WaterSense® Notice of Intent (NOI) to Revise the Specification for Tank-Type Toilets Public Meeting Summary

Webinar, July 18, 2023, 2:00 to 4:00 p.m. Eastern

Meeting Summary

Stephanie Tanner, the U.S. Environmental Protection Agency (EPA) WaterSense program's Lead Engineer, welcomed everyone to the meeting, clarified how to use the webinar software, and reviewed the meeting agenda and purpose. She introduced fellow presenters Maggie Harrington and Robert Pickering of Eastern Research Group, Inc. (ERG), who provide technical support under ERG's mission-support contract to WaterSense.

The purpose of the webinar was to review the *WaterSense Notice of Intent (NOI) to Revise the Specification for Tank-Type Toilets*. The presentation slides and NOI can be reviewed on the WaterSense website at www.epa.gov/watersense/residential-toilets#revision.

1. Introduction to WaterSense

Ms. Tanner (EPA) provided an overview of WaterSense, a voluntary program that labels water-efficient, high-performing products, including the program's history. Through sales of WaterSense labeled products, the program has helped save more than 7.5 trillion gallons of water since it was started in 2006 through 2022. She also reviewed the WaterSense specification revision process. EPA conducts a specification review where it engages industry professionals and interested parties to provide input on major or minor revisions. If EPA chooses to complete a major revision, it issues an NOI that identifies its intended revisions and solicits feedback. Once the agency proceeds with a draft revised specification, it again collects feedback from interested parties before issuing the final revised specification.

2. Tank-Type Toilets Background

In accordance with the America's Water Infrastructure Act of 2018, EPA published its *Notice of Specification Review* for tank-type toilets, lavatory faucets and faucet accessories, showerheads, flushing urinals, and weather-based irrigation controllers in December 2018. The specification review considered changes to the water efficiency and performance criteria for each product category. Following completion of the review, EPA announced that no changes would be made to the specifications at that time.

EPA chose to revisit the *WaterSense Specification for Tank-Type Toilets* as the agency recognizes opportunities to make improvements to the specification criteria. EPA is reevaluating the effective flush volume requirements, including potentially the criteria for dual-flush toilets, due to changes in the marketplace resulting from state and local requirements; opportunities to further transform the marketplace; and potential additional water savings that could be achieved. EPA is also soliciting input on other items from the *Notice of Specification Review* or otherwise related to the current specification for tank-type toilets. Because modifications to the specification would likely impact the certification status of currently labeled tank-type toilet models, EPA considers the intended revisions to constitute a major revision and is therefore initiating, through the NOI, a formal specification revision process to engage with interested

parties and the public. EPA hosted this webinar as an opportunity to inform the public on the potential revisions to the *WaterSense Specification for Tank-Type Toilets* and solicit feedback.

3. NOI: Scope, General Requirements, and Water Efficiency Criteria

Maggie Harrington (ERG) provided attendees with an overview of the scope, general requirements, and water efficiency criteria of the current *WaterSense Specification for Tank-Type Toilets*. She explained that EPA intends to keep the scope of the specification the same. She explained that the general requirements section of the specification would be updated to no longer explicitly reference ASME A112.19.14 *Six-Liter Water Closets Equipped with a Dual Flushing Device* because there is an ongoing effort by the ASME A112/CSA Technical Committee for Plumbing Fixtures to incorporate the applicable requirements of ASME A112.19.14 into ASME A112.19.2/CSA B45.1 *Ceramic Plumbing Fixtures,* which is already referenced in the specification. This change will take effect during the 2024 publication of that standard. EPA also intends to remove the reference to ASME A112.19.14 in the water efficiency criteria section.

Ms. Harrington noted that in the Water Efficiency section of the specification, EPA intends to modify the criteria to eliminate the effective flush volume calculation and instead establish a singular maximum flush volume requirement for both single-flush toilets and the full-flush mode of dual-flush toilets. EPA intends to make this change for a number of reasons, including the likelihood of user error in selecting the correct button for dual-flush toilets and the fact that other standards and regulatory agencies have begun to require toilets to achieve a maximum flush volume regardless of whether the toilet has dual-flush capabilities. Ms. Harrington summarized the impact this intended revision would have on currently labeled dual-flush tank-type toilet models.

Ms. Harrington summarized additional considerations for which EPA is soliciting feedback. EPA is interested in knowing whether there are design concerns related to dual-flush toilets in the United States (as have been reported for dual-flush toilets using a drop valve design in the United Kingdom). In addition, EPA is interested in whether interested parties would suggest EPA reduce the flush volume criteria for single-flush toilets to earn the WaterSense label to lower than 1.28 gallons per flush (gpf). Ms. Harrington also summarized the feedback requested in the NOI.

Participant Comments and Questions

Denise Dougherty (Sloan) asked how non-ceramic toilets are impacted with regards to the ASME A112.19.14 standard. Mr. Pickering (ERG) explained that the current WaterSense specification for tank-type toilets only references the applicable standards for ceramic toilets. Mr. Pickering noted that non-ceramic tank-type toilet models are not very common. EPA references other standards for stainless steel or plastic plumbing fixtures in its *WaterSense Specification for Flushometer-Valve Water Closets*, but EPA has not been asked to reference those standards in its WaterSense tank-type toilet specification. It is Mr. Pickering's understanding that standards covering non-ceramic materials tend to reference the ASME A112.19.2/CSA B45.1 standard for most of the test methods. Mr. Pickering noted that, for example, other standards reference the flush volume test included in ASME A112.19.2/CSA B45.1 for toilets directly rather than having the flush volume test repeated in those standards.

Mr. Pickering suggested the commenter submit a written comment about their concerns and include references to other standards they would like to see EPA incorporate into its specification if they were, for example, a manufacturer that makes non-ceramic tank-type toilet models.

Denise Dougherty (Sloan) asked what a drop valve is and how the design related to WaterSense labeled tank-type toilets. Mr. Pickering explained that based on their research, a drop valve is a technology used in tank-type toilets that was commonly used in the United Kingdom, specifically for dual-flush toilets. Due to growing concerns with leaks and other issues, manufacturers have apparently started shifting away from using drop valves. Mr. Pickering expressed that WaterSense is unsure whether or not drop valves have similar issues in the United States, which is why EPA is requesting feedback on the topic. If there are similar concerns with leaks, WaterSense can either address them as part of the specification revision or through coordination with the appropriate standards committee.

Brian Lee (Sonoma Water/Sonoma-Marin [California] Saving Water Partnership) noted that Sonoma Water has had requirements of 0.8 gpf or less for its toilet rebates and direct install programs dating back to 2018. Mr. Pickering mentioned that the 0.8 gpf rebate requirement aligns with some of the research summarized in EPA's webinar slides. Mr. Pickering explained that WaterSense is aware of requirements within rebate or incentive programs that are less than 1.28 gallons per flush, but EPA isn't aware of many examples of this on the regulatory side where toilets are mandated to be less than 1.28 in either state or municipal plumbing code or appliance efficiency standards.

Emily Melhorn (City of Flagstaff [Arizona] Water Services) asked if WaterSense is looking to increase performance standards to align with Maximum Performance (MaP) testing scores. Mr. Pickering clarified that EPA is not currently intending to increase performance standards as part of this specification revision. EPA considered performance criteria as part of the specification review that was conducted in 2019 and found that WaterSense labeled toilets were performing well. MaP testing helps to assure consumers that a MaP certified toilet achieves improved flush performance beyond the criteria set by WaterSense that now applies to standard toilet models as well. The WaterSense program does not think that it is necessary to focus on additional waste quantity or performance testing at this time.

Melissa Levo (Seattle Public Utilities) asked why, if part of WaterSense's mission is to influence the marketplace, the current market conditions of tank-type toilets not having shifted below 1.28 gpf have not spurred EPA to consider lowering the minimum WaterSense flush volume to 1.1 gpf. Ms. Tanner explained that because the market hasn't shifted, there is not a reason to lower the flush volume requirements in the specification revision. Ms. Tanner noted that a number of toilets in residential and commercial buildings currently flush over 1.28 gpf or 1.6 gpf. Ms. Tanner clarified that that decision would create a large market disruption. The difference between 1.28 gpf and 1.1 gpf is marginal compared to the difference between 3.5 gpf and 1.28 gpf. WaterSense and the industry agree that there is still a large quantity of toilets with a flush rate of 1.6 gpf or greater on the market. It is WaterSense's conclusion that more savings can still be achieved by replacing the large quantity of 1.6 gpf toilets, as opposed to reducing the flush volume another few tenths of a gallon.

Mr. Pickering added that some studies have been conducted on market penetration of WaterSense labeled products, and while the tank-type toilets specification has been successful at addressing the new purchase market, there still remains a large existing stock of toilets that can reach the majority of the savings that a 1.1 gpf toilet could garner using a 1.28 gpf without the performance concerns. There are still programs from municipalities and utilities to retrofit or replace older toilets, and WaterSense believes that replacing them with toilets that flush at 1.28 gpf can accomplish these savings.

Arnoldo Rodriguez (Valvulas Urrea) asked if all current dual-flush models will have to be recertified, and if so, how much time manufacturers have to do that. Mr. Pickering explained that at this point, EPA has not settled on a plan for transition timing without first receiving and reviewing public comments on the NOI. Once the decisions have been made for what specific specification revisions are planned, EPA will release an associated timeline for products that require recertification. Mr. Pickering gave the following example: If a manufacturer has single-flush toilets or certain dual-flush toilets that already have a maximum flush volume of 1.28 gpf, and they otherwise are not impacted by the specification revision, WaterSense will likely not require that these toilets be recertified. This will all be clarified in the WaterSense draft revised specification.

Brian Alexander (Brevan Brothers Inc.) asked if there is anything planned to prevent leaks. Mr. Pickering asked the participant to expand upon or clarify their question and explained that leak prevention is typically included within the referenced plumbing standards such as ASME A112.19.2/CSA B45.1. Mr. Pickering explained that there are material requirements in the standards so that under certain test conditions, the flapper, for example, doesn't degrade quickly. However, there is nothing explicitly within WaterSense's current or proposed specification revision that specifically addresses leaks at this time.

An anonymous attendee stated that the city and county of Denver rebate toilets with an average of 1.1 gpf or less with the WaterSense label. Mr. Pickering agreed that this is consistent with what the commenter from Sonoma stated. Rebate programs often require flush volumes less than 1.28 gpf, but it's not necessarily required for all toilets sold. The commenter further stated that Denver does not offer rebates for toilets that use either 1.28 gpf or dual-flush toilets that have a full-flush volume of 1.6 gpf. Mr. Pickering explained that WaterSense is aware of utilities that require 1.1 gpf for the maximum flush volume or reference the MaP PREMIUM criteria, which requires the full-flush volume to be no more than 1.28 gpf for their rebate requirements. MaP PREMIUM uses a one-full-flush-to-one-reduced-flush ratio to determine the effective flush volume. What WaterSense is suggesting will not conflict with these rebate program requirements.

Kevin Kennedy (Niagara) asked if a major concern about dual-flush toilets is that customers aren't seeing the water savings they should, and were there any discussion among WaterSense to better mandate the high-and low-volume flush marking requirements for flush icons to avoid confusion and improve water savings? Mr. Pickering explained that WaterSense tries not to prescribe design considerations for plumbing products and wants manufacturers to have leeway to design the products that they think will work best. He explained that WaterSense tends to avoid specific requirements related to markings, design, and color. Mr. Pickering mentioned that some of the studies presented earlier from the United Kingdom demonstrated that even when you have perfectly well-designed marking, user behavior can still negatively impact results.

Users don't always respond to designs the way that we think they should. Ms. Tanner added that the studies looked at many different ways that manufacturers had designed the buttons and icons for dual-flush toilets. The problems seem to be universal across the different button designs manufacturers have used to identify the difference between the larger and the reduced volume flushes.

Emily Melhorn (Flagstaff) asked if WaterSense has any plans to communicate messages that more water does not increase toilet performance. The commenter also mentioned that the central message of dual-flush toilets is that a person needs more water to flush solid waste, so how do we change that conversation? Mr. Pickering explained that, as a result of EPA's 2019 specification review and some of the media around plumbing products over the past few years that suggested water-efficient toilets may not work as well as people hoped, WaterSense conducted independent research and reached out to many of its utility partners to understand consumer feedback from rebate programs and from programs that promote WaterSense labeled toilets. Mr. Pickering explained that over 90 percent of participants in those programs were satisfied with their toilets. Most people likely agree that toilets today work far better than toilets designed 20 to 30 years ago, even though the flush volume was three times higher then, meaning that higher flush volume does not necessarily correlate with a better performing product.

On the WaterSense website's product-specific pages, EPA summarizes performance requirements and explains what EPA did to determine the performance criteria. This includes working with standards development committees to improve and make some of the test methods more robust. WaterSense's hope is that when EPA receives questions about the performance of toilets, the summary of performance requirements on the WaterSense website can help explain why WaterSense labeled toilets work better than toilets designed 20 years ago. Toilet manufacturer partners have put a lot of time and research and development expense into making sure that WaterSense labeled toilets work better now than previously. WaterSense doesn't necessarily have a specific communication plan in place to communicate product performance, but Mr. Pickering encouraged commenters to submit suggestions for additional outreach or communication campaigns for the program to consider.

Arnoldo Rodriguez (Valvulas Urrea) asked if there will be any obstacle to selling 1.6-gpf single-flush toilets in 2024 across the United States, and if 1.6-gpf toilets can earn the WaterSense label. Mr. Rodriguez also asked if any governmental requirements similar to California will be applicable to other states. Mr. Pickering explained that currently, a 1.6-gpf single-flush toilet cannot earn the WaterSense label, but WaterSense remains a voluntary program, and states or municipalities can make their own regulations. In 2024, 1.6-gpf single-flush toilets will still be able to be sold in states that follow the federal standards. Mr. Pickering clarified that WaterSense does not influence state policy. As Ms. Tanner explained previously, Mr. Pickering reiterated that WaterSense encourages states and water conservation programs to reference the WaterSense label to provide consistency across the country; however, WaterSense cannot and does not tell states and municipalities what efficiency criteria or thresholds to set.

An anonymous attendee asked if 1.28-gpf toilets had issues with insufficient drain line transport, especially in older, existing construction plumbing that might have lower sloped drain lines. Ms. Tanner explained that lowering the flush volume is a common concern. Ms. Tanner explained that the concern is valid and something EPA will always consider, but part of the reason

WaterSense labeled dual-flush toilets was because 1.28 gpf or other lower flush volume toilets were relatively new 14 years ago. Since then, there have been millions of toilets sold at 1.28 gpf and hundreds of thousands of toilets sold below 1.28 gpf. There has been very little negative feedback to WaterSense or to manufacturers from customers about problems with the performance of these toilets.

When the WaterSense program was instituted, EPA had a long conversation with the people at the National Institute of Standards and Technology (NIST) about drain line transport. There are drain line transport requirements in the standard, so these toilets have been proven to work. At 1.28 gpf, WaterSense does not have any ongoing concerns about the performance of these toilets. Ms. Tanner explained that WaterSense is aware that there will be situations where a building has unusual or old construction. However, 1.6-gpf toilets are still on the marketplace, and people can make the decision to purchase them. The data that WaterSense has points out that, out of thousands of toilet rebates and direct install programs offered by utilities, those that WaterSense have talked to have generally not received reports of performance problems. Manufacturers have sold millions of these toilets and have not reported any problems coming back, so WaterSense feels confident that there are not widespread problems of drain line transport.

4. NOI: Performance Criteria, Marking, Product Documentation, and Appendix A Updates

Ms. Harrington (ERG) continued with the presentation and summarized the current performance criteria and product testing within the current specification. She explained that EPA intends to keep the waste extraction section of the specification the same. In the Marking and Product Documentation section of the specification, Ms. Harrington explained that EPA intends to remove the language pertaining to the prohibition on marking toilets with “or less,” since this has been otherwise incorporated into ASME A112.19.2/CSA B45.1.

Ms. Harrington also explained that EPA intends to modify the *WaterSense Specification for Tank-Type Toilets* to incorporate three clarifications to Appendix A that EPA has made since the publication of Version 1.2 of the specification. Each of them has to do with toilets with the tanks and bowls made by different manufacturers. Mr. Pickering then fielded questions asked by participants.

Participant Comments and Questions

John Koeller (Koeller & Company) mentioned that in those states that have adopted the WaterSense thresholds for toilets, there is a certain percentage of people who purchased dual-flush toilets exclusively because it is the only way that they can have a 1.6 gpf toilet regardless of what is actually needed in their home. Mr. Koeller noted that some people are not motivated by water efficiency. Mr. Pickering agreed with the commenter and explained that this behavior is a factor for why WaterSense intends to make this revision to the dual-flush toilet criteria. For a variety of reasons, whether it is due to ill intent or just by user confusion, states that are setting these water efficiency criteria or utility programs that are issuing rebates on new toilets may not be getting the savings that they are expecting because dual-flush toilets are being misused. WaterSense’s hope in setting a flat maximum flush volume of 1.28 gpf is to eliminate the user

element and to make sure that states, utilities, or homeowners that install a WaterSense labeled toilet are guaranteed to achieve the 20 percent savings that the WaterSense label represents.

Kyle Thompson (Plumbing Manufacturers International [PMI]) asked about the history of the technical clarifications and why it is necessary to include them in the specification's appendix. Ms. Tanner explained that the technical clarifications are there because, from time to time, WaterSense has received questions from manufacturers about trouble marketing or labeling a product, or testing a product under certain conditions, which affected their ability to get their product labeled even though the product was meeting the WaterSense testing criteria. If WaterSense responded to one manufacturer with an answer to their issue, releasing technical clarifications made it so that other manufacturers could benefit from the guidance.

Following is an example of how products made by two different manufacturers have presented challenges for WaterSense since the beginning of the labeling program. Manufacturer A, which makes the bowl, doesn't necessarily have control over what Manufacturer B, which makes the tank, is doing. WaterSense was initially holding manufacturers responsible for coordinating with each other, and that proved to not be an optimal solution for either manufacturer long-term. There have been several clarifications from the past that have been incorporated into different specifications because it makes it easier for manufacturers to get certified when all the requirements are in one place. Additionally, the certifying bodies see what the WaterSense decision has been, and then they know how to incorporate and respond to that decision. Technical clarifications make the process more fair and more open so that everyone sees what WaterSense is doing and why.

Melissa Levo (Seattle Public Utilities) brought up the fact that the most common complaints they get come from customers with lower flush volume toilets is related to the toilet getting clean after a flush. If the bowl isn't clean, this leads them to flushing more than once. The commenter asked if there is an opportunity to look into other measures of surface cleaning and suggested that maybe the soybean paste is not the best media for testing this aspect of performance. Ms. Tanner clarified that there are a number of other tests for bowl washdown and related aspects in the ASME A112.19.2/CSA B45.1 standard. Ms. Tanner mentioned this is an opportunity for change if participants feel that the performance testing portion of the standard could be improved. If participants provide information in their public comments, then we can look at that as we move forward with this process specification revision process. Ms. Tanner explained that WaterSense is seeking comment on ideas for how we would solve these issues, comment on what tests the public would like to see, and comments on what alternatives to soybean media would the participants like to see used.

5. Effective Date and Transition Timing

Ms. Tanner explained that upon release of the draft specification, EPA will discuss with industry which products the transition process will apply to and the associated transition period such that, at the time the final specification is released, EPA has established clear requirements for WaterSense manufacturer partners and licensed certifying bodies regarding product certification and labeling during the transition period between specification versions. If the changes to specification criteria under Version 2 do not affect a certain subset of products (e.g., single-flush toilets), EPA does not intend to require retesting or recertification of those products.

Ms. Tanner also explained that there are a number of activities that will likely need to occur as a result of the revised specification. Licensed certifying bodies will need to evaluate product listings and update certification information based on the new specification criteria. They'll then need to submit up-to-date product notification templates to EPA. In addition, manufacturers and private labelers will need to update product packaging and documentation, including specification sheets, marketing materials, and web pages. The WaterSense label will need to be removed from products that are no longer certified based on the new specification criteria. She noted that EPA is considering establishing a period of six to 12 months before Version 2 of the specification will become effective.

Participant Comments and Questions

Larry Himmelblau (Chicago Faucet Co.) asked what the current time is between submission by certifiers to the list of labeled models being updated on the EPA website. Mr. Pickering explained that WaterSense targets about three weeks to go through the quality assurance process. The timeline can be longer depending on the data quality that comes in from the certifying body or if there are any major hiccups with the initial submission. The timeline depends on how long it takes to resolve any issues, so ideally about three weeks, but sometimes longer. Ms. Tanner added that the higher the data quality coming in with the product notification template, the faster the timeline is for getting that information from the certifying body to WaterSense. WaterSense asks certifying bodies to submit their data at least once a month. Sometimes they don't submit monthly data and sometimes they don't update their data, so the timeline is dependent on the data quality coming in.

Kyle Thompson (PMI) asked how WaterSense communicates with third-party certifiers and distributors during such a transition. Ms. Tanner explained that WaterSense has regular conversations with third-party certifiers. WaterSense also meets with all their accreditors to provide updates on what WaterSense is doing. The communication starts about two to three months before the specification is finalized; WaterSense starts workings with third party certifiers to make sure that they understand what is going to be in the final specification. WaterSense does this to make sure that they are prepared, to ensure that they have applied to be part of the certification process, to ensure that they have all their accreditations in line with their accreditor, and to determine that they are ready and they understand what is needed and work out any problems in the process. Ms. Tanner expressed that WaterSense does not have the same communication process with distributors, but if anyone has comments or suggestions on how we might talk with them or organize the transition, WaterSense would welcome that feedback.

An anonymous attendee mentioned that when considering the delisting of WaterSense labeled products, keep in mind that delisting implies a fair amount of work for manufacturers with respect to updating instruction pages, websites, and product drawings. The participant went on to say that product delisting implies more work than just updating a product listing with the certifier and depleting product inventory. Ms. Tanner thanked the participant for that feedback and explained that it will be taken into account when WaterSense considers a transition timeline of six months to a year. Ms. Tanner encouraged all participants to let EPA know if more time is needed than what WaterSense is currently estimating. Ms. Tanner explained that the timeline is similar to what other programs use, which is why it is the starting point for this specification.

Ms. Tanner made a final request for anyone with written comments to submit them to watersense-products@erg.com.

With no additional questions submitted, Ms. Tanner thanked the attendees for their time and adjourned the meeting.

Appendix A: Meeting Participants

Presenter	Organization
Stephanie Tanner	EPA
Maggie Harrington	ERG
Robert Pickering	ERG

Attendee	Organization
Alyssa Abbey	Soquel Creek Water District (California)
Jennifer Aguilar	Upper San Gabriel Valley Municipal Water District (California)
Brian Alexander	Brevan Brothers Inc.
Mdgouhs Ali	City of Buckeye Water Resources Department (Arizona)
Ena Alvarenga	Acorn Engineering
Alex Archuleta	City of Columbia (Missouri)
Joseph Baquerizo	Long Beach Utilities (California)
Steffi Becking	2050 Partners
Veronica Blette	EPA
Laureen Blissard	Green Builder Coalition
Amelia Brown	Tampa Bay Water (Florida)
Debra Burden	Citrus County Utilities (Florida)
Ron Burke	Alliance for Water Efficiency (AWE)
Frank Buyna	QAI Laboratories
Maribel Campos	ICC-Evaluation Services (ICC-ES) PMG
Olivia Caracostea	Moen Incorporated
Adam Carpenter	American Water Works Association (AWWA)
James Chagetas	Ferguson Enterprises, LLC
Emily Chang	Appliance Standards Awareness Project (ASAP)
Deborah Chilvers	San Francisco Public Utilities Commission
Christine Claus	City of St. Petersburg (Florida)
Brittany Contreras	City of Hillsboro Water (Oregon)
Grant Cullinan	City of Durham (North Carolina)
Dan Danowski	Zurn Elkay
Helen Davis	Energy Solutions
Edwin DeLeon	Golden State Water Company (California)
Kiera Denehan	Larimer County Conservation Corps (Colorado)
Russell Denney	Mansfield Plumbing Products, LLC
Shirley Dewi	IAPMO R&T
Al Dietemann	General Public
Christine IK Dochin	Hawaii Rural Water Association
Denise Dougherty	Sloan
Jason Duff	Massachusetts Department of Conservation and Recreation
Greg Dupuis	Intertek Testing Services NA, Inc.
Ashley Fahey	Kohler Company
Tina Fann	Municipal Water District of Orange County (California)
Richard Farrington II	Tynan Plumbing Fixtures
Fernando Fernandez	Toto USA, Inc.

Attendee	Organization
Bill Gauley	Gauley Associates Ltd.
Stan Gawlik	Professional Plumbing Group
Mark Gibeault	Kohler Company
Elise Goldman	Metropolitan Water District of Southern California
Kelly Gordon	Fort Collins Utilities (Colorado)
Jill Greiner	City of Charlottesville (Virginia)
Mathew Grigsby	Coachella Valley Water District (California)
Ann Grooms	City of Joliet (Illinois)
Misty Guard	Regulosity LLC
Catherine Harris	City and County of Broomfield (Colorado)
Cameron Helm	Big Bear Lake Department of Water and Power (California)
Jerrad Hennessy	Hennessy & Hinchcliffe
Larry Himmelblau	Chicago Faucet Co.
Lauren Imhoff	City of Renton (Washington)
Michael Johnson	Delta Faucet Company
Mialee Jose	Seattle Public Utilities (Washington)
Kevin Kennedy	Niagara Conservation
John Kij	American Water
Gabriel Koelle	Liberty Pumps Inc.
John Koeller	Koeller & Company
Bekah Konet	CSA Group
Timo Kopka	Laufen Bathrooms AG
Thomas Kramer	Kohler Company
Tanya Kuehl	Kohler Company
C.J. Lagan	LIXIL
Brian Lee	Sonoma Water/Sonoma-Marin Saving Water Partnership (California)
Melissa Levo	Seattle Public Utilities (Washington)
Duncan Liang	CSA Group
James Lim	Durham Department of Water Management (North Carolina)
Christopher Lindsay	IAPMO
Megan Marsee	Bernalillo County (New Mexico)
Patrick Martin	Miami Dade Water & Sewer Department (Florida)
Chris McDonald	Fortune Brands Water Innovations
Bill McDonnell	Metropolitan Water District of Southern California
Charlene McHendry	City of Lacey (Washington)
Kevin McJoynt	Gerber Plumbing Fixtures
Amy Meaut	City of Hillsboro Water Department (Oregon)
Lisa Mejri	Monte Vista Water District (California)
Emily Melhorn	City of Flagstaff Water Services (Arizona)
Qiaoli Meng	ICC-ES
Allison Mettler	Seattle Public Utilities
Akshay Mishra	ANSI National Accreditation Board (ANAB)
Joseph Montemurno	Orlando Utilities Commission (Florida)
Bob Neff	Masco Corporation
Darren Nowels	Northern Water (Colorado)

Attendee	Organization
Lisa Nuttall	Port Royal Owners
Julie Ortiz	San Francisco Public Utilities Commission
Patricio Pacheco	Acequia de la cuminudad
Siena Pack	Plumbing Manufacturers International
Susan Pokorny	JEA (Florida)
Ada Poon	Delta Faucet Company
Wendy Pratt	Zurn Industries, LLC
Dawn Qualley	ICC-ES PMG
Luis Quesada	Corona
Jon Reik	Kohler Company
Arnoldo Rodriguez	Valvulas Urrea
Sara Sayed	Delaware River Basin Commission (New Jersey)
Candace Schaible	Utah Division of Water Resources
Rick Schultz	Town of Castle Rock / Castle Rock Water (Colorado)
Melody Seesangrit	Irvine Ranch Water District (California)
Jennifer Shimmin	Eastern Municipal Water District (California)
Al Smith II	City of St. Petersburg (Florida)
Gary Soe	Toto USA, Inc
Kanchan Swaroop	ASAP
Mark Tanaka	Duravit USA
Brenan Tarrier	New York State Department of Environmental Conservation
Nick Teague	City of San Luis Obispo (California)
Amanda Thomas	City of Thornton (Colorado)
Kyle Thompson	Plumbing Manufacturers International (PMI)
Rodney Tilley	Toho Water (Florida)
Cindy Torres	Valley Water Authority (Florida)
Anahita Valipourkoleti	Intertek
Aaron Vincent	Austin Water (Texas)
Alexandra Wahlstrom	Water Supply District of Acton (Massachusetts)
Jake Weinberger	Broward County Natural Resources Division (Florida)
Steve Williams	Pluvial Solutions
Josie Woger	City of Rio Rancho (New Mexico)
Judy Wohlt	Valek and Company
Robert Wood	City of Santa Fe (New Mexico)
Jessica Woods	City of Round Rock (Texas)
Tiffany Yand	City of Chandler (Arizona)
Josh Zimmerman	Utah Division of Water Resources