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**Mike Hurdzan
Golf Design Group**

the 1970s; Less progress in wetlands management. 25 percent loss in last 200 years. Florida, Georgia and Minnesota greatest losses. Warnings: Water availability will be a critical problem. Population shifts like those to the Southwest. Water quality concerns from runoff of non-point sources.

Bart Blackwelder, Friends of the Earth: "Two issues. Urban Sprawl and Food Safety. Sprawl drains energy and resources. Food affects global economy. May depend on foreign food sources. What are their safety measures?"

Climate change, global warming: Weather events costing \$1 billion a week in damages. Energy sources — The Federal budget is skewed. Fossil fuels are subsidized to the tune of 65 percent. Renewable source development only gets 14 percent of funding."

State of Golf

Bob Maxon, *Golf Digest*: "There are 16,010 golf courses in the U.S. 11,000 or 70 percent are public, not private elitist courses. Many super ranges/practice facilities are being built. More and more management companies are taking over operations. Lots of mergers, diversification and reorganizations. We need something beside 7,200-yard designs. Golf needs to be accessible and time effective to prosper and grow."

Mike Hurdzan, Hurdzan Golf Design Group: "Golf needs to be affordable, accessible and sustainable. Sustainability is

the the key issue. Golf courses are challenged to preserve wetlands, water quality, habitat and green space. We must learn to do more with less pesticides, fertilizer and water. We are subjected to needless studies, unrealistic buffer zones and unrealistic management practices."

There were many more presentations that detailed specific projects and accomplishments that showed what can be done when both sides make a commitment to work together for the betterment of the environment.

There were two realities that I took away from the conference. One, it is possible for both sides to agree to disagree and still work together to make progress and reduce the bitterness. Two, the environmental issue is here to stay.

You and your club can chose to be proactive and find ways to participate in the process or you can be dragged kicking and screaming to the table by rules and regulations that you didn't help to write. Educate yourself, your staff, your golfers and your community about what you can and are doing for the environment.

Water Reclamation Project Offers Valuable Lessons

BY PAUL MOSES

Water Specialties, Inc.

Editor's Note: Water resources will be

the number one issue facing golf courses as growth and development continues in Florida. This information is presented for those who may be involved in discussions with state and local water authorities as one example of what can be done. During the drought of 1998, Jacksonville had water pressure problems because development and demand have outraced the system's capacity to deliver the water. Now Jacksonville officials are looking to cut turf and horticulture uses. Even reclaimed water is fast becoming finite resource. You need to talk about this issue with your club officials.

Commercial and agricultural uses for reclaimed water are gaining popularity in municipalities across the country. Formerly forced to pay top dollar for fully treated water, governments and businesses are realizing major benefits from reclaimed water usage.

Additionally, when the indirect benefits to the environment are considered, it's apparent that water reuse is no longer merely an attractive theory, but an environmental and economic necessity.

Many commercial and agricultural water users in West Orange and Southeast Lake counties are seeing dramatic benefits since the inception of their water reclamation project 13 years ago. The project, Water Conserv II, is a cooperative venture among the City of Orlando, Orange County, and the agricultural community.

At 4,000 citrus acres, it is the largest water reuse project of its kind in the world a combination of agricultural irrigation and Rapid Infiltration Basins (RIBs) that divert water into the ground. Water Conserv II was the first water-reuse project in Florida allowed to irrigate crops produced for human consumption with reclaimed water.

The Water Conserv II project is connected to the city's McLeod Road Water Reclamation Facility and the county's South Regional Water Reclamation Facility by a 21-mile transmission pipeline that also runs to the main distribution center in West Orange County. The center distributes reclaimed water to 47 RIB sites on 1,700



acres, and to 76 agricultural and commercial customers on a 43-mile distribution network.

The average daily reclaimed water volume to the distribution center is 30 million gallons per day (mgd). Sixty percent of the volume is sent to agricultural and commercial customers, and the remaining 40 percent goes into the water table via the RIBs. Storage capacity peaks at 20 million gallons, and pump stations are capable of producing a peak flow rate of 76,000 gallons per minute (gpm). The entire distribution system is monitored and controlled by a central computerized system, whereby flow rates, line problems and pressures can be controlled automatically.

Woodard & Curran, Inc. of Winter Garden is the contract operator of Water Conserv II. This environmental and water treatment engineering firm has been in business since 1975, managing environmental fieldwork, wastewater and cleanwater treatment, and hazardous waste remediation all over the country.

The operating personnel realized early on that the massive flow of water was only as reliable as the infrastructure that delivered it. Nowhere was this more evident than in their flow-monitoring system. With 145 flow meters spread throughout the project, any failures here would jeopardize the credibility of the data collected by the agency to determine user allotments and distribution measurements.

"We actually have flow meters from two different companies in operation," said Phil Cross, the project manager at Water Conserv II, "but some of them would not hold up under the high flow conditions for very long. Over time, the readings from these meters would start to drift because their internal circuit boards would malfunction. We'd have to shut down that transmission line to repair the meters whenever these accuracy problems arose.

"We finally decided to quit throwing good money after bad and just replace the defective meters," Cross continued.

Once the operators of Water Conserv II installed the new meters into the transmission flowlines, an immediate change

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in the reliability of their measurements was noted. Given the new stability of their monitoring system, the operators of Water Conserv II were allowed to concentrate on what they do best: providing a valuable resource to their many customers. The results have been noteworthy.

For example, the Mid-Florida Citrus Foundation has worked in conjunction with the cooperative reuse project for many years to research the effects of reclaimed water on citrus fruit and other crops. "Research results to date from the Citrus Foundation conclude that citrus trees grow faster, gain more canopy volume, yield, and pounds of juice per acre, as more reclaimed water is applied," Cross maintained.

"So as highly-treated potable water continues to face tougher and tighter restrictions by water management districts, reclaimed water becomes a very attractive alternative for irrigation."

"Additionally, our agricultural customers have benefited greatly from enhanced freeze and drought protection due to the high availability of water in the system," continued Cross.

"Since the water is free and plentiful, growers are maintaining higher soil moisture levels, which protects their entire crop area, not just a portion of it. We've seen citrus growers realize increased crop yields of 10 to 30 percent and tree growth of up to 400 percent. For citrus growers this means a saving of about \$128 per acre per year."

While the economic benefits of using

reclaimed water are more immediate, the environmental pluses are significant and many. Because "used" water has traditionally been considered a liability instead of an asset, the success of this project counters many myths about reclaimed water

For example, reuse eliminates the discharge of minimally-treated water in surface waters such as lakes, streams, and rivers; it reduces a dependence on underground aquifers by reducing well water usage; and it actually replenishes the aquifer through the discharge of surplus water into rapid infiltration basins. As an added benefit, the excess water helps establish preserves for endangered and threatened plants and animals.

"There is a large influx of people moving to Florida, so we're beginning to face a water shortage here," Cross stated.

"We've already started to suffer from the consequences of overdrafting the aquifers in the central areas of the state, and in the coastal areas we're seeing an intrusion of seawater into our freshwater aquifers. Reclaimed water presents a very viable alternative to reduce dependence on water from those sources."

Water Conserv II has proven that the application of reclaimed water for commercial and agricultural uses is a win-win situation for all concerned, and their use of reliable infrastructure is an important element to their success.

For more information, contact Water Specialties at (800) 800-3544, or info@waterspecialties.com.