

July 7, 2009

To the EPA WaterSense Program:

The Alliance for Water Efficiency welcomes the publication of the revised draft specification for WaterSense New Homes. Across our diverse membership of water utilities, environmental organizations, manufacturers, and installers, Alliance members maintain a strong level of support for the WaterSense Program and a desire to see it expand in a timely and orderly way. The May 8, 2009 revised draft of the WaterSense New Homes specification marks a solid beginning for WaterSense participation in the labeling of whole buildings based upon published criteria of sustainability.

This letter addresses the competing criteria proposed by Energy Star, and transmits an attachment of detailed comments relating specifically to the revised draft specification for WaterSense New Homes. These comments have been prepared by our WaterSense and Water Efficient Products Committee and affirmed by our Board of Directors.

#### Competing Criteria Proposed by Energy Star

The Alliance for Water Efficiency notes that the EPA Energy Star office has proposed revised eligibility criteria for the Energy Star New Homes program. For the first time, criteria intended to improve the efficiency of domestic hot water use are being proposed as mandatory requirements for all Energy Star-qualified new homes. We welcome this development, but note with some consternation that the Energy Star comment period runs concurrently with the comment period for the revised WaterSense New Homes Specification, and that the two proposals differ in key respects.

Regarding the substance of the Energy Star proposals, there are two key elements to address. First, we believe that it is premature to specify a maximum flow rate for showerheads of 2.0 gpm until additional performance metrics are developed to ensure customer satisfaction is maintained while water efficiency is improved. Since WaterSense has issued a notice of intent to prepare a specification for showerheads, and work on such a specification is well underway, the more appropriate course for Energy Star would be to specify installation of a WaterSense-labeled showerhead upon adoption of the WaterSense showerhead specification. Since the proposed Energy Star specification will not take effect until January 1, 2011 in most states, there should be ample time for a fully vetted WaterSense showerhead specification to be adopted and available to meet the needs of the Energy Star program.

A second issue relates to the design of domestic hot water distribution systems. The WaterSense draft specification seeks to achieve energy and water efficiency by limiting the volume of water that may be contained in piping between the hot water source and the furthest fixture using hot water. Any hot water piping configuration may be installed provided the volume limit is met. The Energy Star draft specification, in contrast, specifies three particular hot water piping configurations, although key terms are not defined and volumetric limits are not established. We believe the WaterSense approach to be far preferable. Indeed, without any limit on water volume, pipe length, or maximum wait time for hot water (any of which might be acceptable approaches), we fail to see how the Energy Star specification as proposed can be expected to achieve the very specific hot water energy savings claimed for this provision in the Energy Star Homes savings methodology document.<sup>1</sup>

<sup>1</sup> A 24% reduction in consumption for gas-fired water heaters and a 31% reduction for electric water heaters are claimed. "Overview of Evolving ENERGY STAR Qualified Homes Program & Methodology for Estimating Savings," Exhibit 4, p. 9.



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Regarding the awkward process of concurrent, but inconsistent, draft proposals from the same agency addressing the same subject matter and same stakeholders, we believe that EPA should provide the public with an explanation as to how this happened and what steps will be taken to ensure that it does not happen again. In this immediate instance, in order to maintain fairness to all stakeholders and to avoid the delay of either specification, we recommend that the comments received on these overlapping provisions be consolidated, and that WaterSense and Energy Star jointly prepare responses to all comments received on these issues. Each program should then issue a reconciled set of hot water criteria that are at least consistent, if not identical.

Thank you for the opportunity to submit these comments. If we can be of further assistance and/or provide further information, please contact us at 773-360-5100.

Sincerely,

A handwritten signature in black ink that reads "Carole Baker". The signature is written in a cursive style.

Carole Baker  
Chair, Board of Directors

A handwritten signature in blue ink that reads "Mary Ann Dickinson". The signature is written in a cursive style.

Mary Ann Dickinson  
Executive Director

# PUBLIC COMMENT SUBMISSION ON EPA WATERSENSE REVISED DRAFT WATER-EFFICIENT SINGLE-FAMILY NEW HOME SPECIFICATION

**Commenter Name:** Mary Ann Dickinson, Executive Director

**Commenter Affiliation:** Alliance for Water Efficiency

**Date of Comment Submission:** July 7, 2009

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## COMPETING CRITERIA PROPOSED BY ENERGY STAR

We note that the EPA Energy Star office has proposed revised eligibility criteria for the Energy Star New Homes program. For the first time, criteria intended to improve the efficiency of domestic hot water use are being proposed as mandatory requirements for all Energy Star-qualified new homes. We welcome this development, but note with some consternation that the Energy Star comment period runs concurrently with the comment period for the revised WaterSense New Homes Specification, and that the two proposals differ in key respects.

Regarding the substance of the Energy Star proposals, there are two key elements to address. First, we believe that it is premature to specify a maximum flow rate for showerheads of 2.0 gpm until additional performance metrics are developed to ensure customer satisfaction is maintained while water efficiency is improved. Since WaterSense has issued a notice of intent to prepare a specification for showerheads, and work on such a specification is well underway, the more appropriate course for Energy Star would be to specify installation of a WaterSense-labeled showerhead upon adoption of the WaterSense showerhead specification. Since the proposed Energy Star specification will not take effect until January 1, 2011 in most states, there should be ample time for a fully vetted WaterSense showerhead specification to be adopted and available to meet the needs of the Energy Star program.

A second issue relates to the design of domestic hot water distribution systems. The WaterSense draft specification seeks to achieve energy and water efficiency by limiting the volume of water that may be contained in piping between the hot water source and the furthest fixture using hot water. Any hot water piping configuration may be installed provided the volume limit is met. The Energy Star draft specification, in contrast, specifies three particular hot water piping configurations, although key terms are not defined and volumetric limits are not established. We believe the WaterSense approach to be far preferable. Indeed, without any limit on water volume, pipe length, or maximum wait time for hot water (any of which might be acceptable approaches), we fail to see how the Energy Star specification as proposed can be expected to achieve the very specific hot water energy savings claimed for this provision in the Energy Star Homes savings methodology document.<sup>1</sup>

Regarding the awkward process of concurrent, but inconsistent, draft proposals from the same agency addressing the same subject matter and same stakeholders, we believe that EPA should provide the public with an explanation as to how this happened and what steps will be taken to ensure that it does not happen again. In this immediate instance, in order to maintain fairness to all stakeholders and to avoid the delay of either specification, we recommend that the comments received on these

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overlapping provisions be consolidated, and that WaterSense and Energy Star jointly prepare responses to all comments received on these issues. Each program should then issue a reconciled set of hot water criteria that are at least consistent, if not identical.

## **COMMENTS ON THE WATERSENSE NEW HOMES REVISED DRAFT SPECIFICATION DATED MAY 8, 2009**

Note: Where no comments are made, the Alliance for Water Efficiency supports the provision as proposed.

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**Topic:** 1.0 Scope and Objective

**Comment:** In light of the WaterSense program's intent to encourage community water and wastewater infrastructure savings, storm water management criteria which preserve local groundwater resources, displace the use of potable water, protect source water quality, and reduce wastewater infrastructure costs should also be developed for this and future versions of the New Homes specification.

**Comment:** EPA should be mindful of the need to maintain the integrity of the WaterSense label, not only with regard to conformity with individual criteria, but also with regard to the relationship of new homes to natural water features and riparian environments.

**Rationale:** WaterSense labeled new homes built in flood plains and wetlands have great potential to tarnish the brand. EPA should consider this aspect of brand integrity in both the development of new homes performance criteria and in the evolving relationship with WaterSense partner homebuilders. Maintaining respect for the natural hydrology of home sites is completely consistent with the purpose of WaterSense.

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**Topic:** 1.0 Scope Objective, re: Licensing of Installers

**Comment:** The paragraph dealing with applicable national, state, and local regulations should be expanded to specifically state that all plumbing and irrigation installers must meet any applicable state or local licensing requirements.

**Rationale:** Proper installation of plumbing and irrigation systems is as important to the achievement of water efficiency as is the selection of water-efficient components.

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**Topic:** Service Connection Issues. A new Section 3.0 dealing with service connection issues should be inserted before the existing Section 3.0.

**Comment:** A fundamental requirement for achieving and maintaining any water efficiency improvements is missing from the New Homes specification. A water meter should be required, whether the new home is connected to a public water system (including reclaimed or untreated source water conveyed through a distribution system) or is supplied by onsite well water.

**Rationale:** For efficiency programs to be effective, water consumption must be measurable and consumption measurement information must be available to the consumer.

**Comment:** Care must be taken during new home construction that the pipe material selected and the installation practices used for any builder-installed service pipe are appropriate to the soil conditions at the site. Documentation of compliance with relevant guidelines or requirements issued by the water utility regarding service line materials and placement should be maintained by the builder and made available at the time of inspection. Service lines should be pressurized and the connections of all fittings at the meter box and the house foundation should be checked for leakage while such fittings remain exposed.

**Rationale:** Service lines – the pipe and fittings running between the utility’s water main and the foundation of the new home – are common sources of leakage in established utility service areas.

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**Topic:** 3.0 Indoor Water Efficiency Criteria, 3.2 Service Pressure

**Comment:** Language should be clarified to state that a PRV is not required if (a) service pressure at the home is 60 psi or less at the time of inspection, and (b) if the public water supplier provides a statement that service pressure is unlikely to regularly exceed 60 psi at the home on a daily or seasonal basis.

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**Topic:** 3.0 Indoor Water Efficiency Criteria, 3.3 Hot Water Delivery System

**Comment:** We disagree with the lack of any requirement for the insulation of hot water service piping and recommend that all hot water pipes be insulated to at least R-3.

**Rationale:** It is common practice for residents to draw water from hot water fittings without use until the hot water reaches the desired temperature. Such wait times have the effect of wasting energy and water while reducing consumer satisfaction. Insulation of hot water piping reduces the waste of energy, water, and time during the delivery, use, and cool-down phases of a hot water event. During the delivery phase, when the piping runs in unconditioned spaces, in a slab, when it is buried, or when the flow rate is very low (less than 1 gpm), pipe insulation significantly reduces the heat loss.<sup>2</sup>

**Comment:** At the very minimum, we recommend that all buried hot water pipe be insulated to R-3 with closed cell insulation material. Insulation should be warranted to maintain its R value in underground applications in damp soil, or alternatively, underground pipe and insulation must be installed together in a waterproof conduit or channel. While physical inspection of the installation of pipe insulation in a finished home can be problematic, builder-supplied photos should be required to document proper installation, as well as inspection of any exposed hot water pipe segments.

**Rationale:** Hot water service pipe insulation is particularly important when piping is installed in a mass floor or mass wall or is buried. Uninsulated pipe buried in damp conditions has been found to lose heat at 4 to nearly 9 times the rate of uninsulated pipes in room temperature air. Adding insulation to buried pipe in damp conditions reduces heat loss by about 90%.

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<sup>2</sup> Hiller, Carl, “Hot Water Distribution System Piping Heat Loss Factors, Both In Air and Buried – Phase II Test Results,” paper presented to ASHRAE Annual Meeting, Salt Lake City, June 22, 2008.

**Comment:** We agree with the establishment of a hot water *in situ* volume limitation in lieu of specific hot water piping system designs. However, we recommend a maximum volume of 0.5 gallon, which will still allow design flexibility, while reducing waiting time and water waste.

**Rationale:** It is important that hot water pipe storage volume be minimized at the time of construction. In coming years, flow rates for fixture fittings (especially showerheads) are likely to decrease further from today's levels, and unnecessary pipe storage volume will extend waiting times as fixture flow rates are reduced.

**Comment:** The performance test for this criterion in the "Revised Draft Inspection Guidelines for WaterSense Labeled New Homes" is flawed. By requiring a 10-degree rise to be achieved with a flow of no more than 0.6 gallon, a system with the maximum pipe storage volume of 0.6 gallon permitted under the specification will seldom, if ever, pass the inspector's test.

**Suggested Change (or Language):** We recommend several changes to the inspector instructions (in addition to the 0.5 gallon volume limit noted above) to ensure that the test is fairer and more realistic:

- The inspector should verify that the water heater is on and that the thermostat is set at the midpoint of the "hot" setting, i.e., not "vacation", "warm", or similar low heat settings, nor the hottest possible setting. For hot water heaters with thermostat settings in degrees, the setting should not be higher than 135 degrees F.
- The fixture to be tested should be a shower or faucet, rather than a tub spout, to allow the inspector more control and precision in measuring the volume required to achieve the target water temperature.
- The target temperature should be restated as an actual temperature more representative of that desired for hot water, i.e., 105 degrees, rather than simply a 10-degree rise.
- The pre-marked volume limit on the measurement container should be increased to accommodate mixing and unavoidable heat loss as hot water from the source travels through unheated pipes in the test. This allowance will vary somewhat by the flow rate of the fixture fitting being tested. For a showerhead, the maximum volume of the draw should be 1.2 times the maximum pipe volume stated in the specification. Thus, if the maximum pipe storage volume in the specification is 0.5 gallon, the maximum volume drawn in the test to achieve the 105 degree temperature target should be 0.6 gallon. This relationship is based on findings of hot water pipe flow dynamics published by Carl Hiller.<sup>3</sup>

**Comment:** The term "hot water source" should be defined to include appropriately insulated demand-activated hot water recirculating systems.

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**Topic:** 3.0 Indoor Water Efficiency Criteria, 3.6 Showerheads

**Comment:** We support the establishment of a reasonable delineation between an individual shower and a multi-person shower based on floor area. However, all of the showerheads directed to the additional increment of floor area must be operated by controls that are separate from the showerheads directed to the initial increment of floor area.

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<sup>3</sup> Hiller, Carl, "Hot Water Distribution System Piping Time, Water, and Energy Waste – Phase II Test Results," paper presented to ASHRAE Annual Meeting, Salt Lake City, June 22, 2008.

**Comment:** Expressing the showerhead water flow limitations in terms of potable water enables the installation of recirculating showers. The operation of a recirculating shower requires the initial filling of a reservoir for the recirculation pump in addition to the potable water drawn as make-up water during shower operation. To ensure water-efficient design, we recommend that the capacity of any recirculating shower reservoir be limited to not more than 20 gallons.

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**Topic:** 3.0 Indoor Water Efficiency Criteria, 3.7 Appliances, 3.7.1 Dishwashers

**Comment:** Support, with the addition of a water factor of less than or equal to 5.0 gallons per cycle, which is included in the Energy Star specification for dishwashers effective July 1, 2011.

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**Topic:** 3.0 Indoor Water Efficiency Criteria, 3.8 Other Equipment

**Comment:** Humidifiers are missing from the list of other equipment. Any whole-house humidifier should not be of the high-consumption flow-through variety. Other commercially available technologies, including low-consumption flow-through units ( $\leq 5$  liters/day) make the use of a high-consumption flow-through humidifier unnecessary.

**Comment:** Bathtubs are also missing from the specification, and should be inserted after paragraph 3.6. Bathtubs and shower/spa tubs should not exceed 75 gallons capacity, measured at the level of the overflow drain. This interior volume will accommodate a generously proportioned (for example, a tub with exterior dimensions of 6' x 3.5') conventional or jetted bath tub. Larger tubs will require significantly more water even if not filled to capacity.

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**Topic:** 3.0 Indoor Water Efficiency Criteria, 3.8 Other Equipment, 3.8.3 Drinking Water Treatment Systems

**Comment:** Support. However, the efficiency rate is ambiguous, and should be clarified that it relates to the relative recovery and reject streams rather than some other operating characteristic, such as the level of removal of impurities.

**Suggested Change (or Language):** Such systems shall yield at least 85 gallons of treated water for each 100 gallons of water processed.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, Front Yard vs. Entire Yard

**Comment:** We support requiring that a front yard be landscaped to meet the outdoor water-efficiency criteria. However, the definition of "front yard" should be clarified (See comment in Definitions section below), and the criteria for requiring entire yard landscaping should be clarified. Builder-installed irrigation in the front yard should not trigger a requirement for builder-installed landscaping that meets the requirements of the criteria in the remaining portions of the yard. This has the potential to limit builder participation in some markets. References to "entire yard" should be replaced with "remaining portions of the yard", and landscaping conforming to the criteria should be required on lots where the builder is offering the enumerated list of amenities *in any of the remaining portions of the yard*.

**Comment:** For lots where the entire yard is not landscaped, the “landscapable area” of the lot must be limited to the front yard.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, Landscapable Area

**Comment:** “Landscapable area” is a term that is critical to the effectiveness of the WaterSense outdoor efficiency criteria. Unfortunately, the definition as proposed is deeply flawed. See the discussion below under “Definitions”.

**Comment:** All builder-installed landscape should conform to the outdoor water-efficiency criteria. We question the need or desirability to exclude lots with landscapable areas of less than 1000 square feet from all landscape criteria.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, 4.1.1 Landscape Design, 4.1.1.1 Option 1

**Comment:** The value of Option 1 is to provide a computationally simple method for ensuring that newly installed landscapes are more water efficient than typical offerings. Since the water budget concept is still new and unfamiliar in many parts of the country, we support a simplified compliance track for builders and landscapers in these areas. Option 1 would be stronger and more effective, however, if the percentage limitation were not stated to apply exclusively to turf *per se*, but rather was supplemented over time to include all plant material with high or medium water use requirements. We recommend that EPA work with states, universities, and trade allies to establish and maintain easily accessible lists of the most commonly used landscape vegetation grouped into high, medium, and low water use plants for each of the USDA climate zones.

**Comment:** It is critically important that Option 1 include an absolute cap, as well as a proportionate cap, on the area devoted to high and medium water use plants. We recommend a cap of 40% or 2,000 sq. feet, whichever is less (or 1,000 square feet if only a portion of the landscapable area, i.e., the front yard, is installed by the builder).

**Rationale:** An absolute cap at this level will still allow functional turf areas for active play, entertainment, and similar activities for which turf is desirable, while ensuring that water-demanding plants will not be used on larger lots simply to fill space. Without a cap, however, substantial expanses of high water use plants could be installed without constraint, save for the size of the lot itself. At lot sizes of one-quarter acre and above, Option 1 will allow water consumption in such yards that would nearly negate the water savings achieved elsewhere in a WaterSense new home. Thus, limiting installation of high and medium water use plants by builders is both reasonable and necessary to ensure that WaterSense new homes are substantially more water efficient than the average residence.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, 4.1.1 Landscape Design, 4.1.1.2 Option 2

**Comment:** We recommend that the specification contain a step-wise strengthening of the ET adjustment factor, beginning at 70% in 2009 and shifting to 60% in January 2011.

**Rationale:** We note that the ET adjustment factor has been revised upward from the previous draft specification. We note further that California will soon be requiring new landscapes to be installed with a water budget using a 70% ETAF. Although wide participation in the WaterSense program is to be welcomed, specifications should be set to ensure that WaterSense new homes will offer significantly above-average water efficiency.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, 4.1.3 Slopes

**Comment:** The challenge for effective water management on slopes is the avoidance of excessive runoff, particularly runoff of applied irrigation water. This provision should be revised from a prohibition of turf on slopes to a requirement to prevent excessive runoff on slopes through any of the following –

- Terracing;
  - Unirrigated (but stabilizing) treatment, such as landscape stone or native grasses and shrubs;
  - Subsurface irrigation, or surface irrigation fitted with low precipitation nozzles, with either approach zoned to the slope; or
  - If previously undisturbed, retention of established plant communities and soil structure.
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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, 4.1.6 Ornamental Water Features

**Comment:** The ornamental water features subject to this provision should specifically be those that are supplied with potable water. A feature making exclusive use of graywater or rainwater, for example, should not be subject to a recirculation requirement.

**Comment:** The requirement that ornamental water features “serve a beneficial use” is so vague as to be meaningless. “Cooling properties,” for instance (an example listed in the definition section), is an attribute of virtually any water body by virtue of the thermodynamics of evaporation. Similarly, a wildlife habitat function could be provided by almost any water feature if such language were broadly construed. We support the inclusion of water features supported by non-potable sources and water features supplied with recirculating potable water that are part of a registered wildlife habitat program, of which there are several available to builders and homeowners. Ornamental fountains and waterfalls sustained by potable water should not be installed in a WaterSense labeled new home. The Definitions section should be revised accordingly.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.1 Landscape, 4.1.X Soil Preparation

**Comment:** Soil preparation requirements should be included, since water demand can be exacerbated by landscape installation on compacted subsoil, as is typically found at graded and backfilled building sites. A minimum of four inches of substrate, appropriate to the needs of each major element of the plant palette of the installed landscape, should be required. For compliance, small samples of substrate should be retained on-site and the installed landscape spot-checked by the inspector with a probe.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.2 Irrigation System

We note that the requirement that irrigation systems be installed by a WaterSense certified irrigation partner has been dropped from the revised draft specification. We recommend a tiered approach, where WaterSense certified designers and installers are not initially required, but become a requirement in January 2011.

**Rationale:** While current levels of partner participation may mean that a WaterSense Irrigation Installer is hard to find in some markets, it is important that the New Homes program help draw more participants into WaterSense certified training programs to upgrade their skills, even as it seeks to strengthen its own brand reputation for quality and efficiency in irrigation design and installation.

**Comment:** A master irrigation shut-off valve in an accessible location should be a required for any installed irrigation system.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.2 Irrigation System, 4.2.3 Runoff/Overspray

**Comment:** This paragraph should state that irrigation systems “shall be designed **and installed** to sustain the landscape without creating runoff . . .”

**Comment:** The duration of system operation to measure and verify the absence of runoff in the post-installation audit should not be left solely to the auditor’s judgment, but rather be based upon a minimum operating time for each zone or station (i.e. 5 minutes), and in no case less than a full rotation or arc for all sprinkler equipment. The Draft Irrigation Audit Guidelines should also be revised accordingly.

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**Topic:** 4.0 Outdoor Water-Efficiency Criteria, 4.2 Irrigation System, 4.2.4 Distribution Uniformity

**Comment:** Field experience indicates that a  $DU_{LQ}$  of 70 percent is far higher than well-installed spray irrigation systems typically achieve. Survey data on DU has been compiled by the Southern Nevada Water Authority, Eugene Water & Electric Board, the Irrigation Association, and the University of Florida. It appears that a DU in the range of 60 to 63 % would achieve performance significantly above average, but not so high as to discourage participation in the program. High DU is an important goal, because it will discourage consumers from overwatering an entire landscape to prevent brown spots in underwatered locations. Nevertheless, we recommend that the requirement be realistically attainable in typical new home installations.

**Comment:** The specification also needs clarification on two additional points. The draft Irrigation Audit Guidelines direct that DU only be tested for turfgrass areas. This should be mentioned in the specification itself if that is the intent. Also unclear is whether the DU requirement is to be met by each station or zone individually, or attained by averaging the entire tested area.

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**Topic:** 7.0 Definitions, Front Yard

**Comment:** The definition of front yard should be clarified for homes on corner lots and homes oriented perpendicularly to the street. In such cases, the front yard should encompass: (a) all of the lot between the house and the street; and (b) any additional area between the front of the house and the adjoining property line not included in (a).

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**Topic:** 7.0 Definitions, Landscapable Area

**Comment:** We recommend returning to a common sense definition of “landscapable area,” such as lot area minus the building footprint, permanent hardscape (driveways, sidewalks, paved walks, ground-level decks<sup>4</sup>), and natural areas protected by easement or covenant. A conceptually similar definition is proposed for California’s statewide model water efficient landscape ordinance.<sup>5</sup> In contrast with the California definition, we recommend the inclusion of unprotected, undisturbed natural portions of the lot within the definition of landscapable area as a useful tradeoff, allowing landscape designers an incrementally larger water budget in return for the unprotected natural areas of the lot left undisturbed. Additionally, for lots where the entire yard is not landscaped, “landscapable area” must be limited to the front yard.

**Rationale:** “Landscapable area” is a key term for the workings of the WaterSense outdoor efficiency criteria. Unfortunately, the definition as proposed is deeply flawed. EPA has stated that the definition was drawn from the US Green Building Council’s *LEED for Homes*. However, a careful review of *LEED for Homes* shows that the term landscapable area is not used, nor was the definition of the term “designed landscape” used, contrary to EPA’s May 8 explanatory letter. Instead, the WaterSense draft text has appropriated the definition of the LEED term “buildable land.” This term is not used in LEED in the context of irrigation efficiency (note the January 2009 errata listings), but rather is used to establish a credit system for building density. Two of the principal shortcomings of attempting to bend this definition to WaterSense’s purpose are the inclusion of driveways within the landscapable area and the exclusion of land “excluded from residential development by law,” which commonly includes land within zoning-required building set-backs, which are often part of the landscaped portion of the lot.

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**Topic:** 7.0 Definitions, Lower Quarter Distribution Uniformity (DU<sub>LQ</sub>)

**Comment:** Reference is made to the use of soil moisture probes as a basis for determining distribution uniformity. However, we are unaware of any published protocol for making such calculations. In the absence of an acceptable protocol, reference to soil moisture probes for determining DU should be removed from the specification. The Draft Irrigation Audit Guidelines should also be revised accordingly.

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<sup>4</sup> We distinguish decks from patios, since the former are more likely to be builder-installed and affixed to the house, while the latter may be located throughout the landscaped area, provide utility and decorative value without irrigation. We also distinguish between elevated decks, which may receive light and irrigation beneath, and ground-level decks.

<sup>5</sup> (dd) “landscape area” means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other nonirrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

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**Topic:** Draft Inspection Guidelines, Auditing/Sampling

**Comment:** We note that the Revised Draft Inspection Guidelines for WaterSense Labeled New Homes requires inspection of 100% of all irrigation systems installed, even while allowing a reasonable sampling regime for home inspection generally. The importance of this distinction is not immediately clear, particularly if, as we recommend above, that the specification includes a phased requirement for irrigation system design and installation by a WaterSense irrigation partner beginning in January 2011.

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**Topic:** Draft Inspection Guidelines, Pre-Inspection and Section 3.1 Leaks

**Comment:** At the very beginning of the inspection, the water meter should be read, and then reread after inspection set-up is complete and prior to any water being drawn by the inspector (a minimum of 15 minutes). An incremental reading of zero should be required. If a zero read is not obtained, the procedure should be repeated following a walk-through of the property to ensure that all faucets are closed and all water-using appliances turned off. Note: It is not the responsibility of the inspector to locate leaks that may be indicated by a meter reading but are not visible during inspection.