MARKET ENHANCEMENT OPPORTUNITIES FOR WATER-EFFICIENT PRODUCTS

STAKEHOLDER MEETING

Public Meeting on Water-Efficient Products for Residential, Commercial, and Industrial Indoor Uses

Renaissance Seattle
Seattle, WA

April 13 - 14, 2004

Meeting Summary

CONTENTS

Section **Page**

1. INTRODUCTION 1

2. OPENING REMARKS 1

3. MARKET ENHANCEMENT PROGRAMS AND APPROACHES 6

4. PANEL DISCUSSION: MARKET ENHANCEMENT FOR RESIDENTIAL AND COMMERCIAL PLUMBING PRODUCTS 13

5. GROUP DISCUSSION: MARKET ENHANCEMENT FOR WATER-EFFICIENT PLUMBING PRODUCTS 19

6. PANEL DISCUSSION: OPPORTUNITIES AND BARRIERS FOR WATER-EFFICIENT PLUMBING PRODUCTS—QUALITY AND PERFORMANCE ISSUES 22

7. GROUP DISCUSSION: QUALITY AND PERFORMANCE OF PLUMBING PRODUCTS AND SYSTEMS 25

8. PANEL DISCUSSION: ENHANCING THE MARKET FOR WATER-EFFICIENT APPLIANCES . . 28

9. GROUP DISCUSSION: ENHANCING THE MARKET FOR WATER-EFFICIENT APPLIANCES . . 32

10. PUBLIC EDUCATION APPROACHES 36

11. PANEL DISCUSSION: ENHANCING THE MARKET FOR OTHER COMMERCIAL/INSTITUTIONAL/INDUSTRIAL (CII) PRODUCTS 38

12. GROUP DISCUSSION: MARKET ENHANCEMENT FOR WATER-EFFICIENT CII PRODUCTS 45

13. CLOSING REMARKS 48

1. INTRODUCTION

The United States today faces both water infrastructure and water supply problems. If investment in water and wastewater infrastructure does not increase, the funding gap between water needs and investments over the next 20 years could grow to as much as $224 billion. Just as important, 36 states expect to experience water shortages over the next 10 years, even without drought conditions.

To address this critical issue, the U.S. Environmental Protection Agency (EPA) is planning a national program to promote water-efficient products to consumers. One of the tools under consideration is a water-efficient product labeling program based on EPA's highly successful ENERGY STAR® program, a government-backed program to protect the environment through superior energy efficiency. As a first step toward assessing the needs of a water-efficient product labeling program, the Agency is conducting a series of stakeholder meetings to work toward possible approaches and partnership opportunities to promote water-efficient products. The April 13 and 14, 2004 meeting in Seattle, Washington, was the fourth of the stakeholder meetings. The first stakeholder meeting was conducted in Washington, DC, on October 9, 2003; the second meeting was conducted in Austin, Texas, on January 15, 2004; and the third meeting was conducted in Phoenix, Arizona, on February 17, 2004.

This report summarizes the presentation and facilitated discussions that occurred at the Seattle meeting. Copies of background information, press releases, speeches, presentations, brief biographies of the panelists, and a list of the attendees can be found on EPA's water-efficiency Web site at <http://www.epa.gov/owm/water-efficiency/index.htm>.

2. OPENING REMARKS

Welcome:
Jim Hanlon, Director, Office of Wastewater Management, EPA

Jim Hanlon, Director of EPA's Office of Wastewater Management, welcomed everyone to the fourth stakeholder meeting to explore labeling and other market enhancement options for water-efficient products for residential, commercial, and industrial indoor uses. Mr. Hanlon expressed his gratitude for such a great turnout and introduced Seattle's Mayor, Gregory Nickels. Mayor Nickels, in partnership with Friends of the Earth and with the endorsement of more than 100 public agencies, businesses, and organizations, requested in July 2003 that EPA establish a voluntary water-efficient product labeling program.

Welcome to Seattle:
Honorable Gregory J. Nickels, Mayor of Seattle

The Honorable Gregory Nickels graciously welcomed everyone to Seattle. During the last few years, Mayor Nickels indicated that Seattle has been experiencing hotter than normal summers as well as drought conditions and, therefore, is interested in making sure that existing supplies of water are extended and used as efficiently as possible.

Seattle had a visionary city leadership more than 100 years ago that set aside the Cedar River Watershed as a drinking-water supply for Seattle. About 50 years ago, the city set aside an additional water supply that is pure, fresh, and well protected. Mayor Nickels stated that Seattle maintains a strong conservation ethic and wants to make the most of these water supplies. This commitment is illustrated by the fact that since 1965, the population in the region has increased by over 50 percent, but the water usage has decreased. During Seattle's most recent drought in 2001, the city worked with regional partners to offer rebates on water-efficient toilets, and people stood in line for hours to take advantage of that opportunity. Mayor Nickels maintains that people are interested in water-efficient products and believes, if given the chance, they will make that decision, and that businesses will thrive by offering those types of products.

Mayor Nickels thanked Brent Blackwelder, President of Friends of the Earth, for coauthoring the letter that he sent to EPA a year ago that helped bring some light to this issue. He also thanked EPA for carrying the torch and talking about this important issue around the country. Mayor Nickels encouraged EPA to take strong measures not only nationally, but also internationally on this issue.

Update on Program Development:
Jim Hanlon, Director, Office of Wastewater Management, EPA

Mr. Hanlon began his update by stating that support for a Water Star program at EPA is strong. Administrator Mike Leavitt is enthusiastic about the program, and the President's FY2005 budget for EPA contains $800,000 to continue planning and implementing the water-efficient product labeling program. Ben Grumbles, the Acting Assistant Administrator for Water and the President's nominee for that post, has indicated that water efficiency is one of his priority issues.

Mr. Hanlon stated that EPA's principal goals for this market enhancement program are to: 1) reduce water and wastewater infrastructure costs, and 2) conserve water supplies. Although the Administration's FY2005 budget proposal extends its commitment to the Clean Water and Drinking Water State Revolving Funds, Mr. Hanlon does not believe that federal funding alone will solve the estimated infrastructure gap of $224 billion. He maintains that the challenge of the infrastructure investment gap demands a multi-faceted approach to better managing and sustaining the nation's infrastructure. EPA's suggested approaches prominently feature water efficiency, along with better system management, full-cost pricing, and watershed

management—the four pillars of sustainable infrastructure. These approaches are explained on EPA's Web site at <http://www.epa.gov/water/infrastructure/index.htm>.

With respect to EPA's goal of conserving water supplies, Mr. Hanlon stated that more and more areas of the country are experiencing water quantity problems, and conflicts over scarce supplies are more numerous. According to a recent U.S. General Accounting Office study, 36 states anticipate that even under average conditions, they will experience fresh water shortages in the next 10 years. A recent article in the *Washington Post* reports that the ongoing drought in the West, which is going onto its seventh year in some states, is the worst drought on record for some areas including Arizona. Mr. Hanlon believes that promoting increased use of water-efficient technologies can have a profound effect in reducing municipal water use and, in effect, creating a new source of supply. Other potential program benefits include protection of aquatic habitats, reduced polluted runoff, and reduced energy use and power plant pollution.

Next, Mr. Hanlon highlighted the three objectives of the program: 1) to help purchasers identify and understand the many advantages of water-efficient products for residential, commercial, or industrial use, 2) to motivate manufacturers to produce more competitive water-efficient products, and 3) to encourage and help distributors, retailers, and local water utilities to promote these products.

The Agency is now very heavily involved in the development of the market enhancement program. In addition to the three previous stakeholder meetings that have been conducted, EPA has procured the technical support of two contractors—D&R International and ERG, Inc.—to assist in designing the program and evaluating the products. Mr. Hanlon stated that each of the stakeholder meetings to date has been attended by more than 100 people representing all major stakeholder categories. Some of the important points that EPA has learned from these meetings include:

- The program should be voluntary and national.
- Product performance and sustainability are key factors. This includes products that act alone as well as those that are part of a system.
- Product performance metrics should be developed early.
- Environment Canada has offered to team with EPA to implement a bi-lateral water-efficient product labeling program.
- Market intervention should avoid confusing the marketplace or placing unreasonable demands on manufacturers or retailers.
- Purchasers, retailers, suppliers, manufacturers, utilities, EPA, and stakeholders, in general, need more education about water-efficient products.

- More water-efficient technology research and development is needed.

- Complementary strategies need to be developed as part of a comprehensive effort to promote water efficiency.

- Ongoing market enhancement efforts such as The Irrigation Association's effort to test and promote "Smart Water Application Technology" may serve as a model for EPA to consider.

Mr. Hanlon then proceeded to discuss the Agency's six major program design tasks.

Identify lessons learned. EPA will research the lessons learned from the development and implementation of other similar voluntary programs, including ENERGY STAR; analyze how these lessons learned might apply as EPA moves forward through the various stages of development of this program; and identify ways to avoid or overcome similar issues.

Evaluate program approaches and markets. EPA will identify and evaluate numerous approaches for enhancing the market for, and promoting the use of, water-efficient products. A mix of approaches—including labeling options, voluntary sign-up partnership programs, targeted market facilitation approaches, and industry-specific partnerships—will be considered and evaluated for appropriateness according to the individual products, the potential markets for those products, and the barriers that restrict adoption of a water-efficient technology or practice.

Evaluate resource requirements and potential partnerships. Resource analyses will address the various funding levels and staffing requirements for all aspects of the program, such as the impact on the pace of program development, program operation, product selection and testing, and outreach and marketing. EPA will also evaluate the potential for forming partnerships with the various groups of stakeholders to create synergies and opportunities for leveraging resources.

Identify program framework options. EPA will identify options for the operating framework of the program, including mechanisms to: identify and enlist partners, including a draft participant agreement; screen and select testing facilities; evaluate product performance; safeguard the integrity of the program; and evaluate the overall success of the program.

Develop tools for outreach and communications. The Agency will develop various tools and promotional materials for outreach and communications and partnership building. These tools will include a brand name and logo for the program and appropriate outreach materials.

Develop market infrastructure. EPA will foster the development of a national organization to represent the interests of state and utility water efficiency programs. This organization would act like its energy efficiency counterpart, the Consortium for Energy Efficiency (CEE), to promote high efficiency products in cooperation with EPA. Such a group would develop consensus product specifications, develop program templates, and identify research needs. EPA is currently evaluating responses to its recent request for proposals to develop such an organization.

Mr. Hanlon also identified several product evaluation tasks to be conducted as part of EPA's program planning activities: such as defining and analyzing product areas, characterizing market conditions, developing a product selection process, evaluating products, and assessing product testing needs and existing laboratory capabilities.

Mr. Hanlon described EPA's schedule for conducting these initial planning activities. By late summer, he hopes to achieve the following: evaluate program approaches, markets, resource requirements, and partnership opportunities; have the public review the product selection process; complete outreach and communication tools, including the brand name and logo; and identify program framework options. By the end of the calendar year, Mr. Hanlon hopes to complete the evaluation of priority products. Mr. Hanlon indicated that this schedule reflects only the initial planning stage; a longer term plan is being developed. In addition, Mr. Hanlon maintains that EPA will continue discussions with stakeholder groups throughout this process, as appropriate.

In summary, Mr. Hanlon acknowledged that a Water Star program will be a formidable undertaking, but noted that if the nation is to sustain its water supplies and water infrastructure, everyone must be smarter about water use, and consumers need more available information on using water more efficiently. Mr. Hanlon maintains that EPA can help by identifying water-efficient products and informing purchasers of the advantages of those products. EPA will need to partner with manufacturers to encourage development and production of more water-efficient products, and work with retailers, suppliers, utilities, states, environmental groups, consumer organizations, and others to promote these products. With respect to the agenda for this meeting, Mr. Hanlon stated that EPA is not limiting its evaluation to the specific products identified in the agenda, but only limited the products discussion to fit in the time allowed.

3. MARKET ENHANCEMENT PROGRAMS AND APPROACHES

The first set of presentations discussed ENERGY STAR's approach to product evaluation and general approaches to enhance and transform the marketplace.

ENERGY STAR Product Evaluation Process
Andrew Fanara, Product Specifications Team Leader, ENERGY STAR, EPA

Andrew Fanara, EPA's Product Specifications Team Leader for the ENERGY STAR program, provided an overview of ENERGY STAR's history and approach for selecting products for evaluation. Mr. Fanara maintains that ENERGY STAR, which introduced its first label for computers in 1992, has achieved a significant impact on the marketplace, with 76 specifications in more than 40 major product categories. During the past 12 years, ENERGY STAR has developed relationships with 1,400 participating manufacturers and partnerships with 400 retailers in more than 20,000 storefronts across the country. American consumers have purchased over 1 billion ENERGY STAR products, and new research indicates that 56 percent of U.S. consumers recognize the ENERGY STAR label. This recognition is largely due to significant leveraging efforts that EPA has undertaken with utilities and manufacturers across the country to promote the label and energy efficient products. Mr. Fanara maintains that in 2003, ENERGY STAR products saved more than $9 billion in energy bills.

The three process areas discussed in Mr. Fanara's presentation include how to screen products, how to develop product specifications, and how to develop and maintain product infrastructure support. Mr. Fanara maintains that the first step is always to assess whether EPA should do an ENERGY STAR label for a potential product. For this initial cut, EPA relies upon the following guiding principles that have been refined slightly over time based on EPA's lessons learned:

- Is there significant energy savings potential on a per unit basis and nationally?
- Will purchasers recover their investment in increased energy efficiency within a reasonable time period?
- Is product performance maintained or enhanced? EPA wants energy efficiency to be an important valued-added proposition to the consumer.
- Can increased efficiency be achieved with multiple technology options that are diffuse in the market? EPA tries to write a technology-neutral specification, one that does not favor a specific manufacturers or proprietary technology.
- Can product energy consumption and performance be measured and verified with testing? If existing test procedures are not available, EPA may be required to write a very specific and/or rigorous test procedure that measures or describes the

performance of the product for verification purposes to qualify for ENERGY STAR.

- Would labeling differentiate products and be visible to purchasers? Product differentiation is probably the most subjective element of the ENERGY STAR program because products are not promoted until a manufacturer goes out and pushes their product. EPA is trying to fill a void where no label exists for a product that promotes energy efficiency, or when the claims about energy efficiency are varied and inconsistent.

Mr. Fanara noted that these principles provide some level of transparency and understanding to manufacturers in how EPA sets specifications. EPA openly admits that it is not a product expert and tries to maintain a very interactive process with manufacturers to gain experience and knowledge from them to write a good, solid, challenging specification that will save consumers real money.

Mr. Fanara presented a list of 11 future products to be screened under the ENERGY STAR program: microwaves, commercial lighting signs, computer servers, glass door refrigerators, mini-split air conditioners, commercial ventilation hoods, pre-rinse spray valves, commercial dishwashers, ice makers, commercial multi-load clothes washers, and pool pumps and related equipment. Over the next few years, EPA will screen these products to see if they are suitable for labeling. Mr. Fanara indicated that ENERGY STAR tries to keep seven to 10 products in the pipeline on an ongoing basis. One of EPA's challenges under this program is to identify new opportunities and maintain the 76 specifications that have been developed to keep them up-to-date. The ENERGY STAR product labeling program has 20 full-time EPA staff and 40 to 60 full-time contractor staff with a budget of millions of dollars per year.

The ENERGY STAR program has developed a detailed graphic illustrating the key steps in developing product specifications. These steps include:

- Notifying the stakeholder of future specifications.
- Conducting energy and environmental analyses.
- Performing market, industry, and design research, developing test methods.
- Releasing draft specifications.
- Soliciting stakeholder input.
- Releasing subsequent drafts of the specifications.
- Posting the draft specifications and stakeholder comments to EPA's Web site.

- Finalizing the specification.
- Developing and submitting a final decision memorandum.
- Forming partnerships with manufacturers.
- Officially launching the specification with industry and stakeholders.
- Monitoring market penetration.
- Revising the specification as necessary.

Mr. Fanara emphasized the importance of developing specifications for products that do not require the consumer to sacrifice performance. To better ensure that this does not occur, Mr. Fanara stated that EPA may add quality/performance criteria to the specification on top of the energy-efficiency requirement. Examples of these criteria are the visibility of exit signs in smoke; the instant-on, no flicker, color rendering, and warranty of compact flourescent light bulbs and light fixtures; the noise levels in fans; the warm-up time for copiers; and the ability of air cleaners to remove particles.

Mr. Fanara maintains that EPA spends the majority of its resources in developing and maintaining the infrastructure support for each product. This infrastructure support consists of market support for partners, consumer outreach and logo awareness, program administration, and program tracking and evaluation. Mr. Fanara noted that EPA has a whole team dedicated to working with partners to promote each product or group of products by developing ads and coordinating national campaigns. The goal is to leverage good ideas, leverage the label, gain market share with consumers, and raise logo awareness, which is ENERGY STAR's platform for raising consumer consciousness. Mr. Fanara also noted that EPA has a process for making sure there are no violations of logo use by tracking what happens in the market, on the Internet, and in newspapers and magazines. Manufacturers that use the logo inappropriately may be referred to the Department of Justice for further follow up. ENERGY STAR staff also spend a large amount of time fostering relationships with manufacturers by working with technical, marketing, sales, and management staff. Mr. Fanara contends that significant resources are also devoted to maintaining the list of ENERGY STAR products that consumers can use to make informed purchasing decisions. EPA also has a process for estimating the market share of particular products by engaging manufacturers and using third parties for additional information. EPA feeds all of this information into an energy savings model called "CCAP" to estimate national impacts of the ENERGY STAR program. CCAP is primarily managed by Lawrence Berkeley National Laboratories. Finally, EPA also conducts testing and performance evaluation and has an initiative where EPA purchases products and tests and evaluates them and then reports their findings to the manufacturers. Mr. Fanara stated that this initiative has been successful, and EPA has found very few failures with compliance.

In conclusion, Mr. Fanara believes that the recipe for success for a labeling program consists of setting clear program goals and objectives, screening products carefully, addressing quality and performance issues where necessary to prevent damage to the program's reputation, focusing on consumer needs, remaining sensitive to manufacturer and marketplace issues, and committing significant resources to build logo awareness, support participants, and establish program infrastructure. Mr. Fanara believes that the ENERGY STAR model is well received around the world as a complementary program to regulatory approaches.

Approaches to Market Enhancement
Julie Colehour, Director of Integrated Marketing, PRR

Julie Colehour, Director of Integrated Marketing at PRR—a social marketing firm—presented an overview of potential approaches for market enhancement and market transformation in the area of water efficiency; specifically, how can EPA push and pull the marketplace to achieve its goal. Ms. Colehour began her presentation by quoting Aldo Leopold (March 1937): "We seem ultimately always thrown back on individual ethics as the basis of conservation policy. It is hard to make a man, by pressure of law or money, do a thing which does not spring naturally from his own personal sense of right and wrong." Ms. Colehour believes that this quote may be the earliest description of market transformation in terms of conservation policy. To truly transform the marketplace, Ms. Colehour maintains that we must change the way people think and feel about water in order to sustain a long-term lasting effect.

To begin a program like this, Ms. Colehour recommends boiling down to the simplest goal of success possible, which in the case of EPA's water-efficient product market enhancement program may be to reduce per person water consumption. The challenge facing EPA is to achieve this goal in the most cost-effective and long-lasting manner. To achieve long-term success, Ms. Colehour maintains that EPA should foster an ethic of water conservation in the marketplace, change people's perspective from the price of water to the value of water, and create a sense of urgency about water availability. She believes that this can be achieved because water is necessary for life, it cleanses us, we interact with it daily, it nourishes the environment, people pay a lot of money to look at it and recreate near it, and it is very much a part of everyone's lives. All of these aspects of water provide a potential emotional connection to water that EPA can capitalize on as the program is created.

Ms. Colehour presented two methods for creating the basic framework of EPA's program: 1) change peoples behavior to use less water or 2) provide better product choices that use less water. EPA could implement one or both of these program options. Ms. Colehour described three possible paths for providing better product choices: 1) spark consumer demand for products to pull the marketplace (e.g., low-carb foods), 2) establish voluntary standards to push and pull the marketplace (e.g., ENERGY STAR), or 3) legislate and force/push the marketplace to change (e.g., flame retardant sleepware).

For each of these three paths, Ms. Colehour described the tactics that could be used to implement the paths in the marketplace. For the first path: building consumer demand, Ms. Colehour suggests looking at grassroots outreach for water conservation, conducting public education on the issue, working with environmental coalitions, looking at gorilla marketing tactics, providing consumer incentives to buy a preferable product such as utility rebates, and/or educating children in schools. With respect to the voluntary standards path, Ms. Colehour suggests creating a labeling program; developing extreme relationships with manufacturers, retailers, utilities, and nongovernment organizations to get them to embrace voluntary standards and market them to the consumer; providing incentives to manufacturers and retailers; conducting in-store promotions; and/or developing traditional marketing tools to drive consumer demand (e.g., advertising, media relations). For the legislative path, Ms. Colehour stated that EPA could legislate product standards, conduct outreach to manufacturers and retailers, and enforce the standards as possible tactics for implementing the approach.

In closing, Ms. Colehour commented that EPA has a great opportunity with this program to transform the marketplace in the long term by educating consumers and changing the way they see and value water. If this program is planned correctly, Ms. Colehour believes that our water resources can be protected for future generations. She closed with a quote from Benjamin Franklin: “When the well’s dry, we know the worth of the water.”

Questions on Presentations

The first set of presentations was followed by a opportunity for audience members to ask questions and comment on remarks given by the first set of presenters.

David Viola, Technical Director of the Plumbing Manufacturers Institute (PMI), asked Mr. Fanara to explain ENERGY STAR’s interest in water-using products such as pre-rinse spray valves and to further elaborate on ENERGY STAR’s process for verifying product performance. Mr. Fanara responded that the energy required to heat the hot water used by pre-rinse spray valves has brought them into ENERGY STAR’s product screening process. Mr. Fanara commented that EPA may not choose to label this product, but that its energy usage warrants at least a screening level analysis. With respect to EPA’s performance verification process, Mr. Fanara responded that EPA always requires some form of product testing to determine if the product is compliant with the ENERGY STAR specification. Depending on the product, this testing may involve self-certification—which is the predominant method chosen by EPA—or third-party certification which is rarely used. Mr. Fanara believes that manufacturers do a good job checking on one another and reporting problems to EPA. Mr. Fanara maintains that the screening and testing procedures are necessary to protect the manufacturers’ investments in their products.

Ed Osann, President of Potomac Resources, Inc., asked Mr. Fanara if his presentation slides—in particular the one illustrating the specification development cycle used by ENERGY STAR—would be available to the public. Mr. Fanara responded that his slides would be made available as part of the meeting summary and that the specification development cycle

illustrations can be found on ENERGY STAR's Web site. Next, Mr. Osann asked Jim Hanlon of EPA to repeat EPA's schedule for completing the major milestones presented in his talk. Mr. Hanlon responded that EPA plans to complete the evaluation of program approaches and markets, analysis of resource requirements and evaluation of partnership opportunities, public review of product selection process, production of outreach and communication tools including the brand name and logo, and identification of program framework options all by the August/ September 2004 timeframe. The evaluation of priority products should be completed by December 2004, and the Agency will formally announce the program by early 2005.

Mary Ann Dickinson, Executive Director of the California Urban Water Conservation Council, asked Ms. Colehour whether she believes consumer awareness of the value of water could be changed if water-efficient products were labeled under the existing ENERGY STAR program. Ms. Colehour responded that the challenge faced by EPA if these products were to be labeled under the existing ENERGY STAR program would be to take advantage of its program framework and partner relationships while keeping the water message distinct. Ms. Colehour believes that ENERGY STAR is one of the best examples in the nation of true market transformation in a conservation area. ENERGY STAR has built a solid foundation that water issues could follow. However, Ms. Colehour believes that EPA would have to carefully plan the program to ensure that the water message is distinct. If combined with the ENERGY STAR program, Ms. Colehour believes that a sister label or a line extension would have to be used to keep the water message distinct from the energy message associated with the ENERGY STAR program. She does not believe that EPA should use one label to address both energy and water efficiency.

Richard Harris, Water Conservation Manager for the East Bay Municipal Utility District (EBMUD), asked both Mr. Fanara and Ms. Colehour how they would go about quantifying the success of education and outreach programs. Ms. Colehour responded that part of developing a successful program involves setting up an evaluation research and tracking mechanism. Over time, EPA should conduct testing with the consumer on brand awareness and if the brand is delivering what has been promised through the program, as well as how consumers are reacting to the program. Data would be gathered through basic consumer research methodologies such as telephone surveys and focus group testing. Mr. Fanara responded that ENERGY STAR solicits direct feedback from manufacturers about consumer perceptions of ENERGY STAR and ENERGY STAR benefits. The feedback varies depending on the manufacturer, as some are leaders and others are followers; some have indicated that they have never had consumers ask about energy efficiency issues for a particular product, and some are reluctant to ask consumers specific questions because they do not want to hear the answer. In addition to feedback from manufacturers, Mr. Fanara recommends obtaining independent viewpoints that can be obtained by a good market research firm that knows how to ask the right questions.

Scott Humphrey, Applications Engineer with Rinnai, questioned whether the ENERGY STAR and Water Star logo could be combined and whether ENERGY STAR has ever labeled a whole system. Mr. Hanlon responded that some products, such as tankless water heaters, clothes washers, and dishwashers, have both energy and water issues that will need to be addressed. Mr.

Hanlon indicated that labeling is only one option being discussed, and EPA is continuing to meet and discuss this issue. Mr. Fanara responded that under the ENERGY STAR program, the U.S. Department of Energy (DOE) is responsible for labeling water heaters. With respect to labeling a system, Mr. Fanara does not know of a traditional type of product that has been labeled that represents a system. However, ENERGY STAR is taking a systems approach to addressing ENERGY STAR buildings and is contemplating a systems approach to HVAC systems in the home due to new federal standards for air conditioners where installation and the whole system are major factors in achieving performance standards.

Lee Mercer, Director of Product Compliance for Moen Inc., asked Mr. Fanara if ENERGY STAR has a minimum energy savings benchmark or minimum payback period that has to be met before a product is labeled. Mr. Mercer also asked whether the ENERGY STAR program could handle the increased load associated with labeling water-efficient products if they were to be addressed under that program. Mr. Fanara responded that the objective of his presentation was to talk about what ENERGY STAR is currently doing. Mr. Fanara stated that there are many pros and cons that need to be discussed before selecting the program for labeling water-efficient products. With respect to minimum benchmarks, Mr. Fanara responded that generally, the program looks for a 15 to 30 percent energy savings over a conventional product and a 10- to 24-month payback period; however, that varies greatly depending on the specific product.

Stan Wolfson, Executive Director of the American Society of Plumbing Engineers, asked Mr. Fanara to explain how ENERGY STAR deals with manufacturers that are not sustaining the required performance standards for their products. What legal recourse does EPA have and what penalties are associated with noncompliance? Mr. Fanara responded that EPA has been very fortunate in this area, as it has not had to deal with many noncompliant manufacturers. However, EPA has an internal process for dealing with manufacturers that are not compliant. If a manufacturer was intentionally deceiving EPA, EPA would remove their products from the list, and they would no longer be a partner. If there was criminal intent, EPA would refer the matter to the Department of Justice.

4. PANEL DISCUSSION: MARKET ENHANCEMENT FOR RESIDENTIAL AND COMMERCIAL PLUMBING PRODUCTS

The first panel of the day discussed the potential market enhancement of residential and commercial plumbing products and consisted of five panelists representing Kohler Company, California Energy Commission, Desert Spring Products, San Antonia Water System, and the city of Austin, Texas.

Kitchen and Bath Products
Mike Chandler, Director of Sanitary Marketing, Plumbing Americas, Kohler Co.
Keith Kometer, Marketing Manager, North American Faucets, Kohler Co.

The first presentation was made jointly by Mike Chandler, Director of Sanitary Marketing, and Keith Kometer, Marketing Manager, both of Kohler Co. Mr. Chandler began the presentation by discussing the factors that are considered by Kohler when developing a new product such as a toilet. Mr. Chandler maintains that Kohler always considers water savings in addition to many other considerations such as product performance. During the next year or so, consumers will begin to see some of the water savings products that Kohler has recently introduced into the marketplace. Now that the industry has accomplished the transition from a 3.5 to a 1.6 gallon per flush (gpf) toilet, Mr. Chandler believes that the company can begin developing products that save more water on a voluntary basis without a labeling program. With respect to product performance, Mr. Chandler contends that Kohler must adhere to industry standards, achieve expected functionality that must be sustainable over the life of the product, and consider and evaluate the overall impact of reduced water on the entire plumbing system.

Mr. Chandler noted that Kohler works with a number of different stakeholders when developing a new product to minimize costs and installation problems. These stakeholders include EPA, manufacturers, installers, people responsible for servicing the product, and consumers. Mr. Chandler maintains that the industry as a whole is developing numerous water saving products and believes it should be allowed to continue full out competition without the restrictions that could be associated with a labeling program. He believes that specifications associated with a water-efficient product label might indirectly hinder a company's research and design efforts. Mr. Chandler maintains that consumers have the final vote and recommends that if EPA were to develop a labeling program, it should not start with toilets, but rather add in toilet fixtures at a later time period. Mr. Chandler also recommends that EPA consider multiple types of water savings, not just the toilet's gpf when developing a labeling program.

Next, Mr. Chandler discussed some of the new water-savings toilets that have been introduced by Kohler. In January 2004, Kohler introduced the new Cimarron™ toilet with both a 1.6 and 1.4 gpf setting. Mr. Chandler maintains that the 1.4 gpf setting can save up to 2,000 gallons of water per year. Kohler's market research on this toilet indicated that consumers did not believe that a 1.4 gpf setting would meet their performance expectations, so the company decided to include both the 1.6 and 1.4 settings to allow the consumer to adjust the water setting based on their confidence level. Kohler has also redesigned an existing product, the Power

Lite™ toilet to offer a dual flush technology that flushes 1.4 gallons for solids and 1.0 gallons for liquids with an overall weighted average of 0.8 gpf. Mr. Chandler stated that this product was voluntarily redesigned in the past few months based on consumers' desire to save water. In addition, Kohler has recently introduced the Sterling Rockton™ toilet which is a true dual flush toilet, a gravity siphonic wash down toilet. This toilet has a dual flush actuation of 0.8 gallons and 1.6 gallons that could save up to 6,000 gallons of water per year.

Mr. Chandler commented that in the past six to eight months, Kohler has introduced three water-saving toilets without a water labeling program telling the company to do it. Kohler has other ideas on how to provide water savings. To get these products developed and encourage the right behaviors, Mr. Chandler asked that EPA allow the industry to compete for awhile without a labeling program. The industry has learned a lot in the last 10 years, and Mr. Chandler believes that it can best apply these lessons in a full and open competition within the industry.

Next, Keith Kometer discussed the current status of faucets and showerheads. Mr. Kometer indicated that the faucet side of Kohler is not witnessing the same consumer interest in flow restrictions as the toilet side. However, there are some geographic areas providing feedback in search of lower-flow faucets. Mr. Kometer maintains that when it comes to faucets, a lower-flow faucet is relatively simple and the water restrictions are typically achieved by modifying the aerator of a faucet. The aerator is an easily accessible and removable part so that the modification can be done relatively easily at the factory or after installation. With aerator restrictors, Mr. Kometer has seen flows go from the standard flow of 2.2 gallons per minute (gpm) down to 0.5 gpm. Kohler offers a 2.0 gpm and a 1.0 gpm aerator as well as a 0.5 gpm spray to allow different levels of flow for commercial applications. However, Mr. Kometer indicated that a flow of 0.5 gpm may not be acceptable for activities such as hand-washing.

Mr. Kometer stated that all Kohler showerheads come standard with 2.5 gpm flow restrictors and that they are designed to maximize performance at a given rate. In conclusion, Mr. Kometer believes that consumers are very fussy about the performance of their showerheads because they do not believe that showers are as good with less water. Therefore, the industry is not hearing from consumers to reduce the flow of showerheads; most feedback indicates that consumers are asking for more water.

Hot Water Recirculation
Gary Klein, Energy Specialist, California Energy Commission

Mr. Klein, an Energy Specialist with the California Energy Commission, presented issues associated with residential hot water systems and provided an overview of the development of the plumbing and energy codes. He explained that the plumbing code was developed in the 1940s and based on "fixture units" with a 7.5 gpm flow rate. Plumbers used a larger diameter pipe to accommodate greater distances and more fixtures. The 1960s represented the beginning of large-scale development in the southern and western portions of the country. According to Mr. Klein, 50 percent of all homes have been built since 1970. Ultimately, energy codes for water

heaters and fixtures were developed in the 1990s that were based on a fixture flow rate of less than 2.5 gpm.

Mr. Klein believes that the plumbing and energy codes now conflict. Mr. Klein maintains that since 1970, the median U.S. home increased from 1,600 to 2,400 square feet, the distance to the furthest fixture increased from 30 to 80 feet, and the number of hot water fixtures increased from 6 to 12. The result of this growth is that it now takes 18 times as long to get hot water. Mr. Klein contends this increase is due to the fact that the pipe area increased by 3 and the velocity reduced by 3, fixture flow rate reduced by 3 and velocity reduced by 3, and the distance increased by at least 2 and time increased by 2. Under this scenario, Mr. Klein believes that water and energy are being wasted while residents wait for the hot water. Mr. Klein estimated that the amount of water wasted per household per year and the associated cost for waiting for the water to get hot ranges from 1,825 gallons and $18 (assuming a waste of 5 gallons per day) to 7,300 gallons and $73 (assuming a waste of 20 gallons per day). The annual energy costs associated with the water wasted ranges from $15 for natural gas (assuming a waste of 5 gallons per day) to $120 for electricity (assuming a waste of 20 gallons per day).

Mr. Klein estimates that more than 20 million existing homes and 1 million new "problem" homes could realize significant water savings if the time to get hot water out of the fixture was reduced. He contends that existing homes located primarily in the southern and western portions of the country could save approximately 10 gallons per household per day with energy and water savings of $1 billion to $2 billion per year. Mr. Klein also believes that existing homes located primarily in the Midwest and western portions of the country could realize a savings of 20 gallons per household per day with energy and water savings of $50 to $100 million per year. Mr. Klein believes that even more water and energy could be saved in the commercial building sector.

The challenge, according to Mr. Klein, is to deliver hot water to every fixture in the house wasting no more energy than necessary and wasting no more than 1 cup of water before the hot water to arrives. One possible solution to the hot water problem is to develop a central plumbing core; however, Mr. Klein does not believe that this approach would be practicable. Another solution could be to have one water heater for every hot water fixture or at least two to three water heaters per home; however, this scenario is likely to be cost-prohibitive. Mr. Klein believes a more reasonable solution would be to install heat trace on the pipes to maintain a more constant temperature on the pipes; however, this approach could increase the overall energy usage. Therefore, Mr. Klein maintains that the most reasonable solution that does not increase energy usage is to install a distribution (recirculation) system within a short distance of every hot water fixture (i.e., the distance of pipe required to hold one cup of water). This system would heat the pipes to ensure that the water currently in the pipes comes out hot. To figure out how to implement such a system, Mr. Klein maintains that we must answer the following five questions.

1. How many feet of pipe are in 1 cup of water?

2. What capacity water heater is needed to supply 1 gpm?

3. What is the heat loss (gain) in the pipe under different conditions?

4. How does effective pipe length impact the delivery?

5. What is the actual flow rate from fixtures at different pressures?

Taking these questions into account, Mr. Klein's preliminary analysis indicates that a demand controlled pump would be the most cost-efficient pump to use in a recirculation system.

Results of a laboratory experiment conducted by Mr. Klein that modeled a house with a distribution system imply that insulation improves performance during delivery, use, and between uses. There must be less than half a cup of water between the hot water source and the fixture to ensure that no more than one cup of water is wasted while waiting. To optimize economics, water conservation, and comfort, the line should be primed and then the pump should be shut off. He also found that structured plumbing provides a practical, cost-effective way to optimize the distribution system. He also concluded that substantial water and energy savings can be realized from multi-family and commercial buildings.

In conclusion, Mr. Klein believes that all stakeholders, including home owners, renters, property managers, and water and energy utilities, would benefit from distribution systems that generate hot water within two seconds.

Humidifiers
Peter VanderPlaat, CEO, Desert Spring Products

Mr. VanderPlaat, CEO of Desert Spring Products, presented information on residential humidifiers and water conservation. Mr. VanderPlaat believes that maintaining humidity control is an essential component of ensuring desirable indoor air quality. While humidifiers are low on the public radar, Mr. VanderPlaat contends that certain popular humidifier technologies have substantial environmental impacts when it comes to water use. To maintain the desirable level of humidity (30 to 50 percent) year-round, most homes require supplemental humidification during the heating season.

Today, there are two main types of residential humidifiers: 1) "portable" such as a console or table-top humidifier, and 2) "whole-house" which is tied into the central furnace and duct system. Mr. VanderPlaat maintains that the portable humidifiers—whether they be a vaporizer, wick, or ultrasonic system—are virtually 100 percent water efficient. There are two types of whole-house humidifiers, active and passive. Active systems work via direct injection using misters or steamers. The misters create a mist of water that runs through the duct system. This type of system requires a pretreatment of water and scheduled maintenance of the nozzle to keep it clean. Steamers require a separate energy source to create the steam that runs through the duct system, but if the furnace temperature drops, the steam can condense and water can pool in the duct systems. Passive systems by-pass the air stream from the furnace to bring water to the

system. Passive systems include drum, flow-through, or rotary disc systems. Drum systems tend to be very reliable, but require scheduled maintenance to remove calcification from the drum. Rotary disc systems are now being developed that use evaporative media on plastic discs. Mr. VanderPlaat contends that whole-house humidifiers that work via drum, rotary disc, mist, and steam systems are virtually 100 percent water efficient. The flow-through systems, however, are not water efficient, but they are one of the best sellers, with approximately 400,000 units installed annually. The flow-through systems employ a simple design where the tap opens up and water flows through the pad and then the warm air flows through the pad. The problem is that most of the water—90 percent on average—is not vaporized and sent though the duct system but rather caught and sent down the drain. According to research reviewed by Mr. VanderPlaat, the amount of water consumed in some types of flow-through humidifiers exceeds the amount of water used for flushing toilets and even for washing. Ten years' worth of data from the city of Toronto, Canada, indicate that some flow-through humidifiers waste nearly as much water as used by clothes washers.

Therefore, Mr. VanderPlaat believes that humidifiers present an important opportunity to conserve water. Mr. VanderPlaat stated that municipalities and EPA can affect change by providing humidification education. He maintains that there is an enormous gap of knowledge in simple definitions such as relative humidity and why humidity helps health, home, and indoor air quality. Mr. VanderPlaat also believes that municipalities and EPA can affect change by identifying efficient and effective technologies such as rotary disc technology and portable console units. Mr. VanderPlaat also recommends that municipalities and EPA take action and offer rebates for efficient humidifiers, include humidifier information in newsletters and on Web sites, and support new standards for the industry.

Utility Viewpoints
Ed Wilcut, Conservation Planner, San Antonio Water System
Tony Gregg, Water Conservation Manager, City of Austin

Mr. Wilcut, a Conservation Planner with the San Antonio Water System, began the presentation by discussing some issues associated with low-flow toilets. Mr. Wilcut maintains that low-flow toilets are still overcoming the public's perception of poor performance. He contends that part of the problem is that all flappers are not created equal. In 2002, EBMUD and the city of Seattle conducted a study on toilet flappers and concluded in part that salespeople are not properly educated on the different types and models of flappers on the markets. Other problems associated with low-flow toilets include flushing performance, glazing, bowl rinse, the chain, the flush valve, the overflow tube, industrial flush toilets and valves, regular maintenance, and diversion devices. To overcome these problems, Mr. Wilcut made the following recommendations.

- Establish and set higher manufacturing and performance standards.
- Pass laws outlawing toilets that require certain flappers.

- Use rubber or plastic instead of metal chains to avoid corrosion between metals.
- Incorporate some type of fail-safe system to prevent catastrophic leaks.
- Clearly label the correct water level on the overflow tube.
- Encourage routine maintenance guidelines with all toilets sold.
- Prohibit the installation of industrial flush valves above 1.6 gpf.
- Educate the public and retailers.

Mr. Wilcut maintains that the results of a toilet rebate conducted in San Antonio, Texas, indicate that the majority of people participating in the rebate were replacing broken toilets and that the rebate was not creating a behavior change. Recently, San Antonio has been conducting toilet distributions that have resulted in 30,000 low-flow toilets installed in homes that would otherwise be using non-low-flow toilets.

In conclusion, Mr. Wilcut recommended that EPA consider the following list of products in the development of a water-efficient product labeling program: hot water recirculating systems, dish washers, clothes washers, X-ray equipment, dental vacuum systems, ice machines, autoclaves, unconventional cooling tower treatment devices, garbage disposals, and restaurant spray valves.

In the second half of the presentation on utility viewpoints, Mr. Gregg, the Water Conservation Manager for the city of Austin, Texas, discussed the impacts of tighter toilet specifications. Prior to 2002, Mr. Gregg indicated that the city of Austin's toilet rebate program offered rebates of $60 per toilet with no criteria for replacement toilets other than it be a 1.6 gpf toilet. He maintains that this program was vulnerable to the loss of conservation savings when the flappers were improperly replaced. Currently, Mr. Gregg stated that Austin's toilet rebate program offers a rebate for the purchase price of the toilet up to $100, and that replacement toilets must meet the following eligibility specifications: use no more than 2.1 gpf if retrofitted with a standard flapper, and maintain a flushing performance index of less than 3.0 on the National Association of Home Builders (NAHB) study. Three pressure assist or vacuum assist models not included in the NAHB study are included in Austin's rebate program. Mr. Gregg indicated that Austin's new rebate program has eliminated rebates for toilets with early closing flappers. Austin's current list of eligible toilets includes 20 models from 15 manufacturers. Therefore, Mr. Gregg maintains that although a stringent toilet labeling program would reduce the number of eligible models, it would demonstrate how far manufacturers need to go in developing efficient low-flow toilets. In conclusion, Mr. Gregg believes that water-efficient products are different than ENERGY STAR products because unlike ENERGY STAR products, the performance of water-efficient products such as toilets and faucets can be easily tampered with and altered.

5. GROUP DISCUSSION: MARKET ENHANCEMENT FOR WATER-EFFICIENT PLUMBING PRODUCTS

The first panel of presentations was followed by a facilitated discussion. Fellow panelists and audience members were free to ask questions as well as comment on remarks given by the first set of panelists.

David Viola commented that manufacturers of plumbing products should not be blamed for the unavailability of replacement parts in retail stores. He cautioned EPA against creating a labeling program and awarding manufacturers for the availability of their replacement parts in retail stores. Mr. Viola indicated that this is a big concern for PMI.

Anna Thurston, Water Conservation Specialist with Tacoma Water, questioned Michael Chandler and Ed Wilcut about mechanisms to remove retrofitted low-flow toilets from the market. Ms. Thurston has defined these retrofitted low-flow toilets as toilets that were not originally designed to be low-flow but have been considered to be low-flow after inefficient retrofits were installed. Ms. Thurston maintains that these toilets are not reliable and erode quickly over time. She asked whether it should be up to the manufacturers, retailers, or utilities to pull these poor performing products off the market. Some of her concern is due in part to the fact that U.S. Representative Joseph Knollenberg of Michigan—the man who tried to stop the passage of the plumbing efficiency standards in the National Energy Policy Act—is still active in politics. Michael Chandler responded that the water industry does not have a mechanism in place to identify products that are performing poorly but acknowledges that some of the non-name brand products on the market do cause problems and usually are used in a lot of high volume installations. Mr. Chandler also acknowledged that there are a lot of products that were sold during the conversion of a standard flush of 3.5 to 1.6 gallons that may not be achieving the 1.6 gpf standard. He maintains that many stakeholders are involved in dealing with this issue. Ed Wilcut responded that the utilities and manufacturers need to work together on this issue.

Peter DeMarco, Director of Compliance Engineering for American Standard, Inc., commented that the industry has been addressing the performance issues of low-flow toilets and that toilets have undergone an evolution to increase their performance. Mr. DeMarco maintains that the issue of adjustability is being addressed through the American Society of Mechanical Engineers (ASME), including the issue of corrosion. He contends that flappers manufactured today undergo a stringent test that subjects them to exposure of in-tank toilet cleaners. Mr. DeMarco also stated that there is an ongoing identification process being conducted that will result in consumers being able to look up and identify the appropriate flapper for their toilet model to maintain appropriate water usage levels. Mr. DeMarco commented that American Standard does support EPA's water-efficient product labeling initiative and believes it will be useful in differentiating between products in the market place and not slow down any product development activities at American Standard, Inc.

Ed Osann asked Keith Kometer whether Kohler has conducted any research on the delivered rate of flow that is necessary for acceptable hand washing and hair washing. If the standard faucet flow rate is 2.2 gpm and if 0.5 gpm is too low of a flow for hand washing, Mr. Osann asked whether the industry has identified a flow threshold for activities such as hand washing. Mr. Kometer responded that Kohler does not have any direct research on the acceptable thresholds for hand washing and hair washing. He believes that there is a degree of personal preference involved in that some people prefer a stronger flow or spray than others. He believes that the different faucet spray types may also affect performance, in that laminar sprays may feel and coat hands better at a more restricted flow than aerated sprays. Ed Wilcut responded that San Antonio has distributed more than 30,000 1.5 gpm faucets and 2.0 gpm showerheads to apartments in San Antonio and no one has complained.

Christopher Galik, an Environmental Policy Analyst with NAHB, stated that he agrees with the comments made by Mr. Klein and that EPA needs to consider the product versus the systems approach and the voluntary (e.g., market enhancement) versus the regulatory side (e.g., codes) of the program that may limit customer choice and increase the cost of housing. Gary Klein agreed with Mr. Galik that EPA must look at both products and systems at one time because if you do not have appropriate plumbing you will exacerbate the problems associated with water-efficient products. He also believes that EPA must develop a program that is open to future innovative alternatives to water-using products such as a “sonic shower” when it determines how it will rate water-efficient products. For example, Mr. Klein questioned the audience to determine which is more energy and water efficient, an electric razor or a water-based razor.

Mary Ann Dickinson commented that she was very intrigued with the consumer perception issue that has been discussed and acknowledged that manufacturers are making great efforts at being water efficient. She was, however, appalled to discover at the 2004 Kitchen and Bath show in Chicago, Illinois, that every manufacturer of showers was also selling multiple showerhead systems that use over 15 gpm for the total shower experience. She stated that several industry representatives at the show commented that these systems were designed in response to customer surveys indicating that the customers want hotter, wetter showers. Ms. Dickinson asked whether we can change the National Energy Policy Act to specify that the standard is for the total shower and not the individual fixture. Secondly, she questioned the ability to market ultra-low-flow showerheads when market research indicates that consumers want hotter, wetter showers. Keith Kometer responded that the manufacturers decisions to design and produce multihead shower systems is based on more than just customer surveys. It is also based on the fact that consumers are buying the systems and paying for a shower experience. Mr. Kometer indicates that they have seen a dramatic increase within the United States at the higher end of the market. He also indicated that manufacturers are working to increase customer satisfaction with individual showerheads that are water restricted. Mr. Kometer also responded that Kohler has developed alternatives to the multihead shower system. Specifically, Kohler has developed a recirculating system that does not use fresh water each time. Although this may not meet the desire to be clean, it does offer the experience of using a lot of water in the shower. Consumers, however, have not responded as favorably to this approach as the multihead shower system.

Michael Chandler responded that education is needed to have an effective communication with the consumers. He believes that the 56 percent of the consumers that are aware of the ENERGY STAR logo do not really understand the program. Therefore, Mr. Chandler contends that EPA could leverage its ENERGY STAR and Water Star marketing dollars to increase awareness on water and energy efficiency. He also believes that based on consumer behavior over time, increasing the cost of water would help promote water conservation. Tony Gregg responded that demand can always be created for new products that are not necessary (e.g., six head shower systems, Hummers) but that the likely response from utilities will be to try to change the plumbing codes to prohibit the products and pass new state laws.

Larry Acker, CEO of ACT Inc. Metlund Systems, commented that the cost of water must be increased to create conservative behaviors. Mr. Acker asked Mr. Klein to expand on the behavioral habits of people with respect to water usage and to describe the impact of plastic piping and type of piping (e.g., parallel) on hot water systems. Mr. Klein responded that human behavior can double or triple the amount of water wasted while waiting for hot water. However, Mr. Klein believes that behaviors could change if hot water was delivered quicker. Mr. Klein stated that parallel piping has been found to be better in systems where there is a long duration between hot water uses, but that trunk line systems were better in cases where there were one use after another. Mr. Klein declined to comment on the performance of plastic piping, stating that he does not know enough about the material to make an informed comment.

Cindy Hansen, Water Resource Specialist with the San Diego County Water Authority, asked Mr. Gregg about customer response to Austin's new list of approved toilets. Mr. Gregg responded that the list promotes dialogue between utilities and customers as to why specific products are not on the list, which creates a one-on-one education process about early closure flappers and performance. Mr. Gregg also believes that the stores understand why the city has created the list even if they do not agree with the list. Mr. Gregg also commented that the city of Austin would be glad to raise water rates, but water is based on the cost of delivery, which will probably not change any time soon. He does not believe that raising the cost of water is a solution to promoting water conservation because the cost of water is still lower than other costs incurred by the homeowner.

Lou Bendon, Vice President of PMSI, asked Mr. Kometer to describe Kohler's marketing efforts to promote and research and design efforts to design multiple showerhead systems and/or new showerhead options. Mr. Kometer responded that Kohler offers some materials on how the systems should be designed to get the proper flowrates and performance from each showerhead. They are generally sold through two step distribution and are generally specified by a salesperson/designer at one of the showrooms. Mr. Kometer also stated that Kohler offers a variety of body spray options and always allows the consumers to turn off all but one showerhead. Mr. Kometer indicated that Kohler has found that people often like to take a shower with just a single showerhead when they are rushed and/or getting ready for work, and prefer the multiple showerheads when they have time to relax and enjoy the experience. Mr. Kometer believes that more lower-flow showerhead options will be coming down the road as the consumer demand increases. To date, there have been regional and local requests for lower-flow

showerheads and he predicts there will be an increase in requests in the future. Mr. Kometer stated that Kohler does have people test different showerheads during the research and design phase to solicit direct input. The company seeks ways to maximize the shower experience while minimizing the amount of water used. Mr. Kometer maintains that Kohler markets this approach with its lower-flow showerheads. Mr. Chandler also responded that Kohler is putting a significant amount of money behind the water-saving products it has been developing for a number of years on a voluntary basis. Mr. Chandler also reminded the audience that multiple showerhead products account for less than 0.1 percent of the water used in homes due to their high costs.

6. PANEL DISCUSSION: OPPORTUNITIES AND BARRIERS FOR WATER-EFFICIENT PLUMBING PRODUCTS—QUALITY AND PERFORMANCE ISSUES

Stan Wolfson, Executive Director, American Society of Plumbing Engineers

The first presenter of the second panel was Stan Wolfson, Executive Director of the American Society of Plumbing Engineers (ASPE). Mr. Wolfson began his presentation by stating that ASPE fully supports energy and water efficiency, the environment, self-sustaining buildings, and the development of new technologies. Mr. Wolfson identified several concerns with EPA's water-efficient product labeling initiative. Overall, he indicated that he was not comfortable with the voluntary and labeling aspects of the program, citing problems associated with implementing the efficient plumbing standards in the 1992 Energy Policy Act. First, Mr. Wolfson stated that EPA is lacking the necessary information to evaluate and make decisions about the benefits and value of a labeling program. Specifically, he questioned who would create the label—EPA staff, a special or standards committee, manufacturers, consumer groups, or engineers and contractors. Mr. Wolfson also questioned whether the program would distinguish between residential, commercial, industrial, and institutional sectors. In addition, Mr. Wolfson questioned whether consumers would be warned about retrofitting or installing replacement parts in water-efficient products with respect to maintaining the expected performance level. Mr. Wolfson believes that a labeling program must determine what kind of scale should be used, how to measure efficiency, and establish program goals.

The second concern identified by Mr. Wolfson is an identification of the products to be labeled. Specifically, Mr. Wolfson questioned whether they would be fixtures, piping systems, plumbing systems, or everything together. He also questioned whether the whole product or fixture would be labeled or just specific parts. He maintains that the appliance itself must be measured for efficiency, as done by the ENERGY STAR program. Mr. Wolfson also questioned who would create the standards. Next, he questioned whether a monitoring system would be established and if so, who would conduct the monitoring. Another concern was determining the effects of a labeling program on existing plumbing codes and standards. He also questioned how EPA would establish and implement testing protocols and determine who is meeting the specified performance standard (e.g., through certification, licensing). Mr. Wolfson also questioned who would conduct the research and testing of the products for inclusion in the

program and asked how EPA would determine the impact of new products on existing infrastructure (e.g., drain lines, water inlet pressure, backflow preventors, mechanical devices, plumbing systems) and in-place system elements (e.g., water temperature, residential/commercial venting, water pressure in the line, water treatment facilities, waste water removal). Finally, Mr. Wolfson questioned the effects on future system elements, such as grey water collection systems, grey and black water separation systems, and packaged filtration systems.

International Code Council and the Environmental Protection Agency
Kraig Stevenson, Regional Manager of Governmental Relations, International Code Council

Mr. Stevenson, Regional Manager of Governmental Relations for the International Code Council (ICC), began his presentation by describing the mission and structure of ICC, which was founded in 1994. ICC is a 50,000-member association dedicated to building safety with more than 190 years of collective experience in developing the codes used to construct residential and commercial buildings, including homes and schools. Mr. Stevenson stated that international codes are a comprehensive set of codes for all areas of building safety that are adopted by city, county, state, and federal government agencies. To date, codes are used in 48 out of 50 states across the United States.

ICC has two sister organizations, the International Accreditation Service (IAS) and the ICC Evaluation Service (ICC-ES). Together, Mr. Stevenson maintains the ICC family can help create a comprehensive listing program for EPA. Although good level compliance could be achieved with a voluntary program, Mr. Stevenson believes that standards can help increase compliance. He maintains that ICC can provide experience with energy and plumbing codes to EPA's program and that EPA and ICC could partner to develop water conservation requirements through the ICC code development process. Mr. Stevenson suggested conducting consumer education to help consumers understand how to use the label.

Mr. Stevenson described ICC-ES and IAS as a subsidiary, nonprofit, public-benefit corporation of ICC. He stated that ICC-ES performs technical evaluations of building products, components, methods, and materials, including plumbing products. Mr. Stevenson stated that ICC-ES issues evaluation reports on product code compliance that are available free of charge on the Internet at <http://www.icc-es.org>. These reports help officials consider approval of technology in an informed and timely manner. Mr. Stevenson indicated that IAS assesses and monitors the acceptability of testing laboratories, calibration laboratories, inspection and quality control agencies, and fabricators. He contends that IAS ensures that testing labs where manufacturers have their water conservation products (e.g., faucets) tested are accredited and qualified to test products correctly. Mr. Stevenson believes that IAS is well-known as a trusted and qualified accreditation service and is recognized by national and international organizations. Mr. Stevenson maintains that ICC-ES would be able to provide a listing/evaluation service for products that comply with water conservation standards established by EPA and can be incorporated into the international codes.

Opportunities and Barriers for Water-Efficient Plumbing Products
Bill Gauley, President, Veritec Consulting Inc.

Bill Gauley, President of Veritec Consulting Inc., cautioned EPA and the audience to carefully evaluate the measurements, standards, and other values assigned to EPA's water-efficient product labeling program to ensure they are not misleading. He maintains that humans are curious and like to assign values to things even if they are wrong. He also contends that EPA should determine if the program should use exact, relative, or vague measurements depending on the objective of the measurement. Mr. Gauley maintains EPA's challenge is where to draw the line between efficient and inefficient. He believes that it is fairly obvious when something is very inefficient as well as very efficient, but it is not as obvious when a product is marginally efficient or inefficient. Mr. Gauley also believes that EPA must consider whether efficiency extends beyond water usage and whether its long-term vision of efficiency extends beyond its current vision. If EPA's labeling program is intended to help the consumer and lower system demands, Mr. Gauley questions whether the program should consider aspects beyond water demands such as water quality. He also guarantees that some individuals or groups will disagree with the system once it is developed; but once it is developed, the system must be followed for it to work. Mr. Gauley believes that this program does not face "barriers," but rather "challenges" and that all challenges are actually opportunities. In conclusion, Mr. Gauley contended that whatever rating system is developed, it must make sense to the public and the industry; it must work towards achieving program goals; it must be meaningful; and it must be both rigid and flexible. When designing the program, he believes that EPA must look closely, then step back and look at the big picture; involve industry because it knows more about future innovations and directions; and develop easy-to-use guidelines. Mr. Gauley maintains that this is an excellent opportunity to establish meaningful standards and improve the market.

Charles Mitchel, Washington State Chapter President, National Association of Plumbing Heating and Cooling Contractors

Mr. Mitchel, State President of the Washington State chapter of the National Association of Plumbing Heating Cooling Contractors (NAPHCC) and founder of Mitchel Plumbing Company, discussed some of the opportunities associated with EPA's initiative. Mr. Mitchel believes that this program could help consumers learn more about water conservation issues and become more water efficient. He stated that one of the goals of NAPHCC is to help train plumbing contractors that are not members of the association, since only about 15 percent of all plumbing and heating contractors are members of this association. Mr. Mitchel maintains that NAPHCC is a proactive group and that it would like to actively participate on this issue to ensure that installers are not overlooked. He stated that he is interested in issues associated with repairing and replacing existing fixtures. Mr. Mitchel contends that every manufacturer has a different way of making the same fixture and that plumbing contractors must be educated in proper maintenance and repair issues and be knowledgeable about where to purchase the replacement parts. These contractors are the people who interact with the consumers and, therefore, can help educate the consumers about water conservation. He also believes that EPA and plumbing contractors should consider water reuse options. In conclusion, Mr. Mitchel stated

that there are many ways to conserve water and asked EPA to keep plumbing contractors in the loop as this program develops.

7. GROUP DISCUSSION: QUALITY AND PERFORMANCE OF PLUMBING PRODUCTS AND SYSTEMS

The second panel of presentations was followed by a facilitated discussion. Fellow panelists and audience members were free to ask questions as well as comment on remarks given by the second set of panelists.

Evelyn Ledsham, Director of Sales and Marketing for Desert Spring Products, asked Mr. Mitchel to identify the top three issues that he has heard from consumers with respect to appliances and water efficiency. Mr. Mitchel responded that customers in Washington State: 1) request a hot water recirculating loop to minimize the wait for hot water, 2) complain about the performance of the low-flow toilets, though he did indicate that this has diminished during the past few years, and 3) complain about the performance of low-flow showerheads.

Anna Thurston commented that she hopes the program will look beyond labeling and examine what sells and what drives consumers. She also believes that the program should educate consumers on why it is important to conserve water.

Stan Wolfson commented that EPA should address the potential health issues associated with low-flow showerheads (e.g., Legionnaires' disease) and bad drainage systems (e.g., severe acute respiratory syndrome).

Ed Osann responded to some of the comments made by Stan Wolfson during his presentation. First, Mr. Osann maintains that EPA and the Steering Committee for Water-Efficient Products is looking at other approaches in addition to product labeling. Mr. Osann contends that EPA's labeling program is not designed to be the "silver bullet" on the infrastructure concerns and referred Mr. Wolfson to EPA's sustainable infrastructure Web site at <http://www.epa.gov/water/infrastructure/index.htm> to learn more about EPA's water efficiency efforts. Secondly, Mr. Osann clarified that EPA's intent has always been to develop an entirely voluntary program, not a regulation. Finally, Mr. Osann stated that EPA's program is supported by more than 117 stakeholders and is intended to be modeled after the ENERGY STAR program unless there is a compelling reason to do something completely different.

Leonard Fleckenstein, Policy Analyst with EPA's Office of Water, asked Mr. Stevenson who pays for the evaluation of a particular product and whether ICC has a related verification process. Mr. Stevenson responded that manufacturers are paying for the evaluation process. Mr. Stevenson also stated that ICC does have a followup program to monitor each particular product. He indicated that manufacturers like to have a standard with monitoring to ensure that they are all competing on the same ground.

Sally Remedios, Manager of Product Compliance for Delta Faucet Company, commented that this industry does not do a good job educating the consumer. She also indicated that manufacturers are already required to list the water usage of the products developed and submit an annual report to the Federal Trade Commission and the DOE. Ms. Remedios suggested that a consumer survey be conducted to determine if consumers ever look at the water usage rates when selecting a product to purchase.

Stan Wolfson commented that although he understands the intent of EPA's water-efficient product labeling program, he does not understand how EPA plans to define the program.

Mary Ann Dickinson commented that the mandatory labeling of flow rates conveys to the consumer that the product meets a legal standard. However, she contends that one of the goals of EPA's labeling program is to provide incentives for super-efficiency and differentiate which product has gone the extra mile and uses less water than the others. Ms. Dickinson believes that this was one of the primary goals of ENERGY STAR at the beginning of its program. The label will give the consumers a simple message, not that the product meets a legal standard, but that in the array of products that they are looking at (e.g., clothes washers) some will have no stickers, some will have an ENERGY STAR sticker, and some may have both an ENERGY STAR and Water Star sticker. This will provide a hierarchy of products so that they can make informed decisions. Ms. Dickinson does not believe that EPA could do enough education to get a consumer to recognize the difference in flow rates between products. She believes that the program should tell the consumer that "if you buy this product you will save more water on a unit basis than a product without the label." Ms. Dickinson commented that one of the goals of the stakeholder meetings is to solicit opinions on how the goals and standards should be articulated; therefore, she asked the manufacturers to provide their opinions on what type of standards they could deal with under this program.

Gunnar Baldwin, Senior National Account Manager for TOTO USA Inc., commented that to meet the goals of this program, utilities should charge the real cost of producing water. He does not believe that utilities are looking at the total cost of water treatment, future water treatment, and infrastructure replacement costs when setting water rates. Mr. Baldwin also believes that consumers must have an intense desire to save water and without this desire the average citizen will not read the labels. Mr. Wolfson responded that more research should be conducted so that we waste less water. Mr. Mitchel responded that it would be a luxury to charge what water is worth, but that maybe utilities could tax excessive water usage.

John Koeller, Principal of Koeller and Company, thanked Mr. Wolfson for allowing an article written by himself and Bill Gauley to be published in his magazine. However, Mr. Koeller questioned Mr. Wolfson's statement that he is confused about the process. Mr. Koeller stated that EPA is involving industry at this early stage to solicit its input before the program is developed. Although Mr. Wolfson's questions are legitimate, Mr. Koeller maintains that EPA never intended to have them answered by this meeting.

Ed Osann commented that publicly owned treatment works are working towards cost-based pricing; however, he does not expect that this new system will occur in the near future. Mr. Osann believes that there are options within the concept of cost-based pricing that can be explored. He maintains that appropriate rate structures can convey to consumers that the cost of water is substantial, and is rising. In addition, Mr. Osann believes that a labeling program and water pricing strategies are complementary to each other, and one should not be delayed before starting on the other.

Peter DeMarco commented that these meetings provide an excellent opportunity for exchanging ideas and soliciting stakeholder input. He believes that Mr. Hanlon's presentation at this and other meetings implies that EPA is listening to what is being said and will address the issues as appropriate. Mr. DeMarco believes this will be a great program and that water-efficient products will take a little bite out of the infrastructure gap.

Larry Acker maintains that since water bills are generally small compared to other bills incurred by consumers, people do not understand the issues associated with a water crisis. He maintains that consumers have questions on certain water issues (e.g., waiting for hot water), but that EPA must educate them about other water issues. In addition, Mr. Acker contends that manufacturers are economically motivated and will regulate themselves, but not their competitors. He also believes that larger manufacturers will try to stop the innovations developed by smaller manufacturers. Mr. Acker maintains that EPA and industry need to start making decisions and become the leaders in water efficiency because water and pollution issues may create irreversible problems in the near future. He believes the program should be conservation oriented to save water. When asked if recirculating systems are good, Mr. Mitchel said that they provide comfort and energy savings with appropriate operation measures in place. Mr. Acker stated that recirculating systems result in substantial heating loss that is not considered energy efficient by utilities, but since consumers request the system, they are being installed and the energy efficiency issues are slowly being addressed. He maintains that EPA and industry are on the right track of doing something to save water.

Richard Harris commented that utilities that are trusted to provide a commodity have to provide the commodity. He maintains that utilities feel a lot of pressure to develop a program to identify water-efficient products. Mr. Harris stated that consumers have approached him asking about fact cards, information, and labels to help them make informed decisions about water-using products. He contends that his policymakers are telling him to provide this customer service. With respect to water rates, Mr. Harris maintains that EBMUD has a three-tiered rate that is a conservation, volumetric rate incentive for residential users and is looking at other tiered incentives for non-residential users. EBMUD has been receiving questions from residential users about ways to get down into a lower tier of the rate. Based on these comments, EBMUD has been increasing its incentive and education programs and believes that if it had a Water Star program it could point to it as a method for conserving water. Without a national Water Star program, Mr. Harris maintains that EBMUD will be forced to develop a water-efficient product labeling program on its own.

8. PANEL DISCUSSION: ENHANCING THE MARKET FOR WATER-EFFICIENT APPLIANCES

The third panel discussion of the day focused on water-efficient appliances. The panel consisted of three presenters representing Maytag Corporation, Whirlpool Corporation, and the Tualatin Valley Water District.

Residential and Commercial Clothes Washers
David Steiner, Vice President of Government Affairs, Maytag Corporation

Mr. Steiner, Vice President of Government Affairs at Maytag Corporation, discussed opportunities for saving water with clothes washers. Commercial clothes washers make up approximately two percent of clothes washer sales in the United States. Mr. Steiner believes that manufacturers have been able to design washers that wring more water out of clothes than in the past. Consumers and businesses, however, want more efficient products, and the ENERGY STAR label gives products a competitive advantage in the residential and commercial sectors.

Mr. Steiner contends that clothes washers have been achieving dramatic water savings. Specifically, he maintains that water usage decreased 15 percent between 2002 and 2003. The upcoming 2004 and 2007 DOE standards require that clothes washers be redesigned and retooled and are expected to result in additional water savings. The 2004 standard should result in a water savings of 1,568 gallons per year per machine and the 2007 standard should result in a water savings of 7,095 gallons per year per machine. Mr. Steiner, however, maintains that the consumer will not sacrifice the following features for efficiency: cleaning performance, large capacity, quiet operation, clothes care, easy loading, user friendly controls, and high quality. He also maintains that consumers want clothes washers at the lowest possible price and will not compromise on health and sanitary concerns.

Mr. Steiner stated that Maytag's Neptune® model has been an excellent example of efficiency for more than seven years. The Neptune® was the first ENERGY STAR clothes washer on the market in 1997 and sold 2.4 million units, saving 980 million kWh of energy (enough energy to light 980,000 homes for a year) and 9.8 billion gallons of water (enough water for all Sacramento, California citizens to shower for three years). Mr. Steiner stated that domestic and foreign competitors soon entered the market and that high efficiency, front-load washers are the fastest growing market segment today. Recently, ENERGY STAR models have been introduced into the conventional top-loading market. Maytag's Neptune® TL, for example, is a top-load model that results in energy and water savings that are nearly equal to the front-load Neptune® model.

Mr. Steiner believes that the ENERGY STAR program works, as ENERGY STAR clothes washers exceed 30 percent of sales in some markets even though they tend to be more expensive. Mr. Steiner also believes that extending the brand to water efficiency will strengthen brand equity. He contends that voluntary labeling educates consumers, drives positive purchasing decisions, encourages innovation in the marketplace, and rewards manufacturers for

stretch targets. Mr. Steiner maintains that the industry faces future challenges, as 65 percent of consumers prefer top-load washers, high-efficiency washers tend to cost more than conventional agitator style washers, low water factor standards can result in cleaning problems and sanitary concerns from poor rinse quality, and anecdotal evidence suggests that low-water-factor machines are sometimes tampered with in the field. In conclusion, Mr. Steiner recommends that EPA establish voluntary labeling for both energy and water savings because:

- It will encourage water efficiency measurement.
- The public understands and supports the label's value.
- It will offer marketplace incentives for manufacturers to design efficient products.
- It will reward innovation.
- It is easier to implement than a regulatory alternative.

Dishwashers
Thomas Catania, Vice President of Government Relations, Whirlpool Corporation

Mr. Catania, Vice President of Government Relations for Whirlpool Corporation, discussed the water savings associated with automatic dishwashers. Mr. Catania maintains that dishwashers provide an interesting opportunity for saving water, but, he believes that more work needs to be conducted to understand the full scope of this opportunity. He stated that the water usage data on dishwashers is not very good, but that existing data indicate that there is a water savings opportunity. Dishwashers, however, only account for approximately three percent of the domestic water usage in the United States.

Mr. Catania identified several water saving opportunities for household dishwashers. Specifically, Mr. Catania maintains that industry should increase the market penetration of automatic dishwashers—the market is currently 60 to 65 percent saturated. One significant advantage of automatic dishwashers is that they use approximately 7.2 gallons of water per load, while hand washing uses approximately 30 gallons. Mr. Catania believes that there is a need to change consumer habits of prewashing and rinsing dishes before loading them into a new, efficient dishwasher. He estimates that breaking this habit could save as much as 20 gallons per load of dishes. According to Mr. Catania, new dishwashers with soil sensors only require that the food be scraped off the plates. He cautioned against prewashing the plates because dishwasher detergents could attack the dishes and utensils themselves if no soils are present.

Overall, Mr. Catania believes that automatic dishwashing results in a significant reduction in water consumption when compared to hand washing. In addition, there is a large variation in water usage, especially in hand washing. Automatic dishwashers use between 9.2 and 14.8 gallons of water to clean 12 place settings, while hand washing four place settings uses

between 5.6 and 29 gallons of water. Mr. Catania maintains that EPA and industry should work together to:

- Educate consumers on the benefits of automatic dishwashers.
- Improve our data by learning from consumer observation/attitudinal studies.
- Transform the market by developing rebate programs.

Mr. Catania believes that this program should leverage consumer awareness without adding unduly burdensome or confusing testing and labeling requirements. He stressed that EPA must be careful not to inundate consumers with too many stickers—they might ignore all of them.

Utility Viewpoint
Tina Alexander, Conservation Coordinator, Tualatin Valley Water District

Ms. Alexander, Conservation Coordinator for the Tualatin Valley Water District (TVWD), discussed TVWD's role in conservation as well as its rebate program for washing machines. Ms. Alexander stated that TVWD serves approximately 180,000 people in Washington County, which is west of Portland, Oregon. Most of these customers are residential (95 percent of the accounts and 75 percent of the water usage). Although TVWD is a water provider only, it bills jointly with the sewer and stormwater agency.

Ms. Alexander maintains that since the drought of 1992, TVWD has consistently emphasized conservation and joined the Regional Water Provider's Consortium Conservation Committee, which has more than 20 water utility members, to implement and integrate regional conservation efforts (as part of the Regional Water Supply Plan developed in 1995). Ms. Alexander contends that since 1993, TVWD has been very supportive of regional conservation efforts and has launched a summer marketing campaign, youth education programs, and trade ally workgroups. TVWD has also maintained a water-efficient demonstration garden at its district office. The regional conservation committee maintains a Web site at <www.conserveh2o.org> that contains a kids' page with an interactive map that shows how water works.

Ms. Alexander stated that initially TVWD focused on reducing outdoor water use and detecting and repairing leaks with the objective of curbing the summer peak. After the drought of 1992, however, TVWD recognized the importance of educating its customers on wise water use. Support for a conservation program came from throughout the organization and TVWD allowed staff to spend time on a conservation plan for the district that includes: conservation efforts, education, regional and national committee participation, the creation of a list of lessons learned, and coordination with other water providers to convey consistent messages. These efforts resulted in TVWD taking on a leadership role in water conservation.

Ms. Alexander stated that TVWD's washing machine rebate is conducted at the local level. Although the rebate was identified as a regional one, Ms. Alexander contends that there is not yet consensus on how to process the rebate for all 20 members of the regional conservation committee. In the past, TVWD focused on outdoor water conservation, but now the organization wants to develop programs with indoor conservation measures, and TVWD also wants to develop new incentive programs for residential customers. Ms. Alexander also maintains that TVWD saw an opportunity to "piggyback" on Oregon's Energy Tax Credit for energy efficient washing machines and forge a positive relationship with appliance retailers by establishing a washing machine rebate program.

TVWD's $50 washing machine rebate was implemented in 2002, and TVWD customers and residents of the city of Sherwood participate. Ms. Alexander believes that on average, TVWD processes 90 rebates per month for TVWD customers and eight for the city of Sherwood. TVWD identified the following six eligibility requirements for the washing machine rebate.

- Water accounts must be in good standing.
- The household must be a single family residence where one meter serves the unit; no apartments or multi-family dwellings are eligible at this time because water consumption cannot be evaluated.
- The washing machine must be installed within Sherwood or the district boundaries.
- A proof of purchase must be provided.
- The washing machine must pass a physical inspection conducted by a TVWD representative. This inspection ensures that program requirements are being followed.
- The washing machine must be on ENERGY STAR's list of qualified clothes washers.

Ms. Alexander stated that TVWD has encountered a number of challenges associated with the washing machine rebate. For instance, the organization has had problems tracking rebates in the customer billing process. In addition, it has taken time to educate customer service staff on the rebate. Some retailers are not using updated forms, and some customers are not completing the forms properly. Ms. Alexander stated that it is also difficult to conduct the inspections, as TVWD is usually closed by the time customers are home and willing to allow an inspection. In addition, customer expectations have doubled due to successful partnerships with many retailers, and effective promotion through TVWD's Web site, bill messages, and office materials. Thus, the program is a budget buster. Currently, TVWD is gathering customer consumption data—pre and post washing machine installation—to analyze actual customer water savings. The challenge, according to Ms. Alexander, is that many customers move in and

out of the district during the evaluation period. As a result, there are no post-use data. In addition, many customers bought their new energy efficient machines when they moved into the district, so there are no pre-use data. Also, the ENERGY STAR list focuses on energy rather than water savings, so water savings are not ensured by using the ENERGY STAR qualifying list. Although the state of Oregon and the Consortium for Energy Efficiency has a list of machines' water factor ratings, they are not as convenient to use.

Ms. Alexander believes that a water efficiency labeling program would ensure true water savings along with energy savings. She also believes that a labeling program would send a message to manufacturers to produce both water and energy efficient machines—both water and energy conservation are important to utilities. Water utilities could use the labeling program's qualifying list and be assured significant water savings. Ms. Alexander maintains that a national EPA label would be a great resource for consumers, allowing them to identify products that conserve energy and water in the absence of other incentives to purchase these products. A national EPA label would also provide generic criteria that water providers could use to promote water-efficient devices. Ms. Alexander stated that TVWD is implementing two other rebate programs—residential landscape rebate program (implemented in March 2004) and a toilet rebate program (which will be implemented in September 2004). Ms. Alexander believes that a label would help both programs.

In conclusion, Ms. Alexander believes that conserving water and energy will help create a sustainable future. She stated that an EPA water-efficient product labeling program would greatly benefit water utilities and promote conservation of the nation's water supplies. Furthermore, the United States will benefit from water conservation for years to come.

9. GROUP DISCUSSION: ENHANCING THE MARKET FOR WATER-EFFICIENT APPLIANCES

The third panel of presentations was followed by a facilitated discussion. Fellow panelists and audience members were free to ask questions as well as to comment on information in the presentations.

John Graham of Ecos Consulting, asked Ms. Alexander whether TVWD considered working with Portland General Electric or Northwest Natural Gas because they are also conducting ENERGY STAR promotions. Ms. Alexander responded that TVWD has not approached these two groups yet about its current rebate programs, but indicated that TVWD worked with them previously on a showerhead promotion. She believes that partnering with these groups is an option because they have audit programs that evaluate water savings.

Phil Manthei, Senior Staff Engineer for Alliance Laundry Systems LLC, commended Mr. Steiner for conveying what consumers want from clothes washers. Mr. Manthei pointed out, however, that the commercial laundry sector does not require product labeling for its appliances. He acknowledged that energy and water efficiency are intertwined in clothes washers and said

that the current FTC appliance labeling program is the proper mechanism for labeling residential clothes washers with respect to water savings. He recommends that EPA conduct a focus meeting with manufacturers to discuss its labeling proposal and solicit comments on the proposal during a public comment period.

Ed Osann commended the manufacturer representatives on the panel for developing successful methods for marketing water-efficient products to consumers. Next, Mr. Osann asked Mr. Catania whether a single company could implement a successful public education campaign to convince consumers to scrape rather than pre-rinse dishes that go into an automatic dishwasher. Mr. Catania responded that a broader, national campaign would be more effective than one a single company could produce. He believes that consumers are often skeptical about the claims made by manufacturers and maintains that a campaign would be more successful if it were produced by an unbiased group and contained data on expected water savings and potential environmental benefits. In addition, Mr. Catania believes that a campaign produced by an individual manufacturer, might focus on a component of the appliance that sets it apart from products manufactured by competitors rather than overall environmental benefits. Mr. Steiner also responded saying that Maytag launched a campaign to convince consumers to stop pre-rinsing their dishes. He believes, however, they might resume their old pre-rinsing habits if their dishwashers fail to adequately clean dishes a single time.

Kristin Taylor, Marketing Director for Laundrywise, asked EPA to look at where appliances are being used when developing this program. Ms. Taylor believes, for example, that apartment residents will save more water by using common laundry facilities than by using individual, in-unit clothes washers. She also believes that a water efficiency label will help encourage apartments to adopt common laundry facilities to conserve water.

Mark Kinter, Technical Consultant for Elgin Sweeper Company, commented that the street sweeper industry has found it challenging to get municipalities to use waterless street sweepers because of the public's perception that wet streets prove the street has been cleaned. Mr. Kinter maintains that significant amounts of water are being used by even drought stricken areas to clean the roads. For example, he contends that the city of Phoenix, Arizona, uses approximately 300,000 gallons per day and the Los Angeles Basin uses approximately 1.5 million gallons per day to clean the streets.

Jennifer Kropack, Water Efficiency Specialist at the state of Washington Department of Health, commented that the departments of Health and Ecology strongly support this program. She maintains that the state has heard from many water utilities that this program would benefit their water conservation activities. Ms. Kropack said that in 2003, the state of Washington passed legislation mandating the implementation of a utility water conservation program by 2006. She contends that Washington's voluntary water conservation programs were not successful in penetrating the statewide market. Ms. Kropack asked manufacturers to quantify water savings from their appliances, which would allow utilities to use this information in water conservation plans. Utilities have been silent servers of a public good, but now their role is changing, as they are being asked to educate consumers on what products to use and what

behaviors to change to address water resource issues. Ms. Kropack also stated that the state of Washington will begin posting comments on EPA's stakeholder meetings on its Web site.

Jerome Patterson, Conservation Technician for the Denver Water Department, asked Ms. Alexander whether TVWD experienced any legal difficulties with the requirement that customers be in good standing to be eligible for the washing machine rebate. Ms. Alexander responded that TVWD's legal department was involved in the development of its rebate form, which requires participating customers to sign statements affirming that they are in good standing. Mr. Paterson indicated that Denver encountered some problems with its $125 toilet rebate last year—some consumers were making money on the purchase of new toilets. Denver is changing its rebate, limiting it to $100. In addition, Denver will not grant rebates that exceed the purchase price of the toilets. Mr. Paterson also asked Ms. Alexander if TVWD will continue offering rain sensor rebates. Ms. Alexander responded that TVWD will continue encouraging the use of rain sensors to limit the amount of water that is used for irrigation during rain events.

Next, Mr. Paterson asked Mr. Steiner and Mr. Catania if consumers can obtain water usage information in print for the different cycles of their appliances. Mr. Steiner responded that Maytag has provided this information to retailers. He indicated that additional materials could be developed to better address these issues. Maytag could also update the data using new testing procedures. Mr. Catania responded that most manufacturers have highly developed Web sites with links to the water and energy usage of specific products, allowing customers to determine payback periods. In addition, Mr. Catania maintains that the FTC has indicated that it wants to enhance the energy label to include a water usage factor. In Europe, products are being rated on multiple dimensions including energy performance, water usage, and cleaning performance. These ratings allow consumers to see where manufacturers are making tradeoffs. Although the United States does not have this type of rating system, Mr. Catania believes that such a system would challenge manufacturers to reach a consensus on performance metrics.

Mr. Paterson commented that consumers have complained that the run time of new appliances is longer than the run time of older appliances. Therefore, he asked Mr. Steiner and Mr. Catania if they had considered listing the run time lengths for the different cycles of their appliances in owner manuals or other product literature. Mr. Catania responded that most dishwasher manufacturers provide extensive use and care guides, allowing the customers to properly operate the appliances. He maintains that new dishwashers and clothes washers use electronics to detect load size and adjust the amount of water used accordingly. This technology should optimize the use of resources. Mr. Steiner responded that new clothes washers allow consumers to select the appropriate cycles. He maintains, therefore, that it is difficult to compare the old and new models. Mr. Steiner believes, however, that some of the new models use less water and energy than the older models, regardless of run time. Mr. Paterson then asked Mr. Catania about the availability of technology in clothes washers to use rinse water from a previous load in the wash cycle of the next load. Mr. Catania responded that this is an old technology that uses significantly more water per load than new ones.

Thomas Behn, Sales Representative for Coin Meter Company, commented that common laundry rooms in multifamily dwellings are dying out, as new apartment complexes are being designed without common laundry rooms. In a study that Coin Meter Company conducted in two buildings in TVWD, the company determined that buildings with individual washer and dryer hook ups use more than four times as much water than buildings with common laundry rooms. Mr. Behn also maintains that developers do not have any incentives to design common laundry rooms and that some banks encourage the development of apartments with individual hook ups. In light of this information, he contends that it is not fair that commercial laundry facilities have to pay a large fee for excessive water usage. He asked the panelists if there were any incentives for developers to build apartment complexes with common laundry rooms. Mr. Steiner responded that he has witnessed a significant drop in commercial sales and an exponential increase in the sale of residential units and commented that Maytag is concerned about the trend away from common laundry rooms. Mr. Steiner also mentioned that this trend was one of the reasons why Maytag pushed DOE to include commercial clothes washers in the ENERGY STAR program. Maytag hopes that utilities will now develop rebates for commercial clothes washers. Mr. Catania responded that this situation should improve in 2007 when new residential clothes washers become 42 percent more efficient.

David Broustis, Conservation Program Manager for Seattle Public Utilities, stated that apartment residents are often limited to nonefficient machines due to the size constraints of their units. It appears that most of the efficient clothes washers are too large to be installed in apartments. Mr. Broustis thanked Maytag for developing the Neptune® model and pushing the market. He believes, however, that Mr. Steiner's statistic that 65 percent of customers prefer top-load machines will probably change as more people purchase the more efficient, front-load machines. Mr. Broustis also believes that side-by-side refrigerators are not as efficient as other models and faults the ENERGY STAR program for not comparing these different products. He recommends, therefore, that the water labeling program develop a tiered rating system to promote the most efficient appliances. Although Mr. Steiner agrees with Mr. Broustis's assertion that front-load machines are currently more efficient than top-load machines, he maintains that completely eliminating a type of product will prevent the industry from developing new markets and prevent consumers from purchasing appliances that meet their individual needs. Mr. Catania responded that products do not always evolve into environmentally preferable ones (e.g., large sport utility vehicles). He contends that the process used to set the most recent clothes washer standards was effective because it allowed manufacturers to apply a variety of methods to provide elegant solutions to energy and water issues. He believes that this standard setting process has also been effective in the retooling of refrigerators, which has occurred several times in recent years for a number of reasons. The capital costs of these efforts have not been passed on to the consumer, benefitting both the consumer and the environment. Mr. Catania stated that unfortunately, U.S. manufacturers have announced that they will be moving their refrigerator manufacturing out of the country to recover costs associated with the product's continuous retoolings. Therefore, Mr. Catania maintains that there is a need to strike a balance between consumer needs, the environment, and manufacturing costs.

Burton Preston, Consultant to Eljer Plumbingware Inc., stated that his order of preference for water conservation measures is: 1) increase the cost of water, 2) develop a Water Star/ENERGY STAR program, 3) maintain the current situation, and 4) develop mandatory requirements for water conservation. Mr. Preston believes that many things would be easier if water were priced higher—consumers would be motivated to save water and manufacturers would be motivated to develop new water-efficient technologies. Mr. Preston maintains that risk takers would likely be the first group of consumers to purchase the new products because they tend to be more tolerant of problems associated with new products. When new products are designed to meet legislative requirements, the new products flood the market. In 1992, people were not tolerant of the problems associated with the low-flow toilets mandated by legislation. With respect to developing a Water Star program, Mr. Preston believes that it would be beneficial to develop performance standards and implement a concentrated, industrywide marketing effort. He believes a national program will help manufacturers educate and communicate with consumers and other stakeholders such as builders. Mr. Preston also identified some obstacles to a Water Star program consensus on metrics, including long payback periods, and impact on systems. In terms of today's situation, Mr. Preston believes that it is weak because good measurement tools do not exist to measure product performance. In conclusion, Mr. Preston believes there are a number of negative issues associated with developing mandatory requirements and, therefore, rated the regulatory approach as his least preferred option.

Cindy Hansen asked Mr. Steiner to elaborate on his concerns about the poor rinse quality associated with some low water usage machines. Ms. Hansen stated that San Diego recently surveyed approximately 1,500 consumers who purchased new machines through San Diego's rebate program. She maintains that 97 percent of the customers liked the new clothes washers—many of which had water factors of 6.0 or less—and thought that they performed better than their old washers. Mr. Steiner responded that his concern applies mostly to future mandatory requirements in the commercial settings. He stated that manufacturers are looking at a number of different technologies to develop highly durable machines that comply with the new standards. Some manufacturers are considering recirculating water and partial filling machines (i.e., draining some of the water at times and using the other water in rinse cycles). Manufacturers and consumers have indicated, however, that these are not preferred options because the water used to rinse the clothes might still contain dirt and detergents. Thus he is concerned about these recirculating technologies which might be developed in the future. Mr. Steiner does not have these concerns about existing residential clothes washers.

10. PUBLIC EDUCATION APPROACHES

Park Howell, President of Park & Company, presented an overview of the Water—Use It Wisely campaign that his company developed in 1989. Mr. Howell stated that Phoenix, Arizona, asked his company to develop a consumer awareness program on water conservation. The campaign is meant to be educational, empowering, and fun. He believes that people are the number one water saving device. The campaign quickly grew to include other groups in Arizona

and now has more than 200 national partners. Mr. Howell stated that this is the nation's most comprehensive water conservation education campaign.

According to Mr. Howell, the campaign is about behavior branding, which includes brand awareness, brand interaction (where consumers interact with the brand on a day-to-day basis), and brand use (where consumers interact with the brand in their homes, workplaces, and yards). Behavior branding leads to brand adoption. Mr. Howell stated that Jack Trout articulated the best approach to achieving brand adoption among people that are constantly bombarded with information. In his marketing book *Positioning*, he recommends developing a very simple message. Park & Company developed the message: water use it wisely. Mr. Howell maintains that this message is the campaign's logo and call to action.

To work within the limited budgets of municipalities and states, Park & Company recruits media partners and then leverages the social cause of water conservation to increase the campaign's visibility with limited dollars. The campaign has partners that help deliver the message on TV, on the radio (in both English and Spanish), and in newspapers, magazines, and advertisements for the least amount of money possible. To date, the campaign has developed 12 TV spots and has received 7 national Tele awards for production, quality, and communication excellence. Mr. Howell stated that Park & Company insists that partners invest in the production quality of the campaign, allowing the campaign to compete with advertisements produced by big dollar marketers.

Mr. Howell believes that one of the most valuable reference pieces produced by the campaign is a brochure full of water saving tips and ideas. He urges people to visit the campaign Web site at <www.wateruseitwisely.com>. The Web site is a clearinghouse of water conservation information, including water conservation tips, links to partners' Web sites, and contact information. In 2002, the campaign Web site received the highest Web site rating from Utility Communicators International. The campaign also uses theater slides that identify water saving devices. Mr. Howell maintains that Park & Company has found very unique places to advertise the campaign including the Sky Harbor Airport (which has 20 million travelers a year), the sides of municipal trash trucks, main street (Park & Company hung street banners), and on trash cans. The campaign has also placed water conservation messages on magnets, color posters, kids coloring contests, tattoos, on apparel and specialty items and included messages in water bills and other mailings. Mr. Howell believes that it is important to get the logo displayed in as many places as possible for as little money as possible.

Mr. Howell stated that the campaign also recruits corporate partners, including sport teams, to help promote the message. He contends that Park & Company always states that the campaign is not endorsing a particular sports team or corporation, but rather that the sports team and corporation are endorsing the campaign. Corporate sponsors have placed the campaign logo on team mascots, ATM screens, theater promotions, and restaurant table tents as well as in grocery stores. Mr. Howell indicated that the campaign won Valley Forward's Crescordia award for best educational campaign in Arizona. Mr. Howell stated that 80 percent of consumers in Arizona know the campaign.

Mr. Howell maintains that the campaign has adopted a strategy described by Doug McKenzie Mohr and William Smith in their book entitled *Fostering Sustainable Behavior*: initiatives to promote behavioral change are often most effective when they are carried out at the community level and when they involve direct contact with people. One example of the application of this strategy is the month long event "100 ways to save water in 30 days," which was conducted at 39 Home Depot stores in Arizona in September 2003. During the campaign, cities and states trained more than 150 Home Depot executives who in turn trained their store employees. The stores had point-of-purchase signage and signage in their nurseries identifying Xeriscape zones, product shelf talkers, end caps pointing to manufacturer products such as low-flow showerheads. The stores also handed out more than 40,000 consumer guides with copious water conservation information. In total, the campaign produced more than 16 million total impressions with this event alone.

Mr. Howell believes that the campaign's behavior labeling program is a way to promote products that use less water. The campaign, for example, labeled packages of mulch, explaining that mulch does not need to be watered. The label also included the campaign logo, Web site address, and water saving tips. Mr. Howell maintains that this approach reaches the consumer outdoors at the point of use, and reminds them to conserve water. Mr. Howell recommends that all marketing campaigns take advantage of existing marketing strategies to avoid reinventing the wheel.

Mr. Howell recommends that EPA adopt the Water—Use It Wisely campaign for its water-efficient product labeling program because the campaign has gained so much momentum across the country. The campaign is 4 years old, has more than 200 partners across the country, has brand awareness, and can be easily tailored to any market and any message. Mr. Howell believes that EPA could immediately establish a brand for water conservation by adopting this campaign.

At the conclusion of Mr. Howell's presentation, two audience members asked questions. First, Stan Wolfson asked Mr. Howell to disclose the total budget for this campaign. Mr. Howell responded that many partners have made significant contributions to the campaign and, in total, the campaign has spent approximately $8 million during the past four years. Secondly, Alison ten Cate, Program Manager for D&R International, asked who applies the label and whether any partners have requested exclusivity. Mr. Howell responded that manufacturers apply the label/logo to their products. Although a few partners have requested exclusivity, Park & Company has declined it as everyone needs access to the logo and campaign.

11. PANEL DISCUSSION: ENHANCING THE MARKET FOR OTHER COMMERCIAL/INSTITUTIONAL/INDUSTRIAL (CII) PRODUCTS

The fourth and final panel discussion of the meeting focused on the issue of enhancing the market for other commercial/institutional/industrial (CII) products. The panel consisted of five presenters, representing the Food Service Technology Center, the Fred Hutchinson Cancer

Research Center, Johnson-Barrow, Inc., the National Association of Plumbing Heating and Cooling Contractors, and the New Mexico Office of the State Engineer.

Food Service Products
Don Fisher, President and CEO, Food Service Technology Center

Don Fisher, President and CEO of the Food Service Technology Center (FSTC), presented some background information on the food service industry and identified some water-efficient products that can be used in commercial food service. Mr. Fisher stated that the FSTC program was designed to promote energy efficiency in commercial food service. It is funded by California utility customers and administered by the Pacific Gas and Electric Company under the auspices of the California Public Utilities Commission. Mr. Fisher maintains that the food service industry is very energy and water intensive, using more than 500 BTU per square foot per day and between 300 and 3,000 gallons of water per day. He also stated that water usage varies greatly between restaurants with some exceeding 10,000 gallons per day. Mr. Fisher believes that the higher water users probably have some continuous running water. In general, restaurants use over 50 percent of the water for food preparation (e.g., stock pots, pasta cookers, steam tables) and sanitation activities (e.g., dish washers, glass washers, pre-rinse spray nozzles).

Mr. Fisher maintains that there are more than 1,000,000 food service facilities in the United States that pay approximately $10 billion for energy and use 300 billion gallons of water per year. He believes that this industry has an untapped conservation potential. The FSTC has developed standard methods to test the water and energy efficiency of food service equipment. FSTC uses the data to create customer specific energy use and cost models. Mr. Fisher believes that testing appliances in a controlled environment levels the playing field. In addition, he believes that lab testing proved that the new generation of boilerless steamers are energy and water efficient. FSTC is working with the ENERGY STAR program on three new appliances—fryers, holding cabinets, and steamers. FSTC is conducting field testing to quantify the annual water-savings that can be achieved in commercial kitchens by replacing boiler-based atmospheric compartment steamers with comparably sized models of new generation boilerless steamers. Mr. Fisher estimates that restaurants could save approximately $2,000 per year in water costs alone by switching to boilerless steamers. The resulting energy cost savings could exceed $3,000 per year.

Mr. Fisher stated that FSTC is also developing test methods for soft-serve machines. He maintains that one-third of all food service operations use soft-serve machines and that approximately 80 percent of the machines are air-cooled while 20 percent are water-cooled. Mr. Fisher estimated that water-cooled machines can use an average of 430 gallons per day. Mr. Fisher stated that FSTC initially evaluated ice machines to determine if they were candidates for the ENERGY STAR program and, during the data review process, realized that there is a large range in the water consumption of different machines, making them candidates for a Water Star program. Mr. Fisher maintains that ice machines are found in a wide variety of commercial applications: from bars, delis, and restaurants, to hotels, hospitals, and other institutional kitchens. He believes that these organizations typically harvest between 250 and 1,400 pounds of

ice each day. Mr. Fisher indicated that the Air-Conditioning and Refrigeration Institute (ARI) maintains a database on ice machines with information on the amount of ice harvested, water usage, energy consumption, and condenser water usage.

Mr. Fisher also believes that pre-rinse valves are great candidates for ENERGY STAR and Water Star. He stated that their flow rates range from approximately 1 to 5 gpm at various water pressures. Their spray patterns include the traditional multi-jet spray pattern and a new fan/blade, single jet spray pattern. He also maintains that some spray nozzles have a ring or clip attached for continual spraying. Mr. Fisher contends that not all pre-rinse valves are created equal. Customers should consider the cleaning performance of low flow valves. Cost should not be a barrier to the adoption of this product because the cost differential between low flow and high flow valves is low. Mr. Fisher stated that in 2003-2004, the CUWCC, in partnership with water utilities, installed more than 17,000 spray valves in California food service facilities under a California Public Utilities Commission-funded program. It is estimated that this effort will save 1.9 billion gallons of water annually with $5.2 million saved in water costs and $7.8 million saved in sewer costs. In addition, Mr. Fisher maintains it will save 20 million therms annually and $12.1 million in gas costs for a grand total savings of $25.1 million saved annually in gas, water, and sewer costs. In conclusion, Mr. Fisher believes that there is a natural synergy between energy and water saving devices.

Medical Products
James Walker, Facilities Engineer, Fred Hutchinson Cancer Research Center

Mr. Walker, Facilities Engineer at the Fred Hutchinson Cancer Research Center, presented information on his innovation and determination to achieve water efficiency at the cancer center. Mr. Walker stated that the center was established 28 years ago and has been in its current location in Seattle for 12 years. The center consists of 1.3 million gross square feet (gsf) of developed area, 600,000 gsf of laboratories, and 2.1 million gsf of land that can support future buildings.

Mr. Walker's job is to identify operational efficiency improvements, identify measures requiring capital expenditures, and develop recommendations for owners and utility providers. Mr. Walker believes that overall, research facilities use significant amounts of energy and water. Mr. Walker's energy and water conservation projects enhanced the efficiency of the center's centralized glass washing facility. Glass washers and sterilizers are big water users because they typically use city water to reduce the temperature of their heated water to 140 degrees Fahrenheit, allowing it to be discharged down the drain. Mr. Walker eliminated the usage of city water for tempering by installing shell and tube heat exchanges for domestic water preheating, and he also obtained rebates to install a washer heat recovery system. He estimated that this improvement cost $110,000, had a utility incentive of $30,000, will save $34,600 annually, and has a payback period of 2.3 years. Mr. Walker indicated that the center still needs to install instrumentation to ensure the sustainability of the energy and water savings.

Mr. Walker also increased the efficiency of the center's deionized water production system, which used to require 2 gallons of raw water to produce 1 gallon of deionized water (using a total of 6,000 gallons of water per day). He talked to the vendor and tweaked the system, and now it only requires 1.5 gallons of raw water to produce a gallon of deionized water. Mr. Walker stated that his improvement cost $300 and is expected to save $11,400 annually. Thus, the payback period is considered to be immediate.

In addition, Mr. Walker has improved the efficiency of the center's sterilizer wastewater tempering system. Mr. Walker maintains that each sterilizer was wasting between 1 and 1.5 gpm of water continuously. This wasted water cost approximately $10,000 per year. During his review of the units, Mr. Walker determined that the vendor was not routinely replacing flow control valves. Mr. Walker also added a $2,000 automatic control device to shut off the tempering when the system was not being used. Mr. Walker also improved the efficiency of the center's glass washers by installing a better racking system, and as the washers use deionized water for the rinse process, installing a conductivity monitor to reduce the number of rinse cycles from four or five to two or three. Mr. Walker stated that he obtained $10,200 in incentives and permission from the Department of Ecology to use captured groundwater for irrigation in the summertime. He maintains that the state would not allow the capture of rainwater for irrigation, so he installed a subsoil drainage system at a cost of $17,000 to intercept groundwater. The expected payback period for this enhancement is approximately 10 years because he can only use the center's city water usage rate of $700 per year in the payback calculation.

Mr. Walker stated that Seattle Public Utilities ranks the center as the 39th largest user of water in the city. He maintains that the center would have been ranked the 19th largest user if his water conservation measures were not implemented. Mr. Walker believes that there are other opportunities to reduce water consumption at the center—installing low-flow toilets and water free urinals, evaluating refrigeration requiring city water tempering, using wastewater for irrigation, installing low-flow spray heads in kitchens and deduct meters, and checking solenoid valve operations. He believes that it is the owner's responsibility to identify a "conservation champion;" make the conservation program visible; track consumption; list completed and future projects with costs, savings, and payback and implementation dates; monitor service contractors for landscaping and water consuming equipment; perform design reviews of new construction, remodeling projects, and equipment purchases; seek outside help from utility conservation program managers, consultants, and vendors; commission conservation projects; and inform, train, involve, and recognize the operations staff.

In conclusion, Mr. Walker stated that utilities often provide incentives for water audits, funding for new construction, retrofit project funding, design assistance, and commissioning assistance. He maintains that utilities recommend that facilities ensure consistent funding for conservation programs, coordinate with other utilities for audits, and combine incentives with other utilities where water and energy are saved.

Cooling Towers
Rand Conger, Sales Engineer, Johnson-Barrow, Inc.

Mr. Conger, Sales Engineer for Johnson-Barrow, Inc., presented a basic introduction to cooling towers. Mr. Conger stated that cooling towers themselves are designed to be water savings devices and, although they tend to use a lot of water, they work by using latent energy (energy generated by the evaporation of water) to cool down water and equipment. He stated that a latent energy system produces 1,000 times more energy than a sensible heat transfer system and requires approximately 100 times less water than a once through system.

Mr. Conger stated that the three things that one can do to cooling towers to save water are 1) change the design, 2) maintenance, and 3) water treatment. He maintains that a cooling tower itself is a simple device—a big box that holds water with a fan on top and area for the water to spread out for evaporation. Mr. Conger explained that the device operates by evaporating a small portion of water, leaving colder water—approximately 1.8 gallons per hour per ton of cooling—behind. Mr. Conger stated that drift eliminators and air inlet louvers are two water saving components of cooling towers. Drift eliminators are little louvers formed to capture sprayed water that might be lost at the top of the tower and reintroduce it into the system. Air inlet louvers are designed to prevent water from splashing out the bottom of the tower. Mr. Conger estimated that cooling towers with high efficiency drift eliminators can save more than 18,000 gallons of water and water treatment chemicals per year. In addition, Mr. Conger believes that non-corrosive, stainless steel basins can help reduce leaks and sump sweepers can reduce particulate buildup on the basin that could cause corrosion and lead to leaks. He also maintains that replaceable, non-corrosive eliminators and louvers should be incorporated into the design of water-efficient cooling towers.

Mr. Conger believes that to maintain the efficiency of cooling towers, they should be drained and cleaned annually to eliminate deposits, inspected frequently, repaired to eliminate leaks, recoated, and fitted with new louvers and eliminators to replace worn or damaged ones. Mr. Conger contends that the water efficiency of cooling towers can be improved significantly by treating water to prevent scaling, corrosion, and biological growth. He believes that other water losses in the system do not compare with the losses associated with insufficient water treatment. Mr. Conger maintains that water treatment is important because it controls the bleed or blow-down rate. The bleed rate is the amount of water that is purposely released to the sewer to keep levels of impurity at a relatively constant level. As water evaporates, it leaves behind impurities that can lead to corrosion, scaling, etc. Bleed can be reduced by tower options that reduce incoming particulates, debris, and sunlight; filtering the recirculating water to remove debris and particulates; and treating water using methods such as conductivity control of bleed, chemical corrosion and scale inhibitors, and non-chemical techniques (e.g., pulsed-power and cavitation). Mr. Conger maintains, however, that bleed can rarely, if ever, be completely eliminated. Mr. Conger contends that the amount of bleed that can be reduced is limited by the hardness of the water and the amount of silica, chlorides, and other miscellaneous minerals or impurities in the water. In conclusion, Mr. Conger believes that frequent, careful oversight is essential to maintaining water-efficient cooling towers.

Installer Viewpoint
Charley Mitchel, Washington State Chapter President, National Association of Plumbing Heating and Cooling Contractors

Charley Mitchel, State President of the Washington state chapter of NAPHCC and founder of Mitchel Plumbing Company, conducted his second presentation of the meeting on the installer's viewpoint of CII products. Mr. Mitchel has more than 25 years of experience in the plumbing industry, is a registered journeyman plumber with the state of Washington, and is a certified backflow assembly tester. He also operates a small plumbing company and has done a lot of work for residential, commercial, and industrial customers. He maintains that his company puts the customer first and makes sure that they get the most efficient and cost-effective products for their needs.

Mr. Mitchel indicated that NAPHCC, the oldest trade association in the United States, is willing to help EPA with this program in any way possible as the association is a strong supporter of water conservation. One of NAPHCC's key roles is to represent its members' interest on Capitol Hill and with regulatory agencies. He maintains that NAPHCC would be willing to work with manufacturers, testing laboratories, and consumers on this program. He stated that NAPHCC has a code of ethics that commits its members to promote the conservation of water. The association has developed position papers supporting the installation and use of water-efficient products. NAPHCC also supports the use of tax incentives and other incentives such as rebates on water-efficient products used in all residential, commercial, and industrial construction and renovation.

Mr. Mitchel indicated that 1.6 gpf toilets were not initially successful. He maintains, however, that these toilets are now on their fourth generation and are working better. Mr. Mitchel indicated that he would support the installation of other water-efficient products that are fully researched with respect to real-use installation. Mr. Mitchel is committed to making low flow toilets work. In a recent renovation job at a physician's office center, for example, he determined that the toilets were not working properly because a 60 foot long pipe was not properly graded and, therefore, the toilets were not getting enough water to properly flush out the lines. Mr. Mitchel replaced the 1.6 gpf, pressure-assisted toilets with 1.6 gpf, gravity-flush toilets and modified the flushing mechanism to slightly increase the amount of water used per flush. He believes this issue will continue to be a problem when people retrofit their bathrooms because existing plumbing systems cannot always support the low-flow toilets. He believes new plumbing systems need to be designed to make the water-efficient products work. He recommends, therefore, that EPA evaluate the impact of water-efficient products on existing plumbing systems as they develop this program. In conclusion, Mr. Mitchel indicated that NAPHCC would like to be involved in all future discussions because the association's members interact with the customers.

State Viewpoint
Alice Darilek, Water Conservation Coordinator, New Mexico Office of the State Engineer

Alice Darilek, the Water Conservation Coordinator for New Mexico's Office of the State Engineer (OSE), was the final presenter of the meeting. Ms. Darilek began her presentation by explaining why New Mexico and other state governments are supportive of EPA's water efficiency initiative, particularly in the CII sector. New Mexico's OSE was one of the first groups to sign a statement of support for this effort and has been involved in water conservation and promoting water conservation as a water supply alternative for more than 10 years. In the early 1990s, New Mexico became very concerned with its limited water supply and growing population and determined that the state would be subject to recurring periods of drought and significant pollution problems in existing water supplies. New Mexico's OSE was also concerned with maintaining stream flows in the rivers to meet interstate stream delivery requirements (New Mexico must deliver a specific quantity of water to Texas) and maintaining riparian and aquatic habitats.

Ms. Darilek stated that OSE decided to encourage water conservation in the state through various efforts in policy development, financial assistance, technology assistance, demonstration projects, and education. During the past eight years, OSE focused its efforts on education, raising the level of awareness about the importance of the water supply and the reasons why water should be conserved. OSE educated both citizens (mainly the residential sector) and decisionmakers, including municipal water system managers.

Ms. Darilek indicated that early in the conservation program, OSE developed a water guide for the CII sector that helped facility managers conduct water audits, identify opportunities for conservation, and develop and implement water conservation plans. Ms. Darilek maintains that OSE uses this guide a lot in its educational efforts and in its water conservation workshops for industry. OSE also tried to develop and implement a water conservation plan for the state government. Ms. Darilek stated that OSE is currently involved in other state water conservation policy efforts that could be used in the CII sector. One idea is to develop a mobile water audit unit that could travel to smaller communities and conduct educational workshops for facility managers as well as site-specific water audits.

Ms. Darilek maintains that a number of activities are also occurring on the local level in the regulatory arena and with incentive programs. The city of Albuquerque, for example, requires its large water users (greater than 50,000 gallons of water per day) to implement water conservation plans. The city of Santa Fe passed an ordinance that required all commercial facilities to retrofit plumbing fixtures to the 1994 standards by 2003. Ms. Darilek maintains that the city of Albuquerque has several good incentives for its CII users. The city provides free commercial audits and has an attractive rebate program for replacing existing, traditional landscapes with more water-efficient ones.

Ms. Darilek stated that OSE has a strong interest in CII water conservation because New Mexico is a very dry state, and currently in its 8th year of drought. New Mexico has a number of federal facilities (e.g., Los Alamos National Laboratories) that are large water users located in small communities as well as an active semiconductor manufacturer in Albuquerque and a large Intel facility in Rio Rancho. In the early 1990s, Intel wanted to expand its facility and applied to OSE for additional water rights. Community members, however, became very concerned about the potential impact on their water supply. In the end, OSE granted only a portion of the water rights that Intel requested and the rest of the company's increased water needs had to be made up by water conservation. Ms. Darilek believes that Intel did a good job with its water conservation efforts, as it was able to reduce its water needs by approximately 40 percent. As another example, Ms. Darilek stated that commercial entities in Santa Fe use approximately 50 percent of the water, which is highly unusual. She believes these examples illustrate why CII water usage is important to New Mexico.

Ms. Darilek believes that a national water-efficient product labeling program would help the state with its educational efforts in the CII sector. She stated that there are still a lot of facility managers in New Mexico that do not connect the work that they do with water savings at the community or state level and believes they represent a good opportunity for increasing water conservation awareness. She also believes that many facility managers do not know which products are water efficient. They are a good target audience for this program.

In conclusion, Ms. Darilek encouraged EPA to pursue a product labeling initiative, maintaining that OSE is willing to help by providing education and outreach in New Mexico (e.g., Web site, newsletters, workshops, educational events). She believes that other states impacted by drought and limited water supplies, including Washington and Arizona, would also support this program.

12. GROUP DISCUSSION: MARKET ENHANCEMENT FOR WATER-EFFICIENT CII PRODUCTS

The final segment of the meeting consisted of a facilitated discussion where panelists and audience members asked questions and commented on remarks given by the fourth set of panelists.

Stan Wolfson asked Mr. Walker if the Fred Hutchinson Cancer Research Center had ever used commissioning consultants to evaluate the installation and operation prior to accepting an engineering job. Mr. Wolfson also asked if Mr. Walker was familiar with electronic monitoring available on solenoids. Mr. Walker responded that the center does commission all of its new permanent buildings. He believes that the money the center spent on commissioning proved to be a good investment. The center's internal commissioning group, used on smaller projects, consists of a design engineer, a controls contractor, and a controls operating engineer (to ensure that an owner can provide input into the process). With respect to electronic monitoring of solenoids, Mr. Walker believes that there are so many solenoids in the center that it is probably worth using

electronic monitoring. But the center has not yet looked into setting up such a system. Next, Stan Wolfson commended Mr. Mitchel for his presentation and stated that ASPE is committed to keeping drain line standards and is concerned with all aspects of plumbing systems.

John Schommer, Vice President of Watermiser and Inventor at Jv Manufacturing Inc., maintains that the water-efficient product labeling program is great for small manufacturing firms. He believes that this program will allow small companies to compete equally with large manufacturers and get on a preferred products list.

Ed Osann believes that one benefit of the product labeling program is that it identifies high performing products while still providing consumers with options in the marketplace. Mr. Osann agreed with Mr. Fisher that the product performance specification is as great a benefit for commercial operations as the label itself. He asked Mr. Fisher to describe why some operations prefer water to air cooled ice machines. He wondered if these machines are two different products or one product with two different ways of accomplishing the job. Mr. Fisher responded that air and water cooled ice machines are really one product with two different ways of accomplishing the job. He maintains that there is a slight performance edge (in terms of reduced electrical needs) for water cooled ice machines and believes that electrical contractors often overstate this benefit. Mr. Fisher believes that there is a need to better understand this product and thoroughly evaluate information available from the ARI database. He contends that an ice machine is a big water guzzle and one of the few pieces of commercial food service equipment that has distributors. Following this response, Mr. Osann asked why buyers are not selecting the most cost-effective model if the performance of the two types of ice machines is similar. Mr. Fisher responded that users generally do not know what the ice machines are costing them and do not see the impact of water savings. Mr. Walker also said that many owners do not understand the difference between machines and are unable to make informed decisions.

Teri Liberator, Civil Engineer at the Portland Water Bureau, stated that she used to work with companies on the ice machine issue and they commented that air machines make more noise, are hotter, and are harder to maintain than water cooled machines. Ms. Liberator believes that EPA should tie the commercial side of the labeling initiative into the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ to strengthen the water conservation aspects of the LEED system. She also recommends that data on the water, energy, and chemical usage of products should be readily and easily accessible and published to help educate consumers. Ms. Liberator maintains that it is difficult to obtain the data required to compare the performance of different products. She also stated that many facility owners are hesitant to try a new technology, fearing that they will have to shut down operations if the technology does not work. In addition, Ms. Liberator believes that it will be more difficult to account for and compare alternative products in the commercial sector than in the residential sector because of the site-specific issues associated with a commercial setting. She believes that this program should help utilities educate plant operators about water usage in their operations. Ms. Liberator also stated that a few years ago, her utility significantly raised water rates for commercial users—generally large users—their water bills increased by 40 percent. Although this rate increase resulted in some water conservation, Ms. Liberator maintains that excessive

water use is caused by human behavior, not low water rates. Mr. Mitchel responded that tiered water rates based on usage might help acknowledge those that already conserve water and penalize large water users. Ms. Liberator stated that Portland has implemented tiered and seasonal water rates. Mr. Walker responded that energy and water costs account for one-third of his budget and that saving water does mean a lot to him and other facility engineers.

John Koeller stated that he appreciates EPA inviting the medical and food service industry representatives to this meeting, as he believes they are the best candidates for water efficiency measures. Mr. Koeller believes that a water-efficient product label does not have to be merely a physical image—it can be an electronic file and its purpose is to denote a specific performance specification. Thus, he recommends that EPA define the term "label." He also recommends that EPA define the term "consumer" as there appear to be many different uses of this term. He believes it should include homeowners, residents, purchasing agents, facility managers, and other individuals that are not necessarily looking for a label on a product. Mr. Koeller, a member of the LEED technical committee for water efficiency, stated that the committee's goal is to incorporate a water efficiency emphasis into the LEED system. He recommends that EPA work with LEED to ensure consistency between the programs. Mr. Conger also wanted to stress the importance of EPA working with LEED. He maintains that LEED is a living, vibrant program that motivates innovative design and environmentally preferable purchasing at facilities.

Mary Ann Dickinson thanked EPA for focusing on the commercial sector and congratulated the panelists for making excellent presentations. Ms. Dickinson stated that she was impressed with Mr. Walker's ability to get the attention of facility owners and indicated that utilities in California often have difficulties finding water conservation champions at facilities, as water costs are typically less than 1 percent of facility costs. Ms. Dickinson asked Mr. Walker how utilities can find his counterparts at other facilities. Mr. Walker maintains that his local utility deserves credit for setting favorable rates, implementing incentive programs, and aggressively educating consumers. He also attributes his successes to having management support for water conservation initiatives, which is largely due to the fact that the company spends a lot of money paying for its water usage. Ed Osann also responded that although finding the right person will always be challenging, the creation of a product labeling program might make it easier to reach him or her. Ms. Darilek believes that the greatest successes come when the facility has a self-starter who is interested in conserving water. Mr. Conger believes that a product labeling program might help by allowing facility engineers to differentiate between similar products. He stated, however, that most facility operators carefully examine capital costs of a project rather than the long-term operation and maintenance costs. Thus, projects with shorter payback periods are generally more attractive. Ms. Liberator agreed with Mr. Conger's comments.

Ms. Dickinson also asked the panel to comment on why the LEED program is getting so much attention. Mr. Conger responded that he does not know. Seattle requires that at a minimum, new facilities meet the LEED silver standard. This requirement has driven design engineers to become knowledgeable about LEED and market their LEED experience to

customers. Ms. Liberator added that Portland, Oregon's Office of Sustainable Development adopted sustainability criteria for city facilities, heavily marketed LEED, and provided funding for LEED projects.

Richard Harris also thanked EPA and the panel for conducting this session on the CII sector. He agrees that capital expenditure can be a barrier to water conservation projects and believes that facilities must wait for funds to become available for these projects. Mr. Harris also believes that a water-efficient product labeling program will provide facility managers with access to information on water-efficient products, practices, and water experts on a daily basis. He has encountered CII facility managers that refused to take incentive money to conduct projects after realizing how simple the projects were to implement. These individuals implemented the projects using only their company's money.

Mr. Fisher stated that each appliance category is completely different and requires individual stakeholder meetings. For commercial appliances, Mr. Fisher maintains that EPA should establish water efficiency testing methods and set standards that products would have to achieve to be labeled water efficient. He believes that the process of establishing standard testing methods requires purchasing agents or facility engineers to ask manufacturers for all product data. He believes, therefore, that a labeling program would stimulate the development of databases that consumers could use.

Stan Wolfson asked if Mr. Walker belongs to the association of facility managers, which can be used to identify and reach facility managers. Mr. Walker's supervisor is a member, and Mr. Walker recommends using the association to communicate with this audience. Ms. Darilek added that OSE has worked with a network of facility managers in New Mexico.

Tony Gregg asked Mr. Fisher if he knows of a way to stop Chinese restaurants from running a constant stream of water down tables filled with woks. Mr. Fisher responded that this is a difficult issue due to strong cultural perceptions and the use of barebones foreign equipment. At this time, he did not have a solution.

Kris Alderson, Marketing Manager at Bradley Corporation, asked EPA who is developing the list of priority products, what criteria are being used to develop the list, and whether there will be a process for soliciting feedback on the list and product categories. She maintains that if a product category is too broad, it will be difficult to compare products, especially those developed for different applications. Mr. Hanlon addressed this comment in his closing remarks.

13. CLOSING REMARKS

Jim Hanlon thanked the audience for coming to the meeting, offering a special thanks to those that attended all four stakeholder meetings. He emphasized that EPA is at the beginning of

the evaluation process, not the end. This process is interactive and Mr. Hanlon thanked those who have participated to date.

Based on the discussions at the four stakeholder meetings, Mr. Hanlon maintains that there continues to be broad support for the program. He reiterated stakeholder comments, including:

- The program should address and be sensitive to consumer needs and perceptions and long-term product performance.
- EPA must understand the marketplace and the role of retailers, distributors, manufacturers, and utilities.
- Different product categories might require different program options.
- The water-efficient label and message should be distinct to reach the target audiences.
- Additional data must be collected on some products to fully understand potential water savings.
- Full-cost pricing is needed to promote water-efficient practices and products. Mr. Hanlon indicated that the Agency might be able to do more with full-cost pricing and acknowledged that data are critical to making rate decisions. He stated that the Agency can provide costing models to utilities, allowing them to determine the current and full cost of providing water to customers.
- There are a number of water efficiency opportunities in the CII sector and in many cases, facility owners and engineers need more information to make informed decisions.

Mr. Hanlon commented on the schedule for developing program options, stating that the Agency will spend this summer conducting analyses of products, communication tools, and logo options. The Agency will be sensitive to individual product lines and will look at multiple product uses to prevent performance thresholds from having unintended consequences. Mr. Hanlon maintains that EPA does not intend to leave out entire product lines, but the Agency has to start somewhere and might begin with products or product lines that have (or almost have) a standard in place and some stakeholder agreement about where the performance threshold should be set. Products without established testing procedures will take longer to recognize. Mr. Hanlon believes the Agency will be able to make decisions about how to proceed with the program between Fall 2004 and early 2005.

In the meantime, the Agency will be in contact with the stakeholders to solicit input and facilitate specific discussions. Mr. Hanlon promised to keep the stakeholders informed of the

Agency's progress and alert them to draft materials prior to issuing press releases on them. He concluded the meeting by stating that this program offers a real opportunity for the Agency to work with stakeholders to make a difference.