COMMITTEE WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

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2008 Rulemaking on Appliance Efficiency Regulations	)	
	)	Docket No.
California Code of Regulations, Title 20, Section 1601 through Section 1608	)	09-AAER-1A
	)	

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

WEDNESDAY, APRIL 1, 2009

10:04 A.M.

Reported by:
Peter Petty
Contract No. 150-07-001

COMMITTEE MEMBERS

Arthur Rosenfeld, Presiding Member

Julia Levin, Associate Member

ADVISORS and STAFF PRESENT

David Hungerford

Lorraine White

Peter Strait

Bill Staack

Betty Chrisman

Valerie Hall

Daniel Kistler

ALSO PRESENT

Brian Lennon
Irrometer Company

Gene Smith
Hunter Industries

George Alexanian
Alex-Tronics Controls

Jess Ruyg
Chad Wilson
Hydro-Rain

Warren Gorowitz
Ewing Irrigation Products

Andrew Davis
Accurate WeatherSet Company

David Zoldoske
California State University Fresno

ALSO PRESENT

Stephanie Tanner (via teleconference)
U.S. Environmental Protection Agency

Joanna Kind (via teleconference)
Eastern Research Group
U.S. Environmental Protection Agency

Mary Ann Dickinson
Alliance for Water Efficiency

Kent Frame
Department of Water Resources

Robert Wade
Wade Landscaping, Inc.

Chris Brown
Marsha Prillwitz
California Urban Water Conservation Council

Carlos Michelon
San Diego County Water Authority

Daniel Muelrath (via teleconference)
City of Santa Rosa

Pat Eilert
Amanda Stevens
Pacific Gas and Electric Company

Mike Davidson
SPEC Management Group

David E. McLeroy
Green Leaf Mapping and Control Systems

Leah Murakami
Water 2 Save

Heath Bedal
JPH Group, LLC
California Landscape Contractors Association

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P R O C E E D I N G S

10:04 a.m.

PRESIDING MEMBER ROSENFELD: Good morning, ladies and gentlemen. This is the Efficiency Committee's scoping workshop for irrigation equipment. It comes under the Efficiency Committee of the California Energy Commission.

And that is Julia Levin -- I'm trying to talk and point and look -- our new Commissioner Julia Levin right here. And I'm Art Rosenfeld, I'm the Chair of the Energy Efficiency Committee. On my right is my Advisor David Hungerford. And not present on Julia's left, because he's busy doing other things, is her Advisor.

Let me start off with the usual formalities, suggesting you turn off your cellphone ringers. Let me further, before introducing other people, do a little bit of apologies on the timing.

The original agenda had us having a lunch period from 12:00 to 1:30. Unfortunately, Commissioner Levin and I have to be over at the Governor's Office from about 2:00 till, we hope, 2:45.

I'm going to suggest that when it gets to be noon that we take a brief break. There is a little delicatessen and coffee shop on the second floor. And if we take a 15-minute break for nourishment and other essentials, and then run till quarter to two, whereupon Commissioner Levin and I will disappear, we hope for less than an hour. And if you don't mind, we'll call that a lunch break.

And David is going to run things, start promptly at 3:00. We should be back. Do I hear any mutineers? Not yet. We'll see how you feel at 12:00.

Okay, before I turn the meeting over to Lorraine White, I think it would be a good idea if all of those up here at the mikes introduce themselves. So, starting with you, can you say your name and your affiliation, and a couple of words why you're here if you want to.

MS. WHITE: Commissioner, --

PRESIDING MEMBER ROSENFELD: I'm sorry, what did you say, Lorraine?

MS. WHITE: They are part of the panel that will be the second presentation. So, to --

PRESIDING MEMBER ROSENFELD: Oh, you

want to wait until the second presentation?

MS. WHITE: If you don't mind.

PRESIDING MEMBER ROSENFELD: Okay, Lorraine.

MS. WHITE: Okay. And then that way they will be able to make their brief comments at that time.

PRESIDING MEMBER ROSENFELD: And it'll be closer in our memories.

Okay, now I would like to introduce Energy Commission Staff, though.

MS. WHITE: Yes.

PRESIDING MEMBER ROSENFELD: We're sort of spread around. Actually, Lorraine, why don't I turn this over to you. I notice Bill Stack here and other people who should be introduced, yes.

MS. WHITE: I will be happy to introduce our team.

PRESIDING MEMBER ROSENFELD: Okay. So this is Lorraine White, who's running the show for the next eight hours.

MS. WHITE: Thank you. Lorraine White, Project Manager for the AB-1881 proceeding, which is the Commission's proceeding to set performance standards and labeling requirements for irrigation

equipment.

And the other members of our team, if you would stand when announced, is Bill Staack, our legal counsel. If you have any questions about the legality of what we're doing, please call him. I, unfortunately, am not qualified to comment on that regard.

We also have with us Peter Strait, who will be assisting us not only with the analysis, but helping me out with the podium works. We have Betty Chrisman, who is also a part of the analytic team. She's one of our key standards staff. So if you would like to have a historical perspective on what we've done in the past, she is definitely the person to call.

And we have Valerie Hall, who is my boss. She is the director of our efficiency and renewable division. And have I missed anyone? We have Daniel -- please pronounce your name for me.

MR. KISTLER: Kistler.

MS. WHITE: Kistler. He is our student assistant and he's been very instrumental in helping us do some of our literature searches and develop our mailing list. The fun job for a student.

So, Commissioner, any further opening comments?

PRESIDING MEMBER ROSENFELD: No, why don't you start through the --

MS. WHITE: Commissioner Levin, did you have any opening comments you'd like to make?

COMMISSIONER LEVIN: No, thanks.

MS. WHITE: Okay. Thank you.

Well, I appreciate everyone's attendance. And before we begin I just want to briefly let people know on the phone that we will be loading our presentations as they are to be provided.

And right now I just wanted to have people take a look at the agenda. And again call to your attention Commissioner Rosenfeld's comments about when our breaks will actually take place. They're slightly different than the previous version which was available at the end of last week. And we will check in about noon and see when that short break will occur.

So, other logistics for today. We are actually webcasting this so that people on our website can look at the presentations. Call-in number is provided so that they can listen and ask

questions. That number is provided in the notice and here on the slide.

When dialing in the passcode is irrigation; and I am the call leader, Lorraine White.

The information about this workshop, including an MP3 audio recording, as well as a written transcript, will be available. The audio recording will be available only until such time as the written transcript is posted. After that time we need to clear some space on our computers. So it will be a written transcript.

The presentations will also be there. All our public meetings are transparent. We have information available both in our docket and available to the public. You can find that information on our website. Just look for landscape irrigation standards and you will be directed to the right locations for the documents and presentations.

For those that are participating in person, we would like to insure that everybody has a chance to ask questions and provide comments. We want to make sure that we don't forget anyone, so I've asked that blue cards be made available.

They are out in the front.

If you have questions that you would like to ask during a presentation or during a panel, please fill them out and provide to either myself or Peter or Anjelica. Anjelica is the woman there at the dais. Sorry, Anjelica, I did actually forget -- she is one of our other team members.

We would very much like to insure that you get a chance to ask your questions and provide your comments at the appropriate time.

Also, at the end of the prepared presentations, about 4:00, we have time for open public comment. So anyone that would like to provide things that were not directly related to a presentation or discussion can provide additional comments at that time. On the schedule, it's about 4:00.

There is one last procedural announcement that I have to make. In the event that they turn on the alarm for an emergency we ask that everyone, in an orderly fashion, exit the double doors of the hearing room and proceed to the left or to the right, out the exits.

We're required to go across the street

and reconvene in the park, which is kitty-corner from our building. That way we know everyone got out safely. And we can come back into the hearing in the event that we get the all clear sign. So that is definitely something we need to make you aware of.

In addition, up the stairs and underneath the awning, we have a nice little snack shop if anyone gets hungry or thirsty. Please help yourself there. And then restrooms are under the stairs, or out the door and to the left.

So, with that, and all of the housekeeping done, let's proceed.

We have had the pleasure of very high interest in our activities, Commissioners, and several folks have wanted to come and address you. We would like to talk about the irrigation devices, themselves. And have convened a panel of representatives of the industry.

There are many more manufacturers and deliverers of service out there, but these folks will be able to provide us a really good overview of the devices and how they work, and recommendations on what they would like to see you address in the scope of this proceeding.

Later we will be hearing from a representative of the Center for Irrigation Technology at California State University Fresno. That would be David Zoldoske, and he's going to be talking about the testing protocols that have been developed over the years to evaluate the performance of these devices.

We have the pleasure of two representatives from EPA. They will be providing information on the WaterSense program and the work that they have done over the last three years, in particular, on the irrigation efficiency issue.

Then we have the pleasure of a representative from the Alliance for Water Efficiency, who will be talking about efforts elsewhere in the country.

Our partners in this, representatives from Department of Water Resources, will be talking about the model landscape ordinance and the role that these standards will have in implementing that ordinance.

We have with us representatives from the California Urban Water Conservation Council. They will be talking about the work that they have done to promote irrigation efficiency through best

management practices.

We will be listening to a representative from the landscaping industry talking about the practitioner's point of view and the importance of good equipment, but not just good equipment. So we'll be able to hear from them.

We have the pleasure of local representatives who will be talking about their programs and additionally providing recommendations to the Committee on the types of things we should be considering.

We have a representative from the electric industry. We will be hearing from PG&E and their consultant on their perspectives and the issues that they see most important when it comes to landscape irrigation water efficiency.

And then, of course, an opportunity for public comment at the end of the day.

So, why are we here? When I think of landscape irrigation I'm not dressed in a suit, I'm in my denim shirt in the backyard trying to figure out why I have a geyser in my lawn. And trying to figure out how to fix it.

And I go to Home Depot or Lowe's or someplace, Ace Hardware, wherever I'm going, to

try and find a replacement so I can repair my water problem.

And it turns out that I'm not alone in how I do this. And this is not the most efficient way of doing it. So the Legislature, in 2006, passed a law, AB-1881, that directs the Energy Commission to set standards, performance standards and labeling requirements for this type of equipment.

We are to set these standards for at least controllers and sensors by January 1, 2010. And then report to the Legislature on when we plan to set standards for the rest of the equipment.

The provision in the law says landscape irrigation equipment including, but not limited to, landscape irrigation controllers, moisture sensors, emitters and valves. And that "but not limited to" provision may end up being quite important as we go through this process.

After we've set these standards, the law requires that we prohibit the sale or installation of these noncompliant pieces of equipment by January 1, 2012.

There is a direct relationship to another portion of that law which is implemented

by DWR, Department of Water Resources, who is tasked with updating the model landscape ordinance.

Provisions in the law then require local agencies to adopt this model ordinance or better by January 1, 2010.

The Department of Water Resources is in the process of finalizing the regulations right now, and we'll be hearing more about that later.

The law also says under certain circumstances local agencies need to require that separate meters be installed for new connections after January 1, 2008.

What I was surprised by when I read into this law was the broad support and the diversity of support. It's not just environmental nonprofit organizations or water agencies, there were members of the industry, the manufacturers, the practitioners, in particular the California Landscape Contractors Association. You had different types of interests all focused on this issue of landscape water use efficiency.

And I've been asked several times why the Energy Commission. Why did the responsibilities fall to us? And the only thing I

can say is that it's probably tied to our long history in setting appliance standards. Done a very good job, as I'm sure you have commented on many times, Commissioners.

We have not only responsibility for licensing power plants and developing energy forecasts, and doing research, developing and maintaining information, reporting policies to the Governor and developing renewable resources. But we have a long history dating back to 1978 related to standards that affect not just energy, but water resources.

And we've got standards for washing machines and dishwashers and water heaters and faucets and things like that within that code. And the appliance efficiency regulations can be found in our California Code of Regulations, Title 20. It's a nice lengthy code section. It's got many many appliances already in it with efficiency standards and labeling requirements applying to them.

And in terms of our activities there's really three main criteria that we have to meet in setting these standards. It has to apply to things that use a significant amount of water or

energy.

And for a long time it was just energy. But then back in 2007, 2008 Assemblyman Ruskin successfully passed AB-662, which expanded that consideration to both energy and water. So now the code applies to energy and water.

These standards must be feasible. The technology has to be out there. It has to be accessible to consumers and it has to be something that can be implemented. And above all, it has to be cost effective to the consumer over the life of the product.

What I wanted to bring to people's attention is yesterday I did a little shopping. So, during the break you can take a look at some of the items that I, as a private citizen, was able to find, a little homeowner, at, you know, a common store. And the kinds of things that I would have to pay if I was to invest in these kinds of technologies.

And then technologies range in prices from, you know, $1 or so all the way up into the $60s, $80s, and it can be pricy when you have a lot of these different devices that you have to invest in.

But if you've also made a lot of investments in plants and landscaping this is the type of thing that's going to keep it alive and looking nice.

So the goal of AB-1881 is to insure that we take actions that can reduce the wasteful, uneconomic, inefficient and unnecessary use of water or energy. And focusing on the landscaping equipment in particular is what the Energy Commission has been tasked to do.

I just wanted to touch briefly on our history in setting policies related to these kinds of actions. And, in particular, the fact that from a policy and an analytic standpoint we've been looking at this nexus between energy and water since before 2003. And we started to address the types of actions that the state needs to be taking on the energy side to, in fact, save energy through saving water.

And that we've recognized that there are a lot of tools we have at our disposal to, in fact, achieve those savings. And those policy documents are all available on our website if you want to look at it. Or you can call me and I can tell you more about it.

There's also several other activities that are currently going on in other agencies that we are actually engaged in. We're partners in some of these plans, in developing them, and looking at ways that we can actually utilize the water sector's efficiency gains this way of lowering energy consumption.

But in particular, our actions related to water conservation are directly related to the directions of the California Constitution, which prohibits the waste or unreasonable use of water. A lot of people don't know that's actually constitutional provision, it's not just something we have in statutes or a policy.

Water conservation is looked at as a significant way of lowering greenhouse gas emissions, on the order of 1.4 million metric tons by 2020. That's contained in the scoping plan that ARB recently adopted.

The Governor, also, as a way of trying to address our delta problems, called for a 20 percent reduction in water demand by 2020. And then the State Water Plan sees use and reuse of water being much more efficient in the future as a key way of addressing critical water resource

management issues.

Now, when we set our standards there's a whole bureaucratic process associated with this. And so we're beginning the preliminary phases of this. The Office of Administrative Law has provided us with this caricature diagram of what the process really entails. And there's three major parts to it.

There's the preliminary activities where you look at the issues that you're trying to address through regulation. And you do analyses, you collect data, you outreach to the public, and you get input. You do several workshops to get dialogue on what these regulations need to look like. And you then draft the language, develop the test methods and define what the labeling requirements are going to be.

You compile all that evidence together. You submit it as an official rulemaking. That information is published in a registry and made available for people to look at. And we will be holding at least one public hearing during that process before we adopt our regulations.

Then there is the final step which is the Office of Administrative Law, insuring that

we've done everything we're supposed to under the Procedural Act.

So, we don't take these actions lightly. There's a lot of things involved in doing them. And we're hoping to get all this done by January 1, 2010.

So some of the things that we're going to have to address. And this is just a short list. There's lots of other things we're going to talk about during this proceeding.

We want to know how different devices compare. And, in particular, dumb versus smart controllers. Dumb versus smart sensors. What's the difference between an impact sprinkler head and an emitter. And can you compare those kinds of things.

We want to look at the types of cost effectiveness evaluations that we're going to have to make. What is the real cost of these devices to the consumer over the life of the product. And what kinds of savings can we expect by installing things that are high in efficiency, save both energy and water, and provide the performance that we need in this type of equipment.

We're going to look at ways that we can

develop studies, utilize existing studies, bring that into our record and use it as a basis of an informed decision.

Then there's also questions of enforcement. Once we adopt these regulations how are we going to actually insure that people comply. Under our normal proceedings manufacturers will certify that they're in compliance with our activities.

But AB-1881 provides an additional requirement, and that's to prohibit the installation of noncompliant equipment. So we're going to have to address how best to do that.

And then there's going to be lots of other issues that through the public process we will also be asked to address. And to the best of our ability we're going to endeavor to do so.

Most important in this is going to be your input and your participation. We have asked, in our notice, that comments regarding our scope are provided to us by next Wednesday so that we can try and issue a scoping order that defines for people exactly the types of things that we're going to be looking at.

Keeping in mind, of course, that the

legislation only requires that we look at controllers and sensors this first round. But, from my experience, and from what you can see here, that actually entails quite a few devices. So in and of that, by itself, we will have a full plate.

For those that would like assistance in participating in our activities, you can definitely call me. But we also have a Public Adviser that's available. And they will instruct you on how best to file comments or questions or participate in these types of activities. So they're a real asset.

We would also like to ask people to contribute any studies, scientific-, engineering-based types studies that will inform us in this process. Or any other additional type of information. What kinds of things are out there. What are their costs. How can people have access to them.

I will tell you that the store I went to yesterday there was some equipment I just couldn't buy. So, how, if we set standards, will be insure that people can actually get to this equipment.

We also have a service list on our

internet site for this proceeding. It allows people to sign up and get electronic notification so you don't have to wait for the snail mail.

And then, of course, when we do announce future workshops and meetings we would certainly like your attendance.

So, we have three major phases within our proceeding. In particular, we're shooting to try and get the scoping order out by May 1st. And in May and June have some additional technical workshops where we're going to really, you know, drill down into these types of devices, how they work and what they do.

We're hoping to issue a staff report that summarizes what we've learned in July. And then target developing the actual language for these regulations within the August timeframe. Having a workshop on that; revising the language, if needed. But certainly trying to get the adoption by this Commission before the January 1st deadline. We're targeting December 16th. We hope we can certainly make that, or earlier.

And then, of course, the AOL review, the Office of Administrative Law review would be in January.

This slide provides just general information. Like I said, all our presentations will be on the web. So if people want to refer to this later, we certainly can do so.

So, with that, if anyone has questions I'll be happy to answer them, about the process. Otherwise, we can just dive right into talking about the devices.

Commissioner, seeing no questions, I think I would like to invite our panelists to please come up. Let's see, we're going to introduce each other first. So, wait, Brian, you can come first since you're first.

Okay, I want you here. So our first presenter is going to be Brian, but I will also ask others to introduce themselves prior to their remarks.

PRESIDING MEMBER ROSENFELD: So you're going to introduce each person as he or she gets up?

MS. WHITE: Actually, I think it would be good for everybody to introduce themselves and say where they're from, --

PRESIDING MEMBER ROSENFELD: Good.

MS. WHITE: -- what company they

represent. And then we'll start the presentations and remarks in the order of the agenda. But everybody introduce themselves first.

PRESIDING MEMBER ROSENFELD: Okay, let's start with you.

MR. LENNON: Good morning; my name is Brian Lennon with Irrometer Company in Riverside, California.

MS. WHITE: No, you can do it at your microphone, yeah.

MR. RUYG: Good morning; my name is Jess Ruyg with Hydro-Rain Corporation out of Salt Lake City, Utah.

PRESIDING MEMBER ROSENFELD: Welcome.

MR. WILSON: Chad Wilson with Hydro-Rain; I'm an engineering manager.

MR. ALEXANIAN: George Alexanian from Alex-Tronix Controls from Fresno, California.

MR. GOROWITZ: Warren Gorowitz from Ewing Irrigation Products, Vice President of Sustainability and Conservation, from southern California.

MR. SMITH: My name's Gene Smith. I'm with Hunter Industries. I'm a product marketing manager from San Diego, California.

PRESIDING MEMBER ROSENFELD: I guess that's it. Thank you for coming. Let's go.

MR. LENNON: Again, good morning, and thank you for inviting us. Irrometer Company is based in Riverside, California. We're a startup company, started in 1951. I wasn't there at the time.

We're actually in the same building that the company was originally developed in. So we have a long background on the agricultural side of soil moisture monitoring and management, sampling products. And, of course, landscape is very very important to us.

So Lorraine asked me to speak. I must warn you I'm not an expert. You'll figure that out here pretty soon. And I certainly don't represent all manufacturers of soil and moisture products.

But I can tell you I come from the background of the construction industry, which is a heavily regulated industry. And we should be thankful for that. We're in a building now with many stories and I feel safe in here, and I feel safe that all of the items above us meet a specification.

So it is about time that we've done this in the irrigation business, because we've sort of been lax about it. So, it's great to see the activity towards legislation.

First I thought I'd give you a little background in soil moisture measurement. This may appear to be one of our Treasury Department people but I don't think it really is.

(Laughter.)

MR. LENNON: But I'm not making light of this subject, but I do want to show you some of the things that we see out there.

We call this the squish method. This is an actual photograph, it's not a staged photograph, this is one of our landscape salesmen who was called to help out a homeowners association because they had very high water bills. And that's not uncommon. I see Bob over there. Bob, would you shake your head the landscape -- do you see this out in the field? It's true.

MR. WADE: Yes.

MR. LENNON: That doesn't take a soil moisture measurement device, but honestly, that's some of the stuff that we see out there.

This is an agricultural method. I get the first tractor, okay, we get stuck. I get the second tractor, but the third guy, what was he thinking? Of course, the smart guy is the guy with the crane.

Of course, we have to put a fuzzy animal in there, but the reason I put this is it's a nice segue to let you know that animals are, in fact, pretty smart. And what we're talking about is smart irrigation management.

It was kind of interesting when Lorraine was talking about her visit to the home improvement store about some of the things she was looking for.

We talk about conservation and we always end up with water. But if you think about it, when we're irrigating properly, we're doing a lot more things than just water. Not that water isn't important, but obviously, you know, it has a huge impact on how much fertilizer and chemicals go into the ground. Obviously it's protecting our aquifers. It's amazing how many problems with pests and disease really come from over-irrigation.

Of course, our homeowning investments

right now are in peril, but it still is part of our culture to have a home with beautiful landscape. It has a huge impact on the value of our homes.

And it's amazing, if you want to look at related to energy or embedded energy, how much plant material is replaced. Look at the energy of purchasing it, you know, digging it, installing it, re-establishing it. When, in fact, so much of that plant material tends to be over-irrigated and usually that's the demise of the plant material.

So, if we go to our friends at the Irrigation Association, they define a smart controller by a product that estimates or measures depletion of available soil moisture. I mean ultimately that's what we're trying to do with these devices, is replenish the soil moisture that's been lost through evapotranspiration, through deep percolation and other things.

So, I guess my next slide is regarding what do we estimate or measure. So, I estimated it would take me about ten minutes to drive here from the Starbucks down the street. I did not estimate how long it would take to park. So I am parked over at the mall. So if somebody could

give me a ride back, you're probably saving a lot of time.

So, we can estimate or measure time. Certainly the fuel gauge. I flew up here on Southwest. I am glad that they have a fuel gauge. And it's great that they can estimate how much miles they'll get out of their airplanes. But I sure want them to measure the fuel in that airplane.

Credit card balance you can estimate or measure. I think my wife anticipates, because she seems to know exactly how it works.

The home values. At this point we probably all want to estimate our home value. We don't want to measure it. Let's give it some time.

And then, of course today is a special day, isn't it. So if you estimated your sales tax yesterday you probably want to measure it today.

So what are we really measuring? And basically what this diagram shows is what happens in an irrigation-type cycle. And you can see the water is sort of flowing down from on top. That could be rainfall or irrigation. Of course, the arrow going up is evapotranspiration. The plant

uses some of that water and some is evaporated.

But that blue zone there, that's the magic zone. That's the happy zone of the plant. If we can keep landscape plant material in that happy zone, we're going to save water, we're going to improve plant performance, and that's the best situation.

So let me show you a little diagram here. I'm not trying to be too technical because I'm frankly not all that technical. But basically what you're looking at here, if you look to the left of these, this is an illustration of the soil particles. And to the left is saturation and to the right is wilting point.

And you can see that there's a lot of nooks and crannies that fill up with water. And what we call that, what the technicians will call that, is the available water. And that is basically in that green zone, if you look there where the arrow is coming up now. As soil gets drier, that water becomes harder and harder to get to.

I guess an analogy would be like going to the 7/11, putting a straw in that giant gulp that you get. When you start out, there's a real

tall column of water and it's quite easy to get the water out, doesn't take much suction to pull on it.

But as the water becomes less -- or the liquid becomes less available you have to pull harder on that straw. And that's exactly what the plant does. So, the plant is happiest somewhere in this zone between what they call field capacity and wilting point.

And field capacity, to give you a hands-on analogy, if you will, if you were to take a sponge and throw it in a bucket of water. And then just pick that sponge up and let the sponge drip off to where you're not squeezing it, but it's holding the water, that's about field capacity. And that's as wet as we want our plants, no wetter.

And we don't want it any drier than the permanent wilting point, because you can imagine what that does to a plant.

So that's just kind of an idea of what both weather systems and soil moisture systems are trying to do. They're trying to manage the irrigation water in between that magic zone there.

Some people call it maximum allowable

depletion, but that's basically what we're trying to do.

Okay, now there's all kinds of soil moisture sensors on the market. Without getting too technical, they use many different technologies. But basically what they do is send some kind of signal. There's varying types.

Some use electrical resistance. Some use electrical capacitants. Some use a resonance. But they put some kind of signal into the soil and that soil, depending upon the soil type, the salinity level and the available moisture, available soil moisture, will impact that signal.

So, typically the soil moisture sensors are used with some kind of control device or read devise that sends a signal to the sensor. The sensor gets some feedback. And then it makes a decision.

Now, these are all buried in the soil. If you look in the upper right-hand corner, that's the product that we offer.

To give you an example of how that's constructed, there's a artificial soil placed in there. There's a couple of stainless steel rings that have a slight space between them. We throw

an electrical signal through it. We measure the resistance of that signal. And, of course, if the soil is very moist it's going to have more conductivity. If the soil is very dry it's going to have less conductivity.

So, all of these sensors, whether they're ours or someone else's, are installed somewhat in the soil, or set somewhat similar to this.

Here's an installation. We basically, with turf, because we always want to go into the root zone of the plant material. So if that's your grandma's oak tree that's been there for 100 years, you're going down a couple feet. But, of course, that's quite a bit drier, less irrigation demand.

But in turf, which typically has the highest demand for soil moisture replenishment, we go pretty shallow. And what we're trying to do is put those sensors right where the root zone is.

Effectively, you've heard these routines about talking to the plant. Well, the plant will talk back to you, because the plant is going to put a suction on the soil for its nourishment. And the sensors are going to see that.

So in all cases, whether it's our manufacturing or not, we place the sensors in the soil. Sometimes we have to trench back to the controller, sometimes we go right to the valve box. Some types of sensors can marry to existing valve wires. So it kind of varies on the different manufacturers and the distance from the controller. And then whether it's a commercial application or a residential application.

And Lorraine asked me to give some guidelines as to cost. And maybe Bob can help you; he is a contractor. I'm guessing. If you look at our simplest device, it could be as quick as 45 minutes. If you look at a commercial application, it could be hours. So it's kind of hard to guesstimate what the various types would do.

Most soil moisture management devices are add-on. And I'm sure some of our competing manufacturers would tell you that they also make a controller device. But for the most part, most of these devices complement an existing controller. Although, again, some are a complete control system.

They will work with almost any

controller. You have to have a pretty old controller that -- I mean we're talking maybe 15 to 20 years or older -- in order for these systems not to work.

Most of them interrupt the controller schedule. And what we mean by that, our recommendation when setting these up is to tell your controller, your existing controller, to irrigate as often as it can for shorter period of time.

So the process would be that the controller attempts to open the valves to start an irrigation cycle. Basically what happens, particularly with our device, is it goes through an electronic module. And that module then interrogates the sensor. So before the module will allow the valve to open, it's going to check with the sensor for its disposition.

Now, these all have some kind of adjustable threshold. All these devices, whether it's based on soil moisture percentage, or just -- ours is a value from zero to ten, or zero to four. But they all have some kind of threshold. And that allows the devices to accommodate different soil types, different plant materials. And, you

know, different climatic conditions.

So then once the signal goes through the module it will interrogate the sensor. The sensor will give it feedback. And in the case of our product and most other products, if the soil is wet enough for healthy plant material it will not allow the valve to irrigate.

So the controller doesn't know that the valve hasn't opened. It thinks it's a normal cycle.

So the analogy would be, I guess, it would try at maybe 7:00 a.m. for a five-minute cycle. And it's pretty wet, pretty cool, doesn't need a drink. Maybe it tries it at 9:00 a.m. Same thing.

Maybe by 10:00 or 11:00 a.m., when the cycle attempts, it's starting to get dry and then it will allow irrigation. So you're kind of micromanaging the irrigation based on the plant demand, as we say, or root zone water management is what we call it.

Some of these products require site calibration. Our particular product doesn't. But it's relatively simple. Typically they'll plant the sensor in the ground. They'll get it very wet

to determine what they call field capacity, very very wet. And then they'll call that zero, if you will, and work from there. Ours we just adjust the dial till you get to the plant performance you're looking for.

In terms of cost, this was really tough because we have products that range from $100 to $250. Most of the add-on devices are under the $400 limit. If you start to get into actual controllers, they're fairly sophisticated. Some of them are really sophisticated. They could be as much as several thousand dollars.

Just to give you an example of what our product does. We like to say it makes the controller smart. It's simple to install and use. The instructions takes you about two minutes.

Again, it prevents unnecessary irrigation cycles. That adjustable moisture setpoint, if you see that black dial, we think in terms of soil tension, in the soil tension world, which comes from agriculture. Lower numbers are wetter numbers. In other words, field capacity is about a level 1. Whereas a level 10 is very dry. So most turf would be managed in the 2 to 3 zone.

Basically a rule of thumb is the deeper

the root zone the higher the number. So a tree that's been out there for 30 years with a three-foot, four-foot root zone, you'd manage that much drier. So you can adjust this product to the plant material.

And here's a real nice feature of all of these products, all of the soil moisture products. There's no seasonal adjustments. And to be quite frank with you, what you'll see in our studies is we save the most water in the off-season. Because when it's hot and dry, the grass needs water. But the mistake that most people make is they do not make adjustments to their controller.

Now, I've told you we have an agricultural base. I was talking with our technical guy yesterday. And we do, on the agricultural side, a lot of soil moisture monitoring. And we offer a website to our customers.

And he was looking on the website, and we have a grower up in northern, or central California that has just hundreds of acres of nut trees. And we just monitor it for him, with him kind of thing.

And that soil moisture has not changed

since November. It's just now starting to change because they're pre-irrigating. So there's months and months that have gone by that the soil moisture levels have not changed. It doesn't require any irrigation. So this is a huge benefit to these types of products.

Basically it works like a thermostat. If you think about it, when you turn the thermostat on, when it gets to 73 degrees it shuts the heat off. This is the same principle. You adjust these dials or these thresholds, and that's when the irrigation shuts off.

Just to give you a quick review. We make a small product. Again, Lorraine asked me, you know, what's the street price of these products. This product sells for $100. It's a one-sensor device. It does require that basic controller has a very simple sensor circuit, which most of them have for rain or freeze. Inexpensive, easy to use, simple. It only has four settings. Kind of hard to screw it up. That's the low-end scale.

This product is a little bit more sophisticated. Has a greater range; has two sensors. It can be used to manage a single valve,

the entire controller or a group of valves.

When you want to get real sophisticated, now you're talking about a commercial application. If you see the product in the upper right-hand corner, as you can see, we've taken that module and we've banked.

And when we get to commercial applications, we think in hydrozones. And you'll hear this term. And if we all thought in hydrozones, and designed and implemented in hydrozones, we'd probably save a bizillion gallons today.

But basically the principle is to manage the irrigation, not by disposition of the valves, but by the irrigation needs. So you can have 20 valves that are managing sunny turf. They should all be irrigated in the same schedule.

And you could have two valves that are managing your ice plants. And you have a different schedule.

And that's the principle here, is this device goes with the controller. And it sort of interrupts the controller's signals based on plant demand.

Okay, so this is the technology work. I

mean, I keep hearing do you have information. We have a lot of information. Of course, as I say, we come from the agricultural side. And the research side. And a lot of this information is well documented.

I would recommend, in fact I have a copy here, and I've even seen somebody else with a copy, the Bureau of Reclamation has put out a couple of comprehensive reports.

This particular product, let's see, the first one -- okay, the first one is on devices. It's quite thick and it talks about our device, and just about all the manufacturers out there. It's great reading.

The second one is a summary of smart controller studies. And in there you'll find at the time that the report was collected just about most of the reports that are out there and commonly accepted, both for weather-based controller, soil-moisture-based controllers and that sort of thing.

And then I put in this one from UC Davis because we sort of are very aware of it. There's lot of reports. We have this tremendous community of irrigation experts that are employed by the

state. I don't know why we don't use them more frequently.

In this particular case it's technically a pesticide runoff report. But obviously to get to runoff you have to irrigate. And it's real interesting. It has a comparison with a stand-alone conventional controller, a weather-based controller, and soil-moisture-based controls. And, of course, there's many others available.

Here's just an example of something that we've done. This is actually a result of what is often called the Boulder study. The interesting thing about the Boulder study, it was done in '93. And then a follow-up was done two years later.

And what you're seeing there is the difference between the theoretical or ET suggested irrigation level and the actual level. Now, I want to make something very clear. If this chart included typical irrigation methods, that chart would be twice as tall. Because what you're going to find is most people over-irrigate above the theoretical ET or, you know, the replenishment value, by 30, 40 percent.

So this is actually based on the fact that the soil moisture, the plant material told

us, okay, it may be hot and windy out there, but we're fine, we don't need a drink. And that's about a 26 percent savings. We see savings anywhere from low 20s to as much as 80 percent, depending upon the efficiency of the systems.

So what are we talking about here? I'm so glad that you invited us here because I sort of feel like soil moisture sensing is sort of an overlooked and perhaps misunderstood. And so I really do appreciate the opportunity to share with you.

Obviously we've engaged with SWAT. They're doing a terrific job. They have, if you're not familiar with what they've done, I know David's going to elaborate on it, but basically soil moisture sensors have gone through the protocol for the sensor, itself. We've been tested to that. It's referred to as phase one.

Phase two is coming, which is the control device.

Another option is to go to somebody like the American Society of Agricultural and Biological Engineers. These are standard-writing type organizations. I'm not recommending them, I'm just trying to give some suggestions that

there is opportunity for expert influence or expert technology out there.

Here's something that we've been successful with. In Australia there's a thing called smart approved water market. It's not related to our product or our brand.

Basically, and I've got some information on it here, there's six experts put together by a board. The board reviews the existing test data, much like Lorraine was mentioning. There's an awful lot of third-party testing data on our products and all of these products. And it would sure be a pretty fast way to start saving water right away.

And, of course, what I'm going to suggest is that we look at the advisory panel, and perhaps suggest that we put together, as I mentioned, you have guys in Fresno, CIT, ITRC down in San Luis Obispo. Tremendous amount of research at the universities and CalPoly. I mean there's enough information out there that if the CEC wanted to hit the ground running and start saving water immediately, that they could do it.

And I'd like to put in a personal plea at this point. My personal feeling is this: You

know, I was talking with a customer yesterday in Michigan. I mentioned I was coming up to Sacramento. And he was aware of what we're doing here in California. And I think we have to be careful -- I mean, I get it, we're doing this for California.

But the truth is I think the rest of the nation, maybe the world, is looking at us. And so it's very important that whatever we do makes sense for both new applications and existing applications. And I recognize that this is about new landscape ordinance.

But the reality is, or my perception is that when and if the CEC puts an approval on a product or a device, that's going to be seen as sort of the Good Housekeeping stamp of approval. If anybody remembers what that is, or UL listing.

So, I would implore you to look at these devices. Sometimes we're looked on as a gadget because we have an add-on device. The technology is just as good as any technology out there.

The real advantage is there is a bizillion homes out there right now today that if we gave everyone one of these devices in this room, by Saturday, mid-morning, we'd all be saving

water immediately. And you could do it, yourself.

So, that's what I would ask you to do, is to consider all of the savings, both new landscapes and existing landscapes.

So, that's my presentation. Is there any questions?

ASSOCIATE MEMBER LEVIN: Mr. Lennon, I've got a question. Thank you, that was a very helpful presentation.

I'm curious, though, you mentioned a number of benefits addressing landscape irrigation efficiency. One you didn't mention was topsoil preservation or loss. Is that not an issue with landscape irrigation?

MR. LENNON: I suspect it is. You know, if you look at the mechanics of, and again you need an expert on hydraulics, but obviously anything that we put into the soil, if it erodes the soil or, you know, it runs off is an impact.

What, you know, the bad news is we're terribly inefficient. The good news is there is so much opportunity. I mean I'm new to the irrigation business, about one year, and all of a sudden I've become the water cop in my neighborhood. And I live in a hilly area, and

I've been on my neighbor's case, seriously, because that guy keeps just running water down the drain.

There is so much inefficiency out there, to answer your question, absolutely. And as you'll see, as the other, as the real experts come and talk to you, is there's a real issue here with efficiency and design.

And as I say, in the construction business, in a new home, it's mandated the size of the lumber and the distance between the wall outlets. But they get out to the front yard and as long as they have white pipe and black leaky things, they're good to go.

So, even the best designs, when it comes to execution you're going to see a challenge because sometimes shortcuts are taken. So I think it's very important that what we're doing here today does have this enforcement arm. Because we have worked so hard to make sure that the specifications are available, that the designers employ those specifications.

But it's so critical to make sure that we mandate that when it's installed it's installed to a design, and it's installed efficiently. And

that would include topsoil.

ASSOCIATE MEMBER LEVIN: Thank you.

PRESIDING MEMBER ROSENFELD: Thanks very much.

MR. LENNON: Thank you, sir.

MR. SMITH: My name, again, is Gene Smith. I'm a product marketing manager with Hunter Industries. I've worked in the organization as a mechanical engineer, and most recently in marketing.

What I'd like to do is take the opportunity to discuss water conservation, passive water savers and some active water savers within the irrigation equipment industry.

A lot of the equipment that I'm discussing today is found within the catalogues of many of the equipment manufacturers that are out there, not just exclusively with Hunter. You'll see Hunter on every single one of these slides, but that's just where I'm from.

Instant pressure regulators are devices that are available on spray bodies, and in some cases rotors, that really control the pressure that these devices operate at.

One of the problems we see in the

irrigation industry is the typical systems are operating at too high of a pressure, an operating pressure, to be efficient. Most devices out there, unless they are on a high-end commercial job are typically spec'd or installed without a device that controls pressure. And most of the time they're running at pressures that cause misting and water waste due to evaporation and wind drift.

So this is one of the devices that we believe is key. And you can see it in the written standards for, for instance, the state of Florida. In certain counties they are requiring the pressure regulated. Pressure regulated spray bodies are used exclusively because of the water-conserving properties of the device.

Typical water savings, 25 percent definitely gets us on the direction that the Governor has mandated for 2020 of 20 percent water savings.

And here is just a visual of exactly what I'm talking about. The impact of having a regulator inside the body or the device of the sprinkler, itself. Takes the water drops, makes them much larger, they have a tendency to stay put

onto the turf area or the bed application where they're installed.

Whereas most applications you're going to see water misting up into the air. It eventually, because the particles are so small, they end up drifting away. Or in some cases, on a really hot, humid -- I mean dry day, then end up evaporating before they even hit the turf, before they're ever able to land in the soil properties, or soil area and wet the plant.

Just some data background that we've done really. There's estimates on some zones. Typical residential zones where there's water savings estimates of somewhere in the order of 70,000 gallons per year. Just on a typical residential zone, per year.

I know on my property I've got about a half acre of irrigated area. And I've been able to see a water savings very much similar to this. And that's just a normal residence.

Protecting against water waste due to maintenance equipment damage or other sources of damage. Having regulators in the stems of these devices a lot of times will reduce the amount of water that is lost during an event like this.

Other devices that are very important to reduce the occurrence of water waste during damage are flow sensors, or flow shut-off devices. These can be installed on the main line of the irrigation equipment system. And really can control and understand when there's a high-flow situation, and shut the system off. Try to start the system back up after the zone that has the problem is finished in the irrigation cycle. And continue irrigating without water waste.

That's another very important part of the irrigation system we think needs to have a label and a requirement for water conservation.

Check valves. This is a lot of times overlooked. It's a very simple device, and very very -- not very costly at all to include. A check valve basically is a device that holds the water inside the irrigation system when the irrigation system is off.

If there is elevation change in the irrigation system and there's not check valves in that system, the water will actually drain out under gravity. And it's not pressurized, so it doesn't go through the nozzle and go out into the turf area or the bed area. It drains down the

sidewalks and I've got a picture to kind of illustrate what I'm talking about.

So this is a system that's turned off, but because there's elevation change, the water has drained to the lowest bed and it just runs down right onto the concrete, right down the drain. Causes stormwater problems, et cetera.

Just an estimate again of how much water can be saved. I've just looked at the water volume that's held within different pipe diameters. If some of the water is allowed to leak out through the lower heads every single time an irrigation cycle is turned on and off, you can see that we're looking at -- I mean this is only for 120 irrigation days per year. There's a substantial water savings that can really be avoided -- or water savings that can be obtained if you just include these check valves in the devices.

So this is another part of the passive water savings, and a part of the devices that we believe really needs to be labeled and mandated to conserve water.

A device that's new to the irrigation industry, as far as landscape is concerned, it's

been a part of the ag industry for quite some time, is a device called the MP rotator. But it falls into a category of rotating nozzle type devices.

It's multiple streams, different trajectories. It really fits kind of into the spray nozzle category of devices. But it is really new. And really what we believe it accomplishes, and devices that save water need to accomplish, is to reduce run-off. These are big sources of water loss. Reduces over-spray. Has a very low precip rate so that the application rate of the device will apply it in such a rate that the soil can absorb it.

If we looked at spray-type devices, spray nozzles in particular, the application rate is typically too high. And the soil just can't absorb the water in enough before it begins running off.

It needs to be matched in precip rate, apply water with a high level of uniformity, resist the wind and be durable to last for many years in harsh conditions.

The MP rotator is a product line that gets you coverage from 8- through 13- to 21-, all

the way up into the 30-foot range. So there's quite a range of coverage that makes it very suitable for a lot of the applications that we're talking about for labeling. And some strip patterns that cover some special areas, as well.

Just some studies that we've done to prove out this type of technology. This is just one example. We've gone out and audited a system that had spray nozzles on it. Did a water out of that system and found that the sprays, itself, had an efficiency somewhere in the mid 50s. And this is backed up by many studies that have been done in the past.

Fifty-three percent is not a great uniformity or an efficiency, that is for sure. And there's vast improvement, we think, can be made.

The beauty of the MP rotator or devices like this is that you can just retrofit the system. Unthread the devices that are there. Don't change head spacing. And that's exactly what we did in this case. Thread on a rotating stream device like the MP rotator, and you see that efficiencies climb to 71 percent. Some 31 percent improvements in water efficiency or water

use.

Now, the key in this situation is to obtain this water savings you have to have a savvy installer or savvy maintenance person that knows to adjust the run time of the system, such that you take advantage of the higher efficiency application of the water. But it's there.

This one particular zone estimates of some 4200 gallon savings per year, just from this one zone. And on this property we were looking at there were 20 similar zones at the city of Portland, city parks department.

Some advantages but durability. Case study done in Texas. Again, the opportunity to retrofit systems is enormous, in our opinion, for these types of devices.

This Dell corporate campus in Texas had spray nozzles, obviously, that were causing many problems with water loss and water waste. The system had significant low pressure and problems with pressure because of over-design.

The MP rotators, again, this type of device just replaced the spray nozzles that were on that site, and we immediately saw an improvement in pressure and an increase in

performance and efficiency. And a huge improvement in water use.

Just a shot again to show these types of devices, how they perform much better in the wind. Typically systems are run at pressures that are far too high for their design. Water is wasted through misting, as shown on the spray system on the left. The MP rotator, just by retro-ing, not even taking into consideration the effect of pressure regulation, drastically improves this performance.

A lot more of them can be used on a zone which a lot of times for the contractor really makes installation of them economically viable. Changes to run times are pretty important. These are things that installers are going to need to understand and be educated on.

Water window. Basically there's no impact by using the MP rotator. You can get through the schedule in a water window very similarly you can with any other irrigation devices because of the fact that it's lower and it's precip, and you can get more on one zone.

And it's been tested. Tested in some pretty harsh environments that include also

reclaimed water, which is an important part of what we're doing, also to conserve water and use water wisely.

Just some ways to adjust it. It's very simple to.

Now, I mentioned pressure regulation. There's pressure regulation, can be paired together with the water savings properties of the MP rotator device, itself, to even improve it better and farther. By pressure regulating the MP rotator to its optimal pressure, you get the best performance out of it no matter where in the zone it's located, and what the incoming pressure is.

So these are -- this is again another part of the device options that we believe is very important for labeling and water conservation.

Now, getting on to the control end of things. We've talked so far about what happens out on the end of the line where the sprinklers are. But in terms of the control, you know, very much like Brian was discussing we need to take input from the environment and adjust controllers.

We talk about smart controllers, we talk about input from the climate or from the soil reservoir. We have devices that this sensor group

can be installed somewhere appropriately on the site and it will bring information in and allow the controller to adjust run times. And, again, the efficiencies and the water savings that you get are typically during the cooler months of the year.

The system will be set up to irrigate properly for the peak season. And then during the winter when irrigation is not required at peak levels, it will adjust it down and appropriately irrigate.

It's got a rain shutoff device that's incorporated inside. And, again, a lot of the manufacturers employ a lot of the same technology and a lot of similar concepts. And it's just a matter of making sure that we set a standard that these types of devices really need to be included.

Very simple to install and adaptable to controllers that are already out there. So it's very easy to change a system to go from quote-unquote, "dumb" system to a smart system. And, of course, it can be done in a way that doesn't disrupt the environment around. Very very easy to install.

It's based on local weather data. So

it's a device that actually takes the input from the local environment and adjusts the clock locally. So each individual clock would have its own site information to make sure that it's as accurate as possible.

A drip has become a very important part of water conservation. We believe that the most durable installation equipment is that which has the emitter already built inside the pipe. Emitters come in different flow rates, different lengths; there are differences between emitter spacings to allow for different planting types and different situations.

But this type of a device really allows the plant to get the water right locally applied to it. And we believe that there's really good applications where drip inline tubing really has a great role in water conservation here in California and throughout.

In the same type of a scenario, irrigating trees particularly, we believe that allowing the tree to get water down deep at the root zone where it really needs it, and doing it in such a way that it's protected from maintenance equipment and so on and so forth, we've got

equipment that does just that.

Inside of these root cylinders is located either a low-flow emitter or a low-flow bubbler that applies water to the root zone of the plant and the root zone of the trees.

And in particular, the system that we've got just makes sure that we get good distribution of water throughout the full depth of the root zone, rather than providing water just at the bottom, the base of the equipment, itself.

And I think, based on time, I'm going to go ahead and knock it off there. And ask if you have any questions at this point.

Yes?

MS. WHITE: Please go to the microphone. For those that have questions, we do have a podium here that if you speak into the mike then people on the phone can hear, and our court reporter will also pick it up. Thank you.

MR. DAVIDSON: Thanks for your presentation. I have two quick questions.

PRESIDING MEMBER ROSENFELD: Could you say who you are?

MR. DAVIDSON: I'm Mike Davidson from SPEC Management Group. We're manufacturers; and I

also have a masters in public administration specializing in water resource management, and a PhD candidate, Claremont Graduate University, in public policy and water.

Two quick questions. First, in regards to the MP rotator, you suggested that your standard operating procedure would suggest that you would not need to change spacings at all when you replaced spray heads with the MP rotator. Is that a fair statement?

MR. SMITH: Yes, it is. If you have -- an MP rotator will get you a radius of coverage between 8 and 30 feet. And most spray systems are spaced in the 8 to 15 feet.

MR. DAVIDSON: And secondly, in terms of check valves that are built into the spray heads or rotors, those have limitation in terms of elevation, correct? In terms of how much --

MR. SMITH: Yes, they do.

MR. DAVIDSON: -- about 10 to 12 feet?

MR. SMITH: Yes, that's -- 14 feet is the max, elevation change between heads that you can handle. Typically on the highest end spray model. But there are models out there by us and by other equipment manufacturers that will take up

to 30 feet of elevation change.

MR. DAVIDSON: Okay, thank you.

MR. SMITH: You're welcome.

Thank you very much.

MR. HUNGERFORD: I have one question.

MR. SMITH: Oh, yes.

MR. HUNGERFORD: Did the check valves --

PRESIDING MEMBER ROSENFELD: Who are you, Dave?

MR. HUNGERFORD: I'm Dave Hungerford --

(Laughter.)

MR. HUNGERFORD: Do the check valves increase maintenance requirements for clearing out the heads, say, between seasons and that sort of thing?

MR. SMITH: They can. They definitely, quote-unquote, "get in the way of flow" if you will. But for the most part they're designed to allow whatever's in the line to pass through them and either that or get caught up in the inlet filters in the heads, themselves.

So they are somewhat of a restriction point within the equipment, itself. But typically doesn't increase it too much as far as our history is concerned.

MR. HUNGERFORD: Thank you.

MR. SMITH: You're welcome.

MR. STRAIT: Before we get to the next presenter I wanted to make one quick clarification. If there's a question regarding a presentation that has just taken place, we will answer those immediately following the presentations. If there are general comments that wish to be made, we're going to reserve those until the open comment period at the end of the formal presentations that have been scheduled.

I know that there are a couple people that do want to get up and also have their input to our circumstance, we will be addressing all of those and we'll give everyone a chance to speak at the end of the presentations. Thank you.

Our next speaker does not have a PowerPoint presentation. That's perfectly fine . We're just going to put the agenda up while this person is speaking for those of you listing at home or watching through WebEx.

MR. ALEXANIAN: Okay, I want to thank the Energy Commission for this gathering today in order for the industry to present their concerns and recommendations, so that we have proper water

conservation.

If it were not for the fiscal crisis we're in, I believe water would certainly be just about the number one topic that we should be discussing today. So, again, I want to thank you very much for this opportunity.

MS. WHITE: Sir.

MR. ALEXANIAN: Yes.

MS. WHITE: Would you introduce yourself so the people on the phone know who you are, please?

MR. ALEXANIAN: Right. My name is George Alexanian, and I'm with Alex-Tronics Controls out of Fresno, California. And we manufacture irrigation controllers. And we are very concerned with water conservation, not only in California, but throughout the United States. And I'll go ahead and give a short company background and get into the two or three areas that I have recommendations.

Alex-Tronics, I founded Alex-Tronics in 1977. And the only products that we manufacture are irrigation controllers that are related to or assist with water or energy conservation. We do not have valves or sprinklers or anything else.

On the agricultural side of our business we manufacture filter backwash controllers that are used in drip irrigation systems, which save not only water, but also a significant amount of pumping energy, which is also a concern to the state.

A few years back I applied for, and we received, a grant from the U.S. Department of Energy to develop energy efficiency irrigation control systems for this industry.

And since then we have evolved our mission to incorporate landscape water conservation along with the energy conservation that we were asked to do for the industry, in general.

Currently we manufacture, besides our filter backwash controllers for the ag industry on the landscape side, battery powered irrigation controllers with very long battery life that are used commercially.

For the residential market, we are developing add-on devices that I will describe shortly; and those would address a significantly larger percentage of uses throughout the state of California and elsewhere in the country, as well.

Now, here are my comments and recommendations. Currently the irrigation industry has five approaches to water, to automate landscape water conservation.

First, they would be self-contained smart irrigation controllers that are ET, that is evapotranspiration based, that we see wireless ET data, and sometimes for a monthly service fee. And such an example would be the Toro Intelli-Sense type control systems.

Second, controllers that require a weather station, which is normally located nearby, to calculate ET and make the appropriate water schedule adjustments. And a couple of examples of those would be the Weathermatic SMART LINE and the Hunter ET system.

Third, controllers to have add-on devices that can make them smart. And a couple examples there are the Rain Bird ET Manager, and the Hunter Solar Sync.

Fourth, none-ET based smart water controllers, that is controllers that are still weather-based or climatologically based, but do not necessarily use ET. In this case Alex-Tronics has what we call the model Enercon Plus, one of

our battery powered controllers that I referred to earlier, as such a system.

And fifth, we have ground moisture sensors that Brian has already talked about, such as from Irrometer and Baseline and some other manufacturers.

So those are basically the five types of automated systems that the industry is currently proposing in order to effect water conservations we are looking for. This is, of course, separate from sprayers or valves and that type of product. We're just strictly talking automation here.

Now, the first concern that I have is that the current provision, based on Assembly bill 1881, is that after a certain date only smart controllers can be sold or purchased in California.

While I support this position, the reality is that very few of the millions of Californians will run out the day after this passes and buy a smart controller. And I could list a variety of reasons why, one of them being the cost.

So what I would like to do is make sure that the industry and this panel addresses the

concern of what do we do with existing controllers. It may very well take five to ten years or more before we gradually convert to all smart systems.

While converting to smart controllers will theoretically save landscape water, the immediate goal is saving water immediately. And I think Brian mentioned that, as well.

An added device that goes with an existing controller that people are already familiar with in programming, especially if it's reasonably priced and easy to install and program and so forth, will have a much more immediate impact, in my opinion in the 37 years that I have been in the irrigation industry, and specifically in irrigation controller design and manufacturing, will have a much greater impact, more immediate impact. And I believe this is what we're looking for. In other words, more bang for the buck right away.

So, therefore, here's my recommendation on this point. And I have a threefold recommendation.

I urge the Committee to not ignore the millions of existing nonsmart controllers that

will remain in use in residences and commercial use after the mandate goes into effect. As I said, I support the mandate, however let's talk reality here.

To make this recommendation effective I recommend adding a provision to allow the sale of add-on devices that have been SWAT tested, that can make existing controllers smart. This approach will remove many of the obstacles currently encountered with ET-based smart controllers, by allowing the homeowners to keep a controller they are already familiar with, and reduce the initial and ongoing conversion costs.

The EPA, which had formerly not included add-on devices for their WaterSense labeling, and I believe they may discuss the WaterSense labeling later on today, has apparently reconsidered their position. And has asked the SWAT Committee for its recommendations in terms of how add-on devices may qualify.

Now, let me explain something that may not be clear. Believe it or not, most automated systems we are talking about today are add-on devices. Moisture sensors are add-on devices. The Rain Bird ET Manager is an add-on device that

is added onto existing controllers. The Hunter Solar Sync, the Hunter ET system are add-on devices to their own controllers.

So if we do not include or forbid the sale of add-on devices after the mandated date of, I believe, January 1, 2012, this will be very counter productive in my opinion. So I want to make sure that we do modify that definition or the regulation to incorporate add-on devises to address the existing controllers that will be there. And there will be millions of them in California. So that we have effective water conservation.

And in particular, on the reference to the final regulation text of the model water efficiency landscape ordinance in paragraph, I believe I referred to it, 492.7 entitled, Irrigation Design Plan, it states that weather-based irrigation controllers or soil moisture based controllers or other self-adjusting irrigation controllers shall be required for irrigation scheduling in all irrigation systems.

I would like to recommend that the term add-on device that has been properly SWAT tested or some such language, so that it will not be

forbidden from being sold or supplied in order to effectively address the water conservation in a much more immediate manner.

Another benefit of allowing add-on devices is that this will create increased opportunities for landscape professionals to install these devices, and at the same time upgrade the existing systems. Such as the MP rotator that we were just talking about here. These are more efficient systems. And we need to encourage that type.

And it will create jobs, because it would create opportunities for landscape professionals to go in and address these issues.

And at the same time increase system efficiency that we just heard about.

And it will save money from the municipalities because they will not have to go and manually adjust these irrigation systems out in the field. That's labor costs.

Now, the city of Indian Wells down in the Coachella Valley did a study. And they decided to look into how much water you could possibly save using various methods of water conservation.

One of them was to use more efficient sprayers. In conjunction with that, they also used some drip systems. They checked system efficiency to make sure that everything was spraying correctly. And they used some of the Alex-Tronics smart, but not ET-based, controllers.

And the results were quite good. In a one-year study they determined that they could save 75 percent of the water used from the prior year. Does not say the controller alone saves 75 percent, but it is possible to save a significant amount of water if we allow add-ons and devices that will have more immediate impact on water conservation.

And in addition to saving 75 percent on water, 80 percent of the water cost to the city of Indian Wells. In these days of economic shortcomings it's also important that we save money. This does not include the savings of -- does not include the labor savings or not having to reprogram these units, the energy savings of having to pump less water, or even of greater concern, the savings that they may not have to have significant upgrading of the existing infrastructure.

So saving water not only saves water, saves labor, saves costs, saves energy, saves infrastructure or at least postpones it for a number of years. And we all need to do all of this in order to have a very effective system that our industry can provide.

So, again, I want to emphasize I would like the wording change, or at least I recommend it be changed, to include add-on devices that make existing controllers smart, millions of existing controllers smart, so that we can save more immediate water.

The third recommendation is that while we're talking, and Assembly bill 1881 is primarily related to water conservation with smart controllers and moisture sensors, in other words, smart technology, there's one other alternative to this.

And that is water rationing. Now, the SNWA, the Southern Nevada Water Authority, that is responsible for about a half a million homes in southern Nevada, has not been as successful as they would like, to say the least, in their rebate programs of ET controllers.

And that's one reason why I say that

millions of people are probably not going to run out and buy ET controllers, even with rebates.

So they decided, because of the dire water needs in that area, they have instituted -- they instituted a few years ago, watering, mandated watering schedules. That is you can only water certain times of the day, certain days of the week, depending on your watering group and the time of the year.

They're putting in, install 600 such devices, which, again, are not smart, but they're water rationing devices, just to assist in implementing their mandatory watering schedules.

And they found out that they went from about 20 percent compliance, semi-voluntary, you know, it's mandated but only 20 percent of the people are complying, to 80 percent compliance with this type of a device, which is a very simple add-on device, to 80 existing controller.

Now, while Assembly bill 1881 does not directly address nonsmart technology, I believe it is also a viable option that we do not necessarily want to totally ignore. So there are two methods of water conservation. One is increased efficiency, smart technology -- along with smart

technology, and then water rationing.

Now, I'm going to conclude that we should not ignore the millions of existing controllers, both residential and commercial if we want real rather than theoretical water conservation.

By that I mean while ET theory is good, it will save water, but again that's a theory until it's put to practice. And to date, we are not making enough headway with the methods that we are employing to save water as quickly as we can. Real water is when you can install something and right away you save water.

Finally, we should not limit automation to ET-based systems. There are other systems, and we happen to have a system that we use that is not ET-based, that has been SWAT tested, and as I just explained in the city of Indian Wells, to save as much water, if not more than smart controller systems.

So my other recommendation is that we do not limit smart controllers to ET-based controllers. Currently that is not done. I just want to make sure that the definition of a smart controller is not altered or misinterpreted to

limit smart technology to ET controllers, that other technologies may be available that are just as efficient, if not more efficient, and can actually save water even quicker.

Any questions?

PRESIDING MEMBER ROSENFELD: Yeah, I have two questions. The first one is total confusion from having not read 1881. But, are you saying that unless we explicitly make the changes that you consider, that the sale of sensors -- add-ons, will be prohibited?

MR. ALEXANIAN: I want to make sure that it is not prohibited, because it just talks about, as far as I can recall it only talks about smart controllers. And also in this section that I quoted, it only talks about smart controllers and does not mention any add-on devices.

PRESIDING MEMBER ROSENFELD: Okay. That's --

MR. ALEXANIAN: So I'm not sure it's excluded. I just want to make sure it is not excluded in the final version of the labeling and the requirements and the limitations that this Committee recommends for imposition as of next year or 2012.

PRESIDING MEMBER ROSENFELD: And the other thing I wasn't quite clear about is you talked about Indian Wells, and getting compliance up from 25 percent to 75 percent.

MR. ALEXANIAN: No. That was two different -- Indian Wells did a study with our smart technology along with some drip irrigation and some improved spray heads, and may have used the MP rotator, I'm not sure about that. And that water savings was 75 percent water savings, and 80 percent cost savings.

The other one was in Nevada, was a study that they're currently conducting with controllers that are not smart, but basically are water rationing tools to help the homeowners implement their watering, their mandated watering schedule.

So they are two different issues. That's perhaps where you got confused. I was talking about two completely different methods of water conservation.

PRESIDING MEMBER ROSENFELD: Okay, thank you.

MR. ALEXANIAN: Um-hum.

PRESIDING MEMBER ROSENFELD: Are there other questions? Yes, way in the back, but you

have to come to the mike, please, sir.

MR. McLEROY: I think I can speak loudly --

PRESIDING MEMBER ROSENFELD: No, but there's --

MS. WHITE: Actually you do need to come to the microphone because we are broadcasting this and recording it.

MR. McLEROY: Thank you. After 30-plus years of doing successful water conservation I applaud you mentioning the bottom of the ice berg being the installed legacy controllers, and not just focusing on new controllers. Because literally most of the opportunity is with those old controllers.

And I also wanted to bring up the fact that there's a huge waste stream there if we rip those out. And most of them are commercial/ industrial quality, and they'll be running 10, 15, 20 years from now.

So, thank you for your comments.

PRESIDING MEMBER ROSENFELD: Would you tell us who you are, please, sir.

MR. McLEROY: Dave McLeroy with Green Leaf Mapping and Control Systems.

PRESIDING MEMBER ROSENFELD: Thank you.

ASSOCIATE MEMBER LEVIN: Just a reminder, though. This really is an opportunity just for questions to the speaker. Public comments are scheduled for later in the day.

MR. ALEXANIAN: Any other questions?

PRESIDING MEMBER ROSENFELD: If not, moving right along. Thank you again very much, it was very convincing.

MS. WHITE: Yes. Now we have Jess and Chad with Hydro-Rain.

MR. RUYG: Good morning, everyone. Can everybody hear me okay?

PRESIDING MEMBER ROSENFELD: I can.

MR. RUYG: Great, thank you. My name is Jess Ruyg. I'm the company liaison for Hydro-Rain between contractors and landscape architects. I've been in this industry since 1974, started in the sales field and progressed up into the company.

I've seen a lot of installations, good, bad and what-have-you. I worked with a lot of contractors, a lot of landscape architects. And from an installation point of view, which is where I really come from, it's interesting to see where

water is saved and the basic installation of the system.

I guess I bring to this meeting kind of a low tech approach. I'm not really here to talk about controllers, valves or what-have-you. But about a different product that our company introduced about six years ago.

And when I asked Lorraine about this product, I said, Lorraine, it's really not a - it's not really not a water-saving device in terms of the timer or valve. She said, well, you know, piping in the irrigation installation sometimes tends to be a problem. And she's absolutely right.

I've personally seen where irrigation systems, and I'm talking about PVC pipe, actually installed without glue or primer. And this is an actual fact. I've seen this, myself. And it's kind of interesting to see that. When you deal with the guy that installs this product sometimes he's not properly trained. And so this is the result.

And so what our company did, what Hydro-Rain did is we went to the marketplace with a new product called Blu-Lock. And what this product

basically is, it's a replacement or a potential replacement for PVC systems.

It's made out of an HDPE, which is a high density polyethylene. And it's been determined by the Green Building Council as a green product. It's been certified as such.

The product is very flexible. It is easy to install. There's no glue, no primer. We have had zero failures since this product has been installed over the three years that it's been installed. We make 1/2 inch, 3/4 inch and 1 inch, which was just recently introduced. We've had zero failures in that respect.

So when you think about water savings, when you take a look at the piping that's actually installed in the ground, that's a form of saving of water. And sometimes it can be quite large.

I talked to a couple of contractors about three days ago and learned something that I never knew. And basically they said, you know, Jess, when we're in the field and we're dealing with this plastic pipe, sometimes our guys aren't the gentlest with this stuff and drop it on the ground.

And I've seen pipes split. They've

actually installed it not knowing that it was split. When the system is actually turned on it's a little geyser that you've got going right there. All of a sudden you've got a muddy trench that these guys are working on, and they're trying to fix the problem.

Well, with our product you don't have those kinds of problems. You don't have the glue problems, you don't have the primer problems, and you don't have the splitting problems. It's basically a -- it's a very good product in terms of strength. It doesn't freeze like PVC does, so there again, that's a water saver, as well.

A lot of PVC systems, I know that in Big Bear they've -- a couple of contractors have installed PVC systems alongside with Blu-Lock. The PVC has split, where the Blu-Lock has not.

So, there, again, you've got a water-saver product.

The installation of the product is very simple. It's not only simple, but it reduces the installation time significantly. And when I'm talking significantly, 80 percent of your time is saved by installing Blu-Lock. And this is basically comments made by the contractors.

So, in essence, you've got a green product. You've got a time-saver. And you've got a product that has no leaks in the installation process. So in our eyes it's a winner.

The contractors that I've talked to that have used it absolutely love the product. Basically it adds to their bottomline. A lot of homeowners are requesting green products in their systems, which is what the contractor is delivering. And also because of the no-leak situation the homeowner is able to go ahead and enjoy a system without any contractor call-backs.

What I'd like to do here is I'd like to demonstrate how the product works, because it's a very important part of my presentation. The pipe that I'm showing here is 3/4, and basically I will insert the fitting into the pipe, itself. And this --

PRESIDING MEMBER ROSENFELD: Hold on, let's see if we can get some lights turned on.

MR. RUYG: I'm sorry?

PRESIDING MEMBER ROSENFELD: We're going to try -- I'm going to try to get some lights turned on so --

MR. RUYG: Okay.

PRESIDING MEMBER ROSENFELD: -- so we can see what you're doing.

MR. RUYG: Thank you. This --

PRESIDING MEMBER ROSENFELD: There. It's a big room, maybe you should --

MR. RUYG: Okay. This is the --

PRESIDING MEMBER ROSENFELD: -- stand up.

MR. RUYG: This is the extent of the installation right here. That's the amount of time it takes to install a piece of pipe in Blu-Lock. Now, compare that to PVC and you've got a big, big difference. Now, that was only one fitting. If you took that by 30, 40, 100 fittings in a system you can imagine the amount of time it takes to install this relative to PVC.

One of the other things that has also happened in the industry, the state of California has basically considered that PVC is a good percentage of the product.

The problem that you have with PVC is that from its manufacturing start, while it is manufactured, you've got a lot of carcinogens that are released into the atmosphere. Then you get the product that is put into the irrigation

system. And then all of a sudden you've got other carcinogens that are released into the atmosphere, one of them being dioxins, because of the PVC primer and the glue.

So consequently you've got a lot of toxins being put out. The product is not recyclable. PVC is not recyclable, where Blu-Lock is 100 percent recyclable. So you get a lot of advantage in that respect.

From a pure water-saver point of view, I heard a lot of folks here with some very very good product. Hunter, Alex-Tronics, everybody here has just got some really great products for water saving.

I bring to this discussion a little different aspect of it which is basically water savings from a ground-up type of concept.

One of the things that happened on this, KB Homes, and I'm sure you're all familiar with that name, gave us an opportunity to go ahead and put in a four-home tract in Coachella, California. They gave us two days to go ahead and put in this, irrigate these two homes. Because that was the normal timeframe for PVC.

The contractor actually did three and a

half homes in one day. And the net result from the contractor, and we have this on tape, absolutely no leaks. And the contractor was just absolutely amazed by this installation. Since then KB Homes has authorized Blu-Lock in any installation from 2007 on.

So we're very proud of that, and we would like the panel to consider this product in the future as a water saver and also a green product.

Thank you.

PRESIDING MEMBER ROSENFELD: I'm a little bit confused about what you think the Energy Commission should do, though. We're not in the business of endorsing an actual product. You seem to be making an argument that HDPE is safer than PVC.

MR. RUYG: Yes.

PRESIDING MEMBER ROSENFELD: Do you want to say what you actually think the Energy Commission should do about all this?

MR. RUYG: Well, we're looking at different ways to save water. And one of the things that we tend to look at is obviously controllers, as a way to save water, which

obviously that's a good way to save water.

We're also looking at the MP rotator the Hunter has, which is a great way to save water.

But sometimes we tend to neglect some of the other smaller items that tend to waste water, too, poor installations, poor products.

And so there are many different ways to save water. The obvious ones we've seen and heard about. But sometimes the not-so-obvious ones should be considered, as well.

MR. WILSON: Chairman, Chad Wilson with Hydro-Rain; engineering manager. To put it in perspective of why we want to talk about -- or at least the system that delivers the water.

Similar to the energy grid we have -- the problem we have in the United States right now, our energy grid is old; it needs to be renewed.

A lot of time has been spent on products, the EnergyStar program, where to make them more efficient in the way they use the energy. But that energy is being wasted in the delivery system.

Granted this product is close to the end point of use, but it still offers opportunities

for water savings by being what it is, just the product that it is and what Jess here highlighted.

In addition to Blu-Lock there are some other technologies that Hydro-Rain is pursuing. And I came prepared to speak to many that were already addressed today, so I won't repeat those. But suffice it to say that we have made strategic partnerships with some of the representatives here, with water-saving products as well as others who are not represented using moisture sensors, heads, valves and controllers.

Something that hasn't been addressed is, and is a major concern at Hydro-Rain, and I have to say that Hydro-Rain is a sister company to Orbit Irrigation. So we have quite a long history with the homeowner. Orbit Irrigation markets to the homeowner, and we've seen a lot of response from the homeowner, or lack thereof, with high technology products.

And we're concerned about the customers' response to legislation, and the ease of use of the products that are going to be required and mandated. And the learning curve required. And also passing on that technology to the next homeowner or the next person in line.

So, we're working on interfaces and things to simplify the technology. And I appreciate what has already been said today by the representatives here on that front.

But one thing we are doing that hasn't been mentioned yet is a public education program, or software. We're in development right now with system design software that would walk the customer through a typical sprinkler system design, teaching them the basics of how heads are placed, how zones are divided up.

And there are currently things out there, but nothing that walks them through it on a software platform, and gives them an immediate result.

Another thing that the software's capable of is evaluating current systems and showing them where heads should be placed. So if they do go in and replace an MP rotator, that MP rotator, the head placement may not be perfect. The MP rotator, you know, works with the head placement, but efficiency is more than just product. It's also how those heads are placed.

And so we're trying to educate the public by showing them where their heads should be

for optimum coverage and distribution uniformity.

Also, as far as reports or resources that we find useful, the Irrigation Association and their programs, training programs as well as the information that they provide, reports and such, as well as the EPA WaterSense program, and the labeling and standardization process that they're going through.

PRESIDING MEMBER ROSENFELD: Well, I still have to admit some confusion. I thank you guys deeply for bringing up the difference between the two plastics. And certainly the idea of education and training videos and so on. It sounds very interesting.

I feel -- I don't know about my colleague here, but I feel a little bit out of my depth in terms of what you're going to be asking us to do in terms of legislation.

I mean this is a really big problem and education is a great idea. We don't usually recommend legislation about that.

MS. WHITE: If I might, Commissioners, I'm --

PRESIDING MEMBER ROSENFELD: Yes.

MS. WHITE: I'm pulling up the

legislation because in part Blu-Lock is here because they actually addressed another component of it. And I'm trying to find the provision in the legislation that is relevant to the discussion, for your benefit.

And it is essentially where we are directed to establish standards for landscape irrigation equipment that includes, but is not limited to, the controllers and the sensors -- thank you. It is this provision up here.

PRESIDING MEMBER ROSENFELD: You'd better read it, because of the lights --

MS. WHITE: Sorry. It basically says that we're to set standards for landscape irrigation equipment that includes, but is not limited to, actually. That is another portion of the legislation.

But one of the things that we also have set standards for in the past includes some other fixtures. And there is plumbing code in place that also has standards set for it.

So, as we're going through our proceedings and evaluating the types of equipment we need to be cognizant of, we can think of the irrigation system as a system as a whole, not just

individual parts.

And the legislation does give us latitude to look at things other than just those four specified pieces of equipment, if, in fact, we make a finding that things could save a significant amount of water or energy.

So, I'm unfortunately not finding it right away here in the legislation, but it is right here. The Commission to adopt those requirements by 2010, and then this provision before says, including irrigation controllers, moisture sensors, things like that.

PRESIDING MEMBER ROSENFELD: That's --

MS. WHITE: So we have the latitude to look at other types of equipment.

PRESIDING MEMBER ROSENFELD: Well, I'm just concerned with how you would put into legislation the fact that we just heard, that these pipes are stronger, they don't crack, they can be assembled without glue, all those certain things that I, as a consumer, am interested in.

But, still seems a little off of our turf any way you look at it --

MS. WHITE: And it may be. Yeah. That's part of the things that we can consider and

look at as we go forward in the proceeding.

ASSOCIATE MEMBER LEVIN: Could I just ask a clarifying question. I think you said this earlier, but I missed it. Who certified this as a green product?

MR. RUYG: Did you say who --

ASSOCIATE MEMBER LEVIN: Yes. You said it was a certified green product.

MR. RUYG: Yes.

ASSOCIATE MEMBER LEVIN: Who did the certification?

MR. RUYG: Build It Green.

ASSOCIATE MEMBER LEVIN: Build it Green?

MR. RUYG: Build It Green, yes.

PRESIDING MEMBER ROSENFELD: Okay, let's go ahead.

MS. WHITE: Okay. Any other questions?

And then we'll go to Ewing, thank you.

MR. GOROWITZ: Thank you. I'm not sure I'll be able to get us back on track within five minutes, according to the agenda. But I'll do my best.

And I appreciate being last here because I'm not really going to talk about a lot of products. Some of what I'm going to say has just

been said by Lorraine and Chad also made a couple comments that I wanted to provide some perspective on.

My name is Warren Gorowitz; I'm Vice President of Sustainability and Conservation for Ewing. I'm here to bring a perspective from the professional irrigation distributor standpoint, I guess.

And if you'll indulge me for a minute on some of the things that I've been involved with, because I think it's important as far as some of the comments I'm going to make.

But I currently sit on the board for the American Society of Irrigation Consultants. I also sit on the board for the Alliance for Water Efficiency. Work with the Irrigation Association in the Smart Water Application Technology Committee, or SWAT, which you've been hearing a little bit about.

Also involved with the California --

PRESIDING MEMBER ROSENFELD: Sorry, would you -- we're all hearing about SWAT, which is, say again, SWAT stands for?

MR. GOROWITZ: Sure. It's Smart Water Application Technology. Dave Zoldoske will be

bringing more definition of that after me, actually.

Also involved with the California Landscape Contractors Association, and their resource management committee and their water management certification program.

And finally, probably most importantly of all these, I was involved with the Assembly Bill 2717 with the California Urban Water Conservation Council, and as the vice chair of irrigation.

So I've been involved in these discussions for awhile. And I was going back and looking through my notes and some of the things that I've had an opportunity in meetings, or an opportunity to attend.

And one of them that came to mind, it was kind of interesting, was on February 17th I participated in a panel in Phoenix, Arizona, with the Environmental Protection Agency. And it was a stakeholder meeting to talk about water efficient products, and developing a market enhancement program. And this is the predecessor to what is known now as WaterSense, the EPA WaterSense program.

And ironically, I gave similar comments at that same time. So, some of the same discussion from almost five years ago is still in the process right now.

And I guess what I really wanted to echo is what Lorraine said earlier, it's really important, is that an irrigation system is just that, it is a system. And there are many components to the system. And I applaud the Energy Commission for looking at how to come up with performance standards for some of the components. But it is very different than a toilet or a showerhead or a faucet or a clothes washer because you have a system, and you have different components.

And tied into the components, the actual products, you can have an efficient product, but if it's not used properly you can waste water. And so, again, I just bring you that to be aware of that.

The other part of the system, really, is that an irrigation system involves proper irrigation design so the system has to be designed properly. Then you have the installation of it which needs to be done properly. And then you've

got the maintenance and management of that, as well. And if any one of those is off, you could potentially waste water on an efficient system from the beginning.

I think one of our biggest challenges here, and I was looking through some of the presentations, and I know Mary Ann Dickinson from the Alliance for Water Efficiency's on the line, is that I think we're finding ourselves having to change people's habits. And I think that's one of the biggest challenges. This is really about changing people's habits and what they're doing. And trying to encourage them to adopt or be supportive of new technology.

And really what it boils down to, I know this isn't a discussion for this event here, is people valuing water and what it costs. And that's part of what I think you're seeing with the situation that's going on in California and all over the country as it relates to water issues, is that people are finally starting to take notice how important the water is and the value of it. And that's why, I think, we're looking at all these various regulations and opportunities, too.

So, really -- again, I'm keeping this

real brief -- but my perspective is that I definitely support and endorse one of the things EPA and their WaterSense program, and I know that in talking with Lorraine that there is discussion with EPA and their WaterSense program. So I think that's important to have that dialogue, realizing that's a voluntary program and these are actual standards.

But from the industry standpoint when we look at controllers, which is what we're here to talk about today, the irrigation industry has, and Dave Zoldoske again is going to talk about smart water application technology protocols, but there's been a consensus that's been developed on these protocols from the industry.

So I strongly encourage that those protocols be looked at as far as product performance testing. Are they perfect? No. But they're a starting point that the irrigation industry has been working on for many years, that the EPA has been using and looking at as far as their development of performance standards for receiving a WaterSense label for irrigation controllers.

And I also do agree with what George

said earlier about supporting add-on devices, as well, because of the fact that you did have so many existing controllers out in the market. And I think it's really important that we consider that.

I -- actually catch us back up on time, because again, I was trying to, you know, provide A perspective and not talk real specifically on products as much. But I'll be happy to answer any questions you might have.

PRESIDING MEMBER ROSENFELD: Well, thanks for pointing out the system improvements. We, of course, at the Energy Commission, know that because in addition to regulating appliances, we regulate buildings. And they are certainly systems. And most of them run badly.

(Laughter.)

PRESIDING MEMBER ROSENFELD: Questions? Comments?

MS. WHITE: Any questions for the panel, as a whole? Do we have any questions or comments on the phone, Anjelica? Okay.

PRESIDING MEMBER ROSENFELD: Can't hear you.

MS. WHITE: Okay, no, we don't have any.

So, at this point it's noon and you wanted to assess how we were doing and see if we need to take a short break, or would you like to plow ahead?

PRESIDING MEMBER ROSENFELD: I'm inclined to be repetitious and suggest we take a 15-minute break, which will give us a chance to buy some coffee. It won't be a ceremonial lunch, you can bring donuts back here and eat them.

MS. WHITE: Okay, so we're going to thank you, one, for catching us up. But, we're going to slip anyway. So it will be strictly a 15-minute break. So I ask that people be back here within about 10, 13 minutes or so, because we will start at 12:17 --

PRESIDING MEMBER ROSENFELD: And bring paper napkins and be prepared to munch while you're --

MS. WHITE: Exactly. And after that time we will be having perhaps one commenter speak before we ask David Zoldoske to speak. He, unfortunately, has to leave early, and has made a request to say no more than about three to five minutes worth of things for the Committee.

PRESIDING MEMBER ROSENFELD: Seems very

appropriate.

MS. WHITE: Thank you, sir.

PRESIDING MEMBER ROSENFELD: Okay, see you in 15 minutes.

(Brief recess.)

MR. DAVIS: My name is Andrew Davis. I'm president of the Accurate WeatherSet Company. I began manufacturing irrigation controllers in 1979. And in the early '90s I put a solar sense on an irrigation controller and began manufacturing ET controllers.

Before the break Warren Gorowitz of Ewing talked about a consensus which has emerged of the industry around the SWAT testing. I'm here to speak in opposition to that consensus.

I'm here to urge the Energy Commission not to use the SWAT protocol to set standards for irrigation controllers. Instead I'm here to urge the Energy Commission to use the multiyear testing of ET controllers funded by Proposition 13.

The SWAT testing is a 30-day testing program --

PRESIDING MEMBER ROSENFELD: Hold on one second. I'm taking notes as fast as I can. Are you submitting a written version of this?

MR. DAVIS: Yes. I think she put one of these --

PRESIDING MEMBER ROSENFELD: Okay, it's in the book?

MR. DAVIS: It has a little solar sun and cloud in the upper left-hand corner.

MS. WHITE: Yes, Commissioner. I provided you a copy of his comments which were delivered today. It's a one-sheet document there on your desk.

PRESIDING MEMBER ROSENFELD: Oh, loose. Loose on the desk?

MS. WHITE: Yes.

MR. DAVIS: Here, I have some additional ones.

PRESIDING MEMBER ROSENFELD: Accurate WeatherSet?

MR. DAVIS: Yes, that's correct.

PRESIDING MEMBER ROSENFELD: Thank you.

MR. DAVIS: Okay. The IA/SWAT testing is a testing program where they test one controller from each manufacturer, generally within 30 days, where the ET is .25 and the rainfall is .4 inches.

A 30-day testing of a water conservation

controller is too short to test for water conservation. Any timer, even a dumb timer from the 1980s, could be programmed to pass this 30-day test.

The IA protocol contains crop coefficients for each month. Now a crop coefficient tells you under different weather conditions different plants -- under the same weather conditions different plants require different amounts of irrigation.

PRESIDING MEMBER ROSENFELD: Sure.

MR. DAVIS: Bermuda grass does dormant in the wintertime; it needs more water in the summertime.

The SWAT testing actually has crop coefficients for each month of the year showing how fescue and Bermuda grass, the two common grasses that we use in the state here, vary in their water needs by month. Under the same weather conditions they need different -- less water in the wintertime than in the summertime.

I've looked at those numbers and these plants require some 40 percent less water in the wintertime than in the summertime under the same weather conditions.

A 30-day test program by the SWAT protocol cannot check for this 40 percent water savings over 12 months. Also, the 30-day test program cannot test for water conservation due to changes in seasonal weather from summer to winter. Since the SWAT protocol requires .4 inch of rain for reporting purposes, that means it's a test during the wintertime, and there's no testing available in our dry California summertimes.

The Prop 13-funded multiyear field studies of thousands of controllers can test for the 40 percent water savings over time, and can test for water conservation due to changes in seasonal weather.

Second. The programming and installation of the SWAT testing is not realistic. The one controller from each manufacturer that the SWAT test is programmed by engineers of the manufacturer and installed by either the manufacturer or the highly literate professionals at CalState Fresno.

The Prop 13-funded multiyear field studies involve installation and programming of thousands of controllers by homeowners and contractors. Results from these Prop 13-funded

tests reveal water savings achievable by homeowners and contractors.

The 30-day SWAT testing of one controller from each manufacturer has no value indicating potential water savings from installation and programming by homeowners and contractors.

Some of these controllers that have gone through the SWAT testing are hard to program. And that does not show up when you put i -- because it would show up in the hands of these testings in the fields of the multiyear by the water districts.

I've got a two way down here. Another problem with this SWAT protocol is that the -- and the ET controllers, some of them broadcast the ET data to the controller every day.

When the testing is done of an ET controller at CalState Fresno, it is within a mile of one of these weather stations that the ET data is gathered from.

In the San Fernando Valley there's 1.2 million people watering their homes every night, and there's no ET station there. So how are these controllers going to perform when they are removed

and located far from these stations.

Okay.. The Prop 13-funded studies are showing that some controllers that did well in the 30-day SWAT testing actually increased water consumption when installed and operated by homeowners and contractors for multiple years.

With other controllers no water savings was conserved, even though they've been through the SWAT testing.

MS. WHITE: Andrew, can you wrap up, please?

MR. DAVIS: Yeah, okay.

MS. WHITE: Thank you.

MR. DAVIS: The people of California spent millions of dollars on these tests. The results should be honored and used as the basis for selecting controllers for general sale in California.

And that's basically what I wanted to say about it. I'm not here to protest -- particularly my controller, but I would urge the Energy Commission not to go along with the industry general consensus to use the SWAT testing but instead to look at these studies that the Proposition 13 funds have funded.

I understand that the general report on these is going to be available to the DWR April 1, today was the deadline that I heard was going to be presented to them so you can check for the results of these fundings, the studies from these fundings.

Any questions?

PRESIDING MEMBER ROSENFELD: Yeah, don't go away. Lorraine, is someone later on in the program going to defend the other side of the story?

MS. WHITE: We actually have Dave Zoldoske from CalState University Fresno. And he's going to specifically be talking about the testing protocol, the SWAT testing protocol.

We also have two representatives from EPA talking about what they've seen with the testing protocol. And then some additional comments throughout the day.

Andrew does raise some questions about, you know, our using this protocol versus others. And I think there are quite a few people on the agenda that will help illuminate that for us.

PRESIDING MEMBER ROSENFELD: Okay. And the question, can you just say in 30 seconds, you

talk about the Prop 13 protocols, how much money was spent on that and how big was it and when was it all done?

MR. DAVIS: It's been going on for years. For the last five years the Department of Water Resources, through the prop funding, has funded the -- subsidized the installation of ET controllers in southern California through the Metropolitan Water District, San Diego County Water Authority, MWD and in the Bay Area, as well.

The thousands of controllers have been -- of these ET controllers have been installed in the field. And they have done studies of the water use reduction or increase or nonchange in the water based on -- they've run statistical analysis on that.

And the results of those studies should be at the Department of Water Resources, maybe even today.

PRESIDING MEMBER ROSENFELD: Okay.

MS. WHITE: And we also have someone from the Department of Water Resources who, I don't know if Kent actually has the information, but he can possibly address some of this for us.

PRESIDING MEMBER ROSENFELD: Okay.

Well, you've certainly raised that issue. Thank you very much.

MR. DAVIS: Okay.

MS. WHITE: David.

MR. ZOLDOSKE: Good morning, or good afternoon, or good lunch time or whatever we're at here.

PRESIDING MEMBER ROSENFELD: Good lunch time.

MR. ZOLDOSKE: Thank you, Lorraine. And I do want to thank the Energy Commission and particularly Lorraine White and her staff, who have worked very hard to put this together today.

I don't want to spend a lot of time addressing the previous comments, but I would just, in summary, say there were some inaccuracies of what was said, including the station 80 is not used to drive the clocks in our testing protocol. Typically those are external inputs from other -- it's not a telemetry type system, so that, in fact, is not an issue.

There's a number of other methods and modes for gathering that data, including onsite weather stations provided by the manufacturers.

Also what has been described as, I

guess, testing is really, in my view as a researcher for the last 25 years, those are case studies. You have multiple, multiple variables that you cannot account for in those case studies. And you really can't compare the IA testing protocol to these case studies. And I could probably write you 10 or 15 page explanation why they're not comparable, and why it's not really fair to even have that discussion here.

But, I would like to address the rest of my comments on what I've been asked today by Lorraine to talk about, and that's smart technology. And I'm calling it pathway to efficient turf and landscape irrigation.

And what I want to review for you is that what the Irrigation Association has done to develop a protocol. The testing is done currently at Fresno State. We have an irrigation equipment testing lab that was established in about 1981. So we've been at this a long time.

And in the spirit of full disclosure here, I am a past president of the Irrigation Association, past president of American Society of Agronomy, the California Chapter. Also a vice chair of AB-2717 and a couple other things here.

But in any case, I have been actively involved in landscape irrigation for almost my entire career.

ASSOCIATE MEMBER LEVIN: Mr. Zoldoske, I was hoping you were going to say in the spirit of full disclosure whether or not the Center at CalState Fresno receives any funding from the Irrigation Association.

MR. ZOLDOSKE: We get our funding from industry for the tests. And currently our controller test is $2500. And I'll go over a little bit what that's about.

And there was some initial funding, again gathered from the industry, for some equipment that was purchased, I think about $9000, for the soil and moisture sensing.

So, yes, we do charge for these services. But, as you can imagine, they're -- I believe that they're highly subsidized. We just completed a $4 million testing lab that was funded by state, federal and private funds.

So, anyway, that be it. We don't see ourselves as the only testing lab in the country. In fact, we're working with the University of Florida right now to conduct similar studies in

Florida, because as you'll find as you get into this discussion, everybody thinks everything else is different someplace else, soil, weather, whatever. And it rains a lot there more.

And we've heard some discussions already about, well, it doesn't rain here in the summertime because of the Mediterranean climate. Of course, that's the climate we live in, so we have to be able to account for rainfall.

But there has been extensive testing in Florida. And the IA protocol has withstood the test, at least initially, to have similar results under highly variable weather conditions both in Florida and California.

So, was there any other disclosures I needed to make?

(Laughter.)

MR. ZOLDOSKE: If I've forgotten anything, somebody point it out. I'm among friends here, mostly, I think.

Okay, let's see. Back to my presentation. What is SWAT? Smart Water Application Technologies. And that was just a term that was trademarked by the Irrigation Association and water purveyors.

And when we talk about water purveyors, we're talking about folks in Seattle and Oregon, in Texas and Florida, and California, Metropolitan Water, San Diego, East Bay MUD. You know, you would know all the players. Have been actively involved in putting input into this.

And when we talk about smart technology we really talk about things that don't require human interaction. And, again, I would take exception to being able to take a dumb clock and pass this test. We haven't seen information that suggests that that's actually possible. And it may be, under extraordinary conditions, if that was even possible.

But in any case, we believe that in the controller tests that I'm going to talk about, that it's really hands off, from the time it's set up to the time that the test is completed, there is no what we call human interaction. No changing with the clock, no diddling with inputs. It needs to either receive it automatically or internally have some information that allows it to make changes in irrigation application.

So, why did we do all this? I just thought it was important to go over the history

here. We thought that what water purveyors actually said, hey, we're looking at these technologies. They were testing them, themselves.

And they said, you know, we're really not in the testing business and we don't want to be in that, so if we could gather all our needs and match those up with the irrigation industry's technology and identify those products, then that will be best served to help conserve water, then that's what we ought to focus on. And that's really what the genesis of SWAT was.

So it needs to be simple, hands-off technology. It obviously has to be cost effective. And we have to encourage adoption. So there's incentives, rebates, education, all those things that make people want to adopt those technologies.

Clearly irrigation scheduling was the low-hanging fruit here. And that's why we started with controllers and soil moisture sensors. And there's a whole bunch of studies out there, but 20, 30 percent, potential over-irrigation occurs, primarily August, September and October when folks turn their clocks up, the manual clocks, up to July to meet the water requirements.

And then we go on vacation. School starts. And we don't recognize until October or November that we're still irrigating like it's July. All that water being wasted.

And so we really needed a clock that could recognize that, in fact, the season is changed. We need to put less water on. And therein lies really the biggest savings.

These are not meant to be expert systems. I think there's some confusion there. They're expected to be good systems. And as somebody said once, I thought it was pretty apropos, let's not let perfection get in the way of good. And I think that's really an underpinning here we need to carry through this conversation today.

And this is the stuff we're trying to avoid, right. Runoff, deep percolation. We've all seen it, unfortunately, much too often.

Okay, so, we focused on climate-based controllers. You hear this -- you hear ET controllers being thrown out. This is not about ET controllers. That's simply one of the bases to determine how much water to apply on a daily basis. These are climate-based, which means you

have external inputs and so our moisture sensors are simply what they are, and that's just to measure how much moisture is available in the soil. And make a determination of whether irrigation is required.

And then they can be set up to terminate an irrigation if the water starts to get at the bottom of the root zone.

So what did we want to do? We wanted to reduce applied water. We want to reduce, eliminate runoff, particularly OPs are a big problem with wastewater treatment sites. They don't like having organic phosphates or pesticides out there. And that's important to our friends in the green industry as one of their tools to control pests in the landscape.

And there was obviously a threat that that would go away if we couldn't keep it out of the water, and the water out of the wastewater treatment plants. So if we can eliminate runoff, we can eliminate some of those issues.

We want to obviously improve the adoption rate. And it needs to be hands-off, as earlier discussed.

We've had multiple, multiple meetings.

I've been in Tampa Bay, Florida, with meetings. We've been in Austin, Texas. And this actually was in Fresno about a year ago. This is with the soil and moisture sensor folks.

There was all these discussions. They couldn't agree, so we said we're going to get you in a room, we're going to lock the door and nobody leaves until we figure out what it is that we want to do here.

And I got to tell you the most important thing here was to have the different manufacturers actually speak their mind and talk about the issues. And they went in there a very diverse group. They came out of there with, I believe, some significant agreement. And we've made a lot of progress. We're on our, I think, our fourth draft of the soil and moisture protocol.

We also have ongoing committees. We have a marketing committee that looks to educate. And they put together brochures and stuff that water districts to help promote smart water technology.

We have a technical committee that is made up of volunteers from across the country, engineers and technicians and other folks, that

look at the protocol, what it's trying to do.

And there's actually a third committee I didn't put on here, but it's the IA Executive SWAT Committee. And, again, in full disclosure, I am a member of that committee. And it's chaired by Brian Vincasey (phonetic).

Okay, all this stuff is on the IA website, and it's irrigation.org. And we're on our eighth draft version. We're on our fourth soil moisture. I think there's 15 or more manufacturers' controllers that have been tested. And those reports are on the website. You can look at that.

And we've got a number of soil and moisture tests that have been completed, as well. Soil and moisture sensors, rather.

We've been engaged with the EPA, trying to share our experiences and our progress. Again, because we made this an open process, we've had some meetings that had excess of 200 folks attending.

And some of those, at least in the early days, were quite lively. Everybody thinks that their intellectual property needs to be recognized in these standards and protocols. And, you know,

obviously for good reason, from the standpoint of the individual manufacturer.

But we really wanted to base this stuff on performance as opposed to features. Even though some of those features may have value.

Okay, so we've had a number of workshops. We're getting the message out. As I mentioned, I was on the AB-2717 task force. We discussed controllers being one of the important things to be on the recommendations that eventually ended up at AB-1881. And that's why we're here today.

So, I'm just going to real briefly talk about controllers. It is true, some of them do store historical ET data, which simply says how much water does a plant need on this day, giving its location and plant type, or weather.

And so this curve here simply shows how much water would be required over the course of the year, with 1 being January and 12 being December. And obviously June, July and August are the highest water months.

But you can see after July the water requirement starts to fall off. And that's where we tend to lose water savings because controllers

are not turned down at that time. And we continue to irrigate as if every day was July.

Controllers have onsite sensors that can calculate the local weather conditions. So these controllers, you'll see these types of instrumentation just adjacent to the controller. It could be on your yard. Some are fastened to the eaves of your house, a number of locations. But each home, in essence, could have its own mini weather station. And so you could be located anyplace in the state and have that information determine the irrigation needs of your yard.

Some utilize a proprietary central weather stations where a manufacturer may have a weather station in a given locale. And simply transmit that information over a large region, rather than have individual weather stations located at each home.

Some simply will utilize perhaps rainfall and temperature information with some historic information, and with some proprietary algorithm to determine how much water needs to be applied on a given day.

And others, as we heard George discuss, have add-on devices that can take dumb clocks and

give them some brains. So we like that, as well.

So, what was our target, again? Was to reduce applied water, runoff, and to increase the adoption of the technology.

And again, this protocol is -- the one I'm talking about today, or the two, rather, the controller protocol and the soil and moisture sensor protocol, are the property and developed by the Irrigation Association.

And these are just some controllers sitting on a bench. And they're under test. And while it's true it takes 30 days of minimum test time to evaluate these clocks, we have a number of clocks that will be under test for six, eight months all through the summer, and meeting our ET requirements, but we simply have to wait for the rainfall which, unfortunately, has been more sparse here in California than any of us like, to meet the minimum rainfall requirements.

And these are just a simulation of six valves on a controller, and I'll talk a little bit about what that means.

So these six valves, or six zones, and it's a virtual yard, okay. And that virtual yard has high and low precipitation rates. It has type

soils, it has varying slopes, it has drip micro irrigation, it has sprays and rotors and it has turf, grass, shrubs and trees.

It has all the elements that anybody's yard might have someplace in California. It's true that probably nobody's yard would have all of these elements. But we are trying to essentially test for those areas that we believe are indicative of potentially high water loss, difficult to manage.

And really what we're trying to do here is understand that these clocks recognize, and this is the key point, I think, is does it recognize rainfall and act appropriately.

Do they recognize varying water application rates and distribution uniformity and act accordingly. Does it recognize different plant material, turf, warm/cool season, trees, shrubs. Does it act accordingly.

And does it recognize runoff and deep percolation. And does it manage that water accordingly.

And, in fact, that's what this protocol is designed to do. And we believe that the results from this do indicate that these clocks,

in essence, do have the brains to manage those conditions. And that's really what this is about.

We're not about managing a system that has all kinds of variabilities, mode off heads, maintenance issues, installation issues, and then trying to compound all those variables. We're simply trying to look at the clock here and see does it meet a certain criteria such that we, then, with a high degree of confidence, can expect to see those perform out in the field at a repeatable -- in a repeatable fashion.

We do actually require, when we do test these, ten clocks provided to us. We randomly select one clock to be tested. So we try to make sure we don't get a Cadillac clock. And that they are off the manufacturing line.

Okay, soil and moisture sensors. There's a number of different principles out there, conductivity, TDR, heat dissipation and others. And this is only -- again, there is not one standardized method for measuring soil and moisture sensor. They all have pluses and minuses. Some are able to compensate for salinity better than others. Others, a price point is better. Et cetera.

We're on our fourth protocol. And we have been working very hard again with industry, academics and water purveyors to have a protocol that is meaningful and provides a test that will insure that products work efficiently in the field.

And this is just a quick slide just to show that we have a -- this is a six-month process. It's very intensive. And I want to say the fee for this evaluation is in the neighborhood of $7500, I think. I don't know if I've got that right, but I could check on that for you.

But it is a six-month study, and it includes three replications of each test condition. And here's just a quick list of test conditions. And just to summarize it, we've got three soil types at a number of different salinity levels. Every time we fertilize our lawns we add salts to it. That can affect some soil moisture sensors.

As well as we test it for freezing. Because if it breaks when it freezes, we do get occasional freezes here in California, and we don't want product failure due to freezing.

This is just the amount of data that's

collected. And you do a regression on it and this line simply is a predictive model on when we measure a certain response from the soil moisture sensor, what does that tell us about the level of moisture available in the soil.

These are summary reports, and I know it's too small to look at, but this is similar to what we do on the controllers, as well as on the soil moisture sensor. These reports are put together by water purveyors and industry equipment manufacturers. And they're meant to be fairly simple for information, a summary information, for people to make point-of-purchase decisions.

And we have very extensive reports that may be, you know, 10 or 12 pages or more long, that if somebody wants to get into the meat of it, they certainly are welcome to.

So, in conclusion, on the soil and moisture sensors, we find out that there's a very good linear relationship between medium and coarse textured soils.

On the fine soils it tends not to be a straight line. And that's what you saw in the previous, was a straight line of the datapoints. We tend to get a polynomial, which means it's

going to have some sort of swing to it.

And we have focused our studies between field capacity, and that basically means the soil's full of water, to wilting point, and that's at point of which the soil moisture level and the plant begins to die, or is wilting, if you will.

And any points beyond that or drier than that aren't really important from the agronomic aspects of the plant. So we've not focused our efforts there.

And then the phase two, which we are about to beta test, we're taking these initial soil moisture sensing data and we're going to tie it to a clock. And we're going to try to come up with a comparable test results to what we've -- on our controllers, our weather-based controllers, such that, again, as a homeowner you could determine whether you liked the idea of a smart controller that had the brains internal to it, or some external feed that allowed it to make irrigation decisions. Or a soil moisture sensor that essentially could take a, what we would call a dumb clock and allow it to make appropriate irrigation decisions.

And so we're hoping that the two tests

will allow one result that's comparable so we can compare apples and apples.

And we've heard a lot of discussion today about sprinklers, sprayers, MP rotators, et cetera. And we absolutely agree that irrigation system is what it implies, in that it is more than controllers and soil moisture sensors.

It's the emission devices to get water on the ground. And that includes overhead irrigation; it includes low-volume irrigation, drippers and sprayers. It includes pressure controls. We've heard about that today. And check valves. And also things that might shut off if you've got a broken pipe and other things.

So we believe all of those technologies are out there. They need to be organized. They need to be evaluated. And perhaps the report is standardized such that, again, people can make informed decisions.

And I think in -- we get towards the summary here, we like the idea of labeling and the -- including my own personal opinions, here, so I may be sliding over from a representation of the IA and CIT, as well.

But, I like the idea of SWAT equipment

being labeled as being efficient. I think there's ways to do that. We think there ought to be appropriate designation for folks that design these, because it's important the system to be designed. I can take the best equipment in the world and put it on a poor design, and it will operate poorly.

It needs to be installed properly. It needs to be operated properly, and that's the water management part of that. And if you don't maintain these, it's like your car, if you don't change the oil, you're not going to get very good gas mileage when it's broken on the side of the road.

So, it's all of these things. And I think at the end of the day, whether it's through this legislation or future actions through the state or other agencies, I think we want to look at high efficiency systems and some designation on how to achieve those.

This is our new lab I was just talking about. And we welcome that anybody come by, we'd love to show you around.

And I thank you.

MS. WHITE: Any questions? George,

please.

PRESIDING MEMBER ROSENFELD: Yes, sir. Come on up to the mike.

MS. WHITE: George, please come to the microphone.

MR. ALEXANIAN: This one?

MS. WHITE: Yes, please.

MR. ALEXANIAN: I'm George Alexanian. I gave the presentation earlier about the add-on modules and also non-ET-based controllers.

And I want to back up Dave as to what he said. What the SWAT testing does is test the --

ASSOCIATE MEMBER LEVIN: Sir, if we could limit this period to questions, and save the remaining public comments, I think we would be able to stick to the agenda.

MS. WHITE: Yeah, we need to stick --

MR. ALEXANIAN: Well, I'm addressing what he said.

MS. WHITE: Right, but if it's a particular question that he can respond to, that'd be great.

MR. ALEXANIAN: Right, --

MS. WHITE: If it is general comments, then we're trying to reserve those for later.

MR. ALEXANIAN: Okay. Dave, I know you did a study recently about water conservation on smart controllers in southern California, northern California. Could you give us those numbers, please, as to the water that was actually measured as being having saved with smart controllers in southern California and northern California?

MR. ZOLDOSKE: George, first, that wasn't my study. I think I had repeated that there were some studies that had been done. But I think the average --

MR. ALEXANIAN: Okay, well, refer to studies, the result of the studies that have been done.

MR. ZOLDOSKE: I think it was 15 to 40 percent savings with an average being 25, something like that. So.

MR. ALEXANIAN: Okay. So an average of 25 percent savings for smart controllers was a result of the independent study being done on smart controllers. Thank you, Dave.

MS. WHITE: If you could please come to the microphone. And announce yourself. Thank you.

MS. STEVENS: I'm Amanda Stevens. I'm

here on behalf of PG&E and the investor-owned utilities of California. And I had a quick question for Dave, actually two.

The first one being whether, in your opinion, you talked about the testing protocol for controllers. Would it be feasible to expand that to a testing protocol that could test both, quote-unquote, smart controllers as well as dumb controllers within the same testing procedure?

MR. ZOLDOSKE: Well, the IA controller protocol is open to all controllers.

MS. STEVENS: Um-hum.

MR. ZOLDOSKE: And certainly we've had a number of them that have failed, that would go under the, I guess under the definition of dumb controllers.

And so I think, in essence, when the controllers -- and there is no pass/fail, but I think it's fair to say that there is a perceived performance level that comes out of that that really defines what we consider smart controllers.

MS. STEVENS: Okay. And then my second question was, I was wondering if you've ever done any testing on the energy consumption of these controllers.

MR. ZOLDOSKE: They are, as far as I know, they're all UL tested. I should have George and our electrical engineers talk about this.

Are you talking about the power consumption of them?

MS. STEVENS: Um-hum, yeah.

MR. ZOLDOSKE: That, you know, they're typically all 110, so I can't imagine the amperage is very much -- and George or somebody else could speak to that, but we are very much aware of embedded energy.

MS. STEVENS: Yeah.

MR. ZOLDOSKE: We recognize that water that's saved, that 20 or 30 percent water we're talking about, has a huge energy component of embedded water in that. And we're very very cognizant of that.

MS. STEVENS: We have some other comments, but I'll save those for our remarks later on this afternoon. Thank you.

PRESIDING MEMBER ROSENFELD: But you have a good point. It would be nice to know what the standby, as a part of your testing, it would be nice to know what the standby power is. Just saying that it's 110 volts doesn't make me feel

comfortable.

MR. ZOLDOSKE: No, fair enough. And I think that that's information that we certainly could request from the manufacturers, or measure, you know, the in-rush current or whatever it is that needs to be measured.

Sir, point well taken, and we certainly, as part of this we can certainly identify the power consumption.

PRESIDING MEMBER ROSENFELD: Thanks.

ASSOCIATE MEMBER LEVIN: I have a question about the system testing that you're doing, if there's any way to describe briefly, it seemed like you described a lot of different parts of the elephant, but I think given the pretty wide recognition that we need systems to work, not just the individual pieces, and we need them to work in real world conditions, where there tend to be a lot of failures at different places along the system, how are you, or is anyone, testing whole systems in real world conditions?

Or going back and looking at real world systems, you know, a year, two years, five years into their life.

MR. ZOLDOSKE: Yeah, I think there's

significant data out there on that. A lot of them tend to be case studies. And I always like to differentiate between what I consider, as a researcher, you know, replicated studies, you know, and controls versus not anecdotal, but case studies that look at after the fact, or something put in, and then monitoring it.

In fact, I did a case study with the DWR on golf courses, actually with Marsha Prillwitz a number of years ago. And we looked at potential water savings and other things with interventions and stuff like that.

So I think that data is out there. I think it's recognized that some maintenance is required. And I think that that would be available through the CLCA and other folks. I'm sure there's got to be some information out there, the CUWCC, it's out there.

But it tends to be more anecdotal than, you know, hard research numbers that I would be willing to put legislation under.

ASSOCIATE MEMBER LEVIN: I think maybe one thing for future speakers, in their written comments, I would find very helpful is suggestions about whether there's some sort of warranty.

And again, not for specific parts, but for systems, for applications. It just seems like a really important issue that we need to grapple with somehow.

And that may not be the right approach, but I think we have to go beyond the incentives and the labeling upfront to how do we make sure these things work for long enough to really provide the benefits that we're going to be banking on.

MR. ZOLDOSKE: And I wouldn't disagree with you. I think that at some point water budgets will drive us to that. That you have a certain water budget for your yard, assuming everything works efficiently. And if you can't manage your water budget because your efficiency is low, then you're going to have dead trees and other things. And I think that will force the individual to go out and make appropriate changes.

So I think, at the end of the day, water budgets or tiered pricing is going to be the mechanism that holds everybody's feet to the fire to make suer that everything works properly. That's my view on it.

ASSOCIATE MEMBER LEVIN: Thank you.

PRESIDING MEMBER ROSENFELD: Yes. Come up to the mike, please.

MS. MURAKAMI: Hi, my name is Leah Murakami. I just wanted to -- you had asked about in terms of application. Modoc did hire Kennedy and Jenks to do a study on smart timers. And these smart timers were SWAT approved.

And out of 323 smart timers with eight major manufacturers, the studies actually showed that the majority of them -- they were neutral, and about 30 percent saved water. And 10 percent used a lot more water.

So, it's important, you know, as the gentleman mentioned before with the SWAT testing, it's kind of static situation where the manufacturers are putting the inputs in, but in real world situation, in theory they work, but it's only as good as all the inputs they put in. And so it's something that you really have to think about when you put this into legislation.

PRESIDING MEMBER ROSENFELD: Very interesting. Thank you.

MS. WHITE: If we can move --

MS. MURAKAMI: And I --

MS. WHITE: -- on with the agenda.

We're slipping quite a bit behind. And we actually have a couple of remote presenters that we need to be able to accommodate since they're in D.C. and actually Chicago.

We have Stephanie and Joanna. They are part of the WaterSense program in EPA. And, Anjelica, are they ready to speak?

MS. TANNER: Yes, we are.

MS. WHITE: Great. I have your presentation up, and just let us know when you'd like us to forward the slide.

MS. TANNER: Okay. Well, hello. I'm Stephanie Tanner. I'm in charge of developing product label specification for WaterSense labeled products. And I'm with the Environmental Protection Agency.

And my colleague, Joanna Kind, is here, as well. Unfortunately, I might have to leave in about a half an hour. She'll be here to answer any questions that come up after the presentation.

I want to thank all the Commissioners and Lorraine for inviting us here. The WaterSense program has been involved in labeling and developing the label for irrigation controllers for some time. And I really appreciate the

opportunity to let the Commission know what we've been working on and where we've been in that process.

Next slide. WaterSense is a partnership program that is sponsored by the EPA. And the goal of the program is to promote the value of water and to help Americans make better decisions regarding water use and water-using products. And we aim to increase the adoption of water-efficient products by organizations and consumers.

Next slide. With efficient irrigation I would agree with a lot of the people who have questions and all that. It does require a systems approach. You have to look at advanced technologies, sound design of systems, the proper installation, and then good long-term operation and maintenance.

WaterSense is looking at all of these areas, these label certification programs for irrigation professionals that have a water efficiency component. And we then partner with people who have attained that certification and helped them promote the water efficiency parts of their irrigation practice.

And then the other thing that we're

doing now is we're working on actually labeling of efficient water efficient irrigation products.

I'm on slide 4.

MR. STRAIT: If you'd like I can automatically advance when you've read the last slide. Would you like me to do that?

MS. TANNER: That would be fine.

MR. STRAIT: All right.

MS. TANNER: On our computer I still see the first slide, so it's hard for me to tell where exactly you are.

MR. STRAIT: Oh, that's interesting.

MS. TANNER: So I'm on slide 4.

MR. STRAIT: Yes, I'm on slide 4 currently, also.

MS. TANNER: Okay, excellent. WaterSense has a number of factors that we use to determine which products we're going to label. Our first requirement is that they offer equivalent or superior performance to other products in that category.

Naturally, they have to realize significant water savings on a national level. They have to be able to achieve efficiency through several technology options. We would never label

a product where there was only one product that was sort of proprietary in its technology to have the WaterSense label, because we have to have a sort of transparent test for that product to prove how it was operating.

We look to see that there are measurable results, that the product is cost effective in the marketplace, and that it can be effectively differentiated by the WaterSense label.

And basically that means you have products that are in the same category that are inefficient and some that are more efficient, and the WaterSense label would help consumers to make that determination as to what they should purchase.

And then our final criterion, which is sort of what sets us apart from programs like the EnergyStar program or other programs that are out there is that all of our products have to be independently tested and certified to meet our criteria.

So that's why we have a lot of focus on our testing protocol and our -- to monitor the product performance.

I'm going to slide 5.

MR. STRAIT: On slide 5.

MS. TANNER: Thank you. The EPA, in developing our specification, we rely o a lot of experience from the industry. We look for people who have experience designing products, manufacturing them, installing them and maintaining them to help give us insight as to how the product will operate when they're in the field.

We like to be sure that, while we don't always have a test for it, we do look into how products operate when they connected to the actual system in which they're used. We like to make sure there are no unintended consequences of having a more efficient product in the system, and that -- so that's why we look at all of these different types -- we look for information from all of these different types of stakeholders.

Then we work with our stakeholders to develop -- to define what the important performance attributes are, and then develop test methods to evaluate those attributes. And then establish performance and efficiency levels.

And generally we prefer not to develop the test method just internal to the government.

We like to work with industry partners who want to make sure that the test protocols that we ultimately settle on is considered fair to the industry.

Because, to a large extent, the WaterSense label confers an advantage to efficient products, and we want to make sure that everybody whose product is going to be tested feels that the test is fair, a fair test of their product. Even if the product doesn't do well, they need to think that the test is going to provide, ultimately provide a fair result.

Slide 6, please.

MR. STRAIT: Slide 6.

MS. TANNER: There are four general steps to developing a WaterSense specification. The first step is that we do a lot of detailed technical and market research. And we basically use whatever information is available to us in the public domain.

And we look at what the market for the product is, how we would define the scope and the product category, and what constitutes efficiency or not efficiency in product. And what the different test methods are that are out there,

who's doing it, what the industry groups are, who are the major -- who are all the manufacturers that are involved.

Once we finish that report we make a decision as to what we think might be our direction in what we're going to do with the product. And if we still have any questions that we've been unable to answer that would allow us to move forward with developing a specification.

And when we've done that, we issue what we call a notification of intent. This basically tells the industry what we think, what we found, and what our remaining questions are.

And then once we feel like we've gotten enough information from industry as a result of the notification of intent process, we do ask industry to provide information on those questions that we have. And it's really like our first step in engaging the public in a public way about product development.

And once we feel we've answered any remaining questions the best we can, then we issue a draft specification if we feel it's appropriate. And then we have another public comment period. And then, once that is over and we've evaluated

all the comments, then we issue the final specification.

MR. STRAIT: Slide 7?

MS. TANNER: Yes, please. So, -- just started in 2006, we've labeled four irrigation programs for irrigation professionals. We've labeled ten tank toilets and lavatory faucets and for residential plumbing, and we're working on irrigation controllers and a number of other plumbing products for commercial businesses.

But we've also been doing a lot of research in terms of moisture sensors, drip micro technology and other kinds of irrigation and plumbing products.

So I'm going to talk a little bit more, that's what I think everybody wants to hear about, is what we've been doing with irrigation control technology.

As everybody has said, I mean we agree with the definition that Dave, and I'll have used, in terms of what weather- or sensor-based irrigation control technology is. And we generally define it to be something that establishes or modifies a predetermined irrigation schedule based on a weather station or some kind

of a sensor.

And based on all the studies that have been done thus far, we believe that these products have the potential to save about 20 percent of water in a landscape over conventional clock-driven irrigation controllers.

And that's why we feel that we are interested in labeling these products because WaterSense does require that products save about 20 percent over other products in their field.

On slide 9 now.

MR. STRAIT: Slide 9.

MS. TANNER: As you can see from this slide this is the five-year historic ET curve for Fresno. And most people irrigate at the horizontal line shown on the slide. Whereas they don't really change their clock timer over the seasons, so all the area under the lines in the valleys of the ET line, that is where the potential for savings is.

And that potential is fairly significant. Irrigation water use is one of the main factors that drives peak demand in water utilities and it's a big problem for a lot of water purveyors. And that's why we are so

interested in trying to improve energy efficiency in this area.

On slide 10.

MR. STRAIT: Slide 10.

MS. TANNER: So, from March 2006 to March 2007 we conducted our detailed step one of our process where we looked at all the research. And in April of 2007 we issued a notification of intent and held a very large public meeting in Florida to discuss what our outstanding issues were and what our path forward should be.

As a result of that we established four groups to work on some of the main issues that we felt emerged from that meeting.

We looked at what the exact performance measures should be, so what the levels that, when the controllers get tested what the measure should be and whether a controller met, was water efficient or not. Whether we should use simulated weather to provide better data or a more -- test more products throughout the year. And whether we needed to test in multiple zones. And whether there were some requirements for what the user interface had.

And so these four groups met; in the

interim, two of the groups used simulated weather and the user interface finished their work in 2007. The simulated weather group found that that it was too expensive to try and simulate weather, and they basically agreed to disband themselves after one or two meetings.

And the user interface group finished their work and they came up with a list of ten user interface features that they thought would be important to include some or all of those features in a WaterSense controller.

The other two groups basically proposed some questions that we ended up asking of the SWAT protocol, the SWAT Committee, about the protocol, and what we wanted to do. And how it would fit into labeling. And so I'll talk a little bit more about those questions in the next few slides.

MR. STRAIT: Slide 11.

MS. TANNER: Thank you. The first question was are the SWAT test results transferrable from California to other regions of the country with varying climates.

A lot of people seemed to feel like if you live in a climate that has very different weather that the protocols -- that the

controllers, when they're set to someplace that's very dry most of the year, won't produce a very good result.

And if you go to slide 12, you can see why people are concerned about that. If you look on slide 12 you can see the two-year precipitation and reference ET for a weather station in Florida versus the one that is in Fresno, California, where CIT is located.

And one of the biggest concerns we heard was from Florida utilities who feel like they have high ET and high rainfall, and would the controllers be able to respond appropriately to that. Where in Fresno you have high ET and very low rainfall.

So, CIT did use some further testing on this issue in both Florida and New Jersey, and found that the test results were similar for controllers that had been tested in Florida and in Fresno and Florida and New Jersey. So they sort of put that issue to bed that the controllers did work equally well, in fact very similar scores, when they were tested in other kinds of climates.

Slide 13.

MR. STRAIT: Slide 13.

MS. TANNER: The second question was are the test results reproducible from laboratory to laboratory. About a year ago when we started asking these questions, CIT was the only place where the testing was officially going on.

And as part of the WaterSense program we require third-party testing for all of our products. And therefore, we needed to be sure that the protocol could be used by any laboratory anywhere in the country that was capable of doing the testing.

So we asked the University of Florida to conduct a SWAT protocol and document any additional information or procedures that would be needed to run the test outside of CIT.

And we asked them to do a number of other things, and I'll talk about all of that in a minute. So that was the test phase. They've been doing that testing for us for the last five months. And we're expecting to have a report on that in the next few weeks.

The third question was the test requirements. Are the minimum ET, minimum rainfall and test duration requirements sufficient to adequately test controllers nationwide.

And this was part of what SWAT looked at also in the Florida and New Jersey testing, and they concluded that the current levels in the protocol were fine. As I said, the controllers that were tested both in Fresno and in Florida and New Jersey ended up with very similar scores.

But in addition to that our University of Florida testing is also investigating this issue.

So, where are we now?

MR. STRAIT: Slide --

MS. TANNER: Oh, I'm --

MR. STRAIT: Sorry. I thought you might have been asking -- we're on slide 15.

MS. TANNER: Yes. As I said, the University of Florida has been conducting a study to shed additional light on all of these questions. And the study is complete, but we are analyzing the results, and we expect to be able to discuss them and how we interpret them later this spring.

We do expect that our preliminary view of the results indicates that there's really no problem with any of these areas, and that we'll be able to go forward with developing a draft

specification for this product in early fall, or sometime in the fall of this year.

So, at that time we expect to set the performance measures, decide what features in terms of user interface we would include; how we're going to address add-on devices; and provide a protocol document package to any laboratories or certified -- or are interested in providing the WaterSense protocol test.

We would expect then that we would have a final specification in 2010, the early part of the year.

Slide 16.

MR. STRAIT: Slide 16.

MS. TANNER: So then in addition to the controllers, we've also been working with the soil moisture sensor manufacturers that are part of the SWAT protocol development group for that.

Out intent is to include soil moisture sensors under the same specification that we have for weather-based irrigation controllers. Even though the test would be different, we would expect that they would have the same performance level as we would apply to the irrigation controller.

But in order to do that we need a performance test protocol. And as I understand, they're making progress on that, but it is not actually, it's not ready to go forward at this point in time.

We're also continuing to do research on sprinkler head micro irrigation and rain sensors. And we are interested in working with SWAT on all of these technologies, and where possible, using the protocol that's developed as a SWAT process.

Slide 17.

MR. STRAIT: Slide 17.

MS. TANNER: So in summary we are addressing efficient irrigation practice through the promotion of efficient irrigation professionals and labeling efficient products. We would like to publish the draft specifications sometime this year, followed by a final specification early next year.

And that we have conducted preliminary research on a wide range of products, but we don't have any performance measures or protocols at this point in time, and we're unable to move forward.

So, with that, I will post our website. You can find all of our reports and the

notification of intent and where we are and all of that on our website.

ASSOCIATE MEMBER LEVIN: Ms. Tanner, thank you very much for your presentation, especially doing it remotely. I know it's not ideal.

MS. TANNER: -- fine.

ASSOCIATE MEMBER LEVIN: Is there any questions? And, really, I want to underscore questions, because we are very far behind schedule at this point. If you could keep them very brief, no preambles, just questions for clarification purposes that would be very helpful.

Please identify yourself.

MR. DAVIS: This is Andrew Davis from Accurate WeatherSet Company. Is the EPA open to these field studies that are being carried out in California, where the controllers are actually purchased and installed by homeowners and contractors, as one performance measure for the water saving potential of ET timers versus the static 30-day testing, the SWAT protocol?

MS. TANNER: I would say I would agree with Dave Zoldoske that the field test that you're talking about is very different in nature from the

SWAT testing that we're looking at to form the basis of the WaterSense label.

That test basically took a number of controllers and randomly installed them in a large different -- different people, and then monitored what their water savings was.

And so we feel like that's a lot of information to be gained that would shed light on irrigation, controllers and systems, and marketing of programs and user education and behavior that we could use in developing water irrigation programs and things like that.

But it wouldn't be a really good basis for a testing protocol because new products that come into the market would not have been tested under that. And so how would they then be tested.

Also, as a market-based program, you have to have some ability to do testing that doesn't last two or three years for products.

So those tests tell you how much water the products can save, as a category, but the SWAT testing tells you how the -- you know, whether they perform and do what they, whether they follow the ET schedule or whether they're able to monitor the change in moisture in the soil. And that

doesn't necessarily come out of the field test that you're talking about.

MR. STRAIT: We have one more question.

MR. ALEXANIAN: This is George Alexanian. I talked to you earlier. And I was expressing a concern about addressing existing controllers. And in that regard, with add-on devices that could make them smart.

I attended the Irrigation Association meeting in Anaheim where the EPA representative was making a presentation.

ASSOCIATE MEMBER LEVIN: George, can you please ask your question?

MR. ALEXANIAN: Yes. Has there been any decision made yet as far as the add-on devices being approved for potential SWAT, not SWAT, EPA WaterSense labeling? Or is that still under consideration?

MS. TANNER: Can you hear me?

MR. ALEXANIAN: Yes.

MR. STRAIT: Yeah, we can hear you.

MS. TANNER: Okay. Well, I think what we would be inclined to do at the time I think we're waiting for SWAT to decide what their recommendation was in terms of your add-on

devices.

And I think now they have published their decision, too, that they think they should be included. And they have sort of a method as to how they would be included. And we would be inclined to follow that.

So, you know, I think we needed to hear a recommendation from the industry and to feel comfortable with how people felt like they should be included, for us to feel comfortable including them in part of our specification.

But at this point in time I would say we're open to including add-on devices as part of our specifications.

MR. ALEXANIAN: Thank you for that because I alluded to that, saying that you are considering approving, or WaterSense labeling add-on devices.

And final question, real quick. We're not limiting smart controllers to ET controllers, is that correct, as far as EPA's concerned? You also agree with the IA and the CIT and the SWAT definition? I believe you said that earlier, I just wanted to make it crystal clear.

MS. KIND: I'll tentatively say yes that

I agree. You know, they're tested for controllers, and hopefully soil moisture sensors. So I think -- but any controller can be tested under that protocol, so --

MR. ALEXANIAN: Okay, not necessarily just ET-based?

MS. KIND: What other things are you talking about?

PRESIDING MEMBER ROSENFELD: Water sensors.

MR. ALEXANIAN: Well, for example, we have a controller that's temperature-based along with environmental historical data that does not calculate ET, yet it's gone through SWAT testing and we have some out in the field and they seem to be performing well, as I reported earlier.

And what I don't want to do -- what I'd like to see is the EPA re-defining, let's say, smart controllers to only be ET based controllers.

MS. TANNER: Right, okay. Yes. No. We're not -- they're not only ET based. They have to take in some sort of current data and calculate a revised or modified schedule based on that data.

MR. ALEXANIAN: Okay. Thank you very much.

ASSOCIATE MEMBER LEVIN: If we could move on to the next presentation and reserve any further questions to later.

Mary Ann Dickinson, please, from the Alliance for Water Efficiency.

MS. WHITE: Mary Ann, are you on the line yet?

MS. DICKINSON: Yes, I am. Can you hear me?

MS. WHITE: Yes. I just want to let folks know we are having a little bit of trouble with our webcast. The call-in line is not affected. The presentations are available online. And I've asked our web people to do what they can, as soon as they can, to address our webcast problem. But it may take a moment.

So, for those of you on the line, if you would just be patient, we will try and get these presentations available to you as soon as possible.

Mary Ann, if you would just let us know when you'd like it advanced, we can do so here.

MS. DICKINSON: That sounds great; thank you very much, Lorraine.

MS. WHITE: Thank you.

MS. DICKINSON: And I know that you're very pressed for time so I will try and make this very brief. Lorraine asked if I would provide some perspective from other areas of the country. I know Chris and Marsha will be talking about California.

So what I'd like to do in my few minutes is to just give you some snapshots on what kind of landscape rules and regulations exist elsewhere in the country, and also what kinds of research we were recommending be done in these same areas that have been discussed earlier today.

So, if you would advance to the first slide, Not just in California. We are experiencing the same issues and problems that California has been experiencing for years. They occur everywhere in the country.

We are finding irrigation issues of over-irrigation of turf. Turf is the largest irrigated crop in the U.S. I think we all know that. So, it's a focus of the homeowner, it's a focus to make sure that the homeowner is understanding that more water is not necessarily going to make the lawn greener.

And we are thinking we're making

progress in this area, but we're not. We're finding that even the new development that's being built is being built without necessary attention to the proper installation and maintenance of the irrigation system.

And so the new development can often exceed the peak summer watering over their nearby neighbors in older houses. In a particular community that's been studied, it's a 70 percent increase in peak use of the new development versus the old.

So we're really focusing on water use as an important national area of efficiency priority, since it is the single largest category of average and peak water use in the urban environment.

So, next slide, please.

MR. STRAIT: Next slide.

MS. DICKINSON: So the challenges in irrigation have been talked about very eloquently today. I don't really need to repeat it. But I think we all are on the same page. Once the irrigation system is installed whatever configuration is usually ignored by the homeowner and not maintained properly, not managed properly.

The technology is sometimes not even

well matched with site conditions. Certainly the systems are not maintained and checked for leaks or for breaks in the line.

The controllers very typically are not programmed correctly, and certainly not revised for seasonal conditions. We've heard lots about that already this morning.

And the consumer has this black box mentality about the controller, you know. It's just something that exists over there on the wall of the garage and it's just not something that they touch or want to touch.

And that's part of the issue that we need to deal with, you know. We need to make sure that as we are moving forward with product standards and specifications we're taking into account the human factor of the management of those products.

You know, as clothes washers, for example, get more and more sophisticated, people are paying attention to those digital displays and how to navigate those. And certainly irrigation's been much more complicated than a clothes washer for a long time.

There's also the issue of the plant

material not often being locally appropriate or properly designed. And for the most, as we'll see in a little bit in my presentation, that's kind of the issue that's dealt with in a lot of the regulations and ordinances that exist around the country.

And trying to get into consumer response, which is to over-irrigate to make sure that the landscape is green. So a lot of the regulations have been dealing with that consumer response.

So, next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: So what are the landscape rules and regulations that exist around the country? We've done a little bit of a look-see here in the past couple of weeks to prepare for this hearing. And we're not finding a lot of product-based models or regulations or ordinances that would inform the Energy Commission's work.

With one notable exception, which is rain sensors. But there aren't very many examples of ordinances out there that deal with the issue of controllers, that deal with the issue of system maintenance. There are a few and we'll talk about

those. But primarily most of it is dealing with the actual homeowner and property manager, themselves. Dealing with the behavioral issues of irrigation.

Time-of-day water restrictions are the most common; day of the week, you know, also extremely common. Ordinances prohibiting overspray and runoff just in general terms. And specified that penalties and fines will be levied when overspray and runoff occurs.

And then we see examples of turf limitations, particularly in new developments, where they're specifying a percentage of the property, a maximum percentage that can be devoted to an intensive plant material like turf.

But basically it's getting at the issue that you aren't really probably going to be addressing in your proceeding, as I am understanding your statutory charge. So that consumer behavioral side is one to certainly remember. It's the one that municipalities tend to go at first. But the product side works together with the consumer behavior side, as we know.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: So just remembering we seem to be regulating people not product in the ordinances that exist around the country. One example of the people regulation is regulation of the irrigation contractor.

Texas has passed a very detailed set of Texas irrigator rules that require training and licensing of those that are working in the irrigation industry. And that's a good example of the kind of trend that's heading out there.

The community of Hilton Head requires that all landscape installations that occur be installed with a certified contractor that is certified by them. That that contractor has gone through training that is appropriate and suitable for Hilton Head purposes. So those are two examples of where the contractor is being regulated at the local level.

But most of them are regulating the irrigation customer, not the contractor. They're setting restrictions on the use of water on the property, both time of day and day of week. Setting fines and penalties for overspray and runoff. Dealing with the homeowner association

issues, since many homeowner association covenants have specific requirements for plant material and for maintenance of that landscape.

So sometimes the local ordinances deal with the regulation of homeowners associations. And some do require dedicated irrigation meters for landscapes over a certain square foot of size. But, again, that's regulating the irrigation customer and dealing with sort of the issues related to individual properties.

Go to the next one, please.

MR. STRAIT: Next slide.

MS. DICKINSON: So the most typical product ordinance that I thought would be useful to share here would be the rain sensor ordinance. That's getting traction around the country.

Of course, it is certainly more prevalent in areas of more rainfall than less. But it is now becoming an ordinance of choice for communities that are trying to attempt to manage their growing peak outdoor water use.

The state of Florida requires that all irrigation systems installed after May 1, 1991, have rain sensors installed. And then one particular jurisdiction in Florida requires that

all irrigation systems have it, that the existing ones be retrofitted, as well. So I pulled out those two as an example of, you know, some ordinances just say new installations going forward; others say, no, all of you have to do it.

And so following down the list you'll see that there are at least five states that require it statewide, rain sensor installation and irrigation system. George, Minnesota and New Jersey and Connecticut are examples of those.

And then there are specific communities around the country that have just adopted their own rain sensor ordinance. And typically the ordinances are general. They don't have a lot of product specification language in the ordinance. But, you know, that's something that I think will become a growing trend as rain sensors become a lot more differentiated and we notice that there is the ability to program them for very small amounts of rainfall.

Next slide, please.

MR. STRAIT: Next slide.

MS. DICKINSON: So here's a list of a couple of communities around the country that have done landscape ordinances. Las Vegas, of course,

is very famous for its cash-for-grass program. But it also has an ordinance in place for setting turf limits for single family, multifamily, nonresidential properties and golf courses.

Volusia County in Florida requires pressure-reducing sprinkler heads and requires that irrigation zones be set on all irrigation systems.

We've already mentioned Hilton Head, which requires not only irrigation systems installation by certified contractor, but also requires that rain sensors be installed as part of that installation.

And then San Antonio, Texas and the comprehensive ordinance that requires that the plant material actually be allowed to go into dormancy periods in the summer. So that lawn has the ability to be able to have reduced irrigation during peak periods. They require rain sensors and they require inspection of the irrigation system by San Antonio water system staff.

So those are examples of some. As I said, there are many many more around the country. And I'd be happy to work with the Energy Commission Staff in providing some detailed

examples.

But primarily, as I've mentioned, the ordinances tend to be regulating people, not the product.

I did want to pull up one particular ordinance example, and I will send this off to Lorraine. This is one from Tampa, Florida. And this is one that did have some fairly specific product requirements in it. This is the next slide, More Tampa.

MR. STRAIT: Yes, we're on that slide.

MS. DICKINSON: Okay, thank you. You know, you can just see on the left that sprinkler spacing must be less than 55 percent of the sprinkler coverage diameter. I mean that's a technical specification.

Sprays and rotors cannot be on the same control valve circuit. Sprays and rotors must have matching application rates within the zones.

They must avoid overspray and runoff.

But then they also define that certain areas, like narrow areas that are less than four feet, can only be irrigated with micro-irrigation.

Next slide. Then they also talk about the turf areas, that they must be zoned

separately; that the automatic irrigation controller must have a battery backup, which I thought is a very useful addition.

They require rain sensors, as well. And then they have a new development standard of a split 50/50 between turf and landscape of low-volume irrigation.

So they've got a fairly detailed, comprehensive ordinance. That's an example of what I'm thinking is going to be a growing trend as communities are beginning to realize that they need to be involved in more of the irrigation management in their communities.

They're going to be looking around at what exists out there and copying them. So I think we need to pay attention to what's already on the books to make sure that as we advance forward we're improving the level of management, and not just copying the sort of mediocre management in certain places.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: So, I think what we want to be doing is thinking about making those ordinances more product specific and more useful

for not only the irrigation contractor that has to install and need guidance, but also the homeowner.

And we've heard lots today about the SWAT program, about the Center for Irrigation Technology and the research that they're doing, as well as the research at the University of Florida.

But we think a lot more is needed. I mean those are the two centers around the country that we all look to for guidance. And, you know, it's clear that we need to develop a lot more capability in this area.

We testified in Congress yesterday on a bill that will be coming from the Senate on water efficiency research needs. There was a bill that was already passed on the House side in Congress.

And so we were asked for some of our ideas for research. And we did provide a few areas in the irrigation field, a few areas that were product oriented.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: So here's one example. We suggested that we needed some irrigation product protocol for installation, as well as management. And that that would be something that

would be useful to do on a national basis.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: We also talked about the need to develop national crop coefficients to develop good field measurements of the water needs of all types of plant material, under a variety of climatic and soil conditions.

And that since that would be such useful information to make sure the controllers had proper information, not just ET, but the right crop coefficient. We thought that that work needed to be done. There's great work that's been done in California, but we need to have a lot of that available nationally.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: The issue of more efficient application rates in irrigation systems was one that we highlighted in our testimony. And hope that we could get the research to get examples put together for model designs that could be adopted by utilities, contractors and homeowners.

And certainly that would benefit the CEC

in its work. But obviously you're going to have to be done well before any of these research projects are finished.

But what we wanted to highlight in our testimony is that there's never been a lot of work that's been done in this area on national policy basis and individually tied to put attention to that.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: Which gets us to the subject of the independent testing facilities. Because as the WaterSense program talks about, third-party testing, we're going to need to make sure that there are facilities out there that can handle the huge amount of volume that's going to be required for testing irrigation products.

Particularly ones that need to be matched. You know, if you're talking about labeling a whole system and not just an individual product, you're going to be needing to test and label a whole system configuration. And that's going to create a lot of activity that I'm not sure we're well equipped to handle yet.

So what we need is more facilities like

CIT and University of Florida to independently evaluate alternative irrigation strategies and provide that third-party certification and assurance that the WaterSense program is looking for.

Next slide.

MR. STRAIT: Next slide.

MS. DICKINSON: So, just then to wrap up. The spotlight is on you guys. I think the reason your webcast is moving so slowly today, I think you've got probably hundreds of people listening in.

Everyone is interested to see what's going to happen at the Energy Commission with this proceeding. It's getting a lot of national attention.

And there's going to be, I'm sure, a huge ripple effect expected from whatever standard you all adopt, or whatever product will start being replicated all over the country, not only on a statewide basis, but in local ordinances.

I think Congress is going to be looking at water efficiency a lot more seriously than it's ever looked at it in the past. Yesterday's hearing was a good example of that.

And there will be a research bill, probably $100 million, if the House level is maintained on the Senate side. So, this is a very good thing for us here.

We also are getting a lot of great cooperative sharing from the country of Australia, which is also looking at irrigation issues and doing research in a number of very important areas that we need to share with.

And so, finally, just the coordination with the WaterSense program and making sure that CEC and the WaterSense talk really really closely throughout the rest of this year. I think it is a very important recommendation that I would make.

So, in the interest of being fast and quick, I think I'm done.

MR. STRAIT: All right. Does anyone have any questions specifically about this presentation?

All right, I think we should move on to the next item on the agenda, keeping in mind --

MS. WHITE: There is one.

MR. STRAIT: Oh, there is a question.

MS. WHITE: Anjelica, is there a question? No. Sorry.

PRESIDING MEMBER ROSENFELD: Lorraine, I'm going to use this opportunity to excuse myself and my fellow Commissioner. We'll be -- you'll take a lunch break about 2:00, I guess, and we'll try to be back before 3:00.

MS. WHITE: Okay. We will go ahead and continue on till 2:00, though.

David, take good notes for your Commissioners.

PRESIDING MEMBER ROSENFELD: You decide, Lorraine, when you want to quit.

(Pause.)

MR. FRAME: Good afternoon. My name's Kent Frame; I'm with the Department of Water Resources, Office of Water Use Efficiency. And I would like to thank Lorraine and the Commissioners for inviting us to talk a little bit about what we're doing on the other side of AB-1881.

As you're currently all aware, the Governor recently announced a drought proclamation, along with a 20 percent per capita reduction by 2020.

Currently many local agencies are already including mandatory rationing. And a lot of these actions are going to be relying strongly

on the model water efficient landscape ordinance that DWR has been working on, in conjunction with the SYMS (phonetic) program to meet these goals.

AB-1881 directed DWR to update the model water efficient landscape ordinance and also submit a report to the Legislature on the statewide compliance of existing landscape ordinance, AB-325.

And to recommend a new ET adjustment factor, which is a part of the water budget component of the model ordinance. And to work with the CEC in developing performance standards.

While investigating the ET adjustment factor component we identified four actions that significantly impact irrigation efficiency. And this, in turn, ended up more or less being the backbone of our model ordinance. Mary Ann was talking about behavioral versus performance standards.

And we actually went pretty much into detail into prescribing landscape irrigation system, not only design, but specifications. Coupled with hydrozone utilization in the landscape.

But the four actions that really

impacted our design, irrigation system design, installation, maintenance and management.

In working with the CEC DWR supports strong standards that will result in high irrigation efficiency. Again to mention, that is a big component of our model ordinance.

And this is reflecting the value and increasing scarcity of water and many adverse impacts of inefficient irrigation, landscape runoff and overspray.

We feel that the standards to be developed by the CEC must be consistent with the model ordinance that the state will be adopting.

And then thirdly, we feel that it is important that the CEC standard development be coordinated with the ongoing improvements to the state SNWA program. I'll touch on that a little bit more detail later on.

Some important dates to remember. Lorraine's probably already gone over most of these, so I'll just go through them real fast. Water purveyors are to install meters by 2008. CEC, by 2010, is to adopt performance standards and labeling requirements, after which in 2012 the sale and installation of irrigation controllers or

moisture sensors will be prohibited unless the equipment meets the requirements adopted by the CEC.

As I mentioned, we're in the process of trying to adopt an ordinance. We're down here. We've gone through the process the CEC is initiating. We're down at the bottom right-hand box.

It hasn't been adopted yet. The AOL has just recently returned the ordinance, first clarification on some comments that they had. And so we'll be working with them to move the process along.

Some of the requirements in the statute, itself, AB-1881, are pretty specific. And I want to touch just briefly on those elements within the statute that are in our ordinance that we think will be reflective of different performance standards for different types of equipment. Not only ET controllers, but on various aspects of the irrigation system.

One of the provisions is to minimize landscape irrigation overspray and runoff. And to include a landscape water budget component. Again, we used the ET adjustment factor as a part

of the landscape water budget.

And then include provisions for the use of automatic irrigation systems and irrigation schedules based on climate conditions. And include provisions for landscape maintenance practices that foster long-term landscape water conservation.

And we feel that this is offering a lot of new opportunities in both design of the landscape irrigation system, the design of landscapes, themselves, and to foster long-term maintenance on both the landscape and the irrigation system.

The applicability of the model ordinance as we've written it, it requires implementation in landscapes that require a building or landscape permit, a plan check or design review. So there is a followup component in implementing the model ordinance through the local planning.

And this includes developer-installed public agency projects and private development projects with a landscape area of over 2500 square feet. And then for homeowner-provided or homeowner-hired landscapes we set the threshold at 5000 square feet.

In implementing the water budget component of the model ordinance we took an approach of utilizing a MAWA, or a maximum applied water allowance. And what that does, it takes into allowance for a maximum water that's applied during the highest water demand period of the year.

And then we have an estimated total water use which is part of the model ordinance landscape documentation package that needs to be submitted to the local agency. And in that the ETWU cannot exceed the MAWA. And we feel that this is one way of maintaining and monitoring the water use component, so that over the long term that if a sprinkler head is broken, if an ET controller is, or weather-based controller is malfunctioning, that the monitoring of that MAWA or the ETWU would provide for long-term water use savings.

In complying with MAWA, all landscapes, we hope, we have two different standards, one for existing landscapes, one for new landscapes, local agencies shall administer programs for compliance with MAWA. And these may include irrigation water use analysis or tracking, irrigation surveys. And

even irrigation audits.

Part of the water budgeting we utilize in the ETAF is the SYMs, DWR manages the SYMs program. And the use of grouping water use plants, be they low-, medium- or high-water-using plants, into specific hydrozones.

Part of the landscape design plan includes identifying hydrozones based upon their water use. We're requiring that plants be grouped based on water use. And that they be irrigated with specific emission devices depending on their water use.

Some examples of landscapes that will be prohibited henceforth will be the slopes that you see on the upper right-hand corner, where there's a 25 percent grade that butts up against the hardscape. That will no longer be permitted.

We're limiting the types of emission devices that can be utilized in such environments to plant materials that you see on the bottom right-hand side.

I should add, too, that there are conditions where not with slopes, but where there is turf against a hardscape, that one could utilize in using different emission devices, and

still prevent runoff.

In the irrigation design plan of the model ordinance we're requiring self-adjusting controllers. As you are all aware, based upon the discussions I've been hearing, those are either soil-based or weather-based controllers. And the intent is to reduce or eliminate runoff and overspray.

We're limiting the type of the irrigation system that can be utilized in narrow and irregular shaped areas. In many circumstances we're requiring a 24-inch setback. Albeit there are a few conditions that would permit you to use an emission device that may be overhead against a hardscape providing you can document during the audit that there is no overspray or runoff.

We're not aware of any such devices currently on the market, though I do believe there may be some forthcoming.

Again, slopes was something that we addressed. We're requiring that there be an installation certification and that it be done in accordance with landscape and irrigation design plans.

As I mentioned early on, we thought

studies that we looked at, while investigating the ETAF component indicated that design and installation were big components on to the efficiency of the irrigation system. So we're requiring that that be certified.

Irrigation scheduling parameters are required. Automated irrigation systems, I've heard talk about them being smart. And I think Mary Ann mentioned that, you know, we have a tendency to want to just kind of plug-and-play. And no matter how intelligent the device is, it still requires human intervention.

So we're requiring that irrigation scheduling parameters be established for each landscape. And that actual irrigation schedules that henceforth would be controlled by the controller, itself. And these inputs are to be submitted with the landscape documentation package.

Maintenance schedules for both the irrigation system and the landscape are required to be submitted to the local agency. And that's, again, to prevent scenarios like you see on the bottom left-hand side where there's a lot of water waste.

The irrigation audit report is to be compiled by a certified irrigation auditor as specified in the Irrigation Association 2004 training manual. That's pretty much a widely accepted certification.

And then all landscapes in the cities and counties shall prevent water waste by prohibiting runoff, flowhead drainage and overspray. We're requiring the use of such devices as low head anti drain devices. We're requiring devices that would maintain the manufacturer's specified, not the flow rate but the pressure of the emission device within the system.

We're requiring the use of shutoff devices for weather conditions that interfere with the efficient application of water, such as freezing, excessive wind, or rain.

So just to summarize real briefly, I think that we're attempting to do what Mary Ann Dickinson was describing as we're looking at technology and the irrigation system and the application of water as a means, as a major means of being able to save water in landscapes.

And here's the contact information if

you want more information or want to contact about any part of the model ordinance.

Any questions? Yes.

MR. BEDAL: My name's Heath Bedal; I'm the President of the CLCA. And my question may be more of a clarification on my part, but it looks as though the DWR is already ahead of the schedule on some of these things. That you're already putting in place many things like limitations of product being used in certain situations, and the products being used.

So what is the purpose for the CEC's involvement in this?

MR. FRAME: Well, I do not look at the work that we've done as prohibitive or excluding or requiring specific products. While we were going through the process we have found there's a wide range of products from really bad to relatively good.

And we thought that using the relatively good practices -- products, the practices out there, would produce the desired results from this, that we're trying to obtain from the model ordinance.

So I think the CEC involvement would be

looking at the wide range of products that are available and having some sort of performance standard, maybe be it maybe it's in the middle, maybe it's to the right of the middle, on the higher end. I don't know.

But as it is right now I can go out there and I can buy a mixed/matched set of emission devices and if they're not matched precipitation rate nozzle, if they're not similar products, if one's a really bad one, if one's a decent one, I'm not going to get good irrigation efficiency.

And so I think the purpose of this is to try and achieve that, and to help fostering long-term landscape water use savings.

In the back.

MS. WHITE: And while he's coming up, as you noticed there's quite a bit of landscape that won't be affected by the model landscape ordinance. They've specified what they're focused on.

And our requirements are to look at all equipment sold in California, and so there's probably a broader amount of the market that we'll look at than would necessarily fall within the

model landscape ordinance.

The other thing, too, is as long as we're doing this in consultation with each other, what comes out of our process will help inform future updates to the model landscape ordinance and vice versa. We will be learning from what they've done in developing our standards, as well.

MR. FRAME: If I could just add one more thing -- thank you, Lorraine, -- briefly is that there's been an ordinance in place since 1992. But compliance, we have found, has been very lacking.

And this existing model ordinance does require that those landscapes that fell under the purview of the existing model ordinance will have to comply, or should comply with the existing ordinance.

Having performance standards in place will help those existing landscapes achieve the model that they were originally required to follow.

Yes.

MR. McLEROY: Dave McLeroy with Green Leaf Mapping and Control Systems. My question is about the data that has to be submitted under the

ordinance, i.e., the valve characteristics, what kind of heads and such. And I presume that would include the design, itself, showing where the valve zones are.

Will you make that available to the new owners, new landscapers on that property? Is it going to be available online? Or is it going to be put in a file someplace? Because it is the most important data for getting good efficiency.

MR. FRAME: The model ordinance, I'm not sure. Are you asking if --

MR. McLEROY: You said that you were going to ask for anyone who does certified irrigation installers to submit the data that they're inputting for what kind of spray heads, what kind of hydrozones, all of the stuff that makes up the valve characteristics. So you know that valve one on clock A is a sprayhead, has sprayheads, it's turf and it's on a 20 percent slope.

Is that data going to be available as these properties turn over? Because, quite frankly, what happens is we do all this equipment and all this work, and then the property turns over and it's all lost. Same as with the water

audits.

We need a repository, someplace to put this data so that it's sustainable conservation.

MR. FRAME: That's a good question, and the short answer is yes. We're requiring that it be available. We have a certificate of completion process built into the model ordinance. And as part of that I believe requires that those maintenance schedules for both the landscape and the irrigation system, along with the designs, are provided to the homeowner or the businessowner.

Does that --

MR. McLEROY: That wasn't my question, though. My question is somebody --

MR. SPEAKER: Can you come back up to the mike, please.

MR. McLEROY: -- going to be responsible for keeping that? If we're here to save water, we want sustainable savings. And it's something that's left out of every discussion I go to, is who is going to keep that valve zone map available, and those valve characteristics, which are critical data for managing that water on a sustained basis.

And if there is no plan for that, then

we're just collecting more paper and we're going to reinvent the wheel over and over.

MR. FRAME: Yeah. I'm sorry, I didn't understand your question fully. It's a local agency. This model ordinance is targeted at the local agency, as specified in the statute, which is the city, county or charter city and county. They will be the ones responsible for seeing that it is provided to the applicant.

MR. McLEROY: And future people who take over that property or --

MR. FRAME: That's correct.

MR. McLEROY: -- landscapers? Thank you.

MS. WHITE: Any questions on the phone? Any additional questions.

Well, we've been at it for a little while, so we're going to take a breather. If people could be back in the room shortly before 2:00 we'll be able to finish up the rest of the day.

MR. HUNGERFORD: Lorraine, --

MS. WHITE: Oh, pardon me, 3:00, sorry.

MR. HUNGERFORD: Lorraine, --

MS. WHITE: Yes, David.

MR. HUNGERFORD: -- do we want to take a full hour break or would we rather take a short break and try to get started again a little earlier?

MR. SPEAKER: Shorter break.

MR. HUNGERFORD: Shorter break?

MS. WHITE: Actually I do believe that's your decision now, David.

(Laughter.)

MR. HUNGERFORD: Preferences? Should we come back at 2:45? 2:30?

(Parties speaking simultaneously.)

MR. HUNGERFORD: 2:45 it is.

MS. WHITE: Okay, thank you. We'll see you back here at 2:45.

Whereupon, at 2:03 p.m., the workshop was adjourned, to reconvene at 2:45 p.m., this same day.)

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AFTERNOON SESSION

2:47 p.m.

MR. HUNGERFORD: Thank you all for coming back and having taken a very short break. We're going to get started again, and I'm going to hand it back over to Lorraine. Thank you.

MS. WHITE: Okay. We are going to have to take a few things out of order, David, because of people's flight conflicts and things like that. And we'll probably run well into the public comment period with some of the presentations.

So, we've switched around the landscape irrigation best management practices discussion with a practitioner's point of view, and asked Bob Wade if he would provide his comments first. And, of course, Chris and Marsha are graciously letting him go forward.

So, all righty. Thank you.

MR. WADE: Thank you, Lorraine; and thank you, Marsha and Chris, for yielding your time and making it a bit easier for me to get to the airport.

My name's Robert Wade. I'm a licensed landscape contractor working in Orange County principally. I'm a certified landscape

professional, certified landscape irrigation auditor, EPA WaterSense partner.

I'm on the board of directors of the California Landscape Contractors Association. And I'm Chairman of the Governor Affairs Committee of the Irrigation Association.

You've heard some very good testimony today about different types of equipment so I'm not going to spend too much time on the things that have been discussed. You've listened to experts.

I'm in the field and I don't know the ins and outs of design and the theories of these things, so I'll leave that to the people that represent them.

One thing they haven't mentioned slightly, I would like to speak a little bit about rain sensors. I think they were not in the original bulletin that I got, and I think we should pay a little more attention to them.

The difference between smart controllers and dumb controllers has been discussed all day. Basically the weather-based smart controller, the word smart now is a bit in question, but they do save water and they reduce runoff. That's been

proven time and time again.

What I can address is the supposed difficulty in programming. What it takes to program a smart controller is some sort of recognition of your soil type, your plant material, the microclimate that you're trying to program, slope.

The typical considerations that you should have in mind when you're doing a dumb controller. There's absolutely no difference.

There is a mystery, it's new technology. I believe most of that is in people's heads. There really is no basic difference between programming either one of these controllers.

The one difference is on a smart controller you program the site conditions, you only program that once. You don't touch that again unless you change the landscaping. If you replant an area, you add color that's going to require additional water for a short period, you need to modify some settings or go into a user program. But you don't touch that programming once it's done.

On a dumb controller, if you're going to manage that controller right, you're in the

controller at least once a month. If you're really after it, it's more than that.

So, in my mind the smart controllers are a bit easier to deal with, not more difficult. The mystery, I think, is just that, a mystery.

The smart controller problems. We start with the basic assumption, and this was discussed earlier today, that all irrigation systems have weak areas. It has to do with distribution uniformity.

Essentially every place we look at, one of my -- part of my business is to retrofit these, put smart controllers on when they haven't been, and to modify the irrigation so it's up to today's standards.

All irrigations have weak systems. When you install a weather-based controller the controller is now operating as it should; it's watering as it should. The weak systems show up as dry spots or hot spots.

The first response is to blame the technology. It's the only thing that's changed in the landscape, so therefore it must be the reason that you're getting dry spots.

The first response is to go into the

dial and turn the dial up and apply more water. Virtually 100 percent of the time the problem is not in the landscape, broken heads, misaligned heads, clogged heads, heads that are spraying concrete instead of grass or plant material. All sorts of things that if somebody took the time to look it would be patently obvious what the real reasons are that you have problems in your landscape.

Another problem with smart controllers is the economics. Some owners of these systems would rather let -- just turn the water up, pay more for a little bit of water and not be bothered with the fix-it, because they perceive the fix-its cost too much money to do.

The reality there is to just repair a system is fairly cheap to do. If you upgrade it and you start bringing in all the appliances that we can use, it can get expensive. But just to get a system running the way it should, it's usually very cost effective.

The cost of water. I looked at a water bill for a site that I'm bidding last week, and they were paying $1.30 a unit. It's hard to justify them spending lots of money to get their

system up to our standards when they're paying $1.30 a unit.

The cost of water is a real motivator. The water departments that have an aggressive tiered rate policy have proved that. They have shown that if somebody gets an F on their water bill, they want that fixed. They know they are not an F student, they want it fixed. So they will spend more on the repair than they will on that tiered prohibitive water cost.

Runoff regulations is another problem. We all know it's wrong. Proper design will eliminate the runoff, proper head selection and design. But it continues to happen. And cities are aware of it, but they are reluctant to take that next step where you start getting notices for small fines or some other sort of pressure to fix the problem.

And I think we need to somehow make that leap, not make it punitive, but make people aware that just is no longer acceptable.

The benefits. It gets you away from clock and calendar programming. And what I mean by clock and calendar is ten minutes a day three days a week. This is how most dumb controllers

are programmed. That's essentially an industry standard. What's your setting? Ten minutes a day, three days a week. A little bit, you know, you take out a day in the winter and you add a day in the summer.

Again, with the smart controllers you program the site, not the time. You let the controller figure out how much time to water.

Automatic ET adjustments. There are several ways, and I'm using ET generic. I know we have been talking about other things, so I don't want to offend. If it's not an ET product you represent, I'm putting you in the same boat. It's the ET adjustments.

They get there in various ways. This is what keeps the program working the way it should, and it keeps people's hands out of the controller.

It sets up a demand irrigation. Just about all lawns that I'm familiar with have a depletion schedule going on in the background that is not readily available to the user. But when it hits a certain depletion amount it waters, it's as simple as that. And until it hits that it's not going to water.

This is very different from a controller

working three days a week, ten minutes. It's what we really need to get to. You can almost virtually guarantee if you change controllers you've just saved 25 percent. Even with the irrigation system still running badly. We've seen this time and time again.

And when I am talking with people about whether they should or should not do that, I tell them that. I can guarantee 25 percent with a good controller.

The programming requires a close inspection of the landscape. Most of the controllers that I'm familiar with have in their package in the box they come in, there's either a sheet or it's part of the instruction book, that has a chart you fill out.

So you turn on valve number one and you go look at it. What kind of plants, what's this, what's that. The benefit here is you also see the problems. And very often the stuff that I see, I know they haven't turned the system on in quite some time and walked it. So we encourage that.

The close inspection of the irrigation system tells you what's wrong, what needs to be fixed.

The controller -- in my mind, the biggest thing that these smart controllers do is they introduce multiple run times. We have put in, in the last two and a half years, about 1600 controllers, through city programs and our own sales.

And we have used principally one manufacturer. I'm going to do my best not to name anybody, but we had found that in July and we're watering tall fescue, which is predominately the grass in southern California, and clay soil is the soil that we're used to seeing, we found that in the middle of July it's supposed to get 14.something minutes per watering event.

Okay, and that's when it does water it may shut off three or four days, may shut off two if it's real hot. But typically three or four days between waterings.

It requires 14.something, but what the controller does is it breaks that up into 3.4 minute watering times. Turns off for half an hour; comes back on again for 3.4 minutes. Just under 3.5 minutes.

So I kept seeing this over and over. So I just started researching why 3.4 minutes. Well,

when you take tall fescue, which needs a certain amount of water, and you take clay soil, and you take a pop-up sprayhead, the amount of water that comes out of that per minute for two minutes, at 3.5 minutes it becomes runoff.

So the controller will stop watering at 3.4 minutes, let that water soak in. Then come back on. Instead of running for 10 minutes.

So if you sort of extrapolate that, when you're running it for 10 minutes, 6.something minutes is runoff. It's not even getting into the ground. It's going straight to the gutter.

So this is where these controllers really start to save water, and they start saving on the runoff problem which stops the excess fertilizers and pesticides and all that other stuff we don't want in our oceans and water. And keeps all that stuff on the landscape, because it's watering correctly.

Also the human element. It's something that is a problem. Has to do with training of the landscape personnel. They don't believe it. You put a program in in the middle of winter and it shows you're going to water your lawn once every five weeks. The first time I saw it I didn't

believe it. That's exactly what it shows, and it works.

I said, we got to trust it, let's go do it. And things kept green. They did what they were supposed to do. Everybody wants to turn these things up because we're not used to looking at dry soil, and we just don't believe things can exist on what these schedules are telling us.

It fools me. I have -- talking about soil probes, it's in the back of my car all the time, and I pull up on a site and if it looks dry, I make sure. And usually I'm wrong. I do a soil core and there's plenty of moisture, but the top quarter inch looks bone dry. And that's what we need to get used to looking at.

Honestly, it should be mulched; there shouldn't be bare soil, but a lot of times it is bare soil. But it's, again, it's a paradigm shift and we need to learn to understand what we really are looking at. The human element is a big problem for us.

Soil moisture sensors. These have been covered much better than I can do. I do want to mention SWAT, though. They have, the last time I looked at the site, which was a few days ago, they

had three manufacturers that had been approved. And I'm sure they are testing -- or not approved, but their testing results were posted, which essentially means approved.

I'm sure they are testing others. I do want to mention I don't think I heard directly said, SWAT program is voluntary. The manufacturers do not have to participate. It's their choice.

They also do not have to have their results posted. And so when you don't see a manufacturer up there, there's a reason. The score wasn't what the manufacturer was anticipating; they don't want the score made public. The ones who do well obviously want that plastered everyplace they can put it.

So SWAT has really sort of, in my mind, become our first reference. If it's on the SWAT website I'm going to trust it because I know how the testing works, and to what lengths they go to be as independent and as professional as they can. So it really is -- it's become my first resource, and I think that is something that we should keep going in a strong way.

One thing about the soil moisture

sensors again that I didn't hear is they are useful as a stand-alone. But also in combination with smart controllers for chronic wet areas.

We do have areas on sites that I just cannot dry out. And so I have installed moisture sensors and they have helped solve the problem. There's still problems on most of these areas, but they're better. So I do think there are several ways to use them.

Rain sensors haven't been talked about too much. The interrupt irrigation during measurable rain events. A quarter inch of rain is not measurable for a landscape. It might feel wet on your back, it's basically non-usable landscape water. It's not enough.

They're easy to put in and they are inexpensive. They have proven in state after state to save all sorts of water. Florida has all kinds of data that show these things are almost magic because it rains so much there.

They are politically correct. Anybody who does this stuff has gotten phone calls, how come these things, I spent all this money and it's watering in the rain.

If it's an ET-based system, it typically

is reading the last 24 hours not right now. So if it wasn't raining yesterday, it was threatening but it wasn't raining. If the depletion engine that's going in the background says, hey, we got to water, it will water while it's raining the first day of a storm. It'll pick it up the second day, but the first day it can ignore it.

A inexpensive rain sensor can stop all those phone calls. Stops the controller, but it stops the phone calls. It relieves anxieties in everybody's office.

And it also keeps the trust factor, which on this new technology sometimes is difficult to establish, it keeps it moving forward. People say, hey, look, it is raining and we're not watering. So I think just for that, it's just like an insurance policy.

Valves, all types and sizes. Again, they were discussed. Anti-drain valves, I do want to add something to what was talked about here earlier in the Hunter talk.

Talked about check valves installed in the pop-up bodies. It's a fantastic invention. I think all the manufacturers have them. They should be used, if not exclusively, much more than

they are.

We typically in our work that's all we put in. Whether it's the top or bottom of the system, that's all we put in. It just makes sense. They're not used nearly enough. I see consistent problems with that. I see heads that are turned off and they'll run for five minutes going right into a drain. It's a stupid waste of water and it's easy to fix.

There are other ways to do them. They can mount on risers; they can be mounted in the pipe. The head on the water, that can be dealt with. There is no reason not to use them. They're cheap, they're just overlooked.

Emission devices. Again, many types and styles. We have quite a few over here.

Application and precipitation rates. A couple things going on here that can be confusing to a lot of people. Gallons per hour or minute, and inches per hour. The heads, a lot of times in the catalogues, which you look at first is the gallons per minute, or on drip lines, gallons per hour.

What we do is we worry about inches per hour because it gives a better representation of

what's being applied, what's actually hitting the ground.

All emitters and heads have a use. There isn't one out there that should be outlawed. And kind of one of my soap boxes is we need to keep all material on the market. We need to learn how to use it correctly is what we had to do with that.

Here's a comparison. There are many variables that will change how many inches per hour, but these are out of catalogues and these are common numbers.

Rotors. Usually larger areas, larger turf and big slopes. Roughly an inch an hour depending on your insert.

Sprayheads. This is out of a catalogue, 1.7 inches per hour. Rotating heads. It's already been mentioned. This is an MP. MP is actually .45, but half an inch an hour.

Drip emitters. They don't rate them on inches per hour, but there's a guy who knows what he's doing who did the math backwards and was able to figure out it was 1.6 inches per hour. But it's only watering one square foot, that emitter.

The 1.7, the sprayhead and the drip

emitter essentially put out the same water. Just there sprayhead is putting out at a much larger area. Once again, one type does not fit all applications.

Some of the conclusions. The controls, weather-based, are not a silver bullet, but they are central to what we want to do with water conservation. The controllers should yield 25 percent savings without many worries.

Irrigation technology is constantly improving. I know of a couple things that have been working and they're coming on the market soon. One is a new sprayhead. And if we say that we can't use sprayheads, that we have to use low-flow or drip or the rotating heads would probably fit into those categories, sprayheads certainly wouldn't.

There's a product coming out that stands to be fairly revolutionary that we won't be able to use. And I don't think that's the direction we should be going. We should be encouraging research and innovation rather than saying we've already gotten as far as we're going to go and we want to keep these heads good, those heads aren't good.

Component selection should be left to the landscape and irrigation experts. That's landscape irrigation contractors, landscape architects, irrigation consultants. Anybody who is a professional in this field. The components should be left to our selection.

We should eliminate the ones that are pure water wasters, but we should leave the component selection to the ones who use these products.

The emission devices should not be legislated. I put that in there because I've seen some proposals. And I feel really strongly that it seems that sprayheads are out of favor at the moment.

Well, if you're trying to use MP rotators, they have limitations. Their limitation is small areas. You need to stay with sprayheads if it's turf.

The sizes of turf I'm all in favor of. I think that's good design. But if you have smaller areas of turf, you know, in old developments that aren't going to tear the turf out, your best solution often is sprayheads with the inserts that they have come up with recently

that will water four feet or five feet.

And SWAT should be your first reference for recommendations on the products that they do test. There are some they haven't gone into. I saw that David today said they have plans for it, but they're not there yet. So the ones that they are testing, I think that's what we should look at first when we're selecting equipment. But if it's not on that list, I would have a hard time referring it or selling it to a customer.

And the human factor. I've said this before, I'm a landscape contractor and I will admit right off the top that we have done a terrible job in training our crews. For the most part, the reactions to all this they don't get, they don't want to get. They're safe in where they are.

There is also the sort of overriding problem is, and this happens -- well, it happens in any situation, but a lot of times it's more exacerbated in large HOAs. If the grass isn't green you're gone.

And so if they think they're taking any sort of chance with new technology and the grass is not going to be green. And probably programmed

it won't be. There'll be spots that you're going to have to fix. There's a chance that they think they're going to lose their job, they're going to lose a big contract or they're going to lose a house.

So there is a built-in problem that we need to deal with, and that's educating the owner on all this. That long term you're going to make money. You are doing better for the environment, you're doing better for everybody. So is the company you're dealing with because they're trying to be progressive. Give them a little bit of time to get everything worked out on the side. But the human factor is really a problem.

Now, if I have a couple of minutes there's a few comments that came up while I was sitting there I'd like to just briefly talk about.

It was mentioned with the Hunter demonstration, I believe you asked the question about leaving MP rotators where they are, just swapping heads. And I don't think that's the best way to use them. MP rotators have great flexibility. It's very common that we relocated heads all over a site. Because you can go from 8 to 33 feet with an MP rotator. And you can match

those. That's considered matched precipitation.

And when you have turf that's winding and narrow and wide, one valve you can do it all. If you just match what the existing head location is, you're probably going to be missing a big chance to really improve the uniformity.

Also you're assuming that they were in the right place to begin with. Typically they're not. If it's older sites, the old way to do it was dig everything, get a bunch of risers in your hand and throw them out. That's how it all used to happen.

Now everything's done with a tape or a measuring wheel. And so we relocated just to get things in the proper spots. And we find that we get much better uniformity which means fewer heads, which means less water applied.

I talked about check valves. Talked about studies and actual water saving numbers. One of the city programs that I was in was the Newport Beach free program, where they gave the controllers away. And we installed, over the course of a year and a half, probably 900 to 1000 controllers. And mostly very wealthy homes. They could afford the cost, they got it for free.

The whole problem was the runoff at the bottom of this gully that went to the beach that was a protected state beach. And it's a stream that's supposed to be dry most of the year, and because of the development happened around it and all the runoff from landscape they had a constant stream flowing in the bottom of this gully.

Well, we came in and we did that, and they really tracked it. They had sensors all over the place. And I will get the savings. I will get that to you. I know who to call and get the numbers.

It was drastic. It's millions of gallons a month that are saved because that stream hasn't dried up, but it has significantly reduced. And the beach pollution is very much improved.

There was mention made of a study about the efficacy of ET controllers, weather-based controllers down at Modoc. And referenced in the Kennedy-Jenks report.

I did want to mention that they found errors in that report and it's been pulled from the website. Some people have been relying on it, but the head of conservation at Modoc, I spoke with him a couple days ago. He was very upset

that people had printed that, because they had pulled it. And they are -- it had bad weather data for one of the zones, the coastal zone. And it showed a real increase in water use.

I asked him, I said, when you rework this do you expect to have significant differences. And he goes, yes, I do. I really think these things really skewed it.

So we're asking that nobody depends on that until it gets back on the website which we hope then will show the true figures.

Okay. There was a comment about certified contractors. And I would encourage everybody, that's who you need to use. IA, CLCA has a certification program. IA has several certification programs. It's not a guarantee that you're going to get the best person to do your work, but it certainly goes a long way towards that.

It does guarantee that you're working with somebody who really cares about what they're doing. They're willing to put in the time and the expense on their own time to go through the certification. The tests are not easy. There's continuing education requirements that you have to

maintain. You have to be involved with what's coming down the road as far as new equipment. You have to know this stuff if you want to maintain your certifications.

So, I would suggest that anybody hire or take advice, they should be a member of either one of those two associations. And they should be certified by them.

And with that, do I have any questions?

MR. STRAIT: You answered them all.

MS. WHITE: Yes. All right, so we have with us Chris Brown and Marshal Prillwitz from the California Urban Water Conservation Council. And they will be making their presentation now.

MS. PRILLWITZ: Did everybody get one of these? I put them out --

MR. BROWN: Good afternoon. My name is Chris Brown; I'm the Executive Director of the California Urban Water Conservation Council. I got my masters degree watching grass grow, I like to say. So I'm somewhat familiar with the topic of today's presentation.

What we're going to cover is some basic principles that we think need to be considered in moving forward with standards. But we're also

going to share with you some of the work of the Council in setting standards for utility conservation practices. And some of the research on technology that we've done and which we published in the near future, one of which is the study that a number of people have referred to today.

And I will start off the presentation with some of the background principles and concerns that we have about the effort that you are embarking on. And then I'll turn it over to Marsha Prillwitz who actually managed the task force process that's called out in the legislation, and who is the landscape expert at the Council in terms of the BMPs and the research that we've been doing.

The Council is made up of over 400 members, many of whom are sitting here today including service providers, manufacturers, and academic institutions, but our two principal groups are about three dozen of state environmental organizations, and more than 230 water utilities throughout the state that implement the best practices that are mentioned in California Water Code.

You've already seen these topics before, so I'm not going to go into them in detail. We'll have a couple of remarks about each one of them. But it's good to see that generally you've heard over and over again that the equipment alone is not going to get the water savings. We have to look at the full system and how it's operated. The context has to be understood in order to achieve the water savings.

One of the aspects is design. In order for irrigation efficiency to be obtained we need to look at hydrozones, the plant materials that's in them, the irrigation system design, as well as those two. We also need to look at nonirrigated areas, pervious or cover in which water can percolate into the soil versus impervious or hardscape where the water runs off and down into the gutter.

And finally, we need to look at buffer areas or swales on the edge of landscapes that can either keep irrigation from running off into the hardscape, or it can direct water back into the irrigated landscape, taking advantage of extra water when we get it.

We also need to look at installation

issues. When irrigation contractors go out, they oftentimes follow the design until they run into tree roots, boulders, things on the ground that, in fact, the designer couldn't contemplate or didn't know about.

There's the need to make sure that you have matched precipitation rates among the emitters or irrigation heads; that the proper valves are used, including check valves, which you've heard about today.

The location of sensors is also critical. If you put a rain sensor underneath a tree or the eave of a building you're not going to know when it's raining, that sensor's not going to be able to detect the rainfall.

Likewise soil moisture sensors placed in the wrong place will not provide the kind of benefit that you're looking for. Bob just mentioned the importance of having one in a wet area, the irrigated area, in order to prevent irrigation in that zone. Whereas you may want to have other sensors in different zones that indicate when it's time to irrigate the drier parts.

In both of these cases, design and

installation, it's really important to have certification or licensed processes so that the people who hire professionals know that they're getting a high-quality service in addition to the equipment that they need.

Finally, there's operations. If you don't actually turn this on -- it's not like a toilet where if you've installed it you know it's facing the right direction, and that basically the technology is secure.

If you don't actually turn this thing on it may be misaligned, it may throw water in the wrong direction. It may actually not throw water the proper distance, either. I could be throwing too far or too short. So they actually have to turn them on and operate the systems. Field studies and field operation actually verifying your system are critical for performance.

As is, and you've heard this today, maintenance. If you don't go out there and look at the system over time, and check in on it, you are not going to know whether you're getting those water savings.

We saw earlier a slide of the squish test. You can only do a squish test if you're out

in the landscape and checking on the maintenance and operation of that system. You cannot do it just by looking at the controller or the technical side of the irrigation system.

So with all of those caveats on what an efficient landscape program would be, I'm going to get to the concerns that we think you should consider as you go forward with irrigation equipment standards.

And one little personal crusade -- I've been told that this is my new crusade by other people -- is we need to put the O back in ETO. You've heard several times today of ET controllers. They're actually referenced evapotranspiration controllers, and some of the presentations did refer to those terms.

ET, or evapotranspiration, is the actual transmission of water from the soil into the atmosphere. These controllers like this one here are not capable of measuring that. The closest thing we have to that right now is a soil moisture sensor, which can actually tell the controller when that soil is moist, when it's dry.

If it's just taking weather data, it's estimating how much water the plants are using.

And that's a really important consideration in terms of future water savings. And really should be taken into account as you move forward with setting up equipment standards and regulations.

It's important also to capture some of the genius of the quote-unquote "dumb" controller that you've heard about today, which is irrigation scheduling.

Irrigation scheduling is important for plant water demand because the less frequent that many of these plants get water, including turf grass, the deeper the roots grow and the healthier the plants are.

So, in fact, what we've heard repeatedly referred to as dumb controllers here, have a very smart system for helping you get a healthier landscape. And that needs to be captured in your standards. That it may be a weather-based irrigation controller, or have the proper soil and rain sensors.

But it also has to have a scheduling function in the irrigation controller that allows a utility, especially during a water shortage, to cut back on the times in which people actually run those systems.

This is critical as we enter our third year of drought here in California, that we not hamper water utilities' ability to manage the overall water budget of a community. And that includes both scheduling, and it also includes the ability to ratchet back the percentage of water that's replaced with each irrigation cycle.

Allocation systems, which are used by a number of California cities, require people to actually reduce the total water budget on a monthly basis. The controllers that we license or approve in California need to be able to handle both of these restrictions, either by schedule or by percentage of application rate.

Finally, with regard to sensors, I totally agree with Commissioner Levin's comment earlier, we need some sort of warranty. One of the problems historically with soil moisture sensors has been that they actually quit functioning after a short period of time.

They interact chemically with the soils in certain cases, not all, but in certain cases. And actually the sensor no longer operates. And the user is not going to know this.

We've already heard a number of people

testify to the fact that the end user treats this like a black box, and they're not going to know that their soil moisture sensor is not working anymore because they don't go out and do a squish test. So it's really important that we get warranties on soil moisture sensors.

Check valves have been mentioned. Pressure regulation has been mentioned today. Absolutely critical. Either at the head, or even in front of the entire irrigation system. Not just these MP rotators, but drip systems and all irrigation equipment has certain optimal ranges for pressure. And if heads are run, spray nozzle heads are run at too high a pressure, eventually that nozzle will be forced and damaged into a full-open position.

So any landscape in which you are trying to manage the water use by using a shorter range will be impossible, because high pressure has basically destroyed the ability of the nozzle to be adjusted over time.

And finally I would like to say about all of these things, one aspect of regulations and standards that you need to consider is package labeling. The consideration that as we get with

many of the things that we buy off the shelf, a clear indication that this will not operate as it's advertised unless you also take into account the design, installation, operations and maintenance of the system as a whole. So that customers don't believe that they've bought a magic tool that will deliver water efficiency to them without their proper use of that.

And with that I'll turn it over to Marsha.

MS. PRILLWITZ: And we still have quite a good crowd here, thank you all for sticking around.

Yes, I'm Marsha Prillwitz and I'm working with the California Urban Water Conservation Council on various landscape projects.

Last year the Council had a huge project where they went through and revised the memorandum of understanding and the best management practices that all of the signatories to the Council have agreed to implement.

And one of those BMPs is the landscape best management practice. The standard landscape BMP requires that 90 percent of the dedicated CII,

commercial, industrial and institutional, landscape meters receive -- they're assigned a water budget, and that they're provided some technical assistance in terms of helping their customers follow the water budgets.

So 15 percent of mixed and unmetered CII connections, according to the BMP, would be offered technical assistance and offered also a water survey, a landscape water survey.

This is standard language from the existing BMP. And it's been modified slightly in terms of bringing it up to date. But the new feature is the extensive flex menu that agencies can implement rather than going through the standard approach.

This allows some flexibility to agencies in terms of looking at different ways that they can put together a package of program landscape activities that would result in the 15 to 20 percent savings that they would have anticipated getting from the standard language best management practice.

So, there are five basic parts to the flex menu approach. And the first one is monitoring and reporting on landscape water use.

That is doing a landscape water budget that was mentioned previously and use reports. And also some agencies would prefer to go with an agency-wide water budget. They can say our customers have so many acres of irrigated landscape; and overall in our agency we are within the water budget for this particular item.

The second flex item it technical landscape resources and training, where agencies can document the design of the systems that they've provided in terms of irrigation design, as well as landscape design.

They can perform landscape and irrigation audits. They can present landscape workshops with others and do training and presentations. And document the water savings that are accomplished through these different methods.

They can pick and choose any of these different flex time items -- I keep saying flex time -- flex items from the listing. The next set is provide incentives. Some water agencies have very good budget based rate structures and they say they're accomplishing this through the pricing signals that they give their customers. And so

they're achieving the landscape water conservation goal by having these budget-based rate structures in place.

Conversions to dedicated landscape meters. They can document the savings they associate with these kinds of change.

Irrigation system upgrades. Anything from the controller to the check valves can be counted toward the flex items.

And converting to alternative sources of water, from recycled water to grey water, rainwater and cisterns are some other options.

There are a couple other ways listed in the flex items list, and one is local and regional collaboration with the city and county planning agencies in terms of adopting ordinances based upon the model ordinance approach.

There's a holistic approach where an agency can say we've done this whole collection of landscape water conservation measures, and this whole program results in the 15 to 20 percent water savings we would have achieved through the standard process.

And then there's the catch-all, other measures. Indeed, we expect a lot of innovation

over the next ten years or however far into the future. And if these innovative new products come along that agencies think they can achieve these water savings from, yes, that's another thing that agencies can do to meet their requirements for the best management practices.

In terms of this new approach that's just been passed, and the Council is in the process of putting together some different guidebooks to help the agencies implement the program -- I think I went a little too far here.

So, included in the guidebook will be examples of how different agencies have implemented different landscape programs; useful research and case studies upon which they can estimate the water savings that they will achieve by these different flex items. And step by step, how and why to do things.

We understand that education is a continuous process. We have new people coming into the field. We have retired people who need to be reminded of some of these things. And so it's a continuous process. And the Council will be providing a lot of technical assistance and training and workshops to help people in the

implementation of these landscape BMPs.

There are a couple of other projects we've been working on at the Council that have been very exciting. And Lorraine has sat in on a couple of the conference calls we've had on this smart urban landscapes project.

This is a project that was funded by the U.S. Bureau of Reclamation. And in the process what we did was we looked at landscape design guidelines from all different areas of the state that have been established, as well as some federal guidelines. And we came up with the best ideas from all these existing standards to come up with landscape design guidelines.

And then the Council hired a landscape architect firm from the Bay Area to design six residential landscapes templates that incorporated all the ideas from the landscape design guidelines.

And we had an advisory committee who reviewed this information, gave us additional information. Quite a few of the people in this room participated in this process.

So not only do we have landscape designs for a typical sized lot, as well as a zero lot

line property. And I think we're seeing more of these in built-out urban areas where they're really doing this, I guess you might call it smart development type program.

And it has plant selections, typical plant selections for the six different regions in the state. Whoops.

MR. STRAIT: I did not do that. I will turn it back.

MS. PRILLWITZ: I did it?

MS. WHITE: Yes.

MS. PRILLWITZ: Shame on me.

MS. WHITE: That's okay.

MS. PRILLWITZ: Hang with us.

(Pause.)

MS. WHITE: We will be coming back online here in just a moment.

MS. PRILLWITZ: One of the things I could mention -- well, maybe I shouldn't while this is turned off.

MR. STRAIT: Wouldn't be fair to the people online.

MS. PRILLWITZ: Okay. Did I hang up all those people?

MR. STRAIT: Yes. They're still on the

conference call, we just have to --

MS. WHITE: Yeah, we are.

MS. PRILLWITZ: Is it because I'm left-handed, I always use that as my excuse.

(Pause.)

THE OPERATOR: Welcome to the conference calling center. Please have your passcode and conference leader's name available. A coordinator will assist you momentarily.

(Pause.)

THE OPERATOR: Thanks for calling. Your passcode?

MS. WHITE: The passcode is irrigation.

THE OPERATOR: You -- the last name with spelling.

MS. WHITE: Lorraine White. I am the call leader. There is a disconnection.

THE OPERATOR: Okay, I'll join you right back into the callers that are online.

MS. WHITE: Thank you.

THE OPERATOR: You're welcome.

(Pause.)

MS. WHITE: Okay, we're patched back in. And we're back online. Thank you.

MS. PRILLWITZ: Thank you. For those

online, sorry. This is Marsha, and I pushed some button. And I'll try not to push it again.

Yes, oh, okay. So, we have landscape templates for the Bay Area, central valley, Sierra foothills, southern coastal, inland and foothills areas.

So, we're planning to post this material on the Council website by the middle of this month. We'll be having a conference call to see how best we can present the information so that the member agencies can tailor it to their own particular regions. So that'll be up soon.

You've heard quite a bit about this big project that was funded by prop 13 through the Department of Water Resources, the California Water Smart Irrigation Controller project.

And we've got some information. Basically we had the East Bay Municipal Utility District was the northern California lead on this project. And Metropolitan Water District of southern California was the southern California lead. So we had five agencies in northern California and 12 in southern California who participated in this process.

Peter Mayer was our technical person

with AquaCraft. And the Council provided coordinating services for this particular project.

We believe the study complements the efforts that are being taken by the SWAT and the WaterSense group, where they're doing a lot of the testing in terms of functioning according to the specifications, the bench testing of the equipment.

And this particular study is one of several that actually tracks the water savings associated with it. So we see that this information can certainly complement the testing that will be done in these other areas.

Now, we had a report come out last October, a very preliminary report that was given at a meeting in Las Vegas, Nevada. And since then we have conducted a very serious technical review.

We had all of the participating agencies reviewing the document, as well as the independent researchers from Florida, from the U.S. Bureau of Reclamation, as well as Department of Water Resources and UC Davis.

And so we've made some significant changes in terms of the statistical analyses. This report is not out yet. We expect to get the

latest draft by the end of this week. We'll be reviewing it inhouse at the Council, then providing it to the participating agencies for their review.

And upon final regurgitation, we will be -- we will have the agencies sending the report to the Department of Water Resources as the final report. So I imagine it's going to be another month or so before it'll be a publicly released document.

But these are some very preliminary information that I received from our statistician this week. In terms of the number of sites, we had almost 2300 sites. The percentage savings overall was 14.5 percent. And the mean thousand gallons, 137,000 gallons of water through this project.

Northern California with 411 controllers that we tracked, a percentage savings of 4.7. And southern California, 1183 controllers with a mean percentage savings of 16.6 percent.

Now this is different than the numbers that you've heard previously. And what we're asking you to do is bear with us because these are not the final numbers. But we just want to give

you some sense of based upon the technical comments we received and the changes that we've made in terms of interpreting the data, this is where we're looking right now in terms of these results.

This is another interesting table in terms of the individual controllers. Of the ones who have increased 41.8 percent of the controllers in the study actually had an increase in water use, which was pretty surprising to me.

No change, 1.5 percent. And a decrease in water use of 56.7 percent. So we're showing a 14 percent overall water savings, so we could say that those who decrease water were greater, decreased more water than those who increased the water.

But I think that what we see here is that you can't think of it as a slam dunk. Just because you install a controller, a smart controller that's been approved, that's on the list, it doesn't necessarily mean that every controller an agency installs will accomplish these water savings.

I speeded that up so we have time for questions, I hope. I have the contact information

for Chris and myself. And I do encourage you to go to the Council website. We've got lots of information on landscape water conservation, about drought and many other things.

And we look forward to your assistance as we put together the guidebook. We'd like to get several of the presentations from today to include that material in the guidebook that will be coming out.

Warren.

MR. GOROWITZ: Just a quick question, I promise it's a question.

MS. PRILLWITZ: Yes.

MR. HUNGERFORD: Please give us your name.

MR. GOROWITZ: Sure. Warren Gorowitz with Ewing.

Marsha, will this report detail out what percentage of the controllers were installed by the homeowner, consumer, --

MS. PRILLWITZ: Yeah.

MR. GOROWITZ: -- versus what was professionally installed?

MS. PRILLWITZ: Actually, I think I have that information here. And that's changed from

our original report, too, because we had one of the agencies turned in a lot of data after that first report was submitted. And so that was one of the reasons we had these changes.

Let's see, yeah, we'll include that in our comments, Warren.

MR. GOROWITZ: Okay. Thank you.

MS. PRILLWITZ: Oh, here it is. Professional installation 920; self installed 1373 -- 74. That's out of the 2294.

Any other questions? This is going to be a jam-packed report. It's not only going to show water savings, but talk about the different methods of distributing and installing the controllers. So I think we'll learn a lot from it.

MR. HUNGERFORD: I have a couple of questions. First, did you -- report, did it track water use over time so that it could measure potential degradation in the water savings?

MS. PRILLWITZ: Yes. We had at least one year of water data for all of these controllers that were included. And most of the agencies are continuing to collect data for a five-year period, because that's what's required

of prop 13, the DWR funding.

So over time we will be getting a lot more information on potential degradation of the savings. But we have at least one year of data on each of these controllers.

MR. BROWN: Both pre and post.

MS. PRILLWITZ: Pre and post.

MR. HUNGERFORD: Excellent, thanks.

MS. WHITE: Okay. We will be now listening to the local agency perspective. And unfortunately David Langridge from East Bay MUD was not able to join us today. But we do have Carlos Michelon from San Diego County Water Authority and Daniel Muelrath from the City of Santa Rosa is actually on the phone. And so after Carlos is finished with his comments, we will see if Daniel is able to join in and provide some remote comments.

MR. MICHELON: Good afternoon. I'm Carlos Michelon; I'm the landscape conservation project manager at the San Diego County Water Authority. I do not have a PowerPoint presentation. I'm just using my computer to prompt me for some speaking points.

I, first of all, want to thank the

Commission for inviting us to provide some initial comments from the water utility perspective. We are a wholesale utility located in the county of San Diego. We have 24 member agencies who, in turn, serve a population of a little over 3 million people.

I'd like to start out by stating our strong support for this proceeding. You know, the Water Authority, its member agencies and stakeholders throughout our region have long been collaborating on the matter of water efficiency in the landscape sector. And we look forward to being active participants in this process.

For contact, some background on some relevant activities we've been involved in, that we hope to contribute in this dialogue. We've had a stakeholder group over the past couple years that has actively participated in the Department of Water Resources model ordinance process.

So, as that process wraps up we're now focusing our energies in supporting the local jurisdictions in crafting implementable language in the respective ordinances with the aim of achieving regional consistency in San Diego County.

Also, we're participants, alongside with SDG&E in a water energy pilot program that is sponsored by the California Public Utilities Commission. I wanted to highlight that under the several elements that partnership contains.

We have a landscape program titled managed landscape program, and it focuses on using technology and professional services to manage irrigation at large dedicated metered sites.

We aim to achieve projected savings in the order of 20 percent and above for all participating sites. And studies will document that through their M&B process.

In terms of regional programs we offer an array of incentive programs and services like landscape audits to customers throughout the San Diego County region. And many of these elements, you know, across-the-board residential, commercial, and we have several components that focus exclusively on landscape efficiency.

And finally, I'll share a little bit more detailed comments on this front, but we collaborate extensively with industry; and we're members of the Council, we're members of the Alliance for Water Efficiency.

We basically collaborate with industry with the ultimate aim of effecting a market transformation for the landscape sector to insure we introduce more water-efficient technologies and services, and can bring down those price points and reach critical mass to have the consumers embrace what's available to take that step toward water efficiency on a long-term basis.

Now, in that process, particularly engaging with national stakeholder processes, such as EPA's WaterSense, we've come to the conclusion that one size does not fit all. And, again, I'll comment on that in more detail. But that's particularly true of landscapes.

As far as preliminary input on this proceeding, the importance of what you're undertaking today is pretty critical from the water utility vantage point. The state's presently in the grips of a significant drought, which is compounded by ecological problems in the Delta.

The net result to us is that our regional wholesale provider, the Metropolitan Water District, in the very near future may be passing through shortage allocations to its member

agencies. We are one of those member agencies. And this may ultimately mean that retail utilities pass on some type of mandatory restrictions to their customers.

So, it's very clear that these proceedings are very appropriate; they're very necessary. And also very timely in that context. We view them as an integral part of the toolbox to help shore up the state's overall water supply reliability.

Now, some comments specific to the process. In terms of scope, it's abundantly clear that irrigation systems are precisely that, systems that are made up of multiple components. So we think you've appropriately framed the scope of your proceedings to address all of the components in the irrigation system; not limiting it to controllers, valves, emission devices or other appurtenances that, you know, a holistic approach to the system is appropriate.

We would very much like to explore how we can address, through this process, the human element. Quite to the point, how to tighten up performance standards in industry by practitioners interfacing with this technology.

I think it's been a point made very clear that you can have the best systems and the best standards, but that can easily be undermined if it's not managed and installed, managed, maintained in an appropriate fashion.

My comment about one size does not fit all is in the context of our efforts to provide EPA with meaningful input with respect to their WaterSense brand. I think on indoor plumbing fixtures making great progress. HETs have this -- high efficiency toilets are an example of something that was very easy to migrate to, and to align our programs with.

But we were very concerned about -- there was a conference last fall in -- that southern Nevada Water Authority sponsored. And we had a stakeholder group through the Alliance providing some input to WaterSense. And those of us from California were trying to sensitize the rest of that national audience that we're under legislative mandate to implement regulations in our state with respect to landscape standards, both the model ordinance and these proceedings.

And our concern is that, you know, we can't come up with necessarily a one size fits all

for a country as great and diverse as ours. And that we advocate regionally appropriate standards. And we wanted just to afford both EPA and all the California stakeholders the opportunity to align those so that, you know, the danger we run if we don't look out for that, is that we could, you know, EPA could very well introduce a WaterSense brand or branded services and products into our marketplace, and some of them might not comply with the new regulations that we're dealing with today.

So, we're doing our best to try to give good input. And I was very pleased to see they were part of this kickoff meeting.

Now, in terms of -- I want to comment on the resources that the state is dedicating to this process. And I'll make reference to a slide that Kent shared in the context of the model ordinance.

There were two very important resources that come to mind when you calculate a water budget. You have WUCLS, the water use classification of landscape species, which is kind of an index of the demand for water from different plant species.

And they have the SINIS system, which is

really the principal source of ET data. And those are examples of state resources that help support a regulatory framework. And it's critical to continue to invest and more fully develop those types of resources.

And I just want to cross over now to your process and suggest that a similar type of dedication of resources, perhaps more aligned on the educational front to help the consumers ultimately get good information on irrigation standards would be very appropriate.

And perhaps we can explore recommendations that mimic what you do on the energy efficiency front in terms of suggesting to the Legislature some type of tax break or incentive that would be very welcome under these financial circumstances to really boost this sector, create an incentive for all of the existing installation-based to upgrade to these emerging standards.

So, we're very optimistic that we can explore through your process some of these avenues.

In terms of technologies, we'll share with you that through our programs we have an

avenue to potentially collaborate to promote these new standards as they emerge.

But I wanted to step back and kind of underscore some very significant characteristics or performance metrics for the irrigation system that I think we need to really address squarely. And I think the Hunter presentation alluded to this. Pressure regulation systemwide and at the point of emission are very important. I think that, alone, from a system design standpoint is one of the single most significant avenues that we need to make real progress.

And we support the concept of built-in check valves. And I don't have a presentation. You're welcome to turn up the lights. I feel like I'm in a cave.

Built-in check valves, addressing the low head drainage issue. Overall an emphasis on low volume irrigation systems, drip, microspray. That is, I think, an assurance to the water utilities. Controlling the rate of application is a very important concept.

We have a lot of good technology, if you will, that has a potential to save water out there. But when you look at the pressure these

systems are operating on, and the application devices, if we control it I think we'll kind of have the ability to hardwire some control on the volume and bring down usage to more reasonable levels.

We had good experience implementing the rotary nozzles. I agree with the comment that we need to leave the door open to consider new technologies that are emerging from other manufacturers. But that has demonstrated to be an easily -- a relatively easily implementable solution, to swap out some nozzles and improve DU and capture the savings by recalibrating that clock.

Then smart controllers, we were participants in the studies that were previously cited in southern California. We do a brisk business supporting the installation of smart controllers throughout our county. It's something we hope to continue supporting, albeit in a more modest fashion.

Because the realities of the drought are as real as the realities of our fiscal situation. So we're doing our level best to continue to support ongoing programs. So we'd welcome

collaboration with the state on this front if incentives in the future would be available. We have the infrastructure to continue making those available to the public.

But in terms of smart controllers, I think Marsha said it best, that, you know, the study and the whole SWAT process, they're both great sources of information. We don't want to pit one against the other. They're complementary.

I think the best way to represent to the Commission what I think our constituency is asking for, I'll relay a comment that I received from a colleague. It's kind of a consumer reports version of, you know, how does this technology perform.

And it has to include some real market-based data on customer satisfaction, as much as it has to include strong science on performance.

So we hope to build on the SWAT platform and refine that approach. But also begin to incorporate the lessons learned from the statewide Prop 13 study, as well as any other local implementation efforts.

But to be sure, it's not a silver bullet. It's not a walk-away solution. And a

great deal of education needs to be put in place not only to the consumer, but to the trades, to appropriately support that technology.

And that concludes my comments for today. If there are any questions.

Hearing none, thank you very much for your attention.

MS. WHITE: No questions, David? Okay.

Peter, could you ask the operator to bring Daniel online.

MR. MUELRATH: Lorraine?

MS. WHITE: Yes. Daniel?

MR. MUELRATH: Yes.

MS. WHITE: Okay, could you please just introduce yourself, give us your title, for the record. And then you can start --

MR. MUELRATH: Okay. This is Dan Muelrath, Santa Rosa Water Conservation Coordinator. And sorry I have to leave early, but that's (inaudible) but now we're on the road.

Overview as part of the Assembly Bill 2717 that all the AB-1881 that Marsha was just talking about -- on that, as well.

We're also (inaudible) since 1992, that you just heard Kent a little bit ago talking about

the update to it. We're a city that's had it on the books (inaudible) inspections for it. But our city adopted it and are doing it (inaudible), regulations and labeling requirements, as well.

And also we have an extensive irrigation -- program, with our contractors going out and doing training sessions -- equipment. They call us back for doing these upgrades. Do a lot of training with architects, contractors and homeowners (inaudible) looking at water savings from this perspective, you really have three different ways to do it.

You can, you know, change behaviors, which is adjusting the irrigation controllers, adopting a water-conserving mindset to reduce the water demand. So if it's at all (inaudible) reduce demand at their site.

And the third thing is to increase irrigation efficiency. That's one thing that we've really looked at. Trying to, you know, look at all these when we developed our program.

Carlos has said it, a number of people have said it, do not (inaudible) silver bullet (inaudible) put them all together to get a really effective product and requirement out there.

One thing that we would (inaudible) programs that we have, the water sensor to rely on. You know, they're labeling those, aerators and toilets and (inaudible) rebate programs to be able to -- those products and (inaudible) information portion, you got a rebate program and you say you look for the WaterSense logo and you know it's going to qualify.

So, some sort of standards from (inaudible), testing requirements, WaterSense will be able to readily adopt, to recognize so the irrigation equipment can be covered that way with those WaterSense labels.

And (inaudible) we're doing inspections and audits and (inaudible) you need to put in so you have something, specific products, but we can't tell when you look for a label and (inaudible), what the application rate should be for your sprayhead, what kind of pressure you need to operate at.

But if we had some of these labeling requirements all on the product it would help, (inaudible) by taking some of the inferior and inappropriate product off of the marketplace.

We go through this when we do our

training, (inaudible), doing the retrofits with savings between 15 and 30 percent, and that's across the board. That can be, you know, whether it's a smart controller or pressure regulation, (inaudible).

As far as the -- ordinance, we currently (inaudible). And one thing that we still find is that it would still comply with the model ordinance, but still be using inefficient products (inaudible) more appropriate water-conserving choice to put in (inaudible) interpretation on whether that product can be used, standard sprayhead versus rotating nozzle (inaudible) still be an opportunity out there for some of these products, whether it's some sort of rating scale, a logo that applies to these products.

Something like that would help us when we're doing water enforcement part of it, whether it's rebate or -- on the project.

So, I would encourage the Energy Commission that I know right now you're looking at the controllers and the sensors, we'd like if you'd kind of go beyond that (inaudible) not just the controller. Other things should be looked at, the pressure regulation, the application of

precipitation rate, and uniform (inaudible) standard or requirement on those emission devices.

I'm sure you guys have figured out by now that even the smart controllers, they're put on an inefficient system and not on a good foundation they will still over-irrigate. That's one thing that we push with our contractors and our rebate programs. Get the foundation, the uniformity up, get the pressure where it should be, and then put smart controllers on.

And the (inaudible) the training that are out there, and whether it's a requirement that contractors go through these trainings in order to be able to install irrigation systems. There's a lot of talking about the Irrigation Association training.

There's a couple of them that are already out there now that is part of the -- to save water, behavioral, (inaudible). And also increasing efficiency so you want to drive home that point that, you know, it's not just the controller and sensor, it's the whole approach from training all the way through the product specification.

And that concludes my comments.

MS. WHITE: Does anyone have any questions for Daniel?

MR. HUNGERFORD: Does anyone have any questions for him?

MS. WHITE: No.

MR. HUNGERFORD: All right, let's go ahead and close that line.

MS. WHITE: Okay, last but not least, of course, for our prepared presentations, some thoughts from the electric utilities on water efficiency. And today we have Pat Eilert and Amanda Stevens from PG&E, to talk to us about what they see as some of the issues.

MR. EILERT: So, this is working?

MS. WHITE: Yes.

MR. EILERT: Great. So, I'll be brief, it's late. So this presentation is on behalf of, as you can see, the four investor-owned utilities in California. Lance DeLaura, my colleague from San Diego Gas and Electric and SoCalGas is in the audience. And I believe Randell Higa from SoCalEdison is on the phone.

So, as most of you know, the California Public Utilities Commission authorizes the four IOUs to conduct energy efficiency programs. So

our interest in this is mostly in the embedded energy as well as the potential standby savings and controllers and so forth.

Our intent is to develop a codes and standards enhancement study which will have specific recommendations for efficiency standards, as well as supporting research.

We started our work on this and Amanda Stevens is now going to present our initial findings. Thanks.

MS. STEVENS: Thanks. Thanks, everyone, for still hanging around. This is getting to be a late hour.

So as many of you here are acutely aware, there's an intricate link between California's energy and water systems. In particular, about 20 percent of California's electricity comes from hydropower.

On the other hand, the water system in California is extremely energy intensive, as many are very aware. About 20 percent of the state's electricity and about 30 percent of natural gas is used in the water cycle.

This cycle extends from source to conveyance, to treatment, distribution and use in

wastewater treatment. The source of water and its conveyance in particular are potentially one of the most energy intensive steps of this process.

In total, about 8 percent of California's electricity is used in these green boxes here for the pumping and treatment of water.

The California Energy Commission has developed and funded several studies that have begun to more closely quantify this relationship between water and energy. In particular here we show some findings from a report that was completed in 2006.

As you see here, the energy intensity of indoor water is slightly greater than outdoor usage because of its extra step in the wastewater treatment processing.

Another key difference, of course, is between northern and southern California, largely in the water supply and conveyance, because much of the water in southern California must be imported through the State Water Project and from the Colorado River.

So taking a weighted average, we've been thinking about a proxy for outdoor uses being about 8100 kilowatt hours per million gallons of

water used. And, of course, we want to know -- we acknowledge, as many people are aware, that there are considerable variabilities throughout the state in the specific embedded energy use in a gallon of water.

And we expect that there are going to be some new studies that will help inform this relationship, and that can be considered in this proceeding as we move forward. And think about not only the water savings, but also the energy savings.

So the next part of my presentation here I'm going to talk a little bit about outdoor water use and urban water use in particular. California, in total, uses about 43 million acrefeet for both urban and agricultural purposes.

About 20 percent of this goes to the urban use. And that's about 20 percent, or 9 million acrefeet. Of this landscape accounts for a substantial fraction, about one-third or 3 million acrefeet per year.

Automatic sprinklers like the one shown here in this picture offer for end users a much more convenient and practical way to keep their laws and gardens in a health condition. However,

they are a system. And like all systems, there are inefficiencies.

We've heard a lot today from various practitioners, manufacturers, other stakeholders about the inefficiencies of the system. A Pacific Institute report, in particular, in 2003 estimated a substantial fraction of savings, about 25 to 40 percent was available through a variety of approaches. Some of these include better hardware, as well as better education, maintenance, better installation.

So some of these improvements, and I'm not going to take the time to show a lot of these specific things that we show on this PowerPoint here, I'm not going to take the time to go over them because we've heard a lot about the technology today.

But just to say that some of these, you know, there's extent to which the Title 20 regulations can capture some of these savings, is really going to be, in our opinion, the focus of this proceeding.

So with that I'd like to talk about some of the potential standard options we've begun to discuss, and we really look forward to talking

more with stakeholders over the coming months to refine some of the options that we'd like to propose to the Commission to consider.

So the first thing we have been thinking of is requiring all controllers to be self adjusting. In other words, climate or soil moisture based. Along with this, implementing minimum performance levels such as irrigation adequacy, irrigation excess, which are currently defined in the SWAT protocol.

And we've heard from other folks, too, that requiring controllers to come with a rain sensor is often a very effective approach on many grounds.

Finally, incorporating, to the extent that some specific design or performance requirements may be needed into the specification to insure reliability of savings, for example, non -- memory to make sure that the performance settings aren't lost in a power outage. Or potentially some requirements that start to address some of the usability concerns.

To the extent those may be appropriate to include in the standard we'd like to talk more with stakeholders over the coming months.

So, finally, what I have here is a very very preliminary estimate, a ballpark estimate, if you will, to understand the potential energy savings, as well as the water savings that may be associated with irrigation control or standards such as this. Which, based on the variety of different studies, we've assumed something on the order of a 10 to 30 percent reduction after water use.

So in the first year of the standard, which the Commission is required to set a performance standard which would go into effect in 2010, the water savings would be on the order of .02 to .06 million acrefeet per year.

The associated embedded energy savings is about 50 to 160 gigawatt hours. And, again, I just want to stress, these are very conservative, or very preliminary numbers. And there's a lot of analysis that will need to be done. In particular because outdoor water savings, it's a very challenging analytical problem because of the huge variability. So I'm sure these numbers will be subject to much further investigation.

One interesting thing I did want to point out was that embedded energy savings is

actually fairly substantial. As a point of reference, the Energy Commission adopted a standard last year for portable table and desk lamps. And the savings from that on a first-year basis, the first year of sales, were estimated to be about 40 gigawatt hours.

So we're talking about from the embedded energy savings associated with a potential controller requirement such as this, we're talking about a really significant energy savings.

So the additional component I wanted to address on terms of controllers was the direct energy use of these devices. Specifically we'd really like to learn more about the energy use of these.

One of the potentially low-hanging fruits that we've looked at is potentially the power supplies that come with these. Most of them have 120 volt to 24 volt AC transformer. The external power supplies, I have a picture here on the left-hand side. Those would be covered under existing federal regulations for external power supplies.

However, power supplies that are included on the interior of the controller box,

such as the one shown on the right-hand side, would not be regulated. So that would be one potential option for thinking about minimizing the standby loss from these types of controllers.

I realize many in the audience assume that it's probably pretty small, which I think is a fair assumption. We looked around for some data, you know, what is the energy load of these controllers. We found very limited data; in fact, only three datapoints.

And those indicated, and I'll show on my next slide, that those indicated about 24 kilowatt hours per year of energy use from one of these controllers.

And I want to emphasize that all three controllers that we were looking at, I'll show here, these were all what we have been talking about as being more traditional clock controllers.

So, to the extent, if we're not sure, what would the plug load be associated with some of these more sophisticated controllers. It's something we don't know right now, but we'd really like to learn a little bit more about that.

So here, for example, if you take 24 kilowatt hours per year and you estimate there's 4

to 5 million controllers in California, you come up with a total energy consumption per year for all these controllers of about 100 gigawatt hours per year. This isn't huge, but it's also probably too large to ignore. So it's something that we'd like to look into more.

So to the extent that any other stakeholders have data or information, or you know, we'd really welcome those discussions to happen over the coming months.

So finally I'm just going to close with a couple of comments. And these touch on things that we've already discussed. But to the extent that we want to insure the reliability of the water savings that we get through a standard that requires these smart controllers. We should also look at performance requirements for things like the soil moisture sensors, which, of course, have been talked about extensively, as well as potentially rain sensors.

And then finally to address this problem which has often been raised in earlier discussions of low head drainage. We also support the option of requiring the sprinklers to come with an anti-drain check valve to eliminate this lost water.

So, that's all I have. I'll take any questions or -- folks are ready to go home.

MS. WHITE: Okay, so that concludes the prepared statements. And I do have two individuals who wanted to say a couple of things. Were there any others?

We have David McLeroy and then Heath Bedal.

MR. STRAIT: At the moment there are none on the phone lines.

MS. WHITE: Great. So, Dave, wherever you might be.

MR. McLEROY: Right. Can I go on the internet?

MS. WHITE: On the internet?

MR. McLEROY: On the internet here?

(Pause.)

MS. WHITE: Yes. Where do you want to go?

MR. McLEROY: Greenleaf.com.

MS. WHITE: Okay.

MR. McLEROY: What I wanted to show you all is that systems approach and talk a little bit about how hard it is to actually manage water, so that we don't stay focused on just equipment.

The equipment is the end game, there's no question about it. If we don't get the human element out of it, most of the time we're going to have errors and re-work.

Okay, I'm going to show you the results and you can look at it over several years, because we keep data; and data is what our clients hire us to collect.

They invest in this equipment. We just activated a system that a client paid $250,000 for seven years ago, and it hasn't worked. The landscapers have been turning it on and off manually.

This particular site is 3.76 acres of landscape on 14 acres of footprint. They've saved $99,000 over six years. And they did it with a virtual smart controller. So smart controllers work.

We make a smart controller that's web-based, can be deployed anytime with thousands of people. But -- or thousands of accounts. But this was done. And you'll see the performance tracking against five-year average ET.

And what we do is we set up two budgets. One is a square foot based budget, so they have to

track against that. This shows how the landscaper did it. He blew the budget in September. The client knew it. And our clients are all for-profit businesses. And what they say is we want to pay for performance with our landscaper.

Everyone gets smart overnight when their money's involved. I think we're going to wrestle with this problem for a long time, until we tell the stakeholders who actually manage the water, here's what we're going to give you, here's our budget, now you manage it.

So these guys are over $5800 in six years against a scientific budget. But they're saving 24,000 on average per year based on what they used to spend.

The process to get to that is pretty time consuming, and we charge thousands of dollars to set this up. The return is 400 percent on average in the first year.

But first you have to go out and you have to measure the site and find out how much landscape you have; calculate the budget. After you've calculated the budget, you have to go out and you have to map the site.

This is typically what we get, is a

colored map. And that'll work. But most of our clients want something that's really well defined. Because after you've mapped the site, you have to go out and collect all the valve characteristics.

And this is what I think you all should be putting in regulation, is that somebody becomes the repository of this data. Because I can tell you, every job we go into the maps are not correct; they don't have the data. Even the ones with smart controllers.

We just audited a site that had $60,000 of smart controllers installed. They saved $2000 in the first year. And the reason that's all they saved was because the landscaper had been doing a great job before.

But every site, especially commercials, have a lot of data. That data and that map are more important than the equipment. Because the equipment won't work if you don't have the data.

So I just showed you a few of the steps. You've got to collect the meters, you got to locate them on a map, you have to define them as dedicated meters or mixed use. When they're mixed use, you have to calculate the winter use so you can subtract that out. And it goes on and on and

on.

It is a systems thing. You got to look at it as a holistic problem. And that's what I wanted to come up before all of you and introduce as a new way of thinking about this. It's not just equipment.

The behavior out there is motivated by money, and not by doing the green thing. Because the green thing is -- it's just too hard to do the green thing in the landscape.

And that concludes my comments.

MS. WHITE: Thank you, David. So now we have Heath, if you would, please. Did you want to stand at the podium there or here? Okay.

MR. BEDAL: I don't have a presentation to give you at all, but I'll try to keep it as brief as possible because I know everyone's wanting to head home, beat out the traffic.

MS. WHITE: Well, they just come back for a whole other presentation. I think they're here for the --

PRESIDING MEMBER ROSENFELD: Hey, man, I'm ready to go.

(Laughter.)

MR. BEDAL: My name is Heath Bedal and

I'm the President of the California Landscape Contractors Association. And we are a group of almost 3000 C-27 licensed landscape contractors in the state of California.

We are also -- our Association also includes distributors and manufacturers, many of them that you guys were witness to today.

But first off I want to thank you for the hard work that you guys are about to put in. I know it's not going to be easy. I don't envy you in any way.

But I do want to make sure that in this process you realize that it's not the same as rating a toilet or washing machine, which have a fixed amount of water. The toilet, you flush, you know that you're going to spend a certain amount of water. For someone to really waste a lot of water they're going to have to flush it a lot of times within an hour to get something out it.

But on an irrigation system, again we've already talked about it. You're looking at components but it's a complete system. And many of the components that you're seeing here today out on the table are what we would really consider retail components. There's some of them out there

that are professional, as we would put it. But these are definitely the ones that I'm sure you see when you walk into a wholesaler -- or not a wholesaler, but a box store of some type.

So, it gives you the impression that possibly we are not ready for something that you are putting together. I would like to say that, you know, we're far beyond that, from what you can see as representation from here.

We are, as a green industry, far beyond this. And I would say really ready to step up and help you out with this entire process.

And, as Ms. Levin had asked earlier, she had brought up about the real world situations and use, our Association has that; 3000 contractors from Eureka down to San Diego. We definitely know how things go in, why they go in certain places, what they actually get used for.

So with that in mind, I would like to extend our help and my help in any way possible to give you those resources, many of which we've already created programs that will help you out with this. But, I want to extend to you that we have unbiased and also non-anecdotal research already in process, already developed, that we can

help you with, based on monthly meter readings and also on a budget-based system.

So these are not numbers that we've collected throughout the internet. These are real-world, in-California numbers that we can help you out with throughout the state.

So, again, I just want to extend my and the California Landscape Contractor Association help in this process. Thank you.

MS. WHITE: Do you have any questions?

PRESIDING MEMBER ROSENFELD: Lorraine, I'm going to ask you, he says they have lots of real data. Have you accessed any of this data?

MS. WHITE: We will be accessing it quite a bit more so than we've been able to do to date. And we have been made aware of new sources of data today that previously we were unaware of.

And so those are all going to be actively pursued to bring into our record and summarized as part of the proceeding.

We also look forward to taking some of these studies and datapoints and discussing them further in the technical workshops.

So I'm encouraging people to file them as soon as they can, with their comments on the

8th. So we have had some studies recently provided to us in, I think, two emails so far on some of these case studies. And they're just recent. They came over in the last two days.

So, we're looking for several more.

PRESIDING MEMBER ROSENFELD: Good.

MR. HUNGERFORD: I'd like to reiterate that your participation in this proceeding is how we craft our standards. The information you provide us goes together with all the information that we've developed on our own and found in other sources, to come up with the final regulations.

And the way to do that is to access our website, get yourself on the service list for this proceeding. And to file comments and to file information in the docket so that we can consider that information.

And we look forward to your continuing participation here.

MS. WHITE: Any further comments, Commissioners?

PRESIDING MEMBER ROSENFELD: I can only comment I'm sorry that we went to a turbulent meeting which lasted a lot longer than 45 minutes. So, in addition to thanking Lorraine and the

staff, I want to thank David for running the afternoon show.

MR. HUNGERFORD: It's complicated.

PRESIDING MEMBER ROSENFELD: Commissioner Levin, do you have any --

MS. WHITE: I do want to remind people that we have transcribed this. We should have the written transcript in about 10 to 14 days. In the interim, because this was webcast, we actually have the audio from the discussions, and then all the presentations will be on the web.

So, for those that would like to reflect on what we discussed here today, I know I will be going back over some materials, it is all available on the website.

PRESIDING MEMBER ROSENFELD: I guess that's it.

MS. WHITE: Yes, sir. Thank you. Thank you all for attending.

PRESIDING MEMBER ROSENFELD: Thank you. We're adjourned.

(Whereupon, at 4:28 p.m. the Committee workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Committee Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 9th day of April, 2009.