Example 3

Estimating the annual water use of a sprinkler system operating in a holding area in Madison, Wisconsin

Assumptions:

- Holding area is 400 square feet
- Water is applied at a rate of 0.025 gal per sq. ft. per cycle
- System uses valved nozzles, so water is not wasted between cycles
- Cycles are set to operate 1 minute in: 15 minutes at temperature 68 – 77 °F, 10 minute cycles at temperatures 78 – 88 °F, and 5 minute cycles at temperatures above 88 °F
- Typical meteorological year has 994 hours from 68 – 78 °F, 566 hours from 78 – 88 °F, and 61 hours > 88 °F

Water per cycle [gal] = square feet * application per square foot = 400 square feet * 0.025 gal per square foot per cycle = 10 gal per cycle

Number of cycles is found by dividing the number of hours by the cycle duration

Range	Number of hours/yr	Number of cycles/yr	Gallons of water/yr
68 – 78 °F	1,171	4,684	46,840
79 – 88 °F	389	2,334	23,340
> 88 °F	61	732	7,320
	Annual water use in holding area:		**77,500**

(note: water can be saved in the holding area by staging sprinklers so they do not operate in the empty portion (or only installing sprinklers in the 75% closest to the parlor, which is occupied a higher percentage of the time). Significant water could also be saved by staging the sprinklers to turn on at THI setpoints instead of temperature setpoints).