

# Southwest Water Conservation Using Mobile Technology

By Laura J. Drangmeister

New Mexico, 'The Land of Enchantment,' is home to spectacular desert scenery, brilliant sunsets and abundant wildlife. Unfortunately, there is not an abundance of the most valuable resource for the Southwest: water. Although new conservation technologies regularly arise, there are limited water savings. Low flow toilets, water-efficient appliances and lifestyle changes are helpful conservation tools, but these methods do not affect the primary source of excess water use in New Mexico: Irrigation.

Irrigation consumes a considerable amount of water in New Mexico. Inappropriate use and excessive run-off from irrigation only exacerbates the problem. Xeriscaping and irrigation conservation campaigns have had some impact, but it's only the tip of the iceberg when addressing the severity of New Mexico's water crisis.

"It's frustrating to see neighbors watering during a rainstorm, gutters filled with runoff water and broken sprinkler heads unnecessarily flooding public parks," said Contact Wireless owner Jon Word. "The solution is really quite simple: turn off irrigation systems when a watering cycle is unnecessary." Traditional sprinkler systems, however, are set to operate on timers and are often difficult to control. If a rainstorm materializes while a homeowner is at work, it is impractical or impossible to make the trip home to interrupt a watering cycle on one's sprinkler timer system.

The water industry needs new technology and effective products to ameliorate water waste problems. Cutting edge project testing and development is funded through New Mexico Governor Bill Richardson's Water Innovation Fund. In November of 2004, Governor

Richardson announced 25 projects that would be funded with a \$10 million drought initiative; the Hydro Pro 1000 was one of those projects. Through innovation and state-of-the-art technology, it will play a major part in New Mexico's water conservation goals, all with a technology that is probably in your pocket right now. After car keys and wallets, mobile phones are the next most-critical item that people must have before they leave their homes. Although the sounds of blaring ring tones are often a nuisance, mobile technologies are changing the way people approach everyday responsibilities, even conserving water.

The firm developed a remote access irrigation control system representative of several technologies that together can help solve New Mexico's water woes. The unit is comprised of a simple paging

receiver board and a logic board that, via numeric commands, controls any make or model of irrigation timer. With one phone call and the entry of a seven-digit code, the device provides a simple, quick method to turn off or delay one, 10, hundreds or even thousands of sprinkler systems when watering is unnecessary or ineffective, such as during rainstorms or windy conditions.

Paging has long been the foundation of simple, reliable and inexpensive communication. Digital messages can be sent over existing networks throughout the country and the wireless coverage is generally superior to competing technologies. The paging receiver board used in New Mexico is characteristic of a very basic numeric pager. The board consists of an antenna and a frequency-specific crystal that enables the board to selec-

## Case studies

According to Contact Wireless, the average New Mexico household has a six- to eight-zone watering system that uses about 300 gallons of water per cycle to water its yard. (This is equivalent to about 100 cases of pint size water bottles.) In New Mexico, it is estimated that during a typical year the average household waters their yard 241 days and most irrigation water is unnecessary 74 days a year. Interrupt a watering cycle just 20 to 25 times during a year and the average household savings in New Mexico would be over 7,500 gallons of drinking water per year, enough to fill a semi-trailer full of bottled drinking water.

Approximately 100 Hydro Pro 1000 devices have been installed throughout Albuquerque over the last six months with significant water conservation results.

Installations at the University of New Mexico's Johnson Field save 126,000 gallons of water each time the system is activated. In the first three months of use, the University reported interrupting the watering system at least four times. Over 504,000 gallons of water have been saved with a few simple phone calls.

Two Albuquerque neighborhoods have also installed Hydro Pro systems as a part of their neighborhood association benefits. The neighborhood association president is responsible for interrupting watering cycles for the entire neighborhood during rainy or windy weather. The neighborhoods report using the unit four times each, with an estimated water savings of 130,000 gallons (combined).

Both of the Albuquerque neighborhoods and the University of New Mexico report that the convenience and simplicity of using the device is a tremendous benefit.

tively accept only data on its unique channel. In addition to the paging board, there is miscellaneous circuitry, which allows incoming information to be passed to the logic board. Dual-tone or multi-frequency tones can be sent from any telephone, even cellular phones, and converted to a digital Post Office Code Standardization Advisory Group signal at the paging switch. The digital signal is then sent via satellite to multiple terrestrial-based transmitters located near the device.

The logic board is designed to decode the incoming digital message and to determine if the message is designated for that particular device. Once identified, the circuit deciphers the numeric code and determines the command that will be activated on the logic board. The logic board is designed to interrupt the irrigation system's common power lead on any make and model of irrigation timer unit. The activation of the unit closes the water valve by turning its power supply off. The unit has the ability to interrupt an irrigation timer from

<b>Specifications</b>	
<b>Dimensions:</b>	4¾" w x 7¾" h x 3" d
<b>Input voltage:</b>	24v (ac) or 12v (dc)
<b>Power consumption:</b>	40 milli-amps idle, 150 milli-amps with all relay circuits active
<b>Paging format:</b>	Post Office Code Standardization Advisory Group, all frequencies and baud rates
<b>Cap codes:</b>	Up to seven separate cap codes can be programmed into the WHP-1000
<b>Group control:</b>	Will respond to 32 different group commands
<b>On board relay:</b>	One Form C-8 amps capable at 120 VAC, 5 amps 12, 24 or 48 VDC
<b>Ground closures:</b>	Total of seven with max cumulative amperage capability of 800 milli-amps at 12 VDC
<b>RS232 serial port:</b>	Standard DB9 female connector required
<b>Terminal block:</b>	12 position easy wire strip for #16 or smaller stripped wire. No connector required.
<b>External antenna connector:</b>	On board male BNC

one second up to 99 days in increments of one second. A command to permanently turn the sprinkler timer off and then back on is also available.

The segregation and grouping options make the device easy to adapt to

every irrigation control need. Each unit can participate in up to 32 separate groups and each group can have an unlimited number of units as members. Additional phone numbers can be used to make unlimited combinations of devices and groups.

The new device is available for prices ranging from \$100 to \$350 per unit, depending on the quantity produced in a single manufacturing run. It is inexpensive to operate, about \$2 per month, but the implications for water waste reduction are considerable. It is designed to operate on a commercial 900 MHz wireless network. By using an established commercial one-way wireless network, the expense of operating the units is drastically reduced compared to the more expensive satellite systems available. The coverage and penetration of the firm's networks throughout the country allows users to control their

sprinklers remotely.

"This has the potential to have an enormous economic impact," Word said. "The system will greatly affect the way New Mexico approaches water conservation for years to come." New Mexico's water crisis is not unique and even in areas where water is plentiful everyone could stand to exercise responsible water use. Implementing such systems around the country and abroad could change the way people think about the efficacy of mobile technologies and in doing so, conserve water resources for future generations.

### **About the author**

*G Laura Drangmeister works with Contact Wireless marketing the Hydro Pro 1000. She can be reached at (505) 888-5877 or email: ldrangmeister@dwtturner.com.*

*Contact Wireless was recently awarded the New Mexico Information Technology Excellence Solution Award for Integrated Systems for the development of the Hydro Pro 1000 by the New Mexico Information Technology and Software Association (NMITSa). To reach Contact Wireless directly call (505) 888-9999 or visit [www.contactwireless.com](http://www.contactwireless.com).*

### **REPRINTS & PDFs**

For more information and quotes,  
contact Tom Losito  
tlosito@wcponline.com  
(520) 323-6144