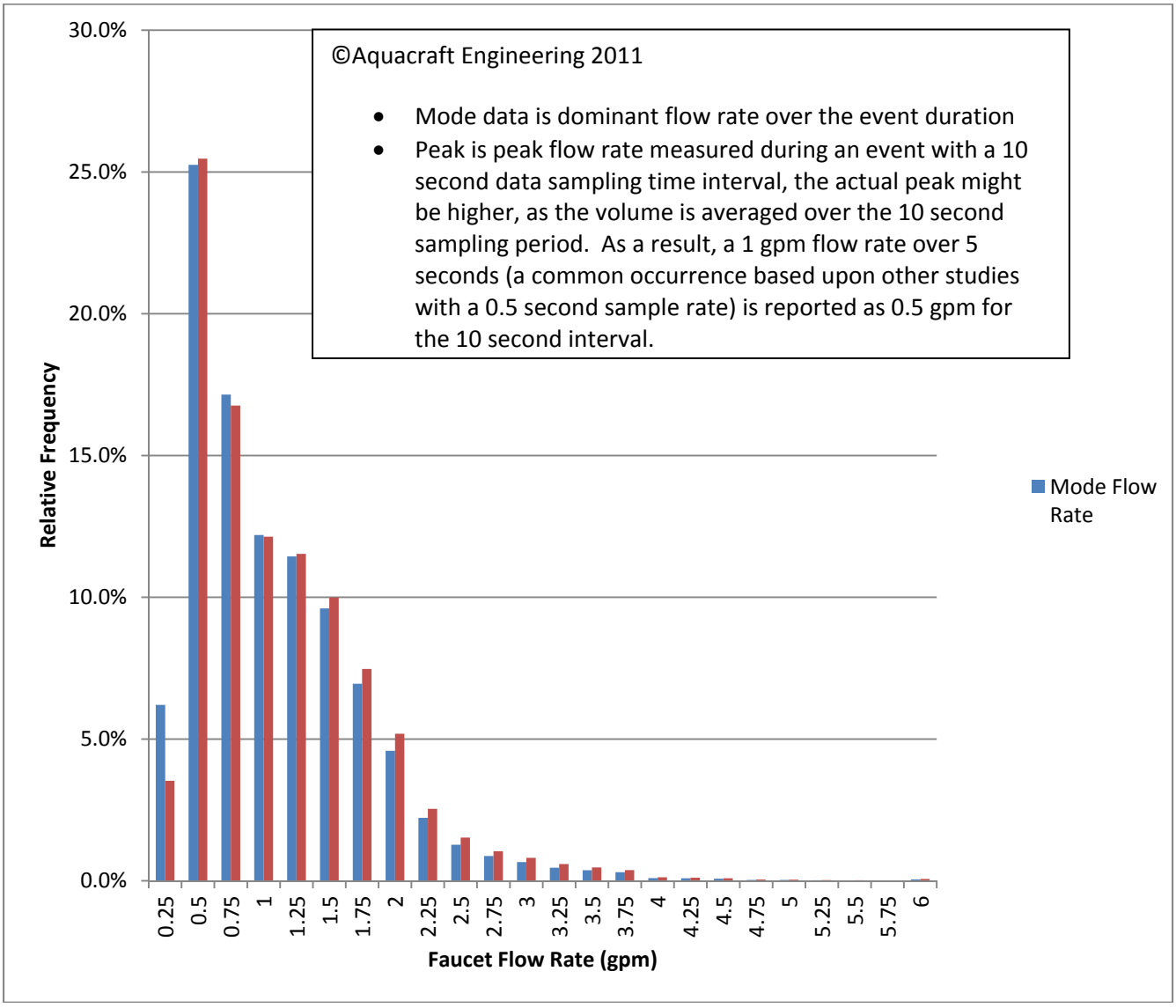


Table 41: Shower statistics

| Parameter | Value |
|---|---|
| Total number of showers in database | 17334 |
| Average number of showers per day per household | 1.97 |
| Average gallons per shower | 18.18 |
| Average shower duration (minutes) | 8.7 |
| Median shower duration (minutes) | 8.3 |
| Average shower GPM | 2.14 |
| Median shower GPM | 1.99 |
| Percent at 2.5 GPM or less | 79% |