Holly Carr: First, let me go ahead and introduce our presenters. First up will be Todd Swingle. Todd joined Cummins Corporate Environmental Management group located at Cummins' global headquarters in Columbus, Indiana in 2011. Todd now serves Cummins as Director of Environmental Strategy working across Cummins' environmental focus areas, including product environmental management, emissions compliance, environmental and energy policy, and sustainability. Welcome to Todd.

Next up is Alan Mileti. Alan is the Utility and Procurement Specialist for National Church Residences housing division in Columbus, Ohio. The Columbus's of the world are well represented today – Columbus, Indiana and Columbus, Ohio. Alan joined National Church Residences in 2009. He manages all aspects of energy at National Church Residences. His responsibilities have expanded to include capital project management, engineering, refinance oversight, and various areas of national procurement.

Finally, Steven Goldman. As Marketing and Communications Coordinator for Environmental Defense Fund's Corporate Partnerships Program here in Washington, D.C., Steven works to amplify EDF's collaborations with industry and replicate sustainability practices from those partnerships, including that with AT&T on water efficiency, and that's what we'll be hearing about today.

Thank you to all of our panelists for being with us today. Before we get started, I do want to remind our audience that we will hold questions until near the end of the hour. Please go ahead and send in your questions via the Web interface. There's a function for sending in questions on the webinar, and we'll be taking those and collecting them throughout the session. This session will also be archived, so you can just sit back and enjoy what our panelists have to share with you today, and the archive should be posted in the next week or so after the session. With that, let me turn it over to Todd to learn more about Cummins' efforts to save water and, therefore, energy across their diverse building portfolio. Todd?

Todd Swingle: Thank you very much, and I'm happy to be here talking today. I definitely wanted to emphasize that we really do see very strong linkages with modern energy, and we've been a DOE partner for quite a number of years on the energy side and have really matured our programs there. Water is much newer for us. We really got started with the development of our program in about 2011, and,

over the one to two years after that, built what we think is a relatively robust program that we've enjoyed some really good successes, and continuing to see more and more of the energy and water linkages within our facilities. Occasionally, there's some challenges, though, where we have water and energy not necessarily moving in the same direction, and I'll talk a little bit about that.

A little bit about Cummins. We are a global company. In 2013, had just over $17 billion of sales. We have about 48,000 employees. That is in our consolidated operations. When we factor in our joint ventures, that number jumps to up over 60,000 people. The box at the bottom right is perhaps one of the most interesting and pertinent to water, is that we operate in 190 countries with over 600 facilities. That is just a lot of facilities that we have to deal with and a lot of cultural and environmental differences that represent challenges for us in how do we structure and deploy our water management, as well as our other environmental programs.

A little bit about who we are at the top also factors into how we have to structure the programs because we have quite a diverse range of operations. About half our business is in the manufacture of engines, but we also manufacture a lot of other supporting parts, so components and fuel systems and filters and generators. The manufacturing footprint of those facilities is quite different from an engine facility, and then a significant number of our facility count is represented by distribution locations, so those are much smaller. We may have distribution locations with four, five, six people all the way up to several hundred people, so we have quite a broad range of both geographical footprint, as well as size, scale, and nature of operations, which you'll see really factors into how we've structured our look at water.

Water stewardship at Cummins, we've factored in our water stewardship approach into really three focus areas. The first that everybody is obviously going to be familiar with is water conservation. Earlier this year, we set several external sustainability goals of which these two water goals are part of that. Water conservation, our goal is to reduce water use intensity, we've chosen labor normalization by 33 percent as compared to a 2010 baseline. It's important we consider this a vital part of our water management program, but we need to go a lot farther. We talk about here the community water engagement piece. We've set a water neutrality goal, so our goal here is work out in communities to help offset the footprint that we bring to bear on an

individual community. One of the examples that I like to use, too, is that we may conserve water, but if we're still the largest water user in town or if we're a significant, visible entity in a location, then how we interact with our community is vitally important.

The last piece is then risk mitigation. We have risks that we see in the U.S., we see much more of them overseas, but it's a good program for us to really pay attention to because managing risk is absolutely critical. This looks at business continuity tied to our water use. One of the pieces that I do like to use as an example here is why this is different than water conservation. If we have water-dependent processes that use 100,000 gallons a day, I can cut that to 70,000 gallons through conservation efforts, but if I am still dependent on water, then I've got business continuity risks, so we really look at not only how much we use but our dependency on water.

One of the things that we have found is that water is very, very complex. We have very good facilities individuals that understand individual pieces of equipment, that can understand the systems that we're dealing with but, as we start to talk about water and where it is sourced from and how it is discharged, we need to factor in quality considerations, quantity considerations and dependency, it starts to become a very complex conversation. To help simplify that, we try to approach each of our site and our facilities leaders in really the segmented type approach, talking first about sources, about discharges, and then looking internally at our operations so that we can have general discussion about types of uses. Employees versus other, say, manufacturing operations is a great example of where we have the differences.

As we maintain an employee base but we ramp production up and down, we may see variable use in the manufacturing segment of our water use but not over in the employee side, so starting to look and talk in these major buckets of water use has been very useful in really starting to make sense for our sites. The other piece that is important is as we look in those other facility uses, we get into places where we have a lot more discretion in how we use water, so whether it's irrigation, how we test fire systems, how we do other operations that may not be as production-critical that we have a lot more flexibility in how to use water and make more beneficial decisions.

The last piece that I really want to talk about is how we approach oversight, and I mentioned, again, that water is a very complex item. We have used this process of prioritize, consult and achieve

to work with our sites. As I mentioned, we have six sites spanning over 120 countries. First, we needed to really take a look at where we were spending our time and effort, and that's the prioritize function. Up at the top, you'll see we did a Six Sigma project that looked at predictive analytics, so looking at various factors that influence water use: square footage, whether we had evaporative cooling or not, the amount of energy we use. This works for the number of employees in a building. We then developed a model that is capable of predicting water use at all of our sites on a peer-to-peer comparison, so heavy-manufacturing to other heavy-manufacturing operations within our footprint. This achieves about a 90 percent confidence interval on predicting water use.

The real nice thing about that is those sites that are using more than we would expect them to as compared to their peers represent our opportunities to go and improve our conservation efforts. The sites that are using significantly less represent our best practice mining opportunities, so we approach these individual sites with a different mindset as we go in based upon our understanding of where they're falling across the spectrum of efficiency within our footprint.

Prioritize on the bottom, we see a four-quadrant box, as well. We don't want to treat all sites the same. When we have sites that have very low risk, we're really very much focused on return on investment-driven conservation opportunities. Looking at our higher-risk sites, we start to think more about community involvement and risk management. Moving into the consult phase, I've visited about 30 of our facilities that came out of that prioritization effort. One of the most valuable tools that we have is simply just doing a water balance, and you'll see the sketch at the top of that graph. Understanding where water is recycled, returned, re-used within the plant, how those individual uses compare to what we would expect for those process types, it really helps sites narrow down their focus so that they can go and work on two or three or four items that are either inefficient or that appear to be inconsistent with the other water use that we see within our company footprint.

The bottom piece that you see is looking at the true cost of water, so factoring in energy and chemicals, and time and maintenance, and all those different things that really can drive the cost of water at four, five, even as much as ten times what you might pay for water and sewer. The end result has then been that we've enjoyed some very good success. In the U.S., our largest facility has more than cut their water use in half, and that was with very minimal

investment. You're looking at operational improvements and areas that they can improve with low-cost/no-cost actions. With that, we're well on our way to meeting our goals, and we look forward to continuing to work harder in the future for these types of opportunities to improve our performance, both here in the U.S. and globally. With that, let us transfer over to the next speaker, and I'll await questions at the end.

Holly Carr: Great. Thank you very much, Todd, for reviewing how you all look at this water topic with such a large portfolio, and how you kind of break it down into bite-sized chunks that can be tackled by your organization. Next up, we have National Church Residences, who also takes a very systematic approach to water reduction, but this time in the multifamily portfolio. Alan, I'm going to turn it over to you to tell us a bit about your portfolio, and also the water reduction strategies that have worked for you all.

Alan Mileti: Great. Thank you. You can just go to that slide with the map on it to start off about our portfolio. Just to introduce our organization real quick, we are one of the larger affordable housing providers for mainly seniors in the country. As you can see from kind of the overview of our map, we operate in 28 states and Puerto Rico. We have 340-plus properties. We've been acquiring a lot lately, so it's ticked up a little bit since I put this together. Approximately 24,000 residents and a little over $1.4 billion in assets, so we obviously have a lot going on in regards to energy, and of course water, and having such a large footprint makes it that much more challenging to think about and to really put programs together that can be applied across the country.

Typically, with our water metering, most if not all of our properties are master-metered for water, so we're paying the whole bill. We never reallocate to tenants, or anything like that. We always take on the entire bill. That's really one of many reasons why water is such a vital thing to chase for us is because, typically, we're eating the entire cost of it. Rarely do we have any properties that the tenant is paying their own water bill. They're just not built like that unless we specify that. That being said, we can move on to the next slide and I'll get into just some of our water habits, what we see in our apartments as providers of affordable housing, especially with seniors.

We typically find that they use more water, at least in our case, compared to a standard person living in an apartment that's working all day, or maybe not a family, but an elderly person is more likely to be in their unit all day long or most of the day, and

more likely to take longer baths or showers, more likely to be cooking, things like that, so all those factors kind of come into play. Our common reasons for high resident water consumption kind of starts with that, with resident habits. Likewise, when there's a leak, or if there's a leaking faucet and someone is not reporting it that can go a long way in driving your water costs, especially if it's leaking consistently. One thing we work on is education to our tenants and to our property management staff, making sure that they understand the relationship of their behaviors and the cost of water and how we can balance that out, and just the approach to conservation in general. The last two are pretty obvious, but obviously older fixtures or poor and aging plumbing equipment, obviously goes a long way in driving up consumption and your costs.

These are just some statistics I pulled from the WaterSense website, which is an EPA website, a really good resource for anything dealing with water. They have tips on how to do landscaping, all sorts of things. Like this says here, 45 percent of the water use in a bathroom occurs with 27 percent in the toilet. Showering is approximately 17 percent, and we found that if you replace showerheads with low-flow showerheads, you can save sometimes up to 50 percent in the shower usage, and then sinks obviously account for some portion of it, not as much as the other two. But taking aerators from 3.2 gallons per minute to 1.0, sometimes .5, that can save up to 40 percent.

Just a few more stats and I'll try to go through these kind of quick so I don't waste too much time, but this just shows you like I was talking about, if you have drips going on, just the amount that that can lead into, and, if you were to multiply the number of gallons I'm showing here by the rate, it would be exponentially higher. You would see much higher bills, especially if you're looking at the bottom bullet point, where it's just dripping nonstop. That's the reason why we always are checking vacant units, making sure there's no issue on tenant turnover, or anything like that. We try to do annual or semiannual inspections at all our properties with our maintenance staff to make sure anything that's going unreported is addressed.

When we took on water, obviously we have a big portfolio, so we had to look at it from a large standpoint and not just one individual property at the time, so we used our data that we collect. We collect all of our water data through a data management process that most people with a larger footprint will have, but we use that data to benchmark our water consumption. Just going through the

steps real quick, we collect one year of water-sewer bills, standardize that into gallons per person per day, which we found for our purposes is the best measure. Investigate high consumers and low consumers that seem way out there to make sure there's no meter errors. Obviously, the average there is the benchmark, and then we use a top-down approach. We'll target properties that are – I think we looked at 25 percent above the benchmark, because you're always going to have some that are higher, some that are lower. We were looking at the ones were real high, and then we used a retrofit program to take care of those which really just changed out the flappers in the toilets, the showerheads and the aerators all at a low flow.

Just real quick, I discussed the anomalies. You can see them circled on the right and the left. We investigated those to see what was driving such low and such high consumption. In one case, it was excessive irrigation. In the low cases, it was data errors. But, at the end of the day, our 2011 benchmark was 73 gallons per person per day. Our goal was to reduce that benchmark, obviously. Again, we looked at our major outliers that were using about 20 percent more than the benchmark. We decided a cost and savings. We looked at a 12-month payback on work, and then we moved forward with an initiative. This just gives you an overview of how we thought about which properties to implement. First, we did a pilot on just properties based on age and what the savings were yielding on an initial proposal, and then we looked at more properties based on that and in certain regions where the water rates were high and the savings were attractive, and then finally, in the third phase, we evaluated everything with the benchmarking process, looked for a 12-month payback, and ultimately retrofitted 32 properties and over 2,800 units.

You can go to the next slide and you'll see our results, where we were at a 73-gallon per person per day benchmark; once we did all these retrofits in these properties, we were down to 64 gallons per person per day. We spent $268.00 but saved in the year $440,000.00 with an average payback over seven months. If you look at that graph there, the red dots represent where a property was with their consumption, and the white line represents where they were moved to after we did that work. Just kind of diving back into what I was talking about earlier, there's lots of things that play into why water consumption could be high that has nothing to do with just changing out equipment. If you have water leaks, you have a toilet that's running constantly, if your meter is broken, running too fast, or if you're excessively irrigating, like we've seen at some places, or irrigating the wrong way.

Then, just from a larger standpoint, we use two different type of approaches to tackle some of those issues with equipment and things like that. Like I said, we use a third-party data management company that also audits our bills, so when consumption goes through the roof, they make us aware and help us resolve it, and then we've put together an organizational energy policy that addresses really everything relating to water, including what equipment you should be using, what irrigation standards are set, and all sorts of things like that. Other than that, I'm all finished. I'll let the next speaker go and I'll take questions at the end.

Holly Carr: Great. Thank you very much, Alan. I love that visual, the graph with the red dots of pre-retrofit usage. It's a powerful visual for the savings that are available, especially when you have a very systematic approach like you've outlined. Very helpful. I want to offer a quick reminder to our audience to send in questions that you may have for our speakers via the chat box. We've received a lot of great questions, and we'll try to get to all of those after our presenters have each spoken. Now let's go ahead and pivot over to Steve Goldman at the Environmental Defense Fund. People often stop at restrooms and landscaping when they're looking at water reduction opportunities in commercial buildings; however, cooling towers are major water users in these buildings that are often left out of the mix. Steve will be talking to us about EDF's unique partnership with AT&T where they tackled together cooling tower water efficiency and have developed some tools that are publicly available and everyone can use, so you can also look at cooling tower efficiency in your buildings. Steve, can you tell us more?

Steven Goldman: Sure, I'm happy to. Hi. I'm Steve Goldman. I'm the Marketing Communications Coordinator at Environmental Defense Fund. If you're not familiar with EDF, we are a U.S.-based environmental group headquartered in New York, with about a dozen offices around the world. We've grown to over 500 staff, including scientists, economists, engineers and lawyers, and policy and business experts. I work with our corporate partnerships team, and we have a pretty unique approach to the way that we work with companies. What we're really interested in doing is working together, not as consultants but as partners, so that we can help unearth practices that can be replicated by other companies and hopefully have a wider impact.

Today, I'll just quickly run through some quick facts about cooling tower operations and the potential for savings, the history of our partnership with AT&T, and then I'll walk through the key tools

and resources and how these can help your companies. Mentioning the Corporate Partnerships Program, this is a photo of two of our senior EDF folks at our first Corporate Partnerships project working with McDonald's, which was a really interesting project where they're working to reduce packaging impacts. At the time, McDonald's was the poster child for waste, and they were symbolized by their polystyrene hamburger containers, and so we approached them with the idea of cutting their packaging waste and saving the company money. After a nearly a year of research and hard work, McDonald's phased out the polystyrene container and made dozens of other packaging changes that saved them millions and helps keep tens of thousands of tons of waste out of the landfill. That kind of partnership has really become a model of how we try to work with companies. Then, you can see here an example of some of the companies we work with. There's quite a range, including AT&T.

To give you an idea of how buildings use water, cooling towers is one of those invisible systems that's not given necessarily a lot of attention paid to it, especially in multi-tenant buildings where you don't necessarily see the bill at the end of the month, but cooling in office buildings can take up as much as 28 percent of water use. In buildings like datacenters, which was of particular interest for AT&T, it can be as much as 50 or 75 percent, which is an incredible amount of water use. Before we were working with AT&T, AT&T had undertaken a water audit to better understand their water footprint. What they found was that they were using over 3 billion gallons of water per year, which is perhaps not as much as averages in some industries but still a pretty significant amount. The biggest issue they had in trying to make water improvements was that they found the cost of water was still relatively cheap compared to the cost of energy, and so the same kind of modeling that you would do in looking at energy efficiency project valuation really didn't work for them for water conservation projects. It was typically easier to meet the traditional financial hurdles in energy projects, but paybacks for water was so much lower it made that difficult.

What they also found was that auditing their entire portfolio, they found that out of about 9,000 buildings, only about 125 facilities, which was less than 2 percent of their portfolio, were responsible for about 50 percent of their water use, and 31 out of those 125, a number which has now gone up to 36, were in high or very high water stressed regions. When they started analyzing those numbers more, they found that the primary use of water at these sites was their cooling systems, and so that led to us working

together to identify what some good pilot projects would be for affecting water use, and figure out what practices could be spread throughout their operations. Armed with that knowledge of looking at cooling, we worked to pick out pilot sites in different geographies, climates, and facility types, and we had three approaches in mind that we classified as technical, operational, and free air.

The technical approach meant putting some type of equipment in the cooling unit, either in front of the cooling tower, like a water softener, or behind it, like a filtration system. Operational approaches meant continuing the use of traditional water treatment but with the expectation that closer monitoring and controls would improve efficiency, like the idea that you would just lose weight by stepping on the scale. Lastly, there's the third approach with the integration of free air cooling, and this is, in simple terms, like opening up the windows to let the cold air outside cool the space so that you can turn off the chiller, which saves not only a great deal of water but also electricity. Working through all three approaches, we found, not surprisingly, that the technical and the free air cooling approaches showed the best results. For example, AT&T found that one cooling tower approach, one cooling tower filtration system upgrade, cost less than $100,000.00 to install, returned $60,000.00 in annual water and sewer savings, and it paid for itself in less than two years.

Now, I point out the dollar savings here because companies have to make the business case, but the water savings were also significant with a 29 percent reduction in overall water use, and a 70 percent reduction in discharges, which meant also less chemicals going into the sewer system. Now, also, investments like these don't have to be large. As you can see, the free air cooling upgrade that they made was a minor upgrade of about $4,000.00 to expand free air cooling in the building but that delivered nearly $40,000.00 in annual savings. As far as the operational approach, AT&T did not see a lot of improvement, which indicated that without some intervention, that really wasn't going to help reduce water use across their portfolio.

But, overall, the final results were very encouraging that ranged from about 14 to 40 percent water reductions at the sites where either of these approaches was implemented, which are great results for pilot sites. But, at the end of the day, what they were looking for was scalability, and the different options that they identified offered the potential to greatly reduce water use across their portfolio. We estimated that if the measures that were used,

either on the technical side or on the free air cooling side, were adopted by commercial and institutional buildings operators across the U.S., just getting 14 percent savings that can save about 28 billion gallons of water per year across the U.S. When we started looking at scaling down AT&T's networks, we found that many types of buildings, not just office buildings and datacenters, had cooling towers and, therefore, could use these tools, and that includes everything from sports venues, hospitals, office buildings, retail space, and universities.

We worked together to build a toolkit that could incorporate all the lessons that AT&T had learned through their pilot projects and make that accessible for any other organization. That brings us to the WaterMAPP, which is a set of tools that we put together. It's essentially a water management application that can be found at EDF.org/attwater. Beyond the success of their pilots, the best outcome of this project was the development of the tools. Because we found that making the business case for water programs can be difficult, we wanted to help make that business case easier for companies, so we developed a water scorecard that includes a water, electricity, and chemical efficiency calculator that companies can see what savings they'll be able to yield from technical or free air cooling improvements, not just in terms of the water savings but also in terms of electricity, sewer charges, and chemicals.

Now, the scorecard is a tool used to create visibility for water performance at facilities. For facility managers, this helps evaluate the areas of opportunities broadly for improving water efficiency, and, for organizational leaders, it's a great way to provide a structured approach to track your progress and compare performance across the portfolio. The efficiency component of the tool utilizes building data that's input into the scorecard, and historical weather data to calculate potential savings and efficiency improvements that would come from increasing the cycles of concentration in your cooling towers or integrating free air cooling. Just to give you a sense of what these inputs and both the scorecard look like, I've included a couple of screenshots in here. That first tab on the left shows where you would enter the data that you'll need to gather, whether you're inexperienced or if you're a facility manager, or from working with your building management staff.

The second tab below shows an example of the water scorecard grade and some of the attributes that go into it. Lastly, on the right, are sample results from the water efficiency calculator, which shows how much your organization could save in terms of

water, energy, chemicals, and sewer charges to your building, as well as the potential savings through the implementation of free air cooling in your building systems. We know companies have scarce resources for efficiency projects, but we found that having a strong business case can really help speed up or help companies prioritize those kinds of improvements. When AT&T worked with us to put together the toolkit, we wanted to have this be a set of tools that would really help develop that business case, and Tim Fleming, who is our counterpart at AT&T, found that those tools very much helped make that case at AT&T for them to move forward.

In addition to the WaterMAPP application itself, which is an Excel spreadsheet with a variety of tabs and guides built into it, we also developed a set of other assets that can help you with working on water efficiency in your own organization. We developed a water scorecard guide that can help you adapt WaterMAPP to your own organization's needs. One of the key points when we were working with AT&T to develop it was making sure that it was open source so that WaterMAPP wasn't only tied to assumptions that were built out of our work with AT&T, but that as companies work with it, if they find that the initial underlying assumptions aren't necessarily applicable to them, that they'd be able to adjust WaterMAPP to whatever their particular circumstances are. The water scorecard guide will help you actually adapt WaterMAPP to your own organization's needs.

In addition, we developed some training materials, including a cooling tower guide for those who aren't familiar with the systems to get to know them, as well as a 12-part video series on cooling towers and cooling tower efficiency. Then, lastly, we also put together a webinar with both Tim Fleming, Brendan FitzSimons from EDF, and others that provides a full walkthrough on how to use the tools. In short, these tools are really as we've imagined them, the gateway drug for companies that are interested in gauging water efficiency but don't necessarily know how to start, and cooling tower opportunities seemed like a great place for companies and organizations to start because a lot of these are relatively long-lived, are not huge capital investments, unless you're talking about a full retrofit, and offer opportunities for not-long paybacks for those.

The idea with the water efficiency toolkit is you can help raise awareness within your own organization, use the water scorecard tool to help identify savings opportunities at facilities, and get a better sense of what areas you want to start *[break in audio]*. You

can share the training materials, including the cooling efficiency guide, training videos and the webinar across your organization to help people understand what areas are the touch-points where you want to try and work. Then, the water efficiency calculator can help when making the business case and then communicating that upwards, so this is where we'd like you to act. Regardless of where you are on water management, we think that there's some pieces of the toolkit that companies will find useful, so we encourage you to download the toolkit, walk through the calculations, see what opportunities your organization has to cut its costs, and tailor it to your own use. In addition, we hope that it leads you to take advantage of other opportunities to cut your water and energy use. With that, I'll give it back to Holly.

Holly Carr: Okay, thanks so much, Steve. Great resources available. I hope folks will check those out and be able to use them in their building portfolios. In our next slide, I think we have an additional resources slide, I know Steve provided the link to those resources earlier, but it's also here on the additional resources slide. You can find everything that EDF has to offer for cooling towers from this project at this URL, and I think we have come to the time where we can take some questions from the audience. We have a lot of great questions that folks have sent in, so I'll just start shooting some out to our panel. A couple of questions for Alan at National Church Residences. One, "Did you replace toilets with high-efficiency toilets? What are your standards or guidelines for what to purchase?" I think you mentioned replacing flappers in existing toilets, so did you also replace the toilets themselves? Can you provide some additional guidance on what you selected to put in your properties?

Alan Mileti: Yep. For the specific initiative that I was talking about where we tried to encapsulate as many properties as possible, that was using a company that was basically going in and doing turnkey installations for us. We obviously had the option to replace the toilets, but that would wipe the payback out, so we dabbled around with replacing flappers and, for the most part, that was pretty successful. Typically, we would be retrofitting from 3.2 gallons per flush to about 1.5, and that being said, if we're doing any sort of a rehab or we have additional money, or a property that just needs new toilets, then we always just replace the whole toilet, so replacing flappers isn't necessarily a standard practice for us. It was more an experiment that worked.

When we do replace toilets, we typically go for a minimum, or I should say worst-case scenario, a 1.5 gallon per flush is what we

specify, and I know we have properties out there with 1.25 or even 1.0 with no issue. With the flappers, the one question that a lot of people ask is did it cause double flushing or issues with the flushing, and, honestly, I never heard an issue with that in all the properties we did. The only issue you'd hear is sometimes the flapper would need to be replaced in a shorter period of time than was expected, but that's obviously a low-cost thing to have to address.

Holly Carr: Great. We had another question regarding exactly what you put in and how it worked, "Any concerns with thermal shock when changing to low-flow, 1.5 gallon-per-minute showerheads, especially with older mixing valves?"

Alan Mileti: Not to my knowledge was I aware of that. We do our best to address those types of plumbing concerns. Obviously, I think the one challenge you have with anything dealing with water, whether it's water heating or just water service in general, is that a lot of our buildings might have been built in 1960, 1970, so the plumbing is rather old. Obviously, to go into a building and rip out all the plumbing and install new is a lot more difficult and expensive than anyone can really take on. I've never really heard a complaint about that, at least that's gotten up to me. Kind of what I mentioned earlier, we do semiannual or annual checks on all sorts of equipment, so I'll have our maintenance technicians go in and measure the amount of time that it takes for water to get hot once the spigot is turned on, and things like that, to make sure it's working. Then, if it's not, we'll start investigating to see what we can do to fix it, whether it's changing the temperature of the water heater, or upgrading the water heater or upgrading the boiler. I hope that answers the question.

Holly Carr: I do, too. I guess our audience member will let us know if they have additional questions. Another question regarding the measurement of water for your properties, "Have you considered installing unit water meters with live usage meters to identify water usage trends and identify issues earlier?"

Alan Mileti: Not really. I guess in a broad sense, we've talked about in some cases just sub-metering in general, both for energy and water, but we've always found that when we start to explore it, the cost of doing that really outweighs the benefits. When we have one meter, especially with our portfolio size, having one meter is a lot easier to monitor and evaluate and find problems with than having 100 of them.

Holly Carr: Okay. Yeah –

Alan Mileti: Yeah, we've not gotten that deep into it, and there's some methodologies that we've used when there's issues at a property that we've used to try to narrow down what the problem is.

Holly Carr: Did you try to attempt to account for properties that had more outdoor space and, therefore, were using more irrigation water –

Alan Mileti: Yeah, I mean –

Holly Carr: − And the follow up to that [*crosstalk*] that, sorry.

Alan Mileti: − no, you're fine.

Holly Carr: Follow up question was if all meters are combined indoor/outdoor water use?

Alan Mileti: What we did is we put out a survey to our whole portfolio, because obviously I don't have the manpower to go to every single property and look at how much they're irrigating, so we did survey our portfolio to kind of get an idea of how much irrigation was really occurring, when it was occurring, what they were using to do it, and if they had a deduct meter or some sort of meter that was monitoring the irrigation usage. We found that most of our properties don't really have deduct meters, so that's kind of where we turned to, like I said, the WaterSense website and we started looking up irrigation standards. We basically just took them and put them into our energy policy, and that will give general advice as to how you should irrigate, how much water you should use per square foot or square yard of land, where irrigation should be happening, where sprinkler heads should be placed, the times of day that you should be doing it.

Beyond that, the only real resource we have is our bill that we receive. Depending on where a property is located, you'll have some that split off the irrigation consumption on the bill, and then you have others where it's just totally combined. It all just depends on how and when the property was built, but we're not going out of our way, at least at this point. I'm sure in the future this will be come a bigger deal given the essence of water and how important it is, but, right now, we don't go out of our way to install separate irrigation meters at properties.

Holly Carr: Okay, okay. Well, thank you. I'm going to send a couple of questions over to Todd at Cummins from our audience. One, folks are wondering if Cummins might be able to share their true cost of

water document that's shown on one of the slides with the screenshots of various resources that you use. If that's something that Cummins is able to share to send out to our audience, we will post that, the archive of the document, in the additional resources section. We'll chat with Cummins about that and see if that's something that we can share.

Todd Swingle: It's something that over time I think we will. We've got some additional internal validation we want to go through, so it won't be immediate but our intent is to work toward doing that in a relatively near term.

Holly Carr: Great. All right, there you go. Second question for Todd, "Are your buildings a typical one-story industrial construction?"

Todd Swingle: I think so, if there is a typical. Relatively high roof, industrial buildings, so the equivalent of a two-story office. Most of our facilities include a two-story office at some edge of the building, and then the rest of it is open high-bay. The portfolio does include what I mentioned is a fair number of distribution facilities that would be akin to what you see as auto service garages, relatively tall because we do bring full-sized semi-trucks in and large equipment for service. Then, there will be some portions of our portfolio that includes R&D type facilities that have quite a few test cells where we do extensive test activities on engines and other components.

Holly Carr: Okay, thank you. We had a question from an audience member requesting an example or two of some of the specific measures that you have implemented in your portfolio where you've seen large reductions and had successes, specific examples of how you deployed the strategy you talked about.

Todd Swingle: Yeah, so quite a few of them have been on the – we've seen a lot with leak detection, so like some of the other speakers, we have older facilities, and, with those facilities, we've gone through and found a number of leaks and doing that type of correction, so that has been a major component. A lot of those have been identified through those water assessment, water audits, and water balance exercises. Cooling towers have been a big improvement in either areas where we have cooling towers and are able to increase their efficiency, or in certain locations where there were single-pass cooling, we've been able to implement cooling systems. The last one that isn't maybe as obvious but has really represented a huge area is what appear to be relatively small but consistent, ongoing flows and streams.

I have a slide that I show some of our sites of a broken fire hydrant and I ask which would they worry about the most, that fire hydrant or a hose running. Well, the reality is a fire hydrant may lose 1,000 gallons a minute but you see it, it's evident, people know about it, they go and stop it. All of the attention tends to be on water, the big flows, but a five-gallon-a-minute stream is several million gallons a year when it's running constantly. So, we've gone into sites and found areas where there's been either hoses or other cleaning equipment, things that have been left running or can be left running or have leaks, those types of things, and have seen significant improvement in placing operational controls on those types of equipment. Our test center in Columbus, Indiana was one of the big ones where they had water that was used to clean out the beds underneath engines, and by hooking it up to a simple solenoid and into their control system, the savings was over 20 million gallons a year.

Holly Carr: Wow. Okay. Great. Thanks, Todd. Steve, we have a couple of questions for you from the audience. The first question was whether or not utility conservation incentives were used for any of the portfolio upgrades that you described.

Steven Goldman: Thanks for the question. I'm not aware that they did use any of those, but I can certainly circle back with our contacts at AT&T and double check that with them. If the person wants to get in touch with me offline.

Holly Carr: Okay, and then the other question was regarding you mentioned sort of two major strategies with cooling towers. One was a $100,000.00 solution and I think the other was a $4,000.00 solution. The $100,000.00 solution was a cooling tower filtration system that is added to the cooling tower, is that correct?

Steven Goldman: I believe it was an upgrade to the filtration system. I think they were utilizing a different filtration technology.

Holly Carr: Okay, so –

Steven Goldman: Unfortunately, I don't know the specifics on that. Also, I could follow up with that, with the person who was asking, if need be.

Holly Carr: Great. To the audience member who had that question, please feel free − in just a moment we're going to provide contact information for all of our panelists. If you would like more detail on exactly what was installed, please feel free to reach out to Steve and then he can provide that information. With that, I think we've covered

most of our questions and we're coming to the end of our time this afternoon. Let's move on to the next slide, John. I think we have an announcement for our next session. Yes. Our next webinar will take place Tuesday, February 3, always 3:00 to 4:00 PM, and this webinar will focus on one of the many financing solutions that are out there to help folks pay for energy efficiency upgrades. In this case, energy savings performance contracting, ESPCs. We'll take a look at that method for financing and see how those ESPC arrangements have changed over the past few years, and also look at some folks who are outside of the traditional customer base for ESPCs and see how new sectors are taking advantage of ESPCs.

We'll also learn a little bit about the DOE's accelerator program around ESPCs that's focused on supporting state and local governments to use ESPCs for energy upgrades in their state and local government buildings, so please join us for that session. You can register at the homepage for the Better Buildings Challenge. With that, I would like to thank our panelists very much for taking time to be with us today. We have contact information for all three of our panelists if you would like to reach out to them individually to get additional questions answered. Certainly, if you would like to learn more about the Better Buildings Challenge or the Better Buildings Alliance, you can reach out to me, Holly Carr, or to my colleague, Kristen Taddonio. Our contact information is here, as well.

We always encourage our audience to connect with us on Twitter to get all the latest updates to the Better Buildings initiative and everything that's going on. You will receive a notice following this webinar in the next few days when the archive of the session is available online. Thanks again for your participation and for joining us today. We hope to see you next month. Take care.

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