



6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-OW-2020-0026; FRL-10007-06-OW]

Notice of Recent Specifications Review and Request for Information on WaterSense Program

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice; request for information.

SUMMARY: The Environmental Protection Agency (EPA) is announcing the completion of the review of WaterSense product performance criteria as required under the America's Water Infrastructure Act (AWIA) of 2018. The AWIA required the EPA to consider for review and revision, if necessary, specifications which were released prior to 2012. The EPA has completed its review and made the decision not to revise any specifications. A summary of the review and findings are included in this document. Additionally, this document announces that the EPA is seeking input and requesting information on any data, surveys, or studies to help assess consumer satisfaction with WaterSense labeled products, which could inform future product specification development. The EPA is also seeking input on how to design a study or studies to inform future reviews that incorporate customer satisfaction considerations. The results of these studies could inform future Agency action when developing criteria for labeling products in the WaterSense program. The EPA is also requesting input on whether it should include consumer satisfaction criteria into the WaterSense program guidelines and, if included, what criteria should be considered and how.

DATES: Comments on these items must be received on or before **[Insert date 60 days after date of publication in the *Federal Register*]**.

ADDRESSES: You may send comments, identified by Docket ID No. EPA-HQ-OW-2020-0026, by the following method:

- Federal eRulemaking Portal: <https://www.regulations.gov/>. Follow the online instructions for submitting comments.

Instructions: All submissions received must include the Docket ID No. for this notification.

Comments received may be posted without change to <https://www.regulations.gov/>, including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the “How do I submit written comments?” heading of the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT:

For additional information, please contact Stephanie Tanner, Office of Water (mail code 4204M), Environmental Protection Agency, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460; telephone number: 202-564-2660; or e-mail: Tanner.Stephanie@epa.gov (preferred).

Also see the following website for additional information on this topic:

<https://www.epa.gov/watersense/product-specification-review>.

SUPPLEMENTARY INFORMATION:

I. How do I submit written comments?

Submit your comments, identified by Docket ID No. [EPA-HQ-OW-2020-0026](#), at <https://www.regulations.gov/>. Once submitted, comments cannot be edited or removed from the docket. The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the

official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e. on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit <https://www.epa.gov/dockets/commenting-epa-dockets>.

II. Background

The Energy Policy Act (EPAcT) of 1992 amended the Energy Policy and Conservation Act by, among other things, establishing mandatory minimum water use standards for plumbing products, with compliance required beginning in 1994. The EPAcT mandated a maximum flush volume of 1.6 gallons per flush (gpf) for toilets, 2.2 gallons per minute (gpm) flow rate for faucets, and a 2.5 gpm flow rate for showerheads. The Department of Energy (DOE) issued regulations implementing those statutory standards. The first toilets and showerheads that met these standards in the mid-1990s did not perform well because they had not been redesigned to use less water.

In the early 2000's, a stakeholder group of about 100 cities, water utilities, non-governmental organizations, and manufacturers of water-using products approached the EPA to ask for assistance in bringing order and credibility to the marketplace for water-efficient products. Several utilities were working to develop their own performance test methods for products, but each individual utility had different tests and different lists of approved products. Manufacturers noted that it was difficult and expensive to make products that met different requirements. Stakeholders expressed a wish for an "ENERGY STAR"-like program for water-

using products that would be both voluntary and non-regulatory. The EPA responded by launching the WaterSense program in 2006.

WaterSense is a voluntary partnership program sponsored by the EPA which was initially launched in 2006 as an initiative to educate American consumers on making smart water choices that save money and maintain high performance standards. The WaterSense label makes it easier for consumers to identify water-efficient products, new homes, and programs that meet the EPA's criteria for efficiency and performance. WaterSense-labeled products and services are independently certified to use at least 20 percent less water, save energy, and perform as well as or better than standard models. WaterSense partners with manufacturers, retailers and distributors, homebuilders, irrigation professionals, and utilities to encourage innovation in manufacturing and support jobs for American workers.

To date, the program has specifications for the seven products identified in the table below. Criteria for the specifications have also been adopted into voluntary consensus reference standards. Several of the products are also covered by mandatory federal DOE plumbing standards, as described in the table. More than 30,000 models of products have been certified to the WaterSense label and nearly 500 million products have been shipped, according to reporting by WaterSense manufacturer partners.

Specification	Initial Release Date (Current version with release date)	Reference Standards	Covered by DOE regulation?
<i>WaterSense Specification for Tank-Type Toilets</i>	January 24, 2007 (Version 1.2, June 2, 2014)	<i>American Society of Mechanical Engineers (ASME) A112.19.2/Canadian Standards Association (CSA) B45.1</i>	Yes
<i>High-Efficiency</i>	October 1, 2007	<i>ASME A112.18.1/CSA B125.1</i>	Yes

<i>Lavatory Faucet Specification</i>			
<i>WaterSense Specification for Flushing Urinals</i>	October 8, 2009	<i>ASME A112.19.2/CSA B45.1; American Society of Sanitary Engineering (ASSE) 1037</i>	Yes
<i>WaterSense Specification for Showerheads</i>	March 4, 2010 (Version 1.1, July 26, 2018)	<i>ASME A112.18.1/CSA B125.1</i>	Yes
<i>WaterSense Specification for Weather-Based Irrigation Controllers</i>	November 3, 2011	Smart Water Application Technologies (SWAT) Test Protocol for Climatologically Based Controllers (8 th Draft) with modifications	No
<i>WaterSense Specification for Flushometer-Valve Water Closets</i>	December 17, 2015	<i>ASME A112.19.2/CSA B45.1 Ceramic Plumbing Fixtures, ASME A112.19.3/CSA B45.4 Stainless Steel Plumbing Fixtures, or CSA B45.5/IAPMO Z124 Plastic Plumbing Fixtures</i>	Yes
<i>WaterSense Specification for Spray Sprinkler Bodies</i>	September 21, 2017	<i>ASABE/ICC 802-2014, Sprinkler and Bubbler Design Requirements</i>	No

III. The American Water Infrastructure Act (AWIA) of 2018 and Review of Specifications

The WaterSense program was officially authorized by Congress in October 2018 under the AWIA (Pub. L. 115-270, Section 4306). The provisions under section 4306 of AWIA are largely consistent with how the program has operated since it began. The law requires the program to periodically review and, if appropriate, revise specifications, although not more frequently than every six years after adoption or major revision of performance criteria. The law also required that, not later than December 31, 2019, the EPA “consider for review and revise, if necessary, any WaterSense performance criteria adopted before January 1, 2012.” In response to AWIA, the EPA commenced a review of five WaterSense specifications that were issued prior to January 1, 2012: tank type toilets, lavatory faucets and accessories, showerheads, flushing urinals, and weather-based irrigation controllers.

The EPA initiated its specification review process in December 2018 when it released the WaterSense Notice of Specification Review.¹ That notice provided the EPA's initial considerations and criteria for evaluating whether to revise the relevant specifications. The EPA considered the following in determining the feasibility in establishing, or in this case, revising a product specification:

- Equal or superior product performance compared to conventional models,
- Potential for significant water savings on a national level,
- State of technology development—product categories that rely on a single, proprietary technology will not be eligible for the label,
- Assurance that the development (or revision) of a specification will not lead to unintended or negative environmental or economic impacts,
- Ability to measure and verify water savings and performance, and
- Cost-effectiveness.

In the context of the criteria above, the EPA reviewed the scope, efficiency, and performance criteria within each specification under consideration for revision to determine if updates may be necessary. The EPA also reviewed the current product marketplace, including product shipment data submitted by WaterSense manufacturer partners as part of annual reporting, to understand the market share of WaterSense labeled products and learn about technological advancements and subsequent efficiency and performance improvements that have been made since each specification's initial release.

The evaluation considered technical and scientific studies, trends in product labeling, other specifications (regulatory or voluntary), and market drivers. WaterSense considered the water

¹ *WaterSense Notice of Specification Review*, December 20, 2018.
www.epa.gov/sites/production/files/2018-12/documents/ws-notice-of-specification-review.pdf

savings potential of changes; as well as potential impacts on product performance, the larger built system, and public health. WaterSense also sought feedback on potential scope expansion and/or new product categories for labeling.

Throughout 2019, the EPA conducted additional product research and collected information from program stakeholders related to the current marketplace for WaterSense labeled products. The EPA also solicited feedback on potential changes to each specification's scope, water efficiency criteria, performance criteria, and the marking requirements of the product package. Through solicitation of public comments² and a series of public webinars³ targeted to specific stakeholder groups, the EPA collected feedback to help guide its decision-making with respect to considering specification revisions.

Comments received and polls conducted during the public webinars showed a difference of opinion among partner types as to the decisions the program should make. Based on the public comments submitted, plumbing manufacturers generally preferred to maintain the current specification efficiency levels and suggested WaterSense instead focus on improving stock penetration of existing labeled products. Promotional partners (e.g., water utilities, units of local government, non-governmental organizations) generally indicated they were interested in improved efficiency, but not necessarily at the expense of product or plumbing system performance. Summaries of the certification trends and stakeholder input from the informal stakeholder polls taken during the EPA's specification review public webinars are available on the WaterSense website at <https://www.epa.gov/watersense/product-specification-review>.

² A compilation of public comments received as part of the EPA's specification review can be viewed at www.epa.gov/watersense/product-specification-review#Comments

³ Presentation materials, meeting summaries, and recordings can be accessed at www.epa.gov/watersense/product-specification-review#webinars

Some commenters raised concerns about potential impacts that water efficiency could have on building premise plumbing systems, drinking water and wastewater infrastructure, and water quality. These commenters stated many buildings and infrastructure systems, including residential home plumbing systems, within the United States were designed for much higher water demand and flows. With more efficient plumbing fixtures and appliances available, and changes in how water is used, there is potential to create flow conditions within plumbing systems that are different from what they were designed to accommodate. For example, commenters noted drinking water has a longer residence time in the plumbing system pipes before delivery indoors for public use. A reduction to the flow rate may contribute to conditions (e.g., water aging, temperature, odor) that are conducive to the growth of opportunistic pathogens (e.g., *Legionella pneumophila*) and other water quality issues. To understand these issues further, in August 2018 the EPA co-organized a workshop with the National Institute of Standards and Technology (NIST) and the Water Research Foundation (WRF) to establish research objectives related to water use efficiency and water quality in premise plumbing systems. Participants from the workshop identified research gaps that are still needed relating to low flow volumes on premise plumbing systems and its impact on water quality, usage, and efficiency.

Comments were also received regarding potential impacts on state laws of further lowering the WaterSense requirements for water consumption levels for tank-type toilets, lavatory faucets, urinals and showerheads. For example, at least six states have already adopted regulations mandating performance requirements consistent with the EPA WaterSense specifications. The EPA is aware that further revisions to the criteria to improve water efficiency beyond the current WaterSense specifications may result in state law and local adoption of requirements.

The EPA considered all information provided and comments received in its specification review as required under AWIA and made the decision not to make changes to existing specifications. In future reviews, the EPA will further consider the issues raised in this review related to system performance, health, and safety. Also, the EPA is focused on promoting plumbing and infrastructure systems that are built and managed for both water efficiency and water quality. As such, WaterSense will be cognizant of these potential unintended consequences as it considers revisions to any of its product specifications.

As part of its specification development review process, the EPA has solicited information from program partners on what updates to performance criteria or referenced standards WaterSense should consider incorporating into specifications that would benefit the user experience and ensure long-term water savings. In future reviews, the EPA is considering including requests for additional information from program partners regarding consumer satisfaction and product choice in the performance specification review of the WaterSense products. Several commenters advised the EPA to conduct a user satisfaction study prior to a revision of a performance specification. This action seeks comment from the broader public in order to address the potential and method for inclusion of consumer satisfaction when evaluating changes to the WaterSense product performance criteria. The EPA request for consumer satisfaction information is discussed further in section V of this document.

IV. Summary of information collected from the WaterSense Specification Review

Each product-specific section below includes a summary of the EPA's findings in the WaterSense specification review process. As noted above, the EPA has made the determination not to revise any of the specifications. In the future, should the Agency make the decision to revise the specification of any WaterSense product, a Notice of Intent (NOI) would officially

initiate the specification revision process. In the NOI, the EPA would identify potential major and minor revisions it intends to include in the specification revision. Stakeholders will have an opportunity to comment on the content of the NOI prior to the EPA's development of any draft revised specification for each WaterSense product-specific type. The draft specification would likewise be made available for public comment prior to final revisions.

a) Tank-type toilets

The Federal standard for tank-type toilets set a maximum flush volume of 1.6 gallons per flush (gpf). The EPA released the WaterSense Specification for Tank-Type Toilets on January 24, 2007, which set a maximum efficiency level of 1.28 gpf and established criteria to evaluate performance. The EPA has since completed two minor revisions to the specification, releasing the latest version (Version 1.2) in June 2014. To date, manufacturer partners have produced nearly 3,900 WaterSense labeled tank-type toilet models.

As part of its review of the tank-type toilets specification, the EPA considered whether to reduce the maximum allowable flush volume criteria to improve water efficiency beyond what is required in the current WaterSense specification. The EPA also considered whether to modify its performance criteria to require that labeled toilets be able to flush a larger quantity of waste and/or toilet paper.

While not specifically included as a consideration in the *WaterSense Notice of Specification Review*, during the stakeholder engagement process the EPA received feedback from several utility and promotional partners expressing concern about the actual water savings from dual-flush toilets. Under the current specification, dual-flush toilets must have an effective flush volume not to exceed 1.28 gallons gpf (4.8 liters per flush [lpf]) and remove at least 350

grams of solid waste per flush. As a result of the public comments, the EPA also considered whether to modify or eliminate the effective flush calculation from the specification.

Findings

To date, eight states and multiple municipalities throughout the United States have adopted regulations mandating that tank-type toilets have a flush volume of 1.28 gpf or less, consistent with the WaterSense specification. A report commissioned by Plumbing Manufacturers International (PMI) estimates that the market penetration of WaterSense labeled tank-type toilet models is only 17 percent of all models currently installed in the United States.⁴ While many jurisdictions now require 1.28 gpf toilets, the EPA does not know of any that mandate toilets to flush below 1.28 gpf. Therefore, the market has not shifted below the WaterSense water efficiency threshold.

As part of the specification review, the EPA received feedback from several utility and promotional partners expressing concern over water savings resulting from dual-flush toilets. Currently, WaterSense labeled dual-flush toilets may have full-flush volumes of up to 1.6 gpf (commensurate with a standard toilet) and still meet the effective flush volume requirement. Commenters indicated that realization of water savings is based on user behaviors related to activation of the full- and reduced-flushes and expressed concern that the effective flush volume ratio of two reduced flushes to one full flush is not typically employed in real-world applications. As a result, WaterSense labeled dual-flush tank-type toilets might not achieve the minimum 20 percent water savings.⁵

⁴ GMP Research Inc., June 2019. *2019 U.S. WaterSense Market Penetration*. A GMP Research Industry Report commissioned by PMI.

⁵ See the WaterSense Plumbing Fixtures Specification Review Webinar for a summary of dual-flush toilet studies. For tank-type toilets, ratios of reduced flushes to full flushes ranged from 0.48:1 to 1.7:1.

Comments were also received relating to increasing the quantity of waste and/or toilet paper beyond the 350 grams of solid waste per flush required. A comment was made that this may encourage manufactures to focus on solids and not sufficiently on other attributes like bowl cleaning and lighter waste removal, which require fluid dynamic design considerations different from bulk waste removal. According to a customer satisfaction survey conducted by the Metropolitan Water District of Southern California in 1999, bowl cleanliness was the number one reason for double flushing. Increasing the gram requirement may unduly impact product choice, consumer satisfaction and offset any savings in water usage.

Currently, the EPA is funding two studies examining low-flow plumbing fixtures on water quality: Drexel University, “Water Conservation and Water Quality: Understanding the Impacts of New Technologies and New operational Strategies;” and Purdue, Michigan State, and San Jose Universities, “Right Sizing Tomorrow’s Water Systems for Efficiency, Sustainability, and Public Health.” These studies will provide insight on the potential impact of declining wastewater flows of pollutants and solid concentrations through the premise plumbing system on blockages, odor, corrosion in pipes, and subsequently, on water quality and human health. In light of these ongoing studies, and consideration of the public comments received, the EPA has made the determination not to make changes to existing specifications. The EPA would like to more fully evaluate the impacts of low-flow plumbing fixtures on water quality and public health. The EPA would consider information from these studies in any future review. In addition, as discussed below, the EPA would consider available data gathered from this action on customer satisfaction and the impacts of a change on consumer product choice in any further review of product specification.

b) Lavatory faucets and faucet accessories

The Federal standard for lavatory faucets set a maximum flow rate of 2.2 gallons per minute (gpm). The EPA released the High-Efficiency Lavatory Faucet Specification on October 1, 2007, which set a maximum flow rate of 1.5 gpm and established criteria to evaluate performance. WaterSense has not revised the specification since its initial release. The specification currently establishes criteria for lavatory faucets and faucet accessories (e.g., flow restrictors, flow regulators, aerator devices, laminar devices). To date, manufacturers have produced more than 18,000 WaterSense labeled lavatory faucet and accessory models.

As part of its review of the lavatory faucets and accessories specification, the EPA considered whether to reduce the maximum allowable flow rate criteria to improve water efficiency beyond the current WaterSense specification. The EPA also considered whether to expand the scope of the specification to accommodate other faucet types, including residential kitchen faucets and metering faucets as requested by manufacturers over the last several years.

Findings

To date, five states and multiple municipalities throughout the United States have adopted regulations mandating that lavatory faucets have a flow rate of 1.5 gallons per minute (gpm) (5.7 liters per minute [lpm]) or less, consistent with the WaterSense specification. Further, unlike tank-type toilets where states have adopted efficiency regulations at the WaterSense level, some states have established regulations setting flow rates lower than the WaterSense flow rate maximum for lavatory faucets. As of July 1, 2016, California requires lavatory faucets to have a flow rate of 1.2 gpm [4.5 lpm] or less. Washington and Hawaii subsequently enacted similar efficiency regulations for lavatory faucets, which take effect in 2021.

The EPA has not been made aware of any performance issues related to lavatory faucets flowing at 1.0 or 1.2 gpm. As part of its initial specification development, the EPA established a

minimum flow rate 0.8 gpm [3.0 lpm] at 20 psi to ensure user satisfaction with WaterSense labeled lavatory faucets and faucet accessories across a range of potential household water pressures. The EPA needs to further evaluate available data and information to determine if a different minimum flow rate is appropriate and if it will meet customer expectations.

Five states throughout the United States, including California, have adopted regulations mandating that residential kitchen faucets have a maximum flow rate of 1.8 gpm [6.8 lpm] or less—nearly 20 percent lower than the current national standard with the option to have an override that allows the faucet to temporarily flow up to 2.2 gpm [8.3 lpm] for pot filling. Compliant products in California are listed on the California Modernized Appliance Efficiency Database System (MAEDBS).

The EPA would need to evaluate multiple performance considerations as part of the specification development process for residential kitchen faucets should this product-type be added to the WaterSense program. Considerations include, but are not limited to, whether to incorporate a minimum flow rate and whether to allow a temporary override for pot filling. Further, as discussed below, a review of customer satisfaction data and data on the impacts of a change on consumer product choice would help provide a comprehensive evaluation of existing product performance for both lavatory and kitchen faucets. Based on these findings, the EPA has made the determination not to make changes to existing specifications for lavatory faucets.

c) Showerheads

The Federal standard for showerheads sets a maximum flow rate of 2.5 gallons per minute (gpm). The EPA released the WaterSense Specification for Showerheads on March 4, 2010, which set a maximum flow rate of 2.0 gpm and established criteria to evaluate performance.

WaterSense completed a minor revision to the specification, releasing Version 1.1 on July 26,

2018. To date, manufacturers have produced more than 9,300 WaterSense labeled showerhead models.

As part of its review of the showerhead specification, the EPA considered whether to adjust the maximum flow rate criteria to improve water efficiency beyond the current WaterSense specification. The EPA also considered how any adjustment to the flow rate could have unintended consequences to public health and safety without the corresponding change to the overall infrastructure of the premise plumbing system.

Findings

The EPA has observed market changes since the initial publication of the specification in 2010. To date, five states and multiple municipalities throughout the United States have adopted regulations mandating that showerheads have a flow rate of 2.0 gallons per minute (gpm) (7.6 liters per minute [lpm]) or less, consistent with the WaterSense specification. In addition, as of July 1, 2018, California requires showerheads to have a flow rate of 1.8 gpm [6.8 lpm] or less. Washington and Hawaii have subsequently enacted similar efficiency regulations for showerheads, which take effect in 2021.

To date, approximately 63 percent of WaterSense labeled showerheads (as defined by the American Society of Mechanical Engineers) have a maximum flow rate of 1.8 gpm or less, and 77 percent of models certified since 2017 have a maximum flow rate of 1.8 gpm or less.

In public comments, some manufacturers expressed concern that reducing the maximum flow rate to 1.8 gpm or less would result in more consumer complaints. In addition, several stakeholders expressed caution regarding lowering the flow rate further without consideration of health and safety impacts, including waterborne opportunistic pathogens (e.g., *Legionella*), thermal shock, and scalding. While water conservation is only one of potentially many factors

influencing water quality in premise plumbing, showers are one of the primary routes of exposure through which humans could encounter these waterborne pathogens. The two research studies the EPA is currently funding will provide more insight on the impacts of water conservation (lowering the flow rate) on public health.^{6,7}

In addition, since the initial release of the specification, the plumbing industry has worked to harmonize the automatic-compensating mixing valve standard (ASSE 1016/ASME A112.1016/CSA B125.16 *Performance requirements for automatic compensating valves for individual showers and tub/shower combinations*) and the showerhead standard (ASME A112.18.1/CSA B125.1). This harmonization was completed to address incompatibilities of these plumbing system components and to ensure products are marked and packaged consistently to educate consumers and plumbing professionals on thermal shock and scalding risks. As part of its specification review, the EPA received comments that thermal shock and scalding pose a greater risk at lower showerhead flow rates. However, one water utility stated that thousands of higher-efficiency (*i.e.*, 1.5 gpm or less) showerheads have been given away by California energy providers without complaints or reported incidents related to thermal shock and scalding.

Based on its findings, the EPA has decided to make no changes to the product specification. In any future review, as discussed below, the EPA will consider information from the two ongoing studies and data on consumer satisfaction.

d) Flushing urinals

⁶ Drexel University, Pennsylvania State University and University of Colorado at Boulder. “Water Conservation and Water Quality: Understanding the Impacts of New Technologies and New Operational Strategies.” EPA Grant Number: R836880.

⁷ Purdue University, Michigan State University, San Jose State University and Tulane University. “Right Sizing Tomorrow’s Water Systems for Efficiency, Sustainability, and Public Health.” EPA Grant Number: R836890.

The Federal standard for urinals sets a maximum flush volume of 1.0 gallons per flush (gpf). The EPA released the WaterSense Specification for Flushing Urinals on October 8, 2009, which set a maximum flush volume of 0.5 gpf and established criteria to evaluate performance. WaterSense has not revised the specification since its initial release. To date, manufacturers have produced more than 700 WaterSense labeled product models—including flush devices, fixtures, and urinal systems (combinations of urinal flushing devices and fixtures).

As part of its review of the flushing urinals specification, the EPA considered whether to adjust the maximum allowable flush volume criteria to improve water efficiency beyond the current WaterSense specification, taking into account the potential impact this may have on the plumbing system and drain line performance. The EPA also considered whether to expand the scope of the specification to include either non-water urinals or non-water urinals with a drain-cleansing action.

Findings

To date, six states and multiple municipalities throughout the United States have adopted regulations mandating that urinals have a flush volume of 0.5 gallons per flush (gpf) (1.9 liters per flush [lpf]) or less, consistent with the WaterSense specification. As of January 1, 2016, California requires wall-mounted urinals to have a flush volume of 0.125 gpf [0.5 lpf] or less, although non-wall mounted urinals can have a flush volume up to 0.5 gpf. Washington enacted similar efficiency regulations for urinals, which take effect starting in 2021.

A report commissioned by PMI estimates that the market penetration of WaterSense labeled models is as low as 2 percent of all models currently installed.⁸

⁸ GMP Research Inc, June 2019. *2019 U.S. WaterSense Market Penetration*. A GMP Research Industry Report commissioned by PMI.

While some states and municipalities have chosen to move forward with promoting more efficient urinals, several stakeholders, including water utilities, raised concerns in written comments about the efficacy and performance of ultra-high-efficiency (i.e., 0.125 gpf) urinals and non-water urinals, particularly in retrofit applications where a building's plumbing system was not designed for lower flows. As part of its specification review, the EPA was not able to identify any new research that assessed the impacts of flow rate on urinal performance, although it is aware of one study that is ongoing in Austin, Texas that intends to evaluate the impacts of flow rate and water quality on urinal and drain line performance. The study is also looking into the excessive build-up of struvite, a common reason for drain line blockages, and the odor associated with low flow and non-water urinals. The EPA learned during the review that consumer dissatisfaction of drain line blockages and odor have led to product replacements of low flow and non-water urinals. More information is needed to understand the scope of these consumer concerns and if other concerns exist.

With this specification review, the EPA did not receive sufficient data or information to suggest that it should incorporate non-water urinals into the WaterSense urinals specification.

The EPA has made the determination not to make changes to existing specifications. The EPA will monitor ongoing research on flushing urinals and other types of urinals available now or entering the marketplace. If information becomes available that provides more data on the efficacy of ultra-high-efficiency (i.e., 0.125 gpf) urinals, non-water urinals, and non-water urinals with a drain-cleansing action, the EPA would consider this information in any future review. Further, as discussed below, a review of customer satisfaction data and data on the impacts of a change on consumer product choice would help provide a complete comprehensive evaluation of existing product performance.

e) Weather-based irrigation controllers

The EPA released the WaterSense Specification for Weather-Based Irrigation Controllers on November 3, 2011. There are no Federal standards for this product category. While the EPA has not revised this specification since its publication, WaterSense has issued several technical clarifications in the intervening years to better define the requirements. The specification applies to stand-alone controllers, add-on devices, and plug-in devices (collectively referred to in the specification as controllers) that use weather data as a basis for scheduling irrigation.

Weather-based irrigation controllers currently on the market either: 1) utilize onsite weather sensors; 2) receive a weather signal from a local weather station(s); or 3) use both to schedule irrigation to meet plant needs. To date, manufacturers have produced nearly 800 WaterSense labeled weather-based irrigation controller models.

As part of its review of the weather-based irrigation controller specification, the EPA considered whether a significant growth in the market for these products and a shift to cloud-based products would benefit from a revision to the specification. Specifically, the EPA considered whether to revise the test method used to determine product performance. The EPA also considered whether to revise the supplemental capability requirements and/or product packaging and labeling requirements.

The EPA acknowledges that there has been a significant increase in both the number of brands of weather-based irrigation controllers on the market, as well as the number of labeled models since the specification was published in 2011. Further, due to technological advancements in the industry, there has been a shift to cloud-based products that make use of smartphones and smart home devices. Many manufacturers and other stakeholders currently in

the marketplace were not in existence and able to participate in specification development prior to 2011, so WaterSense aimed to ensure their input was received during the specification review process. The EPA has evaluated the specification, as described below, in light of this market growth to ensure the specification developed in 2011 is still relevant for products entering the market today.

Findings

While market growth has been significant since the release of the specification, WaterSense estimates that less than 10 percent of existing irrigation systems installed in the United States have a smart irrigation control technology,⁹ or those that alter irrigation schedules based on weather or soil moisture data. Because the remaining 90 percent of the market available for transformation will likely move towards smart irrigation control technology, stakeholders, including both utilities and manufacturers, were not in favor of revising the specification.

The EPA also asked stakeholders during the specification review process whether the supplemental capability requirements included in the current version of the specification remained relevant for products entering the market today. The EPA received no feedback during the public comment period, stakeholder webinars or targeted outreach indicating that any of these requirements should be removed. Two commenters expressed concern over products being able to be easily switched to or operate in standard mode.

⁹ Schein, Letschert, Chan, Chen, Dunham, Fuchs, McNeil, Melody, Stratton, and Williams. 2017. Methodology for the National Water Savings and Spreadsheet: Indoor Residential and Commercial/Institutional Products, and Outdoor Residential Products. Lawrence Berkley National Laboratory. Table A-4. Schein et al. describes the detailed technical approach to WaterSense's stock accounting practice for irrigation products using values available as of the publication date. As it is the EPA's practice to continuously update its work as data become available, the values referenced here are for the 2018 analysis, the most recent year available.

The EPA has made the determination not to make changes to existing specifications. The EPA will continue to participate in the American Society of Agricultural and Biological Engineers (ASABE) X627 *Environmentally Responsive Landscape Irrigation Control Systems* standard development process. In addition, as discussed below, the EPA will consider data received on customer satisfaction and the impact of a consumer product choice in its review of product performance in any future review.

V. Request for Information on Consumer Satisfaction

As the EPA developed the framework for the WaterSense program to provide opportunities for additional water savings, the WaterSense program established a goal that labeled products should use at least 20 percent less water than standard products. The program includes efficiency criteria in its specifications to assess products for water use. Additionally, the program set a goal that labeled products should perform as well as or better than regular models and included performance criteria in its specifications to assess performance.

WaterSense has included strong performance requirements in its specifications and used independent organizations to certify that labelled products meet the EPA criteria. The Agency is seeking to better understand consumer satisfaction with the performance of existing labelled products and whether further changes to the specifications could impact consumer satisfaction. The Agency is also exploring ways that it could collect additional information on consumer satisfaction through its own consumer survey or surveys to inform future decision-making. Understanding consumer satisfaction is important to the EPA as the Agency seeks to ensure that our performance criteria review is in fact ensuring that labelled products are meeting the same standards as products on the market before the WaterSense label was adopted. This request for

information will also help the program identify performance issues it may be able to correct by including new, or revising existing, performance criteria in its product specifications.

WaterSense has an ongoing dialogue with program partners (described in Section II of this document) about the program. In order to more fully assess consumer satisfaction, WaterSense is working with its program partners to identify any data, surveys, or studies that have assessed consumer satisfaction with labeled products but recognizes that additional information may exist. WaterSense does not currently collect information on the purchase of individual products, but some of its program partners and other parties may have information to help the EPA evaluate whether consumers are satisfied with water-efficient WaterSense labeled products. For example, retail partners or manufacturers may have information on whether WaterSense labeled products are returned at a proportionally greater or lower rate than non-labeled products or other indications of consumer satisfaction. Water utilities and local governments which provide rebates for WaterSense labeled products may have information to assess whether their customers who received rebates are satisfied with their purchase. However, there may be non-partners who can also provide responsive information. Specifically, the EPA is requesting information on any data, surveys, or studies that have assessed consumer satisfaction with WaterSense labeled or standard products.

Understanding consumer satisfaction is important to the EPA as the Agency seeks to ensure that our performance criteria review is in fact ensuring that labelled products are meeting the performance expectations of the consumer. With this action, the EPA is requesting input on ways it could better understand and collect information on consumer satisfaction with WaterSense labelled products as the EPA continues to evaluate considerations relating to system performance, health, and safety. Specifically, the EPA is seeking input on how it could design a

study or studies for use in future reviews that incorporate customer considerations. For example, we are interested in input on how we could use a survey or surveys to determine what type of products consumers would like to see on the market, the performance attributes that are important to consumer choice and satisfaction, the range of performance customers are seeking in those attributes, and what additional features or options related to efficiency consumers would like to see in WaterSense products. The EPA is also interested in input on the collection method, frequency, and source of the information as we seek to balance any burden the collection would impose on the public with the usefulness the information would provide the Agency.

Lastly, the EPA seeks input on whether there are specific consumer satisfaction considerations, test methods, or additional criteria it should consider adding to the WaterSense guidelines.

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Director, Office of Wastewater Management.

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