



HOTEL & LEISURE ADVISORS

## Is Water Conservation at Waterparks considered Oxymoronic?

By: Eric B. Hansen, AIA, ISHC

Recently, there was a published cartoon depicting a scenario of a new waterpark resort operating in a drought stricken area of the country. The cartoon related the plight of a typical family wondering why they can't water their yard or wash their car, while a loud splash is heard coming from behind a high fence labeled *waterpark*. In areas of the country where drought has widespread implications on water use, the eco-friendly public has a perception of water use at waterparks as one of a gluttonous society continually consuming a precious natural resource for the benefit of entertainment. Little thought is given to the demonstrative effects that a depletion of water will have upon the local environment. After all, the owners of such venues think nothing of paying the exorbitant water bill as they are passing on the expense to the happy consumer through ticket prices. Are the owners of indoor and outdoor waterparks concerned about water conservation? The answer: yes they are. Water conservation at waterparks is not oxymoronic when understood in the broader context of water supply and water use. In fact, water conservation at waterparks is a naturally occurring design principle.

Indoor waterparks located in the colder, northern part of the continental U.S. have ample water supplies and have not had to consider the impact of drought as an issue. If the water supply is abundant from sources such as the Wisconsin River or the Great Lakes, running low or running out of water is a non issue unless there is a catastrophic event (at which time there will be more important discussions surrounding water use: survival etc). However, as developers are beginning to locate their indoor and outdoor waterpark resorts in areas more susceptible to drought, the issue of water conservation is becoming more prevalent not only within the industry, but within the public view as well.

According to the U.S. Drought Monitor ([www.drought.unl.edu/dm/monitor.html](http://www.drought.unl.edu/dm/monitor.html)) as of April 1, 2008, there are 26 states affected by some measure of drought. The drought intensities of these states range from moderate to extreme drought. Hotel and Leisure Advisors has identified eight indoor waterparks currently operating in five of the drought stricken states. Of more significance, H&LA is tracking a pipeline of 43 proposed indoor waterpark resorts to be located in drought stricken areas. These 43 proposed properties cover 11 states that currently have some level of drought. For instance, the Waveyard, a 125-acre skilled sport water attraction is being built in the arid climate of Mesa, Arizona. This park will contain an artificial whitewater river for kayaking, an artificial beach with man made waves of various sizes up to twelve feet, a scuba lagoon and a snorkeling pond. The initial 50 million gallons of water needed to fill the park will be supplied solely from an underground aquifer and will not tap into Mesa's drinking water supplies. The Waveyard's yearly

water consumption equates to no more than a single Arizona golf course uses in a year. Through effective communication regarding water use at their waterparks, owners are creatively finding ways to locate such resorts in areas of drought.

Owners are also trying to educate the public on water use at water intensive leisure attractions. According to the U.S. Drought Monitor, the most extreme levels of drought are being felt currently in the states of Alabama, Georgia, Tennessee, South Carolina, North Carolina, North Dakota, Nebraska and Texas. Owners and investors planning on developing waterparks in these areas need to have a solid understanding of water use at their resorts. Adequate response to drought declarations in these areas will not only engage local municipalities, but will also inform the public in a proactive manner regarding water consumption issues.

### **Drought Primer**

What is drought and how is it defined? The measure of drought is defined by the type of impact it has on the environment. There are four types of drought impacts commonly used: meteorological drought is defined by a time frame of substantially diminished precipitation; agricultural drought identifies the lack of moisture content of the soil; hydrological drought refers to deficiencies in groundwater and surface water supplies; and socioeconomic drought occurs when drought conditions affect the health, welfare and safety of the people. Of the 26 states currently affected by drought, six states are impacted due to agricultural drought and 20 states are impacted due to hydrological drought.

Drought time frames relate to water years. A water year begins October 1, and ends September 30. Typically, levels of water rise during the first half of the water year and begin to deplete during the last half of the water year. Water supplies are monitored over the course of the year.

In relation to waterparks, the definition of drought is based on hydrological impact. Is the existing water supply during a drought declaration capable of sustaining operations at the indoor or outdoor waterpark? The eco-friendly public views the water supply during a drought declaration off-limits to the niceties of society. During a heightened awareness of conservation and the sensitivity associated with water use, how can a waterpark operate in such an environment? The answer is easy, the public needs to shift its paradigm. The perception of water consumption at an indoor or outdoor waterpark can be one of water conservation.

### **Water Consumption vs. Water Conservation**

For our purposes, water consumption is defined as a singular event in the life of a gallon of water. Water is consumed and discarded. Water consumption is measured by the amount of water being discharged into the sanitary system, or otherwise lost through evaporation, splash out etc. Water conservation is defined by limiting water consumption through water re-use or water reclamation. Both water consumption and water conservation combine to define the total water use at indoor waterpark facilities. It is in the balance between water consumption and water conservation that the paradigm of water use at waterparks is found.

Water consumption at a waterpark facility, after the initial fill, is that of maintenance and topping-off. For each gallon of water lost through maintenance and topping off, a new gallon of water is added. However, overall water use at an indoor or outdoor

waterpark is a combination of water consumption and water conservation. The main objective of water conservation in a waterpark is to reduce the amount of new supply needed on a daily basis through the efforts of water reclamation and minimizing refill needs. Water reclamation is the term given to the re-use of an existing water supply. The water system of a waterpark operates like one giant swimming pool. The pool is filled once, and then the water is filtered at an appropriate rate, reusing the same water over and over. Water levels need to be maintained for public health and safety.

Water loss at a waterpark comes from four activities: splash out, evaporation, deck wash down, and backwash loss. Splash out is defined as loss of water from human interaction with the water system. Evaporation is the conversion of water from a liquid to a gas, and is greater at outdoor waterparks. Deck wash down is a maintenance operation for cleaning the solid surface areas surrounding the aquatic landscape. Backwash is a maintenance operation that is used to clean the filters of the water system and it accounts for the largest majority of water loss in the waterpark. In the overall waterpark water system, the maintenance and topping off operation accounts for 2% to 3% of total water use on a daily basis. In other words, a waterpark is re-using approximately 97% to 98% of its water system. This re-use of water is water conservation and reflects the largest percentage of water use at the waterpark. Daily water consumption for the waterpark is based upon the smaller percentage of water loss that is discharged into the sanitary system.

### **Water Conservation Design at Waterparks**

Besides being good community stewards of local water supplies, owners who develop indoor and outdoor waterparks have the added benefit of increasing their bottom line through good water conservation techniques. Water conservation means a more efficient operation and lower utility bills. In waterpark design, water conservation is a naturally occurring design principle. Through design efficiencies, the more water that an indoor or outdoor waterpark can conserve, the better the return on investment. The waterpark design community is constantly trying to develop new and more efficient methodologies for water conservation, not just in the waterpark attraction itself, but throughout all components of the resort.

A waterpark resort might contain several components, all of which use water. These components are: lodging accommodations in the form of hotel guest rooms or condominiums, restaurants, conference facilities, family entertainment centers, an indoor/outdoor waterpark, and exterior landscaping. Hotel and Leisure Advisors has analyzed that the 2% to 3% of water use at the waterpark component represents only 15% to 20% of the overall water consumption of the entire resort. The lodging and restaurant components of the resort reflect the largest percentage of consumption at approximately 65% to 75% of the overall resort daily water consumption.

Understanding water consumption at waterpark resorts in relation to other entertainment/recreational uses that consume water is a valid methodology to gain perspective and transform public perception. In a comparison of leisure venues, golf courses in the United States consume an average of 300,000 to 500,000 gallons of water per day depending upon region. Similarly, a 100,000 square foot waterpark resort might use on average 125,000 to 160,000 gallons of water per day. These figures indicate that golf courses consume more water on a daily basis than a typical

waterpark resort, and consume significantly more water than the waterpark component itself.

## **A Waterpark Response to Drought**

In order to evolve public perception of waterpark water use in drought stricken areas, the strategy of providing a drought management plan in response to a drought declaration is a method of communicating not only how water is being used at the waterpark, but how the waterpark will respond to a specific level of drought emergency. In general, a drought management plan contains three areas of communication regarding water use. The plan identifies the water conservation techniques inherent in the design of the facility. The plan establishes water conservation best management practices (BMPs) for operating the facility and it provides the waterpark's official response to a jurisdictional drought declaration. Typically, a jurisdictional drought declaration contains several different levels of emergency. A tailored drought response plan to these different levels of emergency is becoming a more common occurrence, even to the point of the drought response plan being a codified requirement of some municipalities in drought stricken regions. As an overall tool for communicating waterpark water use, developing a drought management plan is a key strategy for addressing water use concerns.

## **Summary**

Water use at indoor and outdoor waterparks is a combination of water consumption and water conservation. In the waterpark component of the resort, water conservation accounts for 97% to 98% of the total water use at a waterpark. With the increase of potential waterpark projects being located in drought stricken areas, owners and investors need to increase awareness and change public perception of how water is used at these resort facilities. The strategy of providing a drought management plan, specific for a project located in a drought stricken region, will provide a means of communication and education not only with the local municipalities but also with the general public. The drought management plan will act as the catalyst needed to accomplish the paradigm shift from basic water consumption, leading to water supply depletion, to the reality of water conservation techniques present within the design of the facility's water system and operations.

For more information concerning drought management plans for waterpark resorts please contact Hotel & Leisure Advisors' Director of Development Services, Eric B. Hansen, AIA ISHC. He can be reached via telephone at 216-228-7000 x21 or via e-mail at [ehansen@hladvisors.com](mailto:ehansen@hladvisors.com).

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