Cardno ENTRIX
Shaping the Future

Marco Island Aquifer Storage and Recovery System Award

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American Academy of Environmental Engineers (AAEE) 2010 Excellence in Environmental Engineering Competition Grand Prize

Client
City of Marco Island

Location
Collier County, Florida

On behalf of Cardno ENTRIX, Lloyd Horvath, P.E., of our Fort Myers office, received an Award for the 2010 AAEE Excellence in Environmental Engineering Competition for one of our water resource projects. Our winning project, submitted in the category of Environmental Sustainability, the Marco Island Aquifer Storage and Recovery System, was awarded the Grand Prize at the AAEE Awards luncheon on April 28, 2010. Judging criteria of project submittals were based on an integrated project approach, quality, originality and innovation, complexity, and contribution to social and economic advancement. This award also made Cardno ENTRIX eligible to submit to the International Water Association's 2010 Project Innovation Awards, which will not occur until later this year.

Project Summary

In providing potable water to its customers, the City of Marco Island had for many years struggled with limitations on fresh water, and it was growing evermore reliant on desalination of a brackish groundwater source that was rapidly deteriorating in quality due to salt water intrusion. A limited freshwater supply was available on the mainland, but it was not reliable due to regular droughts occurring during the peak demand dry season. However, during a four month rainy season there is an abundance of fresh surface water that normally discharges to tide. Cardno ENTRIX worked with Marco Island to develop a unique aquifer storage and recovery (ASR) system that now provides effective storage of excess runoff captured during the rainy season. The water is stored in a deep aquifer that formerly contained highly brackish water. The ASR system can recover up to 1.5 billion gallons of fresh water annually during the dry season for potable use. It provides a sustainable freshwater supply that is the foundation of reliability for the City's potable water system. Desalination is no longer the basis of reliability for the system.

Quality

The ASR system was conceived as the solution to an unreliable water supply without having to build a costly desalination system that relied on groundwater source with continually deteriorating quality. The investment in ASR was done in a conservative manner; starting first with a pilot project and followed by expansion after a few years of demonstrated success. The owner is highly satisfied with the results and has now committed to making the ASR system the fundamental water source for the municipality.

Originality and Innovation

Implementing ASR for this project meant overcoming technical obstacles for the first time. The only aquifers available in the project area contained highly brackish water. Nowhere in the world was there a record of successfully and economically implementing ASR for a potable supply system by utilizing an aquifer that contained highly brackish native water. The aquifer utilized at the project site contained native water having a TDS of approximately 6700 mg/l. The native water needed to be effectively displaced for storage and recovery of fresh water, and only about 4 percent mixing of native water could be tolerated in the recovered water.