

200912 DRAFT VERSION 1.1 WATERSENSE® ~~SINGLE-FAMILY-NEW HOME~~ SPECIFICATION

1.0 SCOPE AND OBJECTIVE

This specification establishes the criteria for water-efficient new homes under the U. S. Environmental Protection Agency's (EPA's) WaterSense® program. It is applicable to **newly constructed homes that are:**

- single-family homes and townhomes, ~~three stories or less in size~~
OR
- residential units in multi-family buildings, three stories or less in size
OR
- residential units in multi-family buildings, including mixed-use buildings, that have independent heating, cooling, and hot water systems separate from other units

A new home must be built by a [WaterSense builder partner](#) and meet all of the identified criteria to become a WaterSense labeled new home.

The intent of this specification is to reduce indoor and outdoor water usage in new residential homes, thereby lowering consumer utility bills and encouraging water and wastewater infrastructure savings. EPA's goal is that WaterSense labeled new homes will use approximately 20 percent less water than a standard new home by using a combination of prescriptive and performance-based approaches identified in this specification.

This specification is not intended to contravene state or local codes and requirements. All homes, landscapes, and irrigation systems shall meet all applicable national, state, and local regulations. In addition, plumbing and irrigation installers shall meet all applicable state and local licensing requirements. Unless indicated, criteria for the individual components or products specified in this specification do not constitute criteria to earn the WaterSense label for that component or product category. Individual component criteria are valid only in the context of this specification.

2.0 SUMMARY OF CRITERIA

New homes must meet criteria in three areas:

1. Indoor water use, including plumbing, plumbing fixtures and fittings, appliances, and other water-using equipment.
2. Outdoor water use, including landscape design. Irrigation systems are not required. Irrigation systems that are installed must meet the criteria in this specification.
3. Homeowner education.

For units in a multi-family building to be eligible for the WaterSense label, certain prerequisites must be met in all common use areas and systems as described within the specification and summarized in Appendix D.

3.0 INDOOR WATER-EFFICIENCY CRITERIA

- 3.1 Leaks – There shall be no detected leaks from any water-using fixtures, appliances, or equipment. Compliance shall be verified through pressure-loss testing and visual inspection.
- 3.2 Service Pressure – The static service pressure shall be a maximum of 60 pounds per square inch (psi) (414 kilopascal [kPa]). Compliance for homes supplied by groundwater wells shall be achieved by use of a pressure tank. Compliance for ~~single-family~~ homes with publicly supplied water shall be achieved by one of the following methods:
- Use of a pressure-regulating valve (PRV) downstream of the point of connection. All fixture connections shall be downstream of the PRV.
 - Determination that the service pressure at the home is 60 psi or less at the time of inspection and documentation from the public water supplier that the service pressure is unlikely to regularly exceed 60 psi at the home on a daily or seasonal basis.

For units in multi-family buildings, the service pressure within each unit shall be at a maximum of 60 psi.

Piping for ~~home~~-fire sprinkler systems is excluded from this requirement and should comply with state and local codes and regulations.

- 3.3 Hot Water Delivery System – To minimize water wasted while waiting for hot water, the hot water distribution system shall store no more than 0.5 gallons (1.9 liters) of water in any piping/manifold between the hot water source and any hot water fixture. To account for the additional water that must be removed from the system before hot water can be delivered, no more than 0.6 gallons (2.3 liters) of water shall be collected from the hot water fixture before hot water is delivered. ~~Timer- and temperature-based recirculating systems shall not be used to meet the criteria. Recirculation systems must be demand initiated. Systems that are activated based solely on a timer and/or temperature sensor do not meet this requirement.~~

See Appendix B to determine the approximate volume of water in piping systems.

3.4 Toilets and Urinals

- 3.4.1 Toilets – All toilets shall be WaterSense labeled tank-type toilets. A listing of labeled toilets can be found at www.epa.gov/watersense/product_search.html.
- 3.4.2 Urinals – All urinals, if installed, shall be WaterSense labeled flushing urinals. A listing of labeled urinals can be found at www.epa.gov/watersense/product_search.html.

3.5 Bathroom and Kitchen Faucets

3.5.1 Bathroom sink faucets – All bathroom sink faucets shall be WaterSense labeled bathroom sink faucets or faucet accessories (e.g., aerators). A list of labeled faucets and accessories can be found at www.epa.gov/watersense/product_search.html.

3.5.2 Kitchen sink faucets – All kitchen sink faucets shall comply with federal standards for a maximum flow rate of 2.2 gallons per minute (gpm) (8.3 liters per minute [lpm]).

3.6 Showerheads and Shower Compartments

3.6.1 Showerheads – All showerheads shall be WaterSense labeled showerheads. ~~These criteria are applicable to fixed showerheads that direct water onto a user for bathing purposes and hand-held showers.~~ This includes fixed showerheads that direct water onto a user (excluding body sprays) for bathing purposes and hand-held showers. A list of labeled showerheads can be found at www.epa.gov/watersense/product_search.html.

~~All showerheads shall comply with the requirements of the Energy Policy Act of 1992, which sets a maximum flow rate of 2.505 gpm (7.69595 lpm), when certified in accordance with ASME A112.18.1/CSA B125.1⁺. In cases where more than one showerhead or hand-held shower is provided in combination with others in a single device intended to be connected to a single shower outlet, the entire device must meet the maximum flow requirement in all possible operating modes.~~

~~Note: Showerhead criteria will be revised after the release of the final specification for WaterSense labeled showerheads in early 2010. A copy of EPA's draft showerhead specification can be found at www.epa.gov/watersense/Products.~~

3.6.2 Shower compartments – The total allowable flow rate of water from all showerheads flowing at any given time, including rain systems, waterfalls, bodysprays, and jets, shall be limited to 2.05 gpm per shower compartment, where the floor area of the shower compartment is less than or equal to 2,160 inches² (in.²) (1.4 meters² [m²]). For each increment of 2,160 in.² (1.4 m²) of floor area thereafter or part thereof, additional showerheads are allowed, provided the total flow rate of water from all flowing devices is equal to or less than 2.50 gpm per shower compartment, and the additional showerheads are operated by controls that are separate from the other showerheads in the compartment.

⁺ ~~References to these and other ASME and CSA standards apply to the most current version of these standards.~~

- 3.7 Appliances – If the following types of appliances are financed, installed, or sold as upgrades through the homebuilder, they shall meet these criteria:
- 3.7.1 Dishwashers – Dishwashers shall be ENERGY STAR® qualified. A listing of qualified dishwashers can be found at www.energystar.gov/index.cfm?fuseaction=dishwash.search_dishwashers.
- 3.7.2 Clothes washers – Clothes washers, including those in common-use laundry rooms of multi-family buildings, shall be ENERGY STAR qualified with a water factor (WF) of less than or equal to 6.0 gallons of water per cycle per cubic foot of capacity. A listing of qualified clothes washers can be found at www.energystar.gov/index.cfm?fuseaction=clotheswash.search_clotheswashers.
- 3.8 Other Equipment – If the following pieces of equipment are financed, installed, or sold as upgrades through the homebuilder, they shall meet these criteria:
- 3.8.1 Evaporative cooling systems – Evaporative cooling systems shall use a maximum of 3.5 gallons (13.3 liters) of water per ton-hour of cooling when adjusted to maximum water use. Blowdown shall be based on time of operation, not to exceed three times in a 24-hour period of operating (every 8 hours). Blowdown shall be mediated by conductivity or basin water temperature-based controllers. Once-through or single-pass cooling systems, systems with continuous blowdown/bleedoff, and systems with timer-only mediated blowdown management shall not be used to meet these criteria.
- 3.8.2 Water softeners – All self-regenerating water softeners shall be certified to meet NSF/ANSI 44 Residential Cation Exchange Water Softeners², including the voluntary efficiency rating standards in Section 7 – *Mandatory testing for elective claims* for efficiency rated systems, which states that water softeners shall:
- Be a demand-initiated regeneration system (i.e., it must use a flow meter or water hardness sensor to initiate regeneration; devices that use time clock-initiated regeneration [fixed time schedule] do not qualify for the efficiency rating).
 - Have a rated salt efficiency of not less than 3,350 grains of total hardness exchange per pound of salt, based on sodium chloride (NaCl) equivalency (477 grams of total hardness exchange per kilogram of salt).
 - Not generate more than 5 gallons of water per 1,000 grains of hardness removed during the service cycle (18.9 liters per 64.8 grams of total hardness removed).

² References to these and other NSF and ANSI standards apply to the most current version of those standards.

- 3.8.3 Drinking water treatment systems – Drinking water treatment systems must be certified to meet applicable NSF/ANSI standards, which are:
- NSF/ANSI 42 Drinking Water Treatment Units – Aesthetic Effects
 - NSF/ANSI 53 Drinking Water Treatment Units – Health Effects
 - NSF/ANSI 55 Ultraviolet Microbiological Water Treatment Systems
 - NSF/ANSI 58 Reverse Osmosis Drinking Water Treatment Systems
 - NSF/ANSI 62 Drinking Water Distillation Systems
- Such systems shall yield at least 85 gallons of treated water for each 100 gallons of water processed.

- 3.9 Metering – In multi-family buildings, each unit must be individually metered or equipped with an alternate technology capable of tracking water use and making the information available to the residents of the individual unit.

4.0 OUTDOOR WATER-EFFICIENCY CRITERIA

- 4.1 Landscape – All landscape criteria for single-family homes apply to the front yard. In addition, the criteria apply to all ~~other~~ areas improved upon by the builder for single-family and multi-family buildings including common-use areas of multi-family buildings intended or made available for the use of building residents. This includes areas with vegetation beyond temporary stabilization measures, irrigation systems, ~~permeable hardscape or softscape features~~, pools, spas, and/or water features.

Temporary landscapes (e.g., straw over bare soil) may be installed if permanent landscapes cannot be installed due to climate conditions ~~or because occupancy of units in multi-family buildings occurs before common-area landscapes are installed~~. Homes with temporary landscapes can be inspected for compliance with indoor criteria and may be sold ~~or occupied~~ before a permanent landscape is installed. ~~The WaterSense labeled designation (including use of stickers and certificates) may not be issued-used until the permanent landscape is installed, inspected, and certified to comply with the-outdoor all applicable criteria.~~

- 4.1.1 Landscape design – Design of the landscaped area shall be developed using the *WaterSense Water Budget Tool*. The tool and *WaterSense Water Budget Approach* can be found at www.epa.gov/watersense/water_budget ~~www.epa.gov/watersense/nhspecs/water_budget_tool.html and www.epa.gov/watersense/nhspecs/water_budget_approach.html~~ EPA has developed two options for designing the landscape of WaterSense-labeled new homes; ~~builders shall choose and implement one of these options.~~ For single-family homes, pools, spas, and other water features shall be treated as turfgrass ~~under both options.~~

~~4.1.1.1 Option 1 – Design of the landscaped area shall be developed using the WaterSense Water Budget Tool. The tool and WaterSense Water Budget Approach can be found at and~~

~~4.1.1.2 Option 2 – Turfgrass shall not exceed 40 percent of the landscaped area.~~

For multi-family buildings, common-use pools/spas and all areas that are reserved for private use of a particular residence/unit (such as areas deeded, identified as limited-use common elements, or otherwise restricted by building management) are excluded from the landscapable area. Additional criteria apply to pools/spas in section 4.1.4.

Lots with total landscapable areas equal to or less than 1,000 square feet are exempt from Criterion 4.1.1 Landscape design.

4.1.2 Slopes – Slopes in excess of 4 feet of horizontal run per 1 foot vertical rise (4:1) shall be vegetated.

4.1.3 Mulching – All exposed soil shall be covered with a 2- to 3-inch layer of [mulching material](#).

4.1.4 Pools/spas – Pools and spas financed, installed, or sold as upgrades by the homebuilder in ~~single-family homes~~ shall have an appropriate cover.

Common-use pools/spas in multi-family buildings must have the following features:

1. Be independently metered such that water use attributable to the pool and/or spa can be tracked and leaks can be readily identified.
2. Be equipped with a gutter or grate system to catch water splashes or drag-outs.
3. Be equipped with either sorptive media or cartridge filtration.

4.1.5 Ornamental water features – [Ornamental water features](#) financed, installed, or sold as upgrades by the homebuilder must recirculate water and serve a beneficial use.

4.2 Irrigation System – Irrigation systems are not required. Irrigation systems that are financed, installed, or sold through the homebuilder must meet the following criteria:

4.2.1 Design and installation – All irrigation systems shall be designed or installed by a [WaterSense irrigation partner](#).

Waivers from this requirement may be available if there are an insufficient number of available WaterSense irrigation partners. See Appendix C for

details on determining whether there are a sufficient number of available partners in your area.

- 4.2.2 Post-installation audit – All irrigation systems shall be audited by a WaterSense irrigation partner. Auditing procedures are described in the *Irrigation Audit Guidelines for WaterSense Labeled New Homes* at www.epa.gov/watersense/nhspeccs/nh_ irr_materials.html.

Waivers from this requirement may be available if there are an insufficient number of available irrigation partners. See Appendix C for details on determining whether there are a sufficient number of available partners in your area.

- 4.2.3 Leaks – There shall be no detected leaks during the operation of the irrigation system. The system shall be checked for leaks during the post-installation audit.
- 4.2.4 Runoff/overspray – Irrigation systems shall be designed and installed to sustain the landscape without creating runoff or direct overspray during a minimum operating duration.

Runoff and direct overspray shall be measured during the post-installation audit. The WaterSense irrigation partner shall determine the minimum operating duration based on landscape conditions and irrigation system design.

- 4.2.5 Distribution uniformity – Irrigation systems shall achieve a lower quarter distribution uniformity (DU_{LQ}) of 65 percent or greater. Distribution uniformity shall be measured on the largest spray-irrigated area during the post-installation audit.
- 4.2.6 Rainfall shutoff device – Irrigation systems shall be equipped with technology that inhibits or interrupts operation of the irrigation system during periods of rainfall or sufficient moisture (e.g., rain sensors, soil moisture sensors).
- 4.2.7 Irrigation controllers – ~~As of XXX XX, 20XX, irrigation systems shall be equipped with WaterSense labeled weather-based irrigation controllers. (includes stand-alone controllers, add-on devices, and plug-in devices) Soil moisture sensor-based irrigation controllers may continue to be used provided they contain the following features/capabilities in both smart and standard mode: irrigation controllers that contain the following features:~~
- ~~1. Multiple programming capabilities – shall be capable of storing a minimum of three different programs to allow for separate schedules.~~
 - ~~2. Multiple start times (cycling, cycle/soak, stackable start times) – shall be capable of a minimum of three different start times to allow for multiple irrigation cycles on the same zone for areas prone to runoff.~~

- ~~3. Variable run times shall be capable of varying run times, for example one minute to a minimum of one hour.~~
 - ~~4. Variable scheduling shall be capable of interval scheduling (minimum of 14 days) to allow for watering on even day scheduling, odd day scheduling, calendar day scheduling, and interval scheduling.~~
 - ~~5. Percent adjust (water budget) feature shall include a "Percent Up/Down Adjust" feature (or "Water Budget" feature) such as a button or dial that permits the user to increase or decrease the run times or application rates for each zone by a prescribed percentage, by means of one adjustment without modifying the settings for that individual zone.~~
 - ~~6. Capability to accept external soil moisture and/or rain sensors.~~
 - ~~7. Non-volatile memory or self-charging battery circuit.~~
 - ~~8. Complete shutoff capability for total cessation of outdoor irrigation.~~
1. The controller shall be capable of preserving the contents of the irrigation program settings when the power source is lost without relying on an external battery backup.
 2. The controller shall either be capable of independent, zone-specific programming or storing a minimum of three different programs to allow for separate schedules for zones with differing water needs.
 3. The controller shall be capable of indicating to the user when it is not receiving a signal or local sensor input and is not adjusting irrigation based on current weather or soil moisture conditions.
 4. The controller shall be capable of interfacing with a rainfall device.
 5. The controller shall be capable of accommodating watering restrictions as follows:
 - Operation on a prescribed day(s)-of-week schedule (e.g., Monday-Wednesday-Friday, Tuesday-Thursday-Saturday; any two days; any single day, etc.).
 - Either even-day or odd-day scheduling, or any day-interval scheduling between two and seven days.
 - The ability to set irrigation runtimes to avoid watering during a prohibited time of day (e.g., between 9:00 a.m. and 9:00 p.m.).
 - Complete shutoff (e.g., on/off switch) to accommodate outdoor irrigation prohibition restrictions.
 6. The controller shall include a percent adjust (water budget) feature.³

³ The percent adjust (water budget) feature is defined as having the means to increase or decrease the runtimes or application rates for zones by means of one adjustment without modifying the settings for each individual zone.

7. If the primary source of weather or soil moisture information is lost, the controller shall be capable of reverting to either a proxy of historical weather data or a percent adjust (water budget) feature.
8. The controller shall be capable of allowing for a manual operation troubleshooting test cycle and shall automatically return to smart mode within some period of time, as designated by the manufacturer, even if the switch is still positioned for manual operation.

Prior to XXX XX, 20XX, irrigation systems must be equipped with a controller (weather-based or using soil moisture sensors) that contain the features listed above.

A list of labeled weather-based irrigation controllers can be found at www.epa.gov/watersense/product_search.html.

Note: These irrigation controller criteria will be revised after the release of the final WaterSense specification for weather-based irrigation controllers. A copy of EPA's draft WaterSense specification for weather-based irrigation controllers can be found at www.epa.gov/watersense/Products.

- 4.2.8 Sprinkler irrigation – [Sprinkler irrigation](#), other than as a component of a [micro-irrigation system](#), shall not be used to water plantings other than maintained turfgrass. Sprinkler heads shall have a 4-inch or greater pop-up height and matched precipitation nozzles. Sprinkler irrigation shall not be used on strips of turfgrass less than 4 feet wide nor on slopes in excess of 4 feet of horizontal run per 1 foot vertical rise (4:1).
- 4.2.9 Micro-irrigation systems – At a minimum, micro-irrigation systems shall be equipped with pressure regulators, filters, and flush end assemblies.
- 4.2.10 Schedule – Two watering schedules, developed by the WaterSense irrigation partner as part of the post-installation audit, shall be posted at the controller. One schedule shall be designed to address the initial grow-in phase of the landscape, and the second schedule shall be designed to address an established landscape. Both schedules shall vary according to the seasons.
- 4.2.11 Metering – If an irrigation system is installed in a multi-family building, the system shall be independently metered.

5.0 HOMEOWNER AND BUILDING MANAGEMENT EDUCATION

- 5.1 Operating Manual (for single-family homes) – The builder shall develop and provide to the ~~single-family~~ homeowner a written operating and maintenance manual for all water-using equipment or controls installed in the house and yard, including all relevant WaterSense materials on indoor and outdoor water use. This manual may be a chapter or folder in an existing manual. If clothes washers

or dishwashers are not provided, general information about water-efficient appliances shall be included.

5.1.1 Irrigation System – If an irrigation system is installed, the builder shall provide the single-family homebuyer with a record drawing (i.e., schematic) of the system, an itemized list of irrigation components, copies of the irrigation schedules, and information about reprogramming the schedule after establishment of the landscape. This information should be included in the operating manual.

5.2 Occupant Operating Manual (for homes in a multi-family building) – For multi-family buildings, the builder shall develop and provide to the occupant of each labeled unit a written operating and maintenance manual for all water-using equipment or controls installed in the unit, including all relevant WaterSense materials on indoor water use. This manual may be a chapter or folder in an existing manual. If clothes washers or dishwashers are not provided but hookups are present, general information about water-efficient appliances shall be included. In addition, the manual shall include relevant information on water saving features of the building outside the unit (e.g., landscape, pools, laundry facilities).

5.3 Building Operating Manual – For multi-family buildings, the builder shall provide to the building management, an operating and maintenance manual for all water-using equipments and controls outside of individual units or inside of individual units that are maintained by building management.

5.3.1. Irrigation Systems – If an irrigation system is installed, the builder shall provide building management with a record drawing (i.e., schematic) of the system, an itemized list of irrigation components, copies of the irrigation schedules, and information about reprogramming the schedule after establishment of the landscape.

5.3.2. Pools/Spas – If pools and/or spas are present, the builder shall include detailed information regarding filtration equipment and the manufacturer's recommended maintenance schedule, as well information on monitoring pools/spas for leaks.

5.2 Irrigation System – ~~If an irrigation system is installed, the builder shall provide the single-family homebuyer with a record drawing (schematic) of the system, an itemized list of irrigation components, copies of the irrigation schedules, and information about reprogramming the schedule after establishment of the landscape. This information should be included in the operating manual. See~~

6.0 FUTURE SPECIFICATION REVISIONS

EPA reserves the right to revise this specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. Industry partners and other interested parties will be notified in advance of anticipated changes. Revisions to the specification would be made following discussions with industry partners and other interested parties.

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7.0 DEFINITIONS

ANSI – American National Standards Institute

ASME – American Society of Mechanical Engineers

CSA – Canadian Standards Association

EPA licensed certification provider – An organization licensed by EPA to hire or contract with inspectors, oversee new home inspections, and provide builder partners of certified new homes with the WaterSense new home label certificate. More information concerning the licensed certification provider's roles and responsibilities can be found in the [WaterSense new homes certification system](#).

Evaporative cooling system – System that cools the air using water evaporation. There are two types of evaporative cooling systems: direct and indirect (all called “two-stage”). In a direct evaporative cooling system, a blower forces air through a permeable, water-soaked pad. As the air passes through the pad, it is filtered, cooled, and humidified. An indirect evaporative cooling system has a secondary heat exchanger that prevents humidity from being added to the airstream that enters the home. Cooling systems are defined by the temperatures they can “hold,” either in the space and/or the process or equipment, and the amount of heat they can remove at full capacity. This heat removal is normally expressed in tons of cooling (or refrigeration) capacity. One ton of cooling equals precisely 12,000 British thermal units of heat removal per hour (Btu/h).

Front yard – Use local code definitions when available. Otherwise, the front yard means the portion of the lot extending across the full width of the lot between the front lot line and the front walls of the house.

Hand-held shower – A subset of showerheads that are moveable devices for directing water onto a user and are connected to the shower valve via a hose. Hand-held showers can be installed on a support to function as a showerhead.

Hot water source – The container in which water is stored and/or heated such as a hot water heater or a demand-controlled recirculation loop.

Landscaped area – The designed area of landscape excluding the footprint of the home and permanent hardscape areas such as driveways, sidewalks, and patios. Septic drainage fields and public right-of-ways should also be excluded from this calculation.

Lower quarter distribution uniformity (DU_{LQ}) – The measure of uniformity of irrigation water applied over an area. DU_{LQ} is the ratio of the average of the lowest 25 percent of measurements to the overall average measurement.

Micro-irrigation system - The frequent application of small quantities of water on or below the soil surface as drops, tiny streams, or miniature spray through emitters or applicators placed along a water delivery line. Micro-irrigation encompasses a number of methods or concepts

such as bubbler, drip, trickle, mist, or spray and subsurface irrigation.⁴ For purposes of this specification, micro-irrigation includes emission devices that have flow rates less than 30 gallons per hour (113.6 liters per hour).

Mulching material – A permeable arrangement of organic and/or inorganic materials that will help to retain soil moisture, suppress weeds, and allow free movement of oxygen into and out of the soil.

NSF – NSF International is an accredited, third-party certification body that tests and certifies products to verify they meet these public health and safety standards.

Ornamental water feature – Includes fountains, ponds, waterfalls, man-made streams, and other decorative water-related constructions. To meet the criteria, these features shall recirculate water and serve a beneficial use (e.g., habitat for wildlife, stormwater management, cooling properties).

Post-installation irrigation system audit – Procedure to collect and present information concerning the uniformity of application, precipitation rate, and general condition of an irrigation system and its components.⁵

Sprinkler irrigation – Type of irrigation using mechanical devices with nozzles (sprinklers) to distribute the water by converting water pressure to a high velocity discharge stream or streams.⁶

Static service pressure – The pipeline or municipal water supply pressure when water is not flowing.

Water factor – The quotient of the total weighted per-cycle water consumption divided by the capacity of the clothes washer. Lower numbers indicate more efficient use of water.

WaterSense builder partner – A homebuilder who has committed to building new homes in accordance with the *WaterSense ~~Single-Family~~ New Home Specification*. The builder must signify such commitment by signing a WaterSense partnership agreement with EPA.

WaterSense irrigation partner – A professional certified through WaterSense labeled programs by demonstrating expertise in water-efficient irrigation technology and techniques. The specifications for professional certification programs can be found at www.epa.gov/watersense/partners/product_program_specs.html and a listing of WaterSense irrigation partners by state can be found at www.epa.gov/watersense/meet_our_partners.html.

WaterSense labeled bathroom sink faucet – A faucet that has been certified to meet the *WaterSense Lavatory Faucet Specification*. The faucet must have a flow rate that does not exceed 1.5 gallons per minute (gpm) (5.7 lpm) at a pressure of 60 psi (414 kPa) at the inlet

⁴ American Society of Agricultural Engineers, 2003. ASAE EP405.1 FEB03 Design and Installation of Microirrigation Systems

⁵ Irrigation Association. 2005. *Landscape Irrigation Scheduling and Water Management*.

⁶ Irrigation Association. 2005. *Landscape Irrigation Scheduling and Water Management*.

when water is flowing and is not less than 0.8 gpm (3.0 lpm) at a pressure of 20 psi (1.4 kPa) at the inlet when water is flowing. The *WaterSense Lavatory Faucet Specification* can be found at www.epa.gov/watersense/products, and a list of WaterSense labeled faucets and faucet accessories can be found at www.epa.gov/watersense/product_search.html.

WaterSense labeled flushing urinals – A urinal that has been certified to meet the *WaterSense Specification for Flushing Urinals*. These urinals have a flush volume that does not exceed 0.5 gallons (1.9 liters), comply with existing standards for flushing urinals, and are tested for trap seal restoration and flush effectiveness. The *WaterSense Specification for Flushing Urinals* can be found at www.epa.gov/watersense/products, and a list of labeled urinals can be found at www.epa.gov/watersense/product_search.html.

WaterSense labeled showerhead – A showerhead that has been certified to meet the *WaterSense Specification for Showerheads*. The showerhead must have a flow rate that does not exceed 2.0 gpm (7.6 lpm) at flowing pressures of 20, 45, and 80 ± 1 pounds per square inch (psi) (140, 310, and 550 ± 7 kilopascal [kPa]). The *WaterSense Specification for Showerheads* can be found at www.epa.gov/watersense/products, and a list of WaterSense labeled showerheads can be found at www.epa.gov/watersense/product_search.html.

WaterSense labeled tank-type toilet – A toilet that has been certified to meet the *WaterSense Tank-Type Toilet Specification*. These toilets have a flush volume that does not exceed 1.3 gallons (4.8 liters), have a solid waste removal of 350 grams or greater, and conform to the adjustability and other supplementary requirements included in the *WaterSense Tank-Type Toilet Specification*. This specification can be found at www.epa.gov/watersense/products, and a list of labeled toilet models can be found at www.epa.gov/watersense/product_search.html.

WaterSense labeled weather-based irrigation controllers – An irrigation controller that has been certified to meet the *WaterSense Specification for Weather-Based Irrigation Controllers*. It applies to stand-alone controllers, add-on devices, and plug-in devices that use current weather data as a basis for scheduling irrigation. The *WaterSense Specification for Weather-Based Irrigation Controllers* can be found at www.epa.gov/watersense/products, and a list of labeled weather-based irrigation controllers can be found at www.epa.gov/watersense/product_search.html.

APPENDIX A

Informative Annex for WaterSense Labeling

The following requirements must be met before a new home may earn the WaterSense label.

1.0 WATERSENSE PARTNERSHIP

The homebuilder must have a signed partnership agreement in place with EPA.

2.0 CONFORMITY ASSESSMENT

Conformance to this specification must be certified by an [EPA licensed certification provider](#) in accordance with the [WaterSense New Home Certification System](#).

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APPENDIX B

Determining Volume of Piping Systems

Internal Volume of Various Water Distribution Tubing

Ounces of Water Per Foot Length of Hot Water Tubing								
Nominal Size (Inches)	Copper M	Copper L	Copper K	CPVC CTS SDR 11	CPVC SCH 40	PEX-AI-PEX ASTM F 1281	PE-AL-PE	PEX CTS SDR 9
3/8	1.06	0.97	0.84	N/A	1.17	0.63	0.63	0.64
1/2	1.69	1.55	1.45	1.25	1.89	1.31	1.31	1.18
3/4	3.43	3.22	2.90	2.67	3.38	3.39	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	5.56	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.49	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	13.88	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	21.48	21.48	13.86

Source: Modified from 2009 International Plumbing Code Table E202.1. International Code Council. January

Conversions: 1 gallon (3.8 liters) = 128 ounces
 1 ounce = 0.00781 gallons (0.0296 liters)
 0.5 gallons (1.9 liters) = 64 ounces
 0.6 gallons (2.3 liters) = 76.8 ounces

APPENDIX C

Identifying Available WaterSense Irrigation Partners

WaterSense has labeled certification programs for irrigation professionals in three categories: designers; installation and maintenance professionals; and auditors. Criteria 4.2.1 and 4.2.2 require the use of an irrigation partner who is:

- A certified designer, to design the irrigation system, or a certified installation/maintenance professional, to install the irrigation system (4.2.1); and
- A certified auditor, to audit the irrigation system (4.2.2).

If there are fewer than three available WaterSense irrigation partners who are certified designers and fewer than three available WaterSense irrigation partners who are certified installation/maintenance professionals that provide services to the city, county, or metropolitan area where the home is located, an exemption from criterion 4.2.1 may apply.

If there are no available irrigation partners who are certified auditors that provide services to the city, county, or metropolitan area where the home is located, an exemption from criterion 4.2.2 may apply.

The following steps should be followed to determine if there are a sufficient number of available irrigation partners to comply with criteria 4.2.1 and 4.2.2.

4.2.1 Design and Installation

1. Go to the WaterSense Web site at www.epa.gov/watersense/meet_our_partners.html and review the list of WaterSense irrigation partners by state.
2. If there are 3 or more irrigation partners who are certified designers or 3 or more irrigation partners who are certified installation/maintenance professionals that perform irrigation services in the city, county, or metropolitan area where the home is being built, contact the individuals to determine if they are accepting new residential work. If at least 3 partners in one of the categories are accepting new residential work, there is no exemption.
3. If there are fewer than 3 certified designer partners and fewer than 3 certified installer partners that identified the city, county, or metropolitan area where the home is being built as areas in which they work, but there are additional partners with the appropriate certification indicating they perform work throughout the state, either:
 - a. Contact the individual irrigation partners to determine if they perform irrigation services in the city, county, or metropolitan area where the home is being built and are available to take on additional residential work. **OR**

b. Contact the WaterSense Helpline to ask for assistance in determining if there are 3 or more available irrigation partners with the appropriate certifications that perform irrigation services in the area where the home is being built. If at least 3 partners in one of the categories are accepting new residential work, there is no exemption.

4. If there are neither 3 certified designer partners nor 3 certified installer partners that perform residential work in that state, the home is exempt from the requirement(s) to have the irrigation system designed and/or installed by a WaterSense irrigation partner. Contact the WaterSense Helpline to request a waiver from the requirement(s).

4.2.2 Post-Installation Audit

1. Go to the WaterSense website at www.epa.gov/watersense/meet_our_partners.html and review the list of WaterSense irrigation partners by state.
2. If there is at least one irrigation partner who is a certified auditor that performs irrigation services in the city, county, or metropolitan area where the home is being built, contact the individual to determine if he/she is accepting new residential work. If at least 1 partner is accepting new work, there is no exemption.
3. If no WaterSense irrigation partners who are certified auditors identified the city, county, or metropolitan area where the home is being built as areas in which they work, but there is at least 1 partner who is a certified auditor indicating he/she performs work throughout the state, either:
 - a. Contact the individual irrigation partner(s) to determine if they perform irrigation services in the city, county, or metropolitan area where the home is being built and are available to take on additional residential work. **OR**
 - b. Contact the WaterSense Helpline to ask for assistance in determining if there is an available irrigation partner who is a certified auditor that performs irrigation services in the area where the home is being built. If at least 1 partner who is a certified auditor is accepting new residential work, there is no exemption.
4. If there are no WaterSense irrigation partners who are certified auditors that perform residential work in that state, contact the WaterSense Helpline. The WaterSense Helpline will identify a professional who can perform the audit or will grant a waiver from the requirement(s).

APPENDIX D

Summary of Additional and Adjusted Criteria for Multi-Family Buildings

The following is a summary of criteria specific to units in multi-family buildings. In addition to requirements that apply to products, features, and systems within the unit(s), certain prerequisites must be met in a multi-family building for any unit to be eligible for the label. For the full criteria, please refer to the *WaterSense New Home Specification* (the specification). The summary below refers to criteria in the sections of the specification as noted.

SECTION 1: SCOPE AND OBJECTIVE

- 1.0 For units in a multi-family building to be eligible for the WaterSense label, they must be in a building that meets all the prerequisites outlined in the *WaterSense New Home Specification*. Furthermore, the building shall be:
- Three stories (above grade) or less in size
 - Of any height, provided that the units have independent heating, cooling, and hot water systems separate from other units

SECTION 3: INDOOR WATER-EFFICIENCY CRITERIA

Except where specifically noted or modified, any unit in a multi-family building must meet all of the indoor criteria in the specification.

- 3.2 Service Pressure & Pressure Loss Test – For units in multi-family buildings, the service pressure within the unit must be 60 pounds per square inch (psi) or less.
- 3.7.2 Laundry Facilities – All equipment in common-use laundry rooms shall meet the criteria outlined in section 3.7.2 of the *WaterSense New Home Specification*:
- Clothes washers shall be ENERGY STAR® qualified with a water factor (WF) of less than or equal to 6.0 gallons of water per cycle per cubic foot of capacity. A listing of qualified clothes washers can be found at www.energystar.gov/index.cfm?fuseaction=clotheswash.search_clotheswashers.
- 3.9 Metering – Each unit must be individually metered or equipped with an alternate technology capable of tracking water use and making information available to the homeowner.

SECTION 4.0: OUTDOOR WATER-EFFICIENCY CRITERIA

Units in multi-family buildings will only be eligible for the WaterSense label if all common-use outdoor areas meet the following requirements.

4.1 Landscape – In instances where specific units are occupied prior to others and landscaping is not feasible due to ongoing construction activity, temporary landscapes (e.g., straw over bare soil) can be installed. Units can be inspected for compliance with indoor criteria and may be occupied before a permanent landscape is installed. However, the WaterSense label shall not be issued until the permanent landscape is installed, inspected, and certified to comply with the outdoor criteria.

4.1.1 Landscape Design – The landscape design criteria outlined in section 4 of the *WaterSense New Home Specification* will apply to all common-use outdoor areas.

- Landscapable Area – The landscapable area for multi-family buildings will be defined as the area improved upon by the builder and intended or made available for the use of building residents. Such areas will include all areas with vegetation beyond temporary stabilization measures, irrigation systems, permeable hardscape or softscape features, pools, spas, and water features.
- Private-Use Areas – Areas that are reserved for private use of a particular residence (such as areas deeded, identified as limited-use common elements, or otherwise restricted by building management) are excluded from the landscapable area.

4.1.4. Pools/Spas – Common-use pools/spas in multi-family buildings are excluded from the landscapable area. Pools/spas shall:

- Be independently metered such that water use attributable to the pool and/or spa can be tracked and leaks can be readily identified.
- Be equipped with a gutter or grate system to catch water splashes or drag-outs.
- Be equipped with either sorptive media or cartridge filtration.

4.2 Irrigation System – An irrigation system is not required. If an irrigation system is installed, it shall be independently metered and meet all the requirements discussed in section 4.2 of the specification.

5.0 RESIDENT AND BUILDING MANAGEMENT EDUCATION

5.2 Occupant Operating Manual – The builder shall develop and provide to the occupant of each labeled unit a written operating and maintenance manual for all water-using equipment or controls installed in the unit, including all relevant WaterSense materials on indoor water use. This manual may be a chapter or folder in an existing manual. If clothes washers or dishwashers are not provided but hookups are present, general information about water-efficient appliances shall be included. In addition, the manual shall include relevant information on water-saving features of the building outside the unit (e.g., landscape, pools, laundry facilities).

- 5.3 Building Operating Manual – The builder shall provide to the building management an operating and maintenance manual for all water-using equipments and controls outside of individual units or inside of individual units that are maintained by building management.
- 5.3.1. Irrigation Systems – If an irrigation system is installed, the builder shall provide building management with a record drawing such as a schematic of the system, an itemized list of irrigation components, copies of the irrigation schedules, and information about reprogramming the schedule after establishment of the landscape.
- 5.3.2. Pools/Spas – If pools and/or spas are present, the builder shall include detailed information regarding filtration equipment and the manufacturer’s recommended maintenance schedule, as well as information on monitoring pools/spas for leaks.

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