PUBLIC COMMENT SUBMISSION ON EPA WATERSENSE DRAFT WEATHER-BASED IRRIGATION CONTROLLER SPECIFICATION AND SUPPORTING DOCUMENTS

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Date of Comment Submission: January 18, 2010

Topic:
Appropriateness of Labeling Weather-Based Irrigation Controllers at this Time

Comment:
The Alliance for Water Efficiency supports labeling of weather-based irrigation controllers.

Rationale:
Although the water savings measured in the large California field study were not as large as we wish and expect, AWE views weather-based irrigation control as an important technological improvement. The California study also showed conclusively that weather-based controllers can push irrigators towards a defined but adaptable irrigation target. That study also found the controllers were successful in a wide variety of climate zones and installation conditions. AWE is optimistic that as this technology matures and both professionals and consumers become more familiar with it, water savings will improve.

Suggested Change (or Language):
N/A

Topic:
Use of the Term “Controllers” Throughout the Specification

Comment:
While the specification permits the use of add-ons, the text often times refers to the "controller" rather than "irrigation control system" which might be more appropriately inclusive. By applying this specification to an irrigation control system, the specification would include manuals, software, and any add-on devices that have been performance tested for use with any given controller.

Rationale:
As currently written much of Section 4.0 would be redundant (capability) for an add-on device connected to a controller.

Suggested Change (or Language):
Include a definition of “irrigation controller” that includes the controller *per se* and its manual, software, and any add-on devices connected to the unit. The definition should exclude soil moisture sensors.

Topic:
Reference to *Smart Water Application Technologies* (SWAT) *Test Protocol* Throughout the Specification

Comment:
The specification will be more resilient if the date reference to the SWAT protocol was removed and replaced by "most current" SWAT protocol.

Rationale:
This change allows the specification to evolve without having to reopen the specification for revision.

Suggested Change (or Language):
See above Comment.

Topic:
Section 1.0 Scope and Objective: Number of Stations Specified

Comment:
The number of stations should be changed from a maximum of 16 to a maximum expanded capacity of 48 stations.

Rationale:
A smaller limit to number of active stations appears overly restrictive. There are currently SWAT testing results for several models of controllers that manufacturers have allowed to be posted on the IA website that are expandable up to 48 stations. These models meet the SWAT definition of residential and light commercial or they would not have been allowed to be tested. Furthermore, such controllers are most likely to be used in mid-sized multi-family or office campus settings that can be described as light commercial facilities. As written, the specification would probably include many of the models currently posted if it were sold with no more than 16 active stations, and exclude the same model if it was initially sold with more than 16 active stations. After purchase the consumer may choose to expand capability to more than 16 stations. Does this mean when the consumer activates additional zones the controller should no longer be eligible for WaterSense label it carried when initially purchased or no longer rated as a light commercial controller according to the EPA? More importantly, does expanding to the maximum allowable number of stations change the water conservation potential for zones that the customer wishes to irrigate? We believe the answer to both of these questions is no.

Suggested Change (or Language):
See above Comment.

Topic:
Section 1.0 Scope and Objective: Description of the Controller Products Eligible for WaterSense Label According to the Specification

Comment:
The specification title indicates that it is for weather-based irrigation controllers. Unfortunately the introductory text of section 1.0 narrows the scope to include only devices that utilize ET. Removing all language regarding ET_o from the first paragraph and including an additional bullet point that lists "Controllers that utilize climatological sensor(s)" would widen the scope. If this bullet point is added it may be advisable to clarify that climatological sensors as used here do not include soil moisture sensors (probably best done in definitions).

Rationale:
While ET is and should be the benchmark that devices are tested against for this specification, it was not our understanding that the specification should stifle innovation by forcing the products to use ET as the basis for scheduling.

Suggested Change (or Language):
See above Comment.

Topic:
Section 2.0 Summary of Criteria

Comment:
The draft specification fails to include any criteria for energy efficiency. Energy performance data should be collected and energy performance criteria considered in any subsequent revision to the specification.

Rationale:
As the Alliance for Water Efficiency and many of its member organizations have noted for several years, it is important for many stakeholders that EPA's labeling programs consider both energy efficiency and water efficiency when developing labeling criteria for products that use both energy and water. As a result, water efficiency criteria have been successfully incorporated into Energy Star labeling criteria for residential dishwashers, clothes washers, commercial dishwashers, and commercial ice machines, and significant water savings will result. Conversely, WaterSense criteria for lavatory faucets and showerheads will have clear energy-saving benefits, but without the need for separately stated energy performance metrics. However, where WaterSense is taking the lead in developing a labeling specification for a product using both water and energy, and energy efficiency will not be adequately described by the water efficiency performance metrics, it is incumbent on WaterSense – for all the reasons previously discussed in the context of Energy Star – to consider whether energy efficiency can be effectively improved through the incorporation of energy efficiency criteria in the WaterSense specification. This issue was raised at the initial Tampa workshop on the development of the WaterSense irrigation controller specification, but unfortunately was not acted upon by the agency. We recognize that collection and analysis of energy data at this time would lead to considerable delay in the adoption of this version of the controller specification. However, we recommend that EPA incorporate consideration of energy performance metrics in any subsequent revision of the specification.

Suggested Change (or Language):
N/A

Topic:
Section 4.0 Supplementary Feature Requirements

Comment:
Replace the above referenced section with the one below in the following *"Suggested Change (or Language)".*

Rationale:
Section 4.0 as written is very prescriptive. The features as written often force a method rather than outline performance expectations that can be met by current methods or future innovation. Also as written, language in 4.2 and 4.4 are nearly identical. Our suggested edits are the result of a collaborative work group of controller manufacturers and water purveyors. To the greatest extent possible our goal was to meet the intent of the original language, but to define performance parameters of a high performance controller that can be programmed to meet drought restrictions. We believe this language will invite innovation to meet these performance criteria rather than restrict innovation due to prescribed criteria.

Suggested Change (or Language):
4.0 Minimum Feature Requirements

The controller shall have the following minimum features:

4.1 The controller shall include a storage device or means to preserve the contents of the irrigation program settings when the power source is lost and no backup battery is available.

4.2 Multiple programming capabilities – The controller shall have independent zone specific programming or be capable of storing a minimum of three different programs to allow for separate schedules for zones with differing water needs.

4.3 For areas prone to runoff, the controller shall have the ability to initiate irrigation at least three times for each zone in a 24 hour period.

4.4 The controller shall have a means of indicating to the user when it is not receiving a signal or local sensor input, and the controller is not adjusting irrigation based on current weather conditions.

4.5 Rain shut-off device – The controller shall either include a rain shut-off device or be equipped to interface with a rain shut-off device. The controller shall meet the following requirements.

4.5.1 If the rain shut-off device is not integral to the product, the controller shall provide a dedicated terminal connection to allow a rain shut-off device to be connected during or after the installation of the controller.

4.5.2 The controller will prevent irrigation from occurring when the rain shut-off device is activated by the presence of rain and will continue to prevent irrigation while the rain shut-off device is still wet from rain.

4.5.3 The controller shall have a means for indicating to the user when the rain shut-off device has suspended irrigation.

4.6 Zone level control – The controller shall have the capability to irrigate appropriately for the specific water requirements of each zone. The resulting zone setup can be accomplished by either entering information directly into the controller or by providing appropriate means that allow the user to determine operating parameters such as runtimes which can then be entered into the controller. The following attributes shall be included in the controller setup methodology.

4.6.1 Plant characteristics

4.6.2 Soil characteristics

4.6.3 Slope

4.6.4 Irrigation device characteristics or precipitation rate

4.6.5 Sun exposure

4.7 The controller shall have the ability to accommodate a variety of watering restrictions. It shall have the following capabilities.

4.7.1 Operating on any prescribed day(s)-of-week schedule (for example, Monday-Wednesday-Friday, Tuesday-Thursday-Saturday, any two days, or any single day, etc…).

4.7.2 Even day or odd day scheduling.

4.7.3 The ability to set irrigation runtimes to avoid a prohibited time of day. (for example, irrigation will not occur between 9 AM and 9 PM)

4.7.4 Complete shutoff for total elimination of outdoor irrigation.

4.7.5 Allow for every other week watering on a defined day.

4.8 If the primary source of weather information is not present, the controller will revert to either a proxy of historical weather or a percent adjust (water budget) feature.

4.8.1 The percent adjust (water budget) feature is defined as having the means to increase or decrease the runtimes or application rates for all zones by a prescribed amount by means of one adjustment without modifying the settings for each individual zone.

4.9 Manual operation – The controller shall allow for manual operation and troubleshooting test cycle at the physical location of the controller installation.

Topic:
WaterSense Draft Specification for Weather-Based Irrigation Controllers Supporting Statement Version 1, Section V. Additional Issues for Consideration, Paragraph 3 - Top of Page 8.

Comment:
Replace the above referenced paragraph with the one below in the following *"Suggested Change (or Language)"*.

Rationale:
The original paragraph is technically inaccurate in several ways:

1) Deficit irrigation has a specific technical definition that we believe was not intended in the paragraph. The reference to deficit irrigation was removed. We believe the suggested edits provide more technically accurate language that meets the intent of the original text. As a reference here is a link to the IA glossary:
www.irrigation.org/gov/default.aspx?pg=glossary.htm&id=106#D

   Deficit Irrigation: Irrigation water management alternative where the soil in the plant root zone is not refilled to field capacity in all or part of the field. (NRCS, 1997)

2) ET_o is reference ET for cool season grasses only. The notation of ET_c is used to reference the ET for a variety plants. The "c" is a placeholder for the K_c of each specific plant. The original wording, "…weather-based controllers are designed to deliver a targeted amount of water required by the landscape (usually 100 percent of ET_o)" is not accurate since one of the great water efficiency improvements facilitated by a smart controller is being able to program according to the K_c of several varieties of plant material therefore we suggest changing evapotranspiration notation in this paragraph to ET_c. See page 45 of the pdf link below:
www.kimberly.uidaho.edu/water/asceewri/main.pdf

3) The original text lacked any mention of the importance of irrigation system efficiency in allowing a lower percent of ET_c to apply enough water to sustain plant health throughout the landscape.

4) The original text did not include information regarding tuning the controller for optimal water conservation and landscape health.

5) The original text did not include information on validating retrofit controller weekly runtimes.

Suggested Change (or Language):
Additionally, it is important to acknowledge that weather-based controllers are designed to apply a targeted amount of water based on the landscape plant requirements (usually 100 percent of ET_c) and irrigation system efficiency. Although weather based irrigation controllers provide a great conservation potential, they must be properly installed and configured. A weather-based irrigation controller evaluation in California (Aquacraft 2009), reported many of the sites previously watering under ET_c increased water use after installation. Irrigation professionals with experience in these technologies will be able to address these issues in the field by tuning the controller and the irrigation system for optimum water conservation and landscape health. When replacing a conventional controller in a retrofit project the weather-based controller's weekly runtimes should be compared to the previous weekly runtimes of the conventional controller. If the new weekly runtimes exceed the previous weekly runtimes the weather-based controller settings should be adjusted to apply no more water than the conventional controller it replaced.