Improve irrigation system now to beat next drought

By David D. Davis

While rainfall at the right time solves many irrigation problems, recent weather patterns have brought drought to large portions of the country. Under drought conditions, a system designed and maintained to handle an arid climate might not require too many tweaks to improve efficiency. A system designed to supplement rainfall, on the other hand, may require substantial tweaks and/or upgrades, just to survive a short drought. A prolonged or multiple-year drought could lead to severe turf damage and perhaps complete replacement of the irrigation system.

Even if your golf course and irrigation systems will not face droughts, you will face years of reduced rainfall, reduced humidity and increased temperatures, all of which increases irrigation requirements and stresses on your total system.

In either case, there are several steps you can take to improve your irrigation system. First, actually evaluate your system.

IMMEDIATE ACTIONS COURSES CAN TAKE INCLUDE:

- Audit critical areas of the golf course for coverage efficiencies. Check sprinkler spacing, flow and nozzle pressure.
- Develop a preventive maintenance program to meet your normal irrigation needs as well as drought conditions. This should include nozzle replacement to match coverage requirements and a pump station tune-up, including motors, pumps, filters, etc.
- In addition, tune-up mainline and lateral isolation valves, make sure all valves are fully open, check controller programs and schedules for balanced flow and pressure relationship.
- Develop a short-term drought-management plan. Consider what you have to do to survive a drought. This should includes repair of system components and identification of supplemental water sources. The plan should also include identification of turf and ornamental areas, which can survive on reduced or "deficit" irrigation. When short-term actions do not increase irrigation efficiency, renovation or outright replacement of irrigation system should be planned.

Hiers uses the different water sources depending on what time of year it is.

"From June to October, the river has lower salinity because of the rain we are getting, so we pump largely from the river," said Hiers. "But from November to May, it can be pure ocean water so we rely on our deep well."

The deep well averages 5,200 tds and the river can range upward of 34,300 tds.

The resulting pump system features stainless steel columns and pipes, and the discharge manifold, pump head and internal fision are bonded with epoxy. The valves have stainless steel disks and the bells and impellers are made of cast iron. The system uses rubber bearings to prevent corrosion.

"The system runs five times the amount of a normal-duty pump station," said Male.

Syncroflo and Watertronics take different material approaches.

"We use a lot of fusion-bonded epoxy, especially on the impellers," said Syncroflo's Jim Simonini. "It's less expensive than stainless steel."

On a recent project in Puerto Rico, Syncroflo developed a system that used PVC piping and ductile iron on the check valves. The pumps were all stainless steel.

Watertronics, on the other hand, is partial to using HDPE for its corrosive duty systems.

"We have used HDPE in our project in Kuwait that is using reinforced fiberglass piping to combat extreme conditions.

EFFLUENT APPLICATIONS

While standard pump stations can handle effluent, which usually ranges from 600 to 3,300 tds, the higher-grade parts could find their way into these systems.

"With the knowledge we have gained, we may use more bonded epoxy for reclaimed systems," said Male. "There is a lot more demand for these systems because it is getting harder and harder to get quality water."

Another option is treating irrigation water before it gets to the pump station.

"Using sulfur burners from a company like Aqua SO2 to clean up low level pH and remove sodium may counter the need for epoxy or stainless steel," said Simonini.

With the use of injection systems on the rise, however, Reinders said HDPE is a good choice.

"HDPE does not react with any of the fertilizers or acids that are being injected into the water," he said. "For those systems we use HDPE in the pump manifolds."