

GREEN PIECE



EVAPCO's Newsletter on Environmental Sustainability

May 26, 2010

GP #9

Water, Water Everywhere....?



U.S. Water Facts:

☹ Lake Erie supplies drinking water to more than 11 million people. It is projected to drop three to six feet in the next 30 years if withdrawals continue at the current rate. The states surrounding the Great Lakes and two Canadian provinces have created a compact to manage withdrawals on the lakes and to prevent exportation to other regions. The compact was approved by Congress and signed into law October 3, 2008.¹

☹ The Ogallala Aquifer, the High Plains water source that underlies 174,000 square miles in parts of eight states: Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming is the nation's largest aquifer that supplies about 30 percent of the nation's groundwater used for irrigation. The Ogallala is depleting at a rate of 12 billion cubic meters a year, equivalent to 18 times the annual flow of the Colorado River, with its levels dropping at more than 100 feet in some areas.²

☹ There is a 50 percent chance that Lake Mead, a key source of water for millions of people in the southwestern United States will be dry by 2021 if our climate changes as expected and water usage is not curtailed. According to research at the Scripps Institution of Oceanography / University of California, San Diego, human demand, natural forces like evaporation, and human-induced climate change are creating a net deficit of nearly 1 million acre-feet of water per year from the Colorado River system which includes Lake Mead and Lake Powell. This volume of water can supply roughly 8 million people.³

☹ The Southeast is coming off a drought that has essentially lasted for ten years. The battle over Lake Lanier is still on between Florida, Alabama and Georgia. U.S. District Court Judge Paul Magnuson ruled in July that the original intent of Lake Lanier did not include supplying water for Atlanta's population. He further ruled that Atlanta's use of Lake Lanier water must stop in 2011 unless the three states can reach an agreement.⁴

These examples are a few of the many concerns that are facing the United States today regarding water availability. The U.S. potable water withdrawal is nearly 400 billion gallons of water per day for the following uses⁵:

- ☹ 48 percent for thermoelectric power generation
- ☹ 34 percent for agricultural irrigation
- ☹ **12 percent for water used in and around buildings, public supply and wells**
- ☹ 5 percent is used for industrial applications

The *sustainably focused* community is targeting the 12 percent water usage figure for commercial buildings. Water efficiency design criteria is addressed in the LEED® Green Building Rating System, Green Globes®, Building Green, ASHRAE Standard 189.1 and the proposed ASHRAE water efficiency Standard 191.

The first step in reducing water consumption is to reduce the building load. A *one percent* reduction (1%) in building load directly corresponds to a *one percent* (1%) reduction in evaporative water loss due to evaporation. Green building guidelines require significant reductions in building loads and energy use. A *minimum of 12%* performance improvement over ASHRAE Standard 90.1 is required to receive one (1) Energy & Atmosphere LEED point under LEEDv3 New Construction. This reduced energy design requirement will have a positive impact on water savings, but additional steps must be taken to reduce water consumption in evaporative equipment.

EVAPCO has taken this step with the WDW Water Saving Cooler. The WDW, a combination dry/evaporative cooler reduces closed circuit cooler make-up water requirements by taking advantage of lower dry bulbs, varying building load profiles and is designed to operate dry most of the year. This dry operation results in thousands of gallons of water savings compared to a conventional evaporative cooler. **The WDW recently received approval to be listed in Building Green's Green Spec Directory for water conservation products under their "Green Product Sub-category: Evaporative Air-Cooling Equipment"**⁶



**WDW Wet/Dry Water Efficient Closed Circuit Cooler
Brandon Primary Elementary School Atlanta, GA**

An EVAPCO WDW 112-6L-72-3H Water Saving Cooler is installed at the sustainably designed Brandon Primary School located in the venerable Margaret Mitchell (*Gone with the Wind*) neighborhood in Atlanta, GA.⁷ Mark Minick, principal of Minick Engineering located in Tucker, GA (www.minickeng.com) worked with Heat Transfer Systems, EVAPCO's representative for Atlanta, to specify the WDW on this project for its significant potable water savings. This WDW **will save up to 615,000 gallons of water annually** compared to a standard evaporative cooler with the same heat load and cycles of concentration resulting in a **74% reduction** in make-up water consumption. This water savings volume should qualify for **2 points** under the LEEDv3 for Schools Water Efficiency Credit 4: Process Water Use Reduction.

See the LEED Template and back up water use calculations required for the LEED point submission below in Appendix I. Contact me with any questions regarding this newsletter and how to receive LEED® points for Water Efficiency using the WDW.



Conserve water, and don't let it be "Gone with the Wind!"

Daryn S. Cline

Senior Manager,
Environmental Technologies



Footnotes:

- 1) <http://www.watershedcouncil.org/protect/policy%20and%20advocacy/state-issues/state-issues/the-great-lakes-compact/>
- 2) <http://www.npwd.org/Ogallala.htm>
- 3) <http://scrippsnews.ucsd.edu/Releases/?releaseID=876>
- 4) <http://www.savelakelanier.com/>
- 5) <http://www.mcerf.org/admin/Cms/resourcefile.axd?category=-2478514174960445303&filename=M27.pdf>
- 6) www.buildinggreen.com
- 7) Morris Brandon Primary Center School- <http://www.morrisbrandon.com/>

Appendix I

LEEDv3 Water Efficiency Credit 4: Process Water Use Reduction Credit Calculation

Green indicates that the EVAPCO product can influence the credit and prerequisite.

Grey indicates categories that do not apply to EVAPCO products.

Water Efficiency-LEEDv3

Credit Category	Title	LEED NC	LEED for Schools	LEED Core & Shell	EVAPCO Product Contribution
WE Prerequisite 1	Water Use Reduction	Required	Required	Required	Not applicable, only applies to plumbing fixtures.
WE Credit 1	Water Efficient Landscaping	2-4 Points	2-4 Points	2-4 Points	Pulse~Pure® with EVAPCO towers, coolers or condensers. Irrigate landscaping with blow down water.
WE Credit 2	Innovative Waste Water Technologies	2 Points	2 Points	2 Points	Pulse~Pure® with EVAPCO towers, coolers or condensers. Divert blow down water to onsite cistern instead of water treatment plant.
WE Credit 3	Water Use Reduction	2-4 Points	2-4 Points	2-4 Points	Not applicable, only applies to plumbing fixtures.
WE Credit 4	Process Water Use Reduction	NA	1 Point*	NA	All evaporative cooled products including the WDW and coolers with Finned Coils for Dry Operation.

*LEED® for Schools Only- Design the school HVAC system using a closed loop evaporative cooler with dry operation capability such as the WDW wet/dry cooler or ATWB/LSW/LRW product line with finned coils. Show a 20% water savings over a standard closed circuit cooler to be eligible to receive one credit. Earn an additional credit under Innovation by showing a 40% water savings over a standard evaporative cooled closed circuit cooler

Sample LEED® for Schools Submittal Template



BETA

LEED for Schools 2007 Submittal Template
WE Credit 4: Process Water Use Reduction



(Responsible Individual)

(Company Name)

I, **Daryn S. Cline**,

from **EVAPCO, Inc.**

verify that the information provided below is accurate, to the best of my knowledge.

- There was no refrigeration equipment used in this project that used once-through cooling with potable water.
- There are no garbage disposals installed on the project

Process Water Use Equipment							
Equipment Type	Equipment Name	Make/Model	Water Use	Maximum Water Use		Quantity	
Clothes Washers	Uniform Washer		gallons/ft ³ /cycle	7.5	gallons/ft ³ /cycle	1	
Dishwashers	Cafeteria		gallons/rack	1.0	gallons/rack	1	
Kitchen Sink Faucets	Cafeteria		gallons/minute	2.2	gallons/minute	1	
other	HVAC Cooler	WDW/EVAPCO				1	

NARRATIVE (Optional)

Please describe your proposed benchmark or industry standard for your alternative equipment type(s), showing that the project's selected equipment of this type is 20% below your proposed benchmark or industry standard.

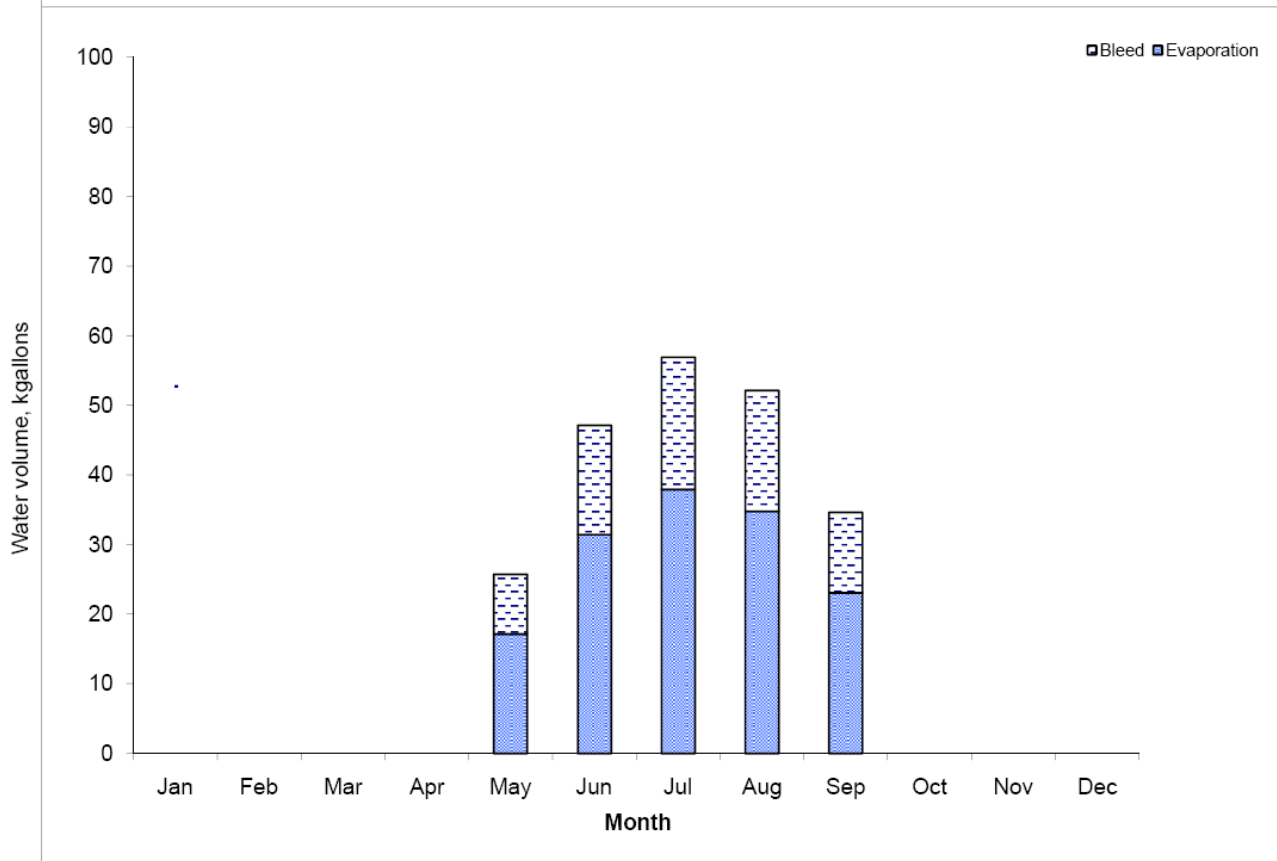
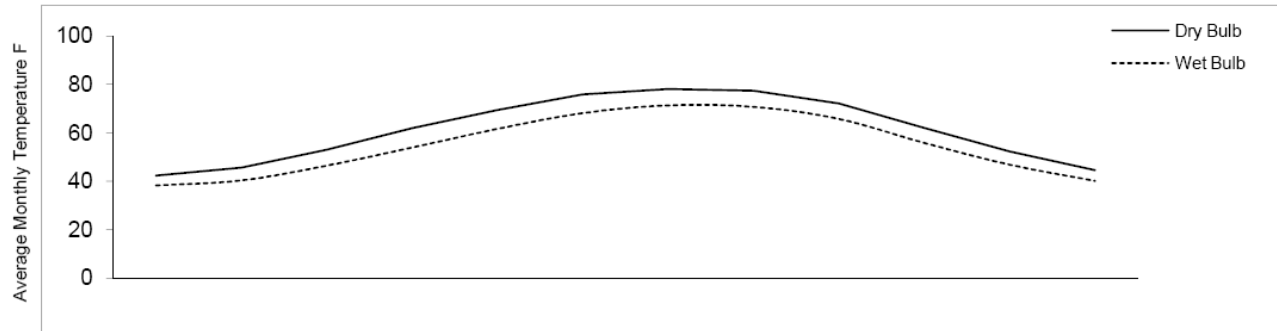
The benchmark for water consumption is an evaporative cooler operating in an all evaporative mode. The WDW product submitted for this project is an optimized combination of a wet and dry cooler, designed to operate in a dry mode a majority of the year. For this project, the design conditions are 320 gpm of 20% Propylene Glycol to be cooled from 95F to 85F at a 78F Wet Bulb. If a standard evaporative cooler was used and operated at a constant load 5 days a week, with 3 cycles of concentration, and a heat load of 1,552 MBH, it will require 831,000 gallons of make-up water annually to replace water used for evaporation and bleed. By selecting a WDW 112-6L-96-3H with the same design and operating conditions as listed, the WDW will only consume approximately 216,000 gallons of make-up water and operate dry most of the year.

EVAPCO LEED® Back Up Documentation-Hybrid Water Usage

Date: March 29, 2010
 Project: Morris Brandon Primary Center
 Location: Atlanta, GA



WDW 112-6L-96-3H Hybrid Water Use and Temperature Profile



kgallons	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bleed	0	0	0	0	9	16	19	17	12	0	0	0	72
Evap	0	0	0	0	17	31	38	35	23	0	0	0	144
Total	0	0	0	0	26	47	57	52	35	0	0	0	216

Analysis is based on single unit performance.

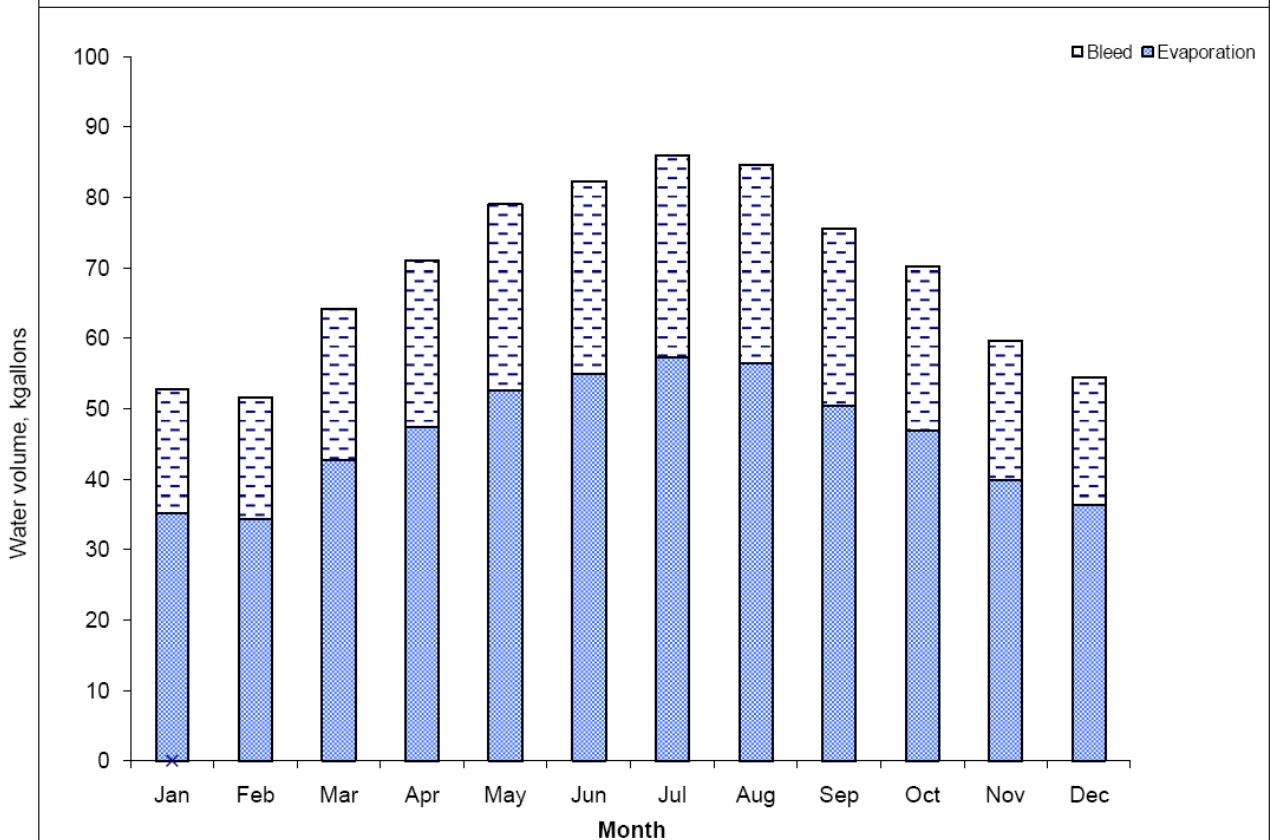
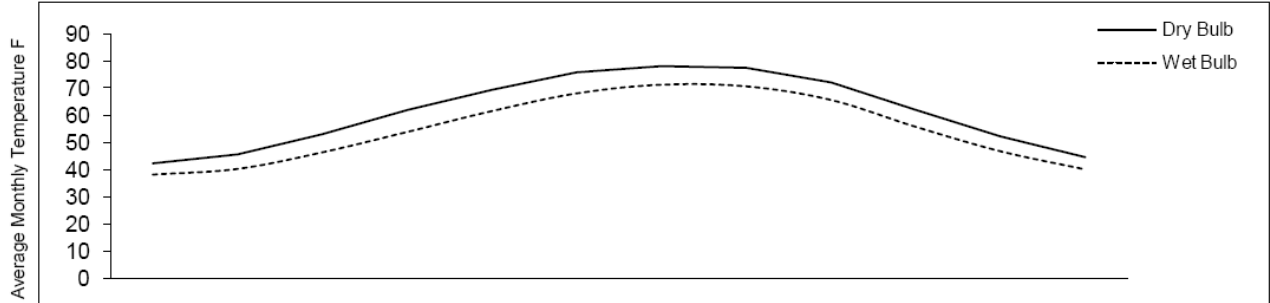
Graph 1W

EVAPCO LEED® Back Up Documentation- Evaporative Cooler Water Usage

Date: March 29, 2010
 Project: Morris Brandon Primary Center
 Location: Atlanta, GA



Evaporative Cooler Water Use and Temperature Profile



kgallons	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Bleed	18	17	21	24	26	27	29	28	25	23	20	18	277
Evap	35	34	43	47	53	55	57	56	50	47	40	36	554
Total	53	52	64	71	79	82	86	85	76	70	60	55	831

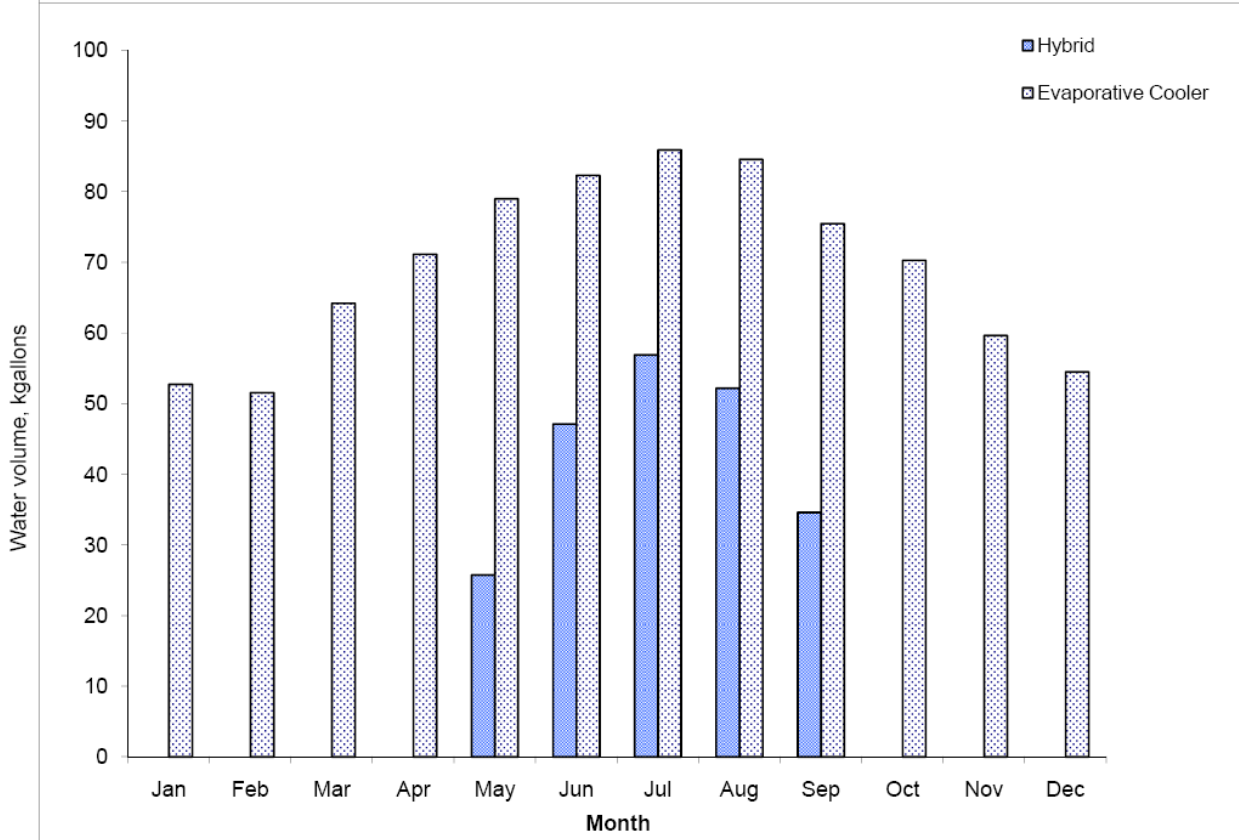
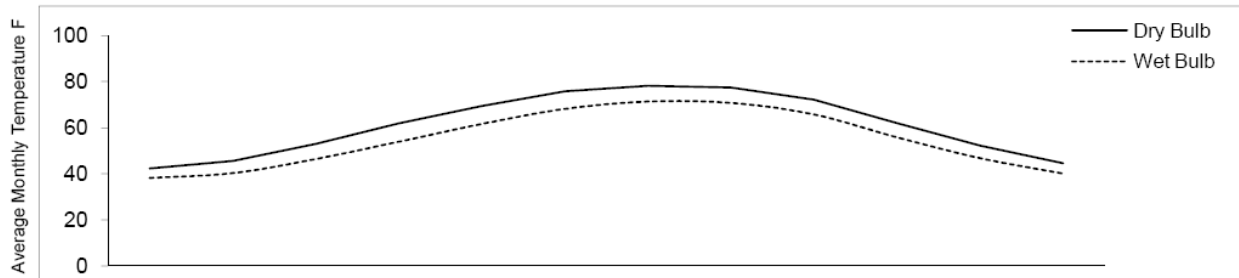
Analysis is based on single unit performance.

Graph 2W

Date: March 29, 2010
 Project: Morris Brandon Primary Center
 Location: Atlanta, GA



WDW 112-6L-96-3H Hybrid versus regular Evaporative Cooler
 Total Water Use (Evaporation + Bleed) and Temperature Profile



kgallons	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Hybrid	0	0	0	0	26	47	57	52	35	0	0	0	217
Comp	53	52	64	71	79	82	86	85	76	70	60	55	831

Comp = Evaporative Cooler

Analysis is based on single unit performance.

Graph 3W