

# The Battle to Regulate Rainwater

By Bob Ferguson

*Literature and popular press are full of articles about the coming water shortage. While there are a myriad of options and technologies available to conserve, collect and recycle water, there is one source that has been available for as long as water itself: rainwater.*

Political and economic barriers impede growth of rainwater harvesting

Rainwater harvesting and reuse is developing into a good market for water treatment professionals. Depending on the end use of the captured water, different levels of treatment will be required, creating a good place for water specialists to offer their expertise in treatment system design and installation.

So why aren't rainwater systems more common? Are there engineering and technical hurdles that we have not yet found a way to overcome?

The engineering and water treatment requirements of rainwater systems are relatively simple. They require a collection system that flows to an appropriately sized storage system with an appropriately sized pump and distribution system.

The treatment systems used in conjunction with rainwater collection systems are similar to those used in other potable water applications. If connected to a building's main plumbing system, the treated rainwater is connected through backflow prevention to protect the incoming potable water supply. All of this will seem familiar to a water treatment professional because the equipment and systems are not significantly different from a residential well water system, save for the storage cisterns.

Despite the fact that there is a need and a market for these systems, and that there are no technical obstacles to overcome, rainwater harvesting and treatment systems are not incredibly common. The biggest obstacles to the development of this market do not come from the arena of engineering, but from the disciplines of politics, law, regulations, standards and economics.

## Political Hurdles

The first example comes from California. In 2011, Gov. Jerry Brown vetoed a California Assembly Bill (AB 275) designed to permit rainwater collection and use. According to the notes in the California Assembly's bill tracking system, there was little disagreement on the bill's technical content or its aim to allow rainwater collection to reduce the demand for treated and distributed water.

The main issue involved which of the two plumbing codes and code bodies in California—the Uniform Plumbing Code, administered by the International Assn. of Plumbing and Mechanical Officials (IAPMO), or the International Plumbing Code, administered by the International Code Council—would get its version of a

rainwater standard into the law. The battle also included two influential unions: the Plumbers Union and the Laborers Union.

Both code bodies and both unions said they are in favor of rainwater reuse projects, but were at odds over which standards to use. The result was a veto based not on the merits of the bill, but on an administrative rulemaking issue.

The battle is only temporarily delayed, however, and it seems the veto will not prevent rainwater collection standards from being added to the California Plumbing Code. The state code, based on IAPMO's Uniform Plumbing Code, is due for update during the code cycle this year. The process likely will result in the adoption of the rainwater catchment standards currently in IAPMO's Green Plumbing Supplement, which will be formalized when the updated plumbing code is in place in 2013.

## The Fight for Water Rights

Other states in the West battle over rainwater because of water rights issues. Many of these states have laws that allocate water rights based on a principle known as prior appropriation. To simplify, all of the surface water in the state has already been claimed by someone, and that person has first right to that water. Rainwater falling anywhere in the state is assumed to eventually make its way to a surface water source and become part of this already claimed water. Under this theory, rainwater is already "owned" by someone.

The issue recently came up in Arizona. Early last year, Senate Bill 1522 was introduced in the Arizona state legislature to clear the way for rainwater capture. The bill created a new category of water—harvested water—to distinguish rainwater from surface water. Harvested water would be considered different from surface water that is already claimed and owned; therefore capturing and using it would not infringe on someone else's water rights.



An underground rainwater cistern is installed in a California home's backyard. (Photos courtesy of Neal Shapiro, city of Santa Monica, Calif.)



Rain barrels are a simple way to collect rainwater in residential applications. These barrels, located at California homes, come in a variety of shapes and sizes to fit homeowners' needs, and can be designed to blend in with a home's exterior.

Objections to the bill came primarily from the local utility that has rights to surface water. According to Yavapai County Supervisor Carol Springer, a former state senator and treasurer who helped develop the legislation, studies show that up to 90% of rainwater never makes it to surface water sources, but is lost through evaporation, transpiration or other means. "Capturing this rainwater could help to recharge the aquifer that we are mining for water and is a significant step toward solving Arizona's water problem," she said.

Many believe that the utility fought the bill to keep from losing its water rights. Even after the bill was amended to drop the new definition and to only create a study committee to investigate technical issues, the bill did not pass. It likely will be reintroduced early this year. "This was absolutely about politics," Springer said.

### Water Economics

Fights over the economics of water supply have a part in this market as well. In Cincinnati, for example, the local water authority is reportedly blocking homeowners' efforts to install rainwater catchment systems.

The city's sewer authority is in favor of rainwater catchment to limit the amount of storm water that flows into its combined sewer and storm water system in order to prevent overflows. It has been reported that the local water authority objects to this type of rainwater reuse, however, citing concerns about cross-connection and backflow issues.

Proponents of rainwater collection say this is easily addressed using backflow prevention. Utility officials counter that they have an adequate supply of water, so additional supply through rainwater catchment is not worth the risk.

Critics of the water utility believe that its real concern is for its business. Their logic is that the utility is in the business of selling water, so any rainwater captured and used is water that it will not be selling. Rainwater is competitive to its business and, with plenty of supply, the additional competition is unwelcome.

Everyone seems to be cooperating to find a solution, however. Late in 2011, Ohio officials convened a committee to review and develop standards to apply to a test case. The test case will help to work out standards that could be adopted into the Ohio Plumbing Code and ultimately demonstrate whether rainwater collection could be safely implemented.

### Health Concerns

Debates about whether rainwater collection is necessary or if it causes more problems than it solves are playing out elsewhere as well. In many of the rebuilding projects in New Orleans in the wake of Hurricane Katrina, there were sponsored efforts to build "green" homes that included cisterns for rainwater capture and storage. However, Louisiana has longstanding laws against the use of cisterns dating back to a concern that standing water can become a breeding ground for mosquitoes that carry yellow fever. While yellow fever is no longer a concern (Louisiana health officials still cite concern for other mosquito-borne illnesses, such as West Nile fever), the laws are still in place and the cisterns sit unused.

When asked to make an exception for this application, Louisiana officials seemed to see no need for change. The problem is that New Orleans suffers not from a lack of water, but an overabundance of it. The city worries more about floods than droughts, so water conservation

is not a pressing issue. While officials recognize the value of the technology, the best applications may be better suited to places like Arizona.

Not everyone agrees with this assessment, however. According to Linda Stone, operations director for Global Green, one of the organizations sponsoring the building of green homes in New Orleans' 9<sup>th</sup> Ward, the city may have lots of water, but its main drinking water supply comes from the Mississippi River.

"This is water that needs to be treated to drinking water standards at great financial and environmental costs in terms of the treatment processes and energy use to deliver it through the distribution system," Stone said. "The rainwater collected at the homes requires far less treatment and energy to produce drinking water, and has a significantly lower carbon footprint."

In line with the pattern seen in other areas, city and state officials and the green building groups in New Orleans are cooperating on the construction and development of a community center with rainwater collection and storage in a rooftop gravity-fed configuration to be used for toilet flushing and irrigation, as well as a source of emergency water when the building is "off-grid." This project will likely prove to be a demonstration that will help stakeholders come to terms on the extent of the need and requirements for rainwater collection and use.

### Positive Progress

Before we get too pessimistic about the future of rainwater harvesting, consider that some of these obstacles are beneficial to the development of rainwater technology and the eventual market.

Many in the industry are concerned that the attractiveness of rainwater harvesting is such that the technology

and its development will get ahead of itself. Some cite the image problems the solar power industry has from higher expectations than it has economically or technically been able to deliver.

Imagine a project, such as what public health officials in New Orleans fear, in which perhaps the wrong cisterns were used, resulting in illnesses or a major public health problem. Such an incident could tarnish the reputation and potential of rainwater harvesting for decades. Ensuring that the market moves forward at a manageable pace may be best to guarantee the technology does not see a major upset. Moving forward at the speed of regulatory and standards development can help to prevent such a problem.

Of course, those in the business know that the market is indeed moving ahead and growing. It is moving in cities like Tucson, Ariz., where rainwater collection is required for all new commercial building projects; Seattle, which now allows rainwater catchment systems to be used as a home's sole water source; and Atlanta, which recently passed an ordinance to allow residential rainwater capture and use—and the list goes on. This market will undoubtedly continue to grow and present opportunities for water treatment professionals. But the major breakthroughs in the development of this market will come not from the technology and engineering sectors, but from politics and policy. *wqp*

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