



Comments on the December 2008 Draft Inspection and  
Certification Systems for New Homes

February 2009

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**Commenter:** Paul Lauenstein

**Affiliation:**

**Comment Date:** December 19, 2008

I'd be much more interested in a certification system for existing homes. That's where antiquated plumbing fixtures and appliances are wasting water day after day.

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**Commenter:** Allen Gilliland

**Affiliation:** Owner, One Sky Homes, San Jose, CA

**Comment Date:** December 19, 2008

**Topic:** Outdoor Water Efficiency Criteria 4.2.1: Irrigation System Design

**Comment:** Draft specification requires irrigation system to be designed and installed by a WaterSense partner certified irrigation professional. This is unnecessary, cumbersome and costly in many applications and this requirement should be eliminated. Specifying measurable and verifiable performance criteria for the irrigation system is sufficient, as it is with the rest of the measures included in the checklist. Why should the irrigation system require special design and installation? In the case of single family homes the irrigation systems are typically limited in size and very simple. The stipulated performance criteria and verification/inspection protocol are more than adequate to insure compliance without adding unnecessary cost for the builder.

**Rationale:** This is the only criteria in the entire checklist that requires installation by a “certified” professional. For example, there is not a requirement for “certified” plumber partner to design and install the hot water delivery system, only verifiable design/installation/performance criteria to which compliance is verified by inspection.

I am not familiar with any other third party-verified, Green Building certification program that has a requirement of this kind in any performance criteria area whatsoever, let alone Water Conservation. This includes Build It Green and LEED for Homes. The focus is on the performance criteria or results, not the method for installation or implementation.

4.2.1 as currently drafted is inconsistent with the rest of the specification and other Water Conservation programs. It also seems discriminatory and anti-competitive. Perhaps a justification could be made for a requirement for irrigation system design by a “certified” irrigation designer in commercial projects because of inherent complexity. But for residential single family homes where systems are simple, performance criteria are sufficient and consistent with the rest of the measures in the checklist.

**Suggested Change (or Language):** Eliminate the requirement for design and installation by a “WaterSense Irrigation Partner” and rely on performance criteria verified by inspection as with the rest of the measures in the checklist.

**Commenter:** Allen Schildknecht  
**Affiliation:** IRRIGATION HAWAII, LTD.  
**Comment Date:** December 22, 2008

Aloha,

I'd like to make a few comments on the following Drafts;

#### **DRAFT GUIDELINES FOR IRRIGATION AUDITS:**

Para A - Distribution Uniformity Calculation:

Comment(s):

1. Shouldn't there be a minimum that is acceptable? Just doing an audit isn't enough if the uniformity is very poor.

Para B – Verification of Specification Criteria by Visual Inspection:

Comment(s):

1. I think the 8' rule may be too large for long-term drip in turf. For example, side strip sprays work good for a 3-1/2' to 4' wide area. Five foot radius sprinklers do a good job for 4' to 6'' areas and 8' sprinklers can be adjusted down to fill in the 6' to 8' area nicely. Drip in turf has not proven itself for long term usage and has a higher degree of maintenance. Once it is not maintained, the distribution and water conservation is reduced. I personally have seen too many drip systems waste water because they don't see the excessive water being used.
2. A lot of micro-irrigation systems today no longer require pressure regulators or flush ends.
3. While matched precipitation nozzles on sprinklers should be required, they should also be matched to the infiltration rate of the soil if possible.
4. Establishment periods are normally 90 to 120 days. Do you need a seasonal adjust during establishment, won't it normally be within the same season?
5. While I agree that multiple start times will help eliminate run-off, without a discussion on infiltration rates and precipitation rates you could still have run off. I think you need a discussion on soil types, plant types and climate. One of the faults of many similar documents (LEEDS, etc.) is they try to incorporate one guideline for all areas, all soil types and all plant materials. These factors vary dramatically and respectfully the irrigation methods need to be adjusted to match.

Checklist: Comments:

- A: Shouldn't this be shown for each station or zone. This could vary from zone to zone and sprinkler type to sprinkler type?

#### **DRAFT INSPECTION AND CERTIFICATION GUIDANCE:**

##### **Outdoor Criteria Comments only:**

1. Under Option 2 I think you need to clarify the 60% of ET and available precipitation calculations. I know what you mean, but it's not very clear.
2. Pools and Spa's: What if the pool or spa is covered when not in use?

3. Ornamental Water Features: Why can't they be included as part of the turf allocation? In many areas, these are an extremely useful landscape feature and can be beneficial to the homeowner. I agree that fountains and misting features should not be included but streams with low water falls waste little more water than turf and perhaps less than a swimming pool which is used by active people (children splashing, etc.).

In addition, many water features today use waterless applications where the water seeps down into a gravel bed and is then re-circulated, minimizing evaporation.

What about a swimming pool or spa with a waterfall?

4. Other: Missing are some other things which can be done to save water and energy through landscape. These include;

- a. Use of permeable paving to minimize run off and maximize ground water recharge
- b. use of shade trees on the south side of the building to cool the house.
- c. use of hedges or wind buffers to minimize wind effects where needed but allow for cooling breezes in summer months.
- d. types of turf grasses or plant materials. Some are far more drought tolerant or less thirsty than others. For example some zoysia species can use 40% less water than a Bermuda grass which uses less water than a bluegrass type. Native plantings vs. lush plantings, etc.
- e. I'm not convinced drip or micro-irrigation is the salvation to reduced water usage. While it can be helpful, it is often misused and improperly operated and poorly maintained. As a result, we may be promoting mismanagement of water. If we promote drip and micro-irrigation, then we must
- f. Alternate water sources? Shouldn't we promote the use of alternate (non-potable) water sources such as brackish, effluent reuse, etc where they can be used and shouldn't these landscapes receive some type of credit for their use?

Hope this helps, what you've done is a good start, but what applies in Washington State doesn't necessarily apply in Florida, or some other areas of the world. Nor does it necessarily match where people are moving to, such as Las Vegas, Phoenix, and other generally warm to hot climates' with little natural rainfall. Even design standards, wind effects and other factors may vary from place to place, so one rule may not apply everywhere.

The standard needs to be reasonably cost effective for the builder, save water and allow for adjustments based upon geographical and climatological conditions.

Aloha,

*Allan G. Schildknecht*

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**Commenter:** Rachel Della Valle  
**Affiliation:** Southern Energy Management  
**Comment Date:** December 23, 2008

To whom this may concern,

The following are a few recommendations after completing three Water Sense for New Homes Inspections and reading through the draft documents.

Inspection Checklist:

- I recommend that the “Ornamental Water Feature” be included in the Required Outdoor Water Efficiency Criteria because it is required that no ornamental water features are installed. It’s not an optional, if installed, item.
- Homeowner Education part of the checklist shall read “Homeowner Education Criteria” as the other two categories are written.
- I suggest there should be written instructions for Bathroom Faucets on the Inspection Checklist, as it appears to be a requirement in the Inspection & Certification Guidance for WaterSense Labeled New Homes. There is nothing on the Inspection Checklist that tells the inspector to test the bathroom faucet flow.
- Irrigation System Design: Note on the Inspection Checklist that the “Completed Irrigation System Design and Installed Checklist” is completed by Irrigation Partner, not the Inspector to reduce confusion.
- Overall, I think the Inspection Checklist has improved since the last draft.

Draft Inspection & Certification Guidance for WaterSense Labeled New Homes:

- I believe the Demand-Initiated Hot Water Recirculating System Inspector Instructions shall include ‘turn on switch’ or ‘hit the control button’ for the hot water in that room, wait about 40 seconds (that’s the length I’ve found the in the field), then complete the test for the temperature rise.
- I also suggest that under the Demand-Initiated Hot Water Recirculating System, the program could include the option of inspecting for this item at rough-in (insulation or framing) if they’re already out on site at that time. Plus it’s easier to measure pipe run visually rather than the temperature rise of water at final inspection. I think it would be good to highlight any items that an inspector could verify at rough-in, such as insulation piping on hot water pipes, rather than collecting builder documentation or testing at final.
- For the Hot Water Delivery Systems (Section 3.5) it would be beneficial to include a description of each system with how it operates. I’ve requested and received information from the EPA on the three systems and that has been very helpful.

Required Equipment:

- Watch with a second hand or stop watch if inspector is using a bucket (not flow bag).

General Recommendations:

- Include on the Inspection Checklist water/energy savings techniques such as collecting rainwater, solar hot water systems, low flow/no flow urinals (different than toilets) as optional or “If Installed”. Or simply include a space for the inspector to note other water/energy saving features that the builder or homeowner has installed above and beyond Water Sense. It may be good for data collection/record keeping in order to eventually upgrade/alter the requirements.

- The landscape design option 1 requirement with regards to the “turf less than or equal to 40% of the landscapable area”. It would be easier for the inspector to measure the turf and total landscapable area if the requirement for option 1 was “turf less than or equal to 50% of the landscapable area”. My reasoning is that in the field the math would be easier. Many other green building programs use the 50% marker for point(s) on their checklists so it would be easier to integrate with other green building programs as well. Is there a reason for the 40% requirement?
- I would like to make another comment on the Initiated Hot Water Recirculating System Inspector Instructions because I am unclear on how long ‘we’ should wait to test the system after hitting the control button for the faucet area. After testing 3 homes it appears that 40 seconds is ample time for the water to recirculate, but perhaps there should be a standard ‘waiting time’? It may depend on the manufacturer, but it may be uniform for all systems as long as the pipe runs are short enough and the pipe diameter is the correct size.

Thank you for time.  
Happy Holidays,

**Rachel Della Valle**, Building Science Technician



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**Commenter:** Steve Hale

**Affiliation:**

**Comment Date:** January 4, 2009

Comments regarding sections of water sense requirements;

1) Ornamental Water Features 4.1.4

Whenever a requirement is "all or nothing" you will lose participants. When compared to a swimming pool ornamental water features can consume far less water. I saw no requirement to have a pool cover for when the pool is not in use so evaporation would be as great as a "pond". Here in the arid Southwest a small water feature either inside or outside can be of benefit to indoor humidity or outdoor wildlife. Rather than eliminate this feature specify either water use limits (replacement water limited to 30 gallons per day in the summer for example) or a formula for reducing turf (reduce turf by 4 times the surface area of water feature for example)

2) Restriction of water sense landscape partners only;

This is too limited. As a builder of small, sustainable homes I perform my own irrigation layout and installation. Since that is not my bread and butter I likely wouldn't meet requirement of "3 years experience" although I have installed systems over a period of many years, I only install about one per year. Requiring a test and joining an association is onerous, an alternative for "self- installed or builder installed" should be allowed.

3) Irrigation Controllers (criteria 4.2.2). This doesn't include "smart controllers" and limits their use by requiring 14 day available scheduling.

4) Sprinkler heads criteria do not restrict spray heads that "mist" and lose so much water to evaporation before it reaches the grass (criteria 4.2.3)

Steve Hale

**Commenter:** Greg Chick

**Affiliation:** Ramona's Plumber

**Comment Date:** January 10, 2009

Thank you, I think your attempt is very “fair” and avoids crossing “the line” of private property rights of Americans who want to express themselves thru Landscaping, and using water to do so. I personally and professionally feel lawns consuming potable water should be banned in certain regions of this mainland country. I feel it is the responsible thing to do and the EPA is the AHJ. I don’t see any difference between those who want to snow ski having to go to snow regions to do so, and turf being a regional thing as well. I am educated and experienced in this field over 30 years. I as an American feel my responsibilities equal my rights. Please consider this an attempt to keep common sense in “controlling and regulating” I thank you for your ban on water features, I see lawn as a water feature, maybe that is the point I wish to make.

Greg Chick

Ramona's Plumber

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**Commenter:** Robert Vandervelden

**Affiliation:** Robert Vandervelden Const; Living Waters Aqua Scapes; Member of National Assoc of Home Builders, Oregon Home Builders Assoc, and Home Builders Assoc of South Western Ore

**Comment Date:** January 13, 2009

Section 4.1.4 No ornamental water features.

I think that this should be changed to read, no ornamental water features unless the area of the water feature is subtracted sq ft per sq ft from the turf allowance or designed under the consideration of a water budget.

In my experience, a professionally designed water feature uses less water than an equivalent amount of turf. The water feature uses none of the chemicals that are added to lawns i.e., nitrogen and phosphate fertilizers. Also we are now designing features that capture the rainwater for make up water. And the quantity of wildlife that comes to use the features is awesome. The birds that come to drink, the dragonflies, the water skippers, the frogs, the tadpoles. The plants that we use, pull the phosphate and the calcium out of the water. And when it rains, the overflow water is returned to the aquifer.

Now I realize that in some parts of the country that there are some places that an ornamental water feature is perhaps not the best use of use but I believe that if the water feature can fit under the turf requirement and or can be designed within a water budget, than a water feature can add greatly to our overall ecology.

Thank you for considering the above change

Robert Vandervelden

**Commenter:** Craig Selover  
**Affiliation:** Masco Corporation  
**Comment Date:** January 13, 2009

Masco Comments – WaterSense Draft Inspection and Certification Guidance document

January 13, 2009

We believe that there are deficiencies the field test procedures for determining compliance to maximum flow rates for kitchen and lavatory faucets and showerheads that can lead to false positive results. The issue is that in the field, the actual pressures when flowing are most often significantly lower than the 60 psi or 80 psi pressures against which the product standards are established. In some cases, devices utilize pressure compensating flow control elements which produce a fairly constant flow rate across a wide range of pressures, and these are less likely to produce a false positive, although they can. It is the plain orifice type of flow control that most likely will produce a false positive.

For example, if a showerhead or faucet outlet utilizes an orifice plate technology, it will produce its highest flow rate at the maximum pressure covered under the testing methodology. This is because the manufacturer will desire for there to be as much flow as possible at lower pressures. For a 2.5 gpm maximum flow (showerhead) at 80 psi, an orifice plate restrictor has a Cv flow coefficient of 0.2795 (flow rate divided by square root of the pressure drop). This flow coefficient will result in a flow rate of 1.76 gpm at a flowing pressure of 40 psi, not uncommon in the field. This is, of course below the 2.5 maximum WaterSense specification. However, where the field flowing pressure is 40 psi, under the draft test procedure, a flow rate of 2.2 gpm would also pass. However, the Cv for this device is higher, or 0.3478; therefore this device would pass 3.1 gpm.

So, our recommendation is that to adequately avoid false positives (approve a non-compliance device), one must have the flow curve for the faucet or showerhead in question, and know the pressure supplied to the showerhead or faucet when it is on to full volume. This would allow the tester to see what the flow rate should be from the flow curve and compare it with the measured flow rate. We also understand that flow curves may not be readily available, but are not sure that there is an alternative way to make a proper determination, given that you cannot boost the building pressure to 60 or 80 psi, either. Some creativity may be necessary to develop an accurate method. Perhaps flow curves could be required at a plan review stage.

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**Commenter:** Ike Casey  
**Affiliation:** PHCC – National Association  
**Comment Date:** February 13, 2009

Dear WaterSense:

Attached are comments regarding the Draft WaterSense New Home Certification and Labeling System. In general, the plumbing contractor community is disappointed that plumbers and plumbing contractors are not called upon for input on these initiatives that are going to affect their work, BEFORE, the document is in draft form. If we were involved in the drafting, we would have encouraged you to make the plumbing contractor more prominent in the certification of WaterSense New Homes. The plumbing system will only work if it is put in correctly by a competent professional.

**Topic:** Draft WaterSense New Home Certification and Labeling System.

**Comment:** Include plumbing contractor in the certification and labeling system

**Rationale:** The plumbing contractor and his/her plumbers will be imperative to the successful installation of water saving products and devices.

**Suggested Change (or Language):** Add under definition of parties:

Plumbing Contractor: The home builder shall contract with a licensed (in areas where a license is required by law) plumbing contractor to install WaterSense labeled materials. The builder partner is encouraged to use GreenPlumber accredited plumbers if available. GreenPlumber accredited plumbers are listed at [www.greenplumbersusa.com](http://www.greenplumbersusa.com)

Note: There is no current provision for a plumbing contractor to become a WaterSense partner. Such provision should be made for a plumbing contractor to sign a partnership agreement and be listed as a promotion partner.

**Topic:** Draft WaterSense New Home Certification and Labeling System.

**Comment:** Include plumbing contractor in the certification and labeling system.

**Rationale:** The plumbing contractor and his/her plumbers will be imperative to the successful installation of water saving products and devices.

**Suggested Change (or Language):** Add in II, B, ii: In the case of indoor minimum water-efficiency criteria, the home must have passed a proper plumbing inspection as required by the local area having jurisdiction to assure that the installation was completed by a properly licensed and trained plumber.

**Topic:** Draft WaterSense New Home Certification and Labeling System.

**Comment:** Include plumbing contractor in the certification and labeling system.

**Rationale:** The plumbing contractor and his/her plumbers will be imperative to the successful installation of water saving products and devices.

**Suggested Change (or Language):** Section III, A, i: (new wording underlined)

An inspector must demonstrate a knowledge base and skill set to conduct inspections of new homes for WaterSense, including an understanding of plumbing systems in homes.

**Topic:** Draft WaterSense New Home Certification and Labeling System.

**Comment:** Include plumbing contractor in the certification and labeling system.

**Rationale:** The plumbing contractor and his/her plumbers will be imperative to the successful installation of water saving products and devices.

**Suggested Change (or Language):** Section V, A, I, a third bullet: Add word plumbing contractor, so that the list reads: . . .representing various aspects of the home building industry, which may include architects, engineers, plumbing contractors, landscape designers. . .

**Topic:** Draft WaterSense New Home Certification and Labeling System.

**Comment:** Include plumbing contractor in the certification and labeling system.

**Rationale:** The plumbing contractor and his/her plumbers will be imperative to the successful installation of water saving products and devices.

**Suggested Change (or Language):** On the inspection checklist require the name of the installing plumber, company and license number if the area having jurisdiction over codes requires a plumbing license.

**Commenter:** Stephen W. Smith  
**Affiliation:** President, Irrigation Association  
**Comment Date:** February 13, 2009

Attached are the Irrigation Association's comments regarding the WaterSense Specifications for New Homes Draft Certification System, Labeling Guidelines and Irrigation Audit Guidelines. These comments are submitted on behalf of Stephen W. Smith, President of the Irrigation Association.

**Topic:** Draft Inspection and Certification Guidance – Outdoor Criteria

**Comment:** We request the opportunity to first review the new specification data before commenting on the “inspector instructions” for Option 1 and Option 2 of the “Landscape Design.”

**Rationale:** The “specific water-efficiency and performance criteria contained in this guidance are based on the first draft of the Water-Efficient Single-Family New Home Specification.” The Irrigation Association made significant recommendations to both the WaterSense New Home Specifications and Water Budget Tool, as they relate to the “Outdoor Criteria.” These recommendations were broad in scope and we have not had the opportunity to review the draft changes accepted by the EPA.

**Suggested Change (or Language):** Allow public comment regarding the “Outdoor Criteria” listed in the “Draft Inspection and Certification Guidance” to be re-opened after the next draft of the Water-Efficient Single-Family New Home Specifications is released.

**Topic:** Distribution Uniformity Calculation

**Comment:** Remove the “Distribution Uniformity Calculation” requirement in the Draft Guidelines for Irrigation Audits of WaterSense® Labeled New Homes.

**Rationale:** 1. In many new homes that are going through the certification process, the landscapable area may not be large enough to perform a “catch-can” test that will be able to produce meaningful results. For instance, the Florida Irrigation Lab method requires at least 16-24 cans to run a catch-can test. In Utah’s “Slow the Flow” program at least 12-20 catch cans are required. Even though the Irrigation Association’s audit guidelines do not address a minimum amount of cans needed to run a successful catch-can test, many tests indicate better results are achieved when the landscape is large enough to accommodate the amount of cans recommended by states like Utah and Florida. In the next revision of our auditor training, the Irrigation Association will recommend a minimum of 24 catch device readings for a meaningful audit.

2. Variable conditions, including weather, play an important role when calculating DU. Weather in many areas often delays the test for days, sometimes weeks, until conditions allow a test to be performed. When there is a re-inspection/co-inspection required, this process may be delayed even further.

3. Based on the efficient products and services already included within the criteria laid out in 4.2.1.2, 4.2.1.3, 4.2.1.4, and 4.2.2, an assumption for a high distribution uniformity exists. We feel that the goals of the Water-Efficient Single-Family New Home Specification will be achieved without having to calculate each irrigation system’s DU. DU measures how evenly water is applied to an area, not the rate of application. Water savings will be achieved through proper irrigation scheduling.

**Suggested Change (or Language):** Remove part “A” under the Draft Guidelines for Irrigation Audits of WaterSense® Labeled New Homes.

**Topic:** Draft Guidelines for Irrigation Audits of WaterSense® Labeled New Homes

**Comment:** Conduct part “B,” the “Verification of Specification Criteria by Visual Inspection,” as the sole inspection of the irrigation system.

**Rationale:** Consistent with our previous suggested change, we feel that the visual inspection of the irrigation system running to verify the water is applied to the target area and that there are no leaks, etc., is the best way to verify the criteria laid out in the draft specifications are met. Because of this suggested change, the draft guidelines are more of an “inspection” rather than an “audit.”

**Suggested Change (or Language):** Remove all references to an “Irrigation Audit” and replace them with “Irrigation Inspection.”

**Commenter:** Brian E. Vinchesi  
**Affiliation:** Irrigation Consulting, Inc.  
**Comment Date:** February 15, 2009

**Topic:** Draft Guidelines for Irrigation Audits

**Comment:** Multiple start times are required. Is this per program or for just one program?

**Rationale:** Not all controllers allow multiple starts or the same number of starts per program.

**Suggested Change (or Language):** Multiple start times (cycling, cycle/soak, stackable start times) per program.

**Topic:** Draft Guidelines for Irrigation Audits

**Comment:** “a minimum continuous operating duration “is vague

**Rationale:** this statement does not define a time frame

**Suggested Change (or Language):** put in a specific time frame. Vary the time frame for different types of sprinklers if necessary using a table or something similar. It could be tied to infiltration rates of soils.

**Topic:** Draft Guidelines for Irrigation Audits

**Comment:** The inspection checklist is lacking.

**Rationale:** There is much more to the system than just uniformity.

**Suggested Change (or Language):** The inspector should not only be checking for maximum pressure, but minimum. Is there a rain shut off- why is one not required? Why are smart controllers not required? Sprinklers should be checked to see if they have the proper pop up height, are at grade and are straight. Valves should have flow controls required.

**Topic:** Draft Inspection and Certification Guidance for WaterSense Labeled New Homes

**Comment:** Turf reduced to 40% does not help with carbon sequestering and turf is a regional issue.

**Rationale:** A Las Vegas or Phoenix landscape that is allowed to have 40% turf would use more water not less. Irrigation is regionally specific, not nationally. The criterion needs to reflect regional differences.

**Suggested Change (or Language):** Set up different percentages for turf area as a minimum based on regions.

**Topic:** Draft Inspection and Certification Guidance for WaterSense Labeled New Homes

**Comment:** A water budget of 60% of ET has no scientific basis.

**Rationale:** There is no science that supports a 60% ET will keep the landscape healthy. The 25% available precipitation is too high for some regions.

**Suggested Change (or Language):** Science shows that watering can take place at 80% of ET without detrimental effects. That is 20% water savings right there. A 60% ET saves much more than 20% which is not the intent of the specification. Effective rainfall is regional. What is effective in Milwaukee is not what is effective in Tucson. Effective rainfall percentages should also be based on regional data using a table.

**Topic:** Draft Inspection and Certification Guidance for WaterSense Labeled New Homes

**Comment:** “Micro-irrigation should be used for all planting beds”. Micro-irrigation can be as inefficient as any other type of irrigation.

**Rationale:** Micro-irrigation does not automatically save water. Homeowners can over water with micro-irrigation just as much as with pop up irrigation. Given the small amount of maintenance on residential systems and the increased maintenance of micro-irrigation due to damage and vandalism it is not a sound design initiative.

**Suggested Change (or Language):** Use the water budget concept to allow the landscape to be watered as need be as long as it meets the budget. The type of irrigation used is irrelevant to the established budget if it cannot be exceeded.

**Topic:** Draft WaterSense New Home Certification and Labeling System

**Comment:** The irrigation system being designed, installed and inspected by the same WaterSense Partner is a conflict of interest.

**Rationale:** The specification goes into great detail to prevent conflicts of interest with the inspectors, but the same WaterSense Partner can inspect their own irrigation system design and installation, which is a direct conflict of interest.

**Suggested Change (or Language):** The installing WaterSense Partner and the inspecting WaterSense Partner should be different entities and not two different people from the same company to prevent a conflict of interest.

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**Commenter:** Mary Ann Dickinson  
**Affiliation:** Executive Director, Alliance for Water Efficiency  
**Comment Date:** February 16, 2009

Dear EPA Water Sense Program Staff:

Please find attached the comments from the Alliance for Water Efficiency on the New Homes Inspection and Certification Guidance. We have embedded our comments and questions into your comments template, divided by topic.

Thank you for the opportunity to comment. If you have any questions, please contact Ed Osann at eosann@starpower.net.

**Topic:** New Homes Certification and Labeling System for WaterSense-Labeled New Homes

**Comment:** The Alliance continues to support third-party verification of the performance of WaterSense-labeled products, and welcomes the inclusion of this concept in the proposed certification and labeling system for new homes.

**Suggested Change (or Language):** The Alliance has a number of comments and questions as follows:

1. It appears that the draft proposal contemplates a free-standing and self-contained certification system. Consideration should be given to the relationship between this certification protocol and that of other whole-building labeling programs, such as Energy Star and LEED. Must the entire framework remain separate, or are there opportunities for HERS raters to become WaterSense home inspectors, for example?
2. Paragraph II.B on page 2 seems to indicate that each new home offered into the program will require a separate inspection before certification and labeling. Similarly, paragraph B.ii. [sic] on page 7 seems to indicate that each home with an installed irrigation system will have a WaterSense irrigation audit. Did EPA consider any sampling regime, such as that used for Energy Star Homes, for either of these on-site inspections? Were there reasons found for rejecting sampling for either type of inspection?
3. What analysis is available regarding the relative cost to the builder for inspection and certification compared with the cost of implementing the WaterSense new home criteria themselves? Put another way, is inspection and certification likely to constitute a large fraction of a builder's total cost of participating in the WaterSense New Homes Program?
4. Why is it necessary for the Program Administrator to operate nationally, and does EPA contemplate that there will be only one administrator? Might there be regional program administrators, or might other building rating programs (i.e., LEED) serve as program administrators for WaterSense certification of buildings in their program?
5. Is the role of certification provider open to water and wastewater utilities?
6. Regarding the registry of Builder Partners, will the partnership agreement with WaterSense builders require the builder to actually deliver a WaterSense certified new home to market within a specific period of time? Otherwise, a roster of builders who might intend to eventually build WaterSense new homes could be misleading.
7. The draft outdoor water efficiency inspection (p. 7) appears to require a separate "inspection" of any irrigation system. Is this inspection actually an "audit" performed by a WaterSense certified irrigation auditor? Is any open trench inspection required during installation?

8. When does the builder actually pay for the inspection? And when does the builder pay for an irrigation audit, if necessary? It is important that payment not be contingent upon the home passing the inspection, and the criteria should so state.

9. Where new home programs with water efficiency measures already exist, we suggest that WaterSense work closely with local builders and local inspector/certification providers to encourage builders to participate and assure a smooth and effective transition to the WaterSense program should they choose to do so.

**Topic:** Draft Inspection and Certification Guidance for WaterSense-Labeled New Homes

**Comment:** The Alliance for Water Efficiency has comments as well as a question.

**Suggested Change (or Language):**

1. In the first paragraph, WaterSense criteria should not be characterized as a “water-efficient home standard,” since the term “standard” often connotes a mandatory requirement, rather than a voluntary program such as WaterSense.

2. What are “issues associated with compliance” that might require a home to be re-inspected (p. 1)? This language appears unnecessarily vague.

3. It would be preferable for the insulation of the hot water delivery system (p. 5) to be verified during construction, before the walls are finished. Perhaps the insulation requirement might be subsumed within the hot water delivery performance test. This should be considered further when the revised criteria are republished for public comment.

4. The water budget instruction (p. 9) appears to be redundant. Since EPA has developed a water budget tool, why not simply require the use of its tool, including following its instructions?

5. Other significant issues may arise within the Inspection and Certification Guidance.

However, since this document’s text is matched to individually numbered elements of the Draft WaterSense New Homes Specification, which itself is subject to further revision and reissuance for public comment, we anticipate that this initial version of the Inspection and Certification Guidance must be modified further, perhaps significantly. Therefore, we recommend that EPA issue a revised draft Inspection and Certification Guidance document concurrent with or shortly following the reissuance of the Draft WaterSense New Homes Specification. The Alliance looks forward to this revised draft and will consider offering further comments when it becomes available.

**Topic:** Draft Guidelines for Irrigation Audits of WaterSense Labeled New Homes

**Comment:** The Alliance for Water Efficiency has comments as well as a question.

**Suggested Change (or Language):**

1. What is the relationship of the irrigation system audit to the inspection of the new home, in timing and in cost?

2. Regarding distribution uniformity, there are no criteria for what constitutes either passing or failing the test.

3. Catch-can tests are known to be unreliable in shrub zones, due to the non-uniform profile of the vegetation.

Mary Ann Dickinson, Executive Director

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**Commenter:** Amanda Dewees  
**Affiliation:** Lower Colorado River Authority  
**Comment Date:** February 16, 2009

Thank you for letting us submit public input on the next phase of the WaterSense New Home specification process. Attached are comments from the Lower Colorado River Authority. If you have any questions, please let us know.

**Topic:** Draft Guidelines for Irrigation Audits of WaterSense Labeled New Homes, Section A. Distribution Uniformity Calculation and Irrigation Audit Checklist

**Comment:** Although there is a requirement to conduct a system audit using a catch-can test, there is no minimum requirement or recommendation for the Distribution Uniformity.

**Rationale:** Distribution Uniformity can vary significantly depending on irrigation system design. Ideally, the DU of a WaterSense new home irrigation system would be high, which would reflect head-to-head coverage and other efficiencies. Systems with low DU, often result in over-watering since homeowners potentially increase overall watering to correct for any dry spots that result from the lack of head-to-head coverage or other system inefficiencies. A well designed system, with a high DU would help to correct this problem at the time of installation.

**Suggested Change (or Language):** Set a required DU of 60% or higher and include the DU standard (as a pass/fail item) on the Criteria by Visual Inspection checklist.

**Topic:** Draft Guidelines for Irrigation Audits of WaterSense Labeled New Homes, Irrigation Audit Checklist

**Suggested Change (or Language):** Include a comments section on the checklist so additional information (if needed) can be included at the time of inspection.

Thank you again—

Amanda Dewees  
Water Conservation Coordinator  
Lower Colorado River Authority  
(512) 473-3200, ext. 2230  
<http://www.lcra.org>

**Commenter:** Marilyn Creel

**Affiliation:** City of Fresno (CA) Water Conservation Program

**Comment Date:** February 18, 2009

RE: Inspection and Certification Guidance for WaterSense Labeled New Homes

**Topic:** checking for leaks, pg 2.

**Comment:** Checking for leaks at all visible water supply connections and valves should be required, not just recommended.

**Rationale:** In course of my position while doing leak inspections on relatively new homes have found several areas where leaks commonly occur that were do to poor installation and/or adjustment of equipment; having WaterSense qualified equipment improperly installed allows for water wastage and not requiring the checking for leaks allows the poor installation to skirt by the intent of the WaterSense program.

**Suggested Change (or Language):** The requirement of checking for leaks should be a standalone criteria or incorporated into inspector instructions on each fixture.

**Topic:** toilet leaks

**Comment:** Part of inspection process should include checking water level in toilet tank to allow for system pressure change, i.e.,-meet manufacturers spec, usually ½" to 1" below overflow tube.

**Rationale:** The most common leak, I have found while doing leak inspections, is toilet floats set to high allowing for continuous or intermittent leaks.

**Suggested Change (or Language):** Water level in toilet tank/ float setting should be included in the above recommended criteria on requirement of checking for leaks at supply connections and valves.

**Topic:** Inspection Check List

**Comment:** Check list should include space for indicating leaks through valves and connection points in all categories of fixtures (indoor and outdoor) plus float adjustment for water level in toilet tank (indoor).

**Rationale:** Check list should indicate if inspection included checking for leaks and identify any leaks that were found.

RE: Guidelines for Irrigation Audits

**Topic:** Leaks

**Comment:** Criteria should include checking for leaks at all visible water supply connections and valves; irrigation laterals; and emitting devises on all stations. This will require observing each irrigation station in operation not just sprinkler stations.

**Rationale:** Improperly installed irrigation equipment allows for water wastage; not requiring the checking for and recording of leaks on the Irrigation Audit Checklist allows poor installation to skirt by the intent of the WaterSense program.

RE: New Home Certification and Labeling System

**Topic:** Certification Provider

**Comment:** Not allowing an organizations' Quality Assurance Personnel to also be an Inspector limits the number of organizations that will be willing to become Providers.

**Rationale:** The requirement to have an organization (profit or non-profit) to have additional personnel (employees or contractors) when business does not warrant the need of the

additional personnel makes it economically unfeasible for an organization to become a Provider. By limiting the number of provider organizations, regions of the country may well not have Providers available to the Builder Partner and hence no demand for the certification; or paying for the Inspectors travel to the Builder's region may well put the cost of certification beyond the cost/benefit to the Builder. If the provision was developed because of concerns of fraud, a signed statement concerning no economic interest in the certification being submitted to the home buyer is the most direct and enforceable route. The shortest distance between two points is a straight line, and no where is this more true than in people's honesty.

**Topic:** Complete draft hard to follow.

**Comment:** The whole New Home Certification Labeling System draft is very hard to follow. It is convoluted in that the procedures and requirements for each 'party' also defines procedures and requirements for 'another party.'

**Suggested Change (or Language):** Addressing the procedures and requirements of each 'party' from the top down (Program Administrator to Builder Partner)) rather than as in the draft from the bottom up (Builder Partner to Program Administrator) would allow setting the requirements and responsibilities in the chain of command. Further, using less verbiage may make it easier to understand; possibly listing procedures in chronological order

**Commenter:** Larissa Mark  
**Affiliation:** National Association of Home Builders  
**Comment Date:** February 19, 2009

Advocacy Group  
Green Building Department  
Water and Wetlands Department

Sheila Frace  
EPA WaterSense® Program  
U.S. Environmental Protection Agency Office of Wastewater Management (4204M) 1200  
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Re: Draft WaterSense® Certification and Labeling System

On behalf of the National Association of Home Builders (NAHB), we are pleased to submit the following comments on the U.S. Environmental Protection Agency's (EPA) draft WaterSense Certification and Labeling System and draft Inspection and Certification Guidance for WaterSense Labeled New Homes, that was published on EPA's Office of Water website on December 18, 2008 (today's proposal).

NAHB represents more than 200,000 member firms involved in home building, remodeling, multifamily construction, property management, housing finance, building product manufacturing and other aspects of residential and light commercial construction. For many of NAHB's members, water supply is a vital concern. The wise and efficient use of water, including reuse, can contribute to conservation efforts, offer significant financial benefits to both water suppliers and consumers, and help ensure adequate water supplies that will allow for future community growth and development. As a representative of the regulated community and the growing number of certified green builders, NAHB has an intense interest in the WaterSense Certification and Labeling program for new homes.

The draft WaterSense Certification and Labeling System provides a categorical hierarchy of participants (program administrators, providers, inspectors and builders). It also establishes an extensive set of expectations for each group and for the certification process. While strict oversight is a vital part of ensuring an effective program, NAHB is concerned that the proposed certification requirements are unnecessarily burdensome and complicated with too many participants involved in the process, inefficient and/or missing training programs and extensive documentation requirements. NAHB is also concerned that the unknown financial obligations associated with the program will further stifle participation. NAHB strongly recommends that EPA streamlines this proposed system, identify and publicize the expected costs associated with participation and implementation and develop a training program for all participants. Without these changes this system may prove too burdensome for widespread participation by the residential construction industry.

Successful implementation of any program requires financial resources, yet EPA has not provided cost estimations for each categorical participant. EPA must identify what, if any, monetary obligations will be required of the Program Administrators, Providers and Inspectors. It is assumed that there will be costs levied on builders for programmatic participation, but it is

unknown if the builder will be held responsible for the required interactions of the other participants implementing the program via increased administrative and inspection fees and delays in the certification process. For example, the expected costs of participation in the Energy Star program are available prior to participation and it is well understood that participants typically pay between \$1,500 and \$2,000 per home to cover the costs of the inspection. Unless inspectors are both Energy Star and WaterSense certified, builders choosing to participate in both programs may easily spend thousands of dollars attempting to gain the dual certification. NAHB recommends that EPA quantify the costs associated with the program and to use inspectors that are also certified in Energy Star to minimize the costs associated with dual certifications.

As previously stated, the proposed WaterSense certification and labeling system has several participants involved in the certification and inspection process. NAHB recommends streamlining the program and removing the “Program Administer” classification. This role not only seems duplicative with EPA’s role in the program, but is also unnecessary, serves no purpose in furthering the goals of the WaterSense Program, and will only add an additional layer of obligatory financial support by the builders. By maintaining EPA as the de facto “Program Administrator,” EPA will not only maintain strict oversight of the program but will also be able to collect and maintain data associated with the rate of implementation and success of the program.

Finally NAHB suggests that EPA review its website and in it insert placeholders for the various items addressed in this proposal. The current draft directs readers to its website on several occasions for further clarifying information. Unfortunately the website has not yet been updated and as a result readers were unable to visualize or review the page housing any information referenced in the document. NAHB suggests EPA expeditiously creates place holders or actual web pages for viewers.

#### *Exploring Alternative Methods of Certification Compliance*

The recent approval of the ICC 700-2008 National Green Building Standard by the American National Standards Institute (ANSI) establishes the rating system as a true consensus-based resource for those interested in incorporating green features and practices into new and existing single and multi-family residential construction and remodeling projects and site and lot developments. The Standard provides guidance for incorporating resource efficient building practices and technologies, minimizing the overall environmental impact of construction and providing education to consumers on the proper operation and maintenance needed to promote the long-term effectiveness of the green features built into their property. The Standard devotes a full chapter to Water Efficiency and requires every project include built-in water conservation practices and technologies. Generally speaking, these practices and technologies are similar to those required by the WaterSense for New Homes Specifications.

As of this writing, the National Green Building Standard is the only such rating system to have earned ANSI approval. NAHB expects that many of its members will seek NAHB Research Center Certification to the National Green Building Standard in response to increasing market interest in certified green homes. The NAHB Research Center certification requires two inspections by accredited verifiers during the construction of the home: one prior to covering wall, floor and ceiling cavities, and one upon project completion. By requirement, a home

certified to the ANSI approved National Green Building Standard demonstrates an emphasis on water efficient practices and technologies and provides assurance that such practices and technologies have been verified by a qualified third party.

Given the duplicity in both the timing of inspections required for NAHB Research Center Home certification and the WaterSense label and the compliance requirements of the ANSI approved National Green Building Standard and the WaterSense specifications, NAHB suggest that EPA consider the NAHB Research Certification to the ANSI approved National Green Building Standard to be sufficient as an alternative method of compliance in attaining the WaterSense certification. In doing so, the incremental costs associated with acquiring both certifications borne by the end consumer is minimized without compromising the intended end result; a home that has been certified to a nationally recognized standard for water efficiency.

### Specific Comments on Proposal Language

**Costs Associated with the program** - An expected cost range for the certification program must be provided. Costs associated with the program must be established and provided to builders interested in participating in the program. It is NAHB's assumption that the certification process for WaterSense will be in addition to the costs associated with Energy Star.

### **I. Draft New Home Certification System Document:**

**Unnecessary Overlap in Hierarchy** – The draft certification system requires program administrators, providers and inspectors to be involved to some degree with the home inspection process. The inspection and certification process does not need three unique players complicating the process. For example, on page 3, Part iii, 3rd bullet the draft specification states “The name of the inspector’s and provider’s authorized representatives and their respective signatures;” this statement implies that the certificate will go from the provider to the inspector to the builder for the requisite signatures. Why is this required? Unless the inspector’s are employed (not contracted) directly by the provider, the review of the inspection by two different entities has the ability to delay and/or unnecessarily make the process more difficult and cumbersome thereby reducing participation in the program. The program and certification process should be seamless and simple especially when many builders are participating in multiple inspections for multiple certifications.

It would also be helpful if this section provided guidance on how to refer to a home under construction as being a “candidate” for the WaterSense label. Many homes are sold prior to completion and prospective buyers may be interested that the builder is seeking to achieve WaterSense certification.

**Individual home inspections unnecessary in all cases** – The requirement of individual home inspections fails to incorporate the cost to builders producing many homes of the same model in an effort to keep costs to the end consumer lower. NAHB suggests the WaterSense program adopt similar sampling requirements as the Energy Star program to avoid needless costs and increase the likelihood of program participation among larger builders.

**Home Owner’s Manual** - The builder is expected to prepare a manual on the operation and maintenance of the water system(s). The information and level of detail required in this manual

has not been defined. Rather than a manual devoted to water efficiency, a chapter or folder in the typical homeowner's manual provided to clients at the time of settlement or move-in seems a more likely manifestation of this requirement, yet it is unclear if such an interpretation would satisfy the EPA's intent for this measure. NAHB suggests that EPA modifies this language and remove the term "manual" and instead require either a chapter in the homeowner's manual or a folder of information provided to buyers at the time of closing.

**Successful Inspections** - Part iii on page 3 reads "Once the inspector has successfully inspected the new home..." The sentence is ambiguous as it is unclear if this refers to the inspector being successful in conducting the inspection (regardless of the outcome) or is the home successful (meaning it has passed)? Realistically both will have to occur, but for clarity and consistency it is recommended that EPA provide a definitive checklist from which an inspector can work. The development of a checklist will allow both the builder and the inspector to know and understand what are the minimum requirements are necessary to pass or fail an inspection.

**Inspection Dates** – On page 3, Part iii, the 5th bullet says "the date..." of inspection, implying that only one inspection will be needed or made. Since multiple inspections will be required to properly verify program compliance, EPA should specify at which point in the construction process it deems appropriate to inspect the property understanding that it will be difficult to check behind the walls for insulation and piping if the inspection is conducted after the home has been mostly completed.

**WaterSense Label** – at several points in the document EPA discusses the WaterSense 'label'. EPA must specify what type of label will be used to certify the home. Will it be a certificate or a placard to be placed on the outside of the home (similar to Energy Star)? Please clarify.  
**Individual House Certification Options** – It is unclear if the builder partners can opt-in/opt-out on an individual house basis. This should/must be the case, especially if the builder attempts to gain certification and is unsuccessful with a given unit.

**Builder partner registry** – page 3, Part IV, the 2nd bullet "Company Website" should be clarified. This statement implies/presupposes that ALL builders have a web-site, which is not always the case. EPA should instead place "if applicable" after "Website".

Page 4, Part v.a. "Any instances of non-conformance..." is overly restrictive. For example, if a products tests at even 61 psi, .1 degree, or 1 second this product would be disqualified under the current programmatic guidelines. Rather than requiring unyielding guidelines, EPA should set acceptable tolerances for minor variations in all measurements.

Page 4, Part v.b. Add the word "initial" before "occupancy" on 2nd line.

Page 5, Part III A.i. "Training of Inspectors" NAHB anticipates a public release of the draft training program and its associated documents. By providing information on the inspector training program, WPA would be helping builders better understanding the expected outcomes of WaterSense inspections and processes.

Page 5.A.ii, second to last paragraph "...in addition, the inspector must disclose to provide any existing or potential conflicts of interest, including financial interests, related to inspections for

WaterSense. The provider must agree to provide this disclosure to the builder or homeowner upon request.” Specific examples of potential conflicts should be provided. Inspectors should also have restrictions in cases of conflicts of interest. Significant conflicts of interest (again for EPA to define) should bar a potential inspector from participating in the WaterSense program.

Page 6, first bullet – ‘Conducting the inspector training and maintaining documentation of training;’ EPA must provide a training manual for inspectors that will address the inspection process, certification process and the process of maintaining certification documentation.

Page 6, last paragraph – ‘(or other method of documentation that contains all of the minimum information in the inspection checklist)’ While supportive documentation may make the inspection process flow smoothly, a detailed checklist developed for each WaterSense Home inspection should provide sufficient information for the certification and auditing process.

Page 8, Attend provider training session – ‘As part of its responsibilities as a provider for WaterSense, the provider is required to train its inspectors to properly conduct and document new home inspections.’ All trainings required for the various levels of authority used in this program must be designed by EPA to ensure consistency.

Page 7, 1st paragraph – ‘if the home possesses an irrigation system, the inspector will verify that it was designed, installed, and inspected by a WaterSense irrigation partner.’ Is overly restrictive; contingencies for instances when there are no WaterSense irrigation partners in an area or where savings and water conservation can be tested and verified regardless of the installers accreditations need to be included.

On Page 8, 3rd paragraph – “EPA reserves the right to conduct periodic in-home inspections of labeled homes prior to their sale or occupancy.” Random inspections can be deemed necessary if multiple homes are subject to the WaterSense label. It is unnecessary to repeatedly inspect a home that has passed its official inspection by a certified inspector. EPA should rethink and revise this strategy to limit the number of visits that each property undergoing certification program is subject to.

Page 9, top of page, 2nd and 3rd bullet – remove ‘re-inspecting.’ If the inspector or record is undergoing training, co-inspection should be implemented so as to not delay the construction process unnecessarily.

Page 14, 2nd bullet and bottom of the third paragraph - remove ‘re-inspecting.’ Ensuring proper inspection techniques of those previously certified should be done by co-inspecting the properties soliciting EPA WaterSense approval.

Page 15, 3rd bullet under ‘Demonstrate impartial governance’ – ‘Has established a governing board of directors or executive committee composed of a diverse group of members representing various aspects of the home building industry, which may include but is not limited to, water-efficiency and home-energy experts, architects, engineers, landscape designers, providers for other green building programs, and/or other stakeholders as appropriate.’ EPA seems to require either that new organizations be established to address the implementation of the WaterSense program or significant modifications be made to existing organizations to

effectively qualify to be an administrator in this program. It is not clear why this should be the case.

Page 15, last paragraph – ‘The organization must demonstrate the ability to offer WaterSense program administration services at a national level.’ National influence is not necessary to implement a program on a local level. The only administrator that should have a national presence is EPA. Other program administrators will only be responsible for implementing the program on the local and/or regional level and therefore it is unnecessary for these organizations to have a national presence.

Page 16, section C - **Demonstrate policies and procedures governing oversight of WaterSense Providers.** This section lends the interpretation that organizations eligible to become program administrators must revise its by-laws, governing policies and procedures in order to be eligible. This may be difficult to do for many organizations. While NAHB feels that this level of oversight is unnecessary, there are nongovernmental organizations (NGOs) that can successfully implement a program such as this. Requiring such an organization to modify its core policies to participate seems unnecessary and unreasonable.

Page 20, 2nd bullet – ‘Receipt of formal complaints from home buyers or other interested parties indicating that the certified new home was generally misrepresented.’ This section is unnecessary given the degree of oversight provided by this program. Misrepresentation or fraudulent activities surrounding the WaterSense program will not occur if the program is executed effectively. Examples of fraudulent activity should also be provided.

## II. Draft Inspection and Certification Guidance Document:

**Documentation** – The WaterSense documentation requirements are onerous. Many times the product is not purchased by the builder but rather by a subcontractor (pipe, faucets, etc.). Builders may receive invoices to verify costs but typically do not receive detailed product information.

**Pre-inspection checklist** – Creating and using a pre-inspection checklist has the ability to expedite the inspection process and also limit the need for multiple inspections. EPA should develop and implement a pre-inspection checklist that can help the builder identify specific requirements that must be met during the home inspection. In order to maximize transparency, the inspection checklist should reflect the recommendations provided in the pre-inspection checklist document. This list can outline what needs to be installed, how it should run and what the baseline for certification will be.

### Required Equipment:

- a. **Digital thermometer.** Since thermometers often have sensitivities of +/- 1-2°F and response times of up to 30 seconds thus making the measurement of differentials over time with any acceptable difficult, EPA should specify approved thermometers and manufacturers and provide information on where to obtain them.
- b. **Flow bag.** These are not common. EPA should specify approved flow bags and manufacturers and provide information on where to obtain them.
- c. **Clinometer or topographic map.** There are other ways to determine slope, such as with a laser level that can be operated by one person. Topographic maps require the services of a

licensed surveyor (further increasing cost) and are not needed in most cases.

d. **Pressure gauge** should be added, along with appropriate fitting/adapters to allow connection to washer outlet or other valve and verify pressure setting of pressure control valve.

#### **Interior Criteria, General Comments.**

a. The temperature testing should be done prior to quantity/flow testing. If the outlet/faucet temperature approaches the 120 degree setting of the water heater during volume testing it will be impossible to get the prescribed 10 degree temperature rise.

b. Prior to arrival the inspector should verify that the water heater is operational. It is common for builders to turn off the gas reduce the temperature setting to “vacation” on a gas water heater or trip the breaker

Page 3, **Interior Criteria, Service Pressure** - The PRV requirement should be “if needed”. The provided service pressure may not exceed 60psi, and almost assuredly will not when water is provided from a private well (commonly pressure switches are set at 40psi).

Page 3, **Interior Criteria, Toilets** - Frequently the builder does not provide the toilet (or other fixtures/faucets) instead instruct the supplier or plumber to provide a WaterSense Label toilet without stipulation of brand and model. While toilets will often have the manufacturer’s name emblazoned somewhere on the fixture, model numbers are less frequent. Similarly, boxes, labels, installation instructions, etc. will generally be removed from the fixture and the premises long before the house is fully completed and therefore prior to a “final” or WaterSense inspection since builders, interested in keeping an orderly project, generally clean up and recycle or otherwise dispose of packaging on a daily basis. For this reason, verification of conforming fixtures and other products via original packaging and may be difficult or impossible. EPA should consider alternative methods of documentation. Further, EPA should provide a list of approved products to builders so that they can then verify the products used with their supplier.

#### **Pages 3 & 4, Interior Criteria, Bathroom and Kitchen Faucets -**

a. As currently required, documentation of fixture compliance will be unduly difficult for the reasons stated above.

b. Turning on the faucet with two handles while simultaneously starting the stop watch may prove physically impossible for a single person meaning two people will be required for the inspection thus adding significant unnecessary cost. NAHB urges EPA to provide acceptable variation tolerances for all measurements.

c. Getting “full flow” from a single handle faucet may prove difficult since single handled faucets may vary in how the handle should be set to achieve this status. (i.e.: should the handle be actually dead center? Pointed up? Pointed down? Etc.).

Page 4, **Interior Criteria, Showerheads** – EPA provides no definition of floor area and no provision for handicapped accessible showers. Placing a bucket under a showerhead on the shower floor will prove highly inaccurate in capturing all of the water that comes out of the showerhead. However, holding the bucket under the showerhead while simultaneously operating both the handles and the stopwatch requires at least two people in what may be a very confined space. Clarification on how the size and dimensions of the shower relates to showerhead performance should be provided in the guidance document as should more realistic testing guidelines.

Page 4, **Interior Criteria, Hot Water Delivery System-**

- a. The requirement for R-4 insulation needs to reflect that piping within walls or other parts of the building envelope is insulated with cellulose, spray foam, or other insulations. Armacell™ or similar pipe insulations that closely encase the pipe are not required.
- b. Significant structural issues are raised if Armacell™ or similar insulation is used and exceeds permitted hole sizes and locations in structural members.
- c. If a manifold system is used, the spacing of ports and piping from the manifold does not work with tubular insulations—the thickness of the insulation plus the outside pipe diameter can interfere with the connection of the pipe fittings to the manifold and may result in leaks. EPA should specify a design resolution for this significant problem related to the insulation requirement.
- d. Both pipe insulation and wall insulation will typically be purchased and installed by a subcontractor, not by the builder or an employee of the builder. Builders do not typically take photos of the plumbing system prior to drywall installation.
- e. A “Core plumbing system” is not adequately defined. Type of verification required for core plumbing system is not included in inspection parameters.

Page 6, **Demand-Initiated Hot Water Recirculating System, Requirements** - There are no parameters for the optimization of energy and water. Design parameters should be in the specifications, not in the inspection protocol.

Page 6, **Demand-Initiated Hot Water Recirculating System, Inspector Instructions**, first bullet

- a. The term “near” is not defined and can be interpreted as requiring three or more switches in a single bath (two lavatories, shower, bidet, etc.). No switch is needed for the hot water valve at the washing machine or bathtub (e.g., may be in a separate compartment).
- b. Temperature test may give poor/fallacious results when metallic tubing (copper) is used in a cold climate due to rapid cooling from the cold pipe. Especially problematic with temperature inaccuracy/tolerance previously noted—the required 10 degrees might actually be met absent cold tubing and instrument error, but would be noted as a program non-compliance by the inspector with corrective and (expensive) re-inspection required.

Page 6, **Whole House Manifold System, requirements** -

- a. The source of the hot water is the water heater, not the manifold as seems to be implied. The pipe between the water heater and the manifold will be at least ½”, more likely ¾”. The cumulative distance between the water heater and the faucet through the manifold is likely to mean that the 38 gallons requirement is exceeded.
- b. The .38 gal requirement should not apply to the washing machine (any faucet), bathtub, or whirlpool tub.

Page 6, **Whole House Manifold System, inspector instructions** - The 30 feet requirement is inappropriate for bathtubs and washing machine faucets since a larger pipe is needed. Vanguard manifold instructions note that some washing machines are filled based on time, not volume. Copper tubing is permitted between the manifold and the fixture; during cold periods the temperature increase may not reach 10 degrees.

**Drinking water Treatment Requirement** – not discussed fully, additional explanatory information should be provided.



NAHB is appreciative of the transparency thus far for the WaterSense program. While the Certification and Labeling System requires clarification and further information in several areas in order to maximize builder participation this document, like the other documents released by the WaterSense program before it, is a sound first draft. NAHB looks forward to the second draft of the certification process after EPA's careful reevaluation. If you have any further questions, please feel free to contact us at 202-266-8000 or by email at [kmorrow@nahb.com](mailto:kmorrow@nahb.com) or [lmark@nahb.com](mailto:lmark@nahb.com).

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