Water Efficiency

Required

WE Prerequisite 1

Potable Water Use for Medical Equipment Cooling

Intent
Eliminate potable water use for medical equipment cooling.

Health Issues

Maintaining adequate potable water supplies is a basic necessity for the health of individuals and communities. Only about 1% of the water on Earth is fresh water. Processing potable water is energy intensive and thus contributes to air emissions associated with fossil fuel energy generation (for the treatment, pumping and maintenance of the potable water systems). Only about 20% of current urban water is used for drinking and sanitary purposes, with the other 80% not requiring treatment to potable standards. Using reclaimed water for selected applications can reduce costs and preserve precious potable water supplies. To protect the public health, a dual or dedicated distribution system must be installed to segregate potable and reclaimed water for health, product and process purposes.

Credit Goals

- Do not use potable water for once-through cooling for any medical equipment that rejects heat. (*Note: This credit does not apply to potable water for cooling tower makeup, or for other evaporative cooling systems; refer to GGHC WE Credit 2.3 & 2.4 for process water use reduction.)*

- As an exception to the above, controlled once-through cooling is allowed where local requirements mandate limiting the discharge temperature of fluids into the drainage system.

Suggested Documentation

❑ Compile documentation of technologies employed to eliminate once-through use of potable water for all medical equipment cooling purposes.

Reference Standards
There is no reference standard for this credit.

Potential Technologies & Strategies

- Use closed-loop cooling water for medical equipment cooling instead of open-loop (once-through). Often, cooling of equipment is considered a critical application, where redundancy is desired to significantly reduce or eliminate the possibility of a loss of cooling. When using closed-loop cooling systems for critical applications (i.e. where failure of equipment due to loss of cooling would result in danger to patients or medical personnel, damage to equipment, loss of medical information, or other significant adverse impacts), owners should utilize multiple pieces of cooling equipment (n+1 redundancy). Where this is not possible, an owner may elect to use potable water in an open-loop (once-through) configuration as the *emergency back-up* cooling system only. Design such emergency back-up

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WE Prerequisite 1 continued

Potable Water Use for Medical Equipment Cooling

systems to switch on only in the event that the primary closed-loop cooling equipment has failed, and such a failure is visually and audibly indicated at the point of use and alarmed at a continuously monitored location.

- Use non-potable water sources for once-through cooling applications.

GGHC Construction Credit Synergy
- WE Credit 2: Potable Water Use Reduction

GGHC Operations Credit Synergy
- WC Credit 2: Building Water Use Reduction
- WC Credit 3: Performance Measurement: Enhanced Metering

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1 point

WE Credit 1

Water Efficient Landscaping: **No Potable Water Use or No Irrigation**

Intent

Eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Health Issues

Maintaining adequate potable water supplies is a basic necessity for the health of individuals and communities. Only about 1% of the water on Earth is fresh water. Processing potable water is energy intensive and thus contributes to air emissions associated with fossil fuel energy generation (for the treatment, pumping and maintenance of the potable water systems). Only about 20% of current urban water is used for drinking and sanitary purposes, with the other 80% not requiring treatment to potable standards. Using reclaimed water for selected applications can reduce costs and preserve precious potable water supplies. To protect the public health, a dual or dedicated distribution system must be installed to segregate potable and reclaimed water for health, product and process purposes.

Native landscapes can dramatically lower irrigation requirements, with little if any supplemental irrigation required after plant establishment, and attract native wildlife, birds, and insects, creating a building site integrated with its natural surroundings.

Credit Goals

- Use only captured rainwater, recycled wastewater, recycled greywater, or water treated and conveyed by a public agency specifically for non-potable uses for irrigation.

OR

- Install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed only if removed within one year of installation.

Note: Vegetated areas in compliance with GGHC SS Credit 5.1: Reduced Site Disturbance: Protect or Restore Open Space or Habitat; GGHC SS Credit 7.2: Heat Island Effect: Roof; GGHC SS Credit 9.1: Connection to the Natural World: Outdoor Places of Respite; or GGHC SS Credit 9.2: Connection to the Natural World: Exterior Access for Patients are exempted from this credit if they use a high-efficiency irrigation system.

Note: Native plants are plants indigenous to a locality or cultivars of native plants that are adapted to the local climate and are not considered invasive species or noxious weeds.

Suggested Documentation

- ❑ Prepare documentation substantiating that potable water consumption for irrigation has been eliminated.
- ❑ Include a brief narrative of the use of native plants or non-invasive drought-tolerant plants.
- ❑ If vegetated areas comply with GGHC SS Credit 5.1, GGHC SS Credit 7.2, GGHC SS Credit 9.1, and/or GGHC SS Credit 9.2, prepare documentation (plans, cut sheets, etc.) of the high-efficiency irrigation system(s) used in those areas.

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WE Credit 1 continued

Water Efficient Landscaping: **No Potable Water Use or No Irrigation**

Reference Standards
There is no reference standard for this credit.

Potential Technologies & Strategies

- Perform a soil and climate analysis to determine appropriate landscape types and design the landscape with indigenous plants to reduce or eliminate irrigation requirements.

- Specify and install a roof-water or groundwater collection system. Use metal, clay, or concrete based roofing materials and take advantage of gravity water flows whenever possible. Roofing materials made of asphalt or with lead-containing materials contaminate collected rainwater and render it unsuitable. Check with local regulatory authorities regarding the collection of rainwater as there may be local regulations governing rainwater collection and reuse.

- Utilize stormwater, greywater, and/or condensate water for irrigation.

GGHC Construction Credit Synergies
- SS Prerequisite 1: Construction Activity Pollution Prevention
- SS Credit 1: Site Selection
- SS Credit 5: Site Development
- SS Credit 6: Stormwater Design
- SS Credit 7: Heat Island Effect
- SS Credit 9: Connection to the Natural World
- WE Credit 2: Potable Water Use Reduction
- EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems
- EA Prerequisite 2: Minimum Energy Performance
- EA Credit 1: Optimize Energy Performance
- EA Credit 3: Enhanced Commissioning
- EA Credit 5: Measurement & Verification
- EQ Credit 7: Thermal Comfort
- EQ Credit 8: Daylight & Views

GGHC Operations Credit Synergies
- WC Credit 1: Water Efficient Landscaping
- ES Credit 1: Outdoor Grounds & Building Exterior Management

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1 point

WE Credit 2.1

Potable Water Use Reduction: **Measurement & Verification**

Intent

Provide for the ongoing accountability and optimization of building water consumption performance over time.

Health Issues

Approximately 70% of the potable water consumption in health care facilities is attributable to process water uses, compared to less than 30% consumed for "domestic" use. Maintaining adequate potable water supplies is a basic necessity for the health of individuals and communities. Only about 1% of the water on Earth is fresh water. Processing potable water is energy intensive and thus contributes to air emissions associated with fossil fuel energy generation (for the treatment, pumping and maintenance of the potable water systems).

Credit Goals

Develop and implement a Measurement & Verification (M&V) Plan consistent with Option D: Whole Building Calibrated Simulation, Savings Estimation Method 2 as specified in the International Performance Measurement and Verification Protocol (IPMVP), Volume III, April 2003, OR Option B: Retrofit Isolation as specified in the International Performance Measurement and Verification Protocol (IPMVP) Volume I, Concepts for Determining Energy and Water Savings, March 2002, to provide for long term continuous measurement of potable cold water uses within the facility.

- Meter the following water uses (as applicable to the project):
  - Water use in laboratory
  - Water use in dietary department
  - Water use in central sterile and processing department
  - Water use in laundry
  - Water use in radiology and imaging department
  - Water use in surgical suite
  - Purified water system (reverse osmosis and/or de-ionized) and filter backwash water
  - Outdoor irrigation systems
  - Cooling tower make-up and filter backwash water
  - Steam boiler system make-up water
  - Closed loop hydronic system make-up water
  - Cold-water make up for hot water system
- The M&V Plan shall cover a period of no less than one year of post-construction occupancy.

Suggested Documentation

❑ Compile a Measurement & Verification Plan with summary schedule of the instrumentation and controls for the required monitoring categories, highlighting the I/O data points to be collected.

❑ Document the monitoring system, including cut sheets of sensors and the data collection system.

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WE Credit 2.1 continued

Potable Water Use Reduction: **Measurement & Verification**

Reference Standards

International Performance Measurement and Verification Protocol (IPMVP), Volume I, March 2002 and Volume III, April 2003, http://www.evo-world.org.

Potential Technologies & Strategies

- Design the building with equipment to measure water performance. Sub-meter potable water systems.

- Use measured system data to identify opportunities for reduced use of potable water.

GGHC Construction Credit Synergies

- SS Credit 1: Site Selection
- SS Credit 5: Site Development
- SS Credit 6: Stormwater Design
- WE Credit 1: Water Efficient Landscaping
- WE Credit 2: Potable Water Use Reduction
- EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems
- EA Prerequisite 2: Minimum Energy Performance
- EA Credit 1: Optimize Energy Performance
- EA Credit 3: Enhanced Commissioning
- EA Credit 5: Measurement & Verification

GGHC Operations Credit Synergies

- WC Prerequisite 1: Minimum Water Efficiency
- WC Credit 1: Water Efficient Landscaping
- WC Credit 2: Building Water Use Reduction
- WC Credit 3: Performance Measurement: Enhanced Metering

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2 points

WE Credit 2.2, 2.3

Potable Water Use Reduction: **Domestic Water**

Intent

Maximize potable water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Note: These credits refer to domestic potable water use. For reduction of potable water use in cooling and process applications, refer to GGHC WE Credits 2.4 and 2.5, Potable Water Use Reduction: Process Water & Building System Equipment. For reduction of potable water use in irrigation, refer to GGHC WE Credit 1, Water Efficient Landscaping.

Health Issues

Maintaining adequate potable water supplies is a basic necessity for the health of individuals and communities. Only about 1% of the water on Earth is fresh water. Processing potable water is energy intensive and thus contributes to air emissions associated with fossil fuel energy generation (for the treatment, pumping and maintenance of the potable water systems). Only about 20% of current urban water is used for drinking and sanitary purposes, with the other 80% not requiring treatment to potable standards. Using reclaimed water for selected applications can reduce costs. To protect the public health, a dual or dedicated distribution system must be installed to segregate potable and reclaimed water for health, product and process purposes.

Credit Goals

- **Credit 2.2 (1 point)** Equip all urinals (but not toilets or bed pan washers) with sensor operators. Equip all handwash sinks (but not compounding sinks, housekeeping sinks, or sinks in toilet rooms for inpatient bed rooms) with sensor operators.

- **Credit 2.3 (1 point)** Use low-flow fixtures or control fixture flows to achieve the following maximum water flows: lavatories - 1.5 gpm; showers - 1.8 gpm; urinals - 1 gallon/flush; and use 1.6 gpm/1.1 gpm flushometers for all toilets.

Suggested Documentation

❑ Compile cut sheets for all sensor-operated controls. Compile schedule sheets and plans indicating the use of such operators.

❑ Compile cut sheets for all water consuming fixtures necessary for the occupancy use for the building with water flow measures highlighted.

Reference Standards

There is no reference standard for this credit.

Potential Technologies & Strategies

- Provide a separate glass-fill device in patient room sinks located to prevent activation of the handwash sensor.

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WE Credit 2.2, 2.3 continued

Potable Water Use Reduction: **Domestic Water**

- Use high-efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensor controls to reduce potable water demand. Reuse stormwater or graywater for non-potable applications such as toilet and urinal flushing, mechanical systems (see GGHC WE Credit 2.4 & 2.5) and custodial uses.

- Water-efficient shower heads are available that require less than 2.5 gallons per minute.

- Lavatory faucets are typically used only for wetting purposes and can be effective with as little as 1.0 gallon per minute.

- Specify self-closing, slow-closing or electronic sensor faucets, particularly in high-use public areas where it is likely that faucets may be carelessly left running.

- Water closets are a significant user of potable water. A number of toilets are available that use considerably less than 1.6 GPF, including pressure-assisted toilets and dual flush toilets that have an option of 0.8 GPF or 1.0 GPF.

Resources

The U.S. Energy Policy Act (EPACT) of 1992, http://tis.eh.doe.gov/nepa.

GGHC Construction Credit Synergies

- SS Credit 1: Site Selection
- SS Credit 5: Site Development
- SS Credit 6: Stormwater Design
- WE Credit 1: Water Efficient Landscaping
- EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems
- EA Prerequisite 2: Minimum Energy Performance
- EA Credit 1: Optimize Energy Performance
- EA Credit 3: Enhanced Commissioning
- EA Credit 5: Measurement & Verification

GGHC Operations Credit Synergies

- WC Prerequisite 1: Minimum Water Efficiency
- WC Credit 1: Water Efficient Landscaping
- WC Credit 2: Building Water Use Reduction
- WC Credit 3: Performance Measurement: Enhanced Metering

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1 point

WE Credit 2.4, 2.5

Potable Water Use Reduction: **Process Water & Building System Equipment**

Intent
Reduce or eliminate the use of potable water for non-potable process use in building system equipment.

Health Issues

Approximately 70% of the potable water consumption in health care facilities is attributable to process water uses, compared to less than 30% consumed for "domestic" use. Maintaining adequate potable water supplies is a basic necessity for the health of individuals and communities. Only about 1% of the water on Earth is fresh water. Processing potable water is energy intensive and thus contributes to air emissions associated with fossil fuel energy generation (for the treatment, pumping and maintenance of the potable water systems).

Credit Goals

Credit 2.4 (1 point)

- Reduce cooling tower blowdown rate (in GPM) by at least 20%. Calculate baseline blowdown rates using the following formula:

  (Evaporation rate in GPM + Carryover in GPM) / (Cycles of Concentration – 1)

  Base cycles of concentration on a maximum allowable chloride concentration of 400 PPM and a maximum allowable silica concentration of 150 PPM.

- Use no potable water for vacuum pumps, air compressors, or mechanical seals on pumps.

- Eliminate the discharge of potable water to drain for equipment cooling using methods such as closed loop cooling condensate discharge for sterilizers.

Credit 2.5 (1 point)

- Provide a system to capture air handling system condensate for use in non-potable applications such as cooling tower makeup or irrigation. Reuse cooling tower and boiler blowdown water for other suitable purposes based on chemical properties of the blowdown water (generally make-up or irrigation).

  OR

- Use municipality-provided non-potable water for all non-potable process water applications.

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WE Credit 2.4, 2.5 continued

Potable Water Use Reduction: **Process Water & Building System Equipment**

Suggested Documentation

WE Credit 2.4

❑ Compile construction drawings showing use of building equipment in compliance with the credit goals.

WE Credit 2.5

❑ Compile construction drawings showing water reuse systems or municipally-provided non-potable water use in compliance with credit goals.

Reference Standards

There is no reference standard for this credit.

GGHC Construction Credit Synergies

- SS Credit 1: Site Selection
- SS Credit 5: Site Development
- SS Credit 6: Stormwater Design
- WE Credit 1: Water Efficient Landscaping
- WE Credit 2: Potable Water Use Reduction
- EA Prerequisite 1: Fundamental Commissioning of the Building Energy Systems
- EA Prerequisite 2: Minimum Energy Performance
- EA Credit 1: Optimize Energy Performance
- EA Credit 3: Enhanced Commissioning
- EA Credit 5: Measurement & Verification

GGHC Operations Credit Synergies

- WC Prerequisite 1: Minimum Water Efficiency
- WC Credit 1: Water Efficient Landscaping
- WC Credit 2: Building Water Use Reduction
- WC Credit 3: Performance Measurement: Enhanced Metering

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