An innovative partnership

The City of Santa Paula, Calif., partners with the private industry to build an energy-saving WWTP

WE&T August 2011

The Santa Paula (Calif.) Water Recycling Facility, originally anticipated to reduce energy consumption by 15%, now is more than 35% energy-efficient than the city's original wastewater treatment plant. Craig Mailloux

It has been more than a year since the completion of the new Santa Paula (Calif.) Water Recycling Facility, an energy-efficient, 15,900-m^3/d (4.2-mgd) wastewater treatment plant (WWTP).

Not only did the facility come on-line 7 months early, but it also has exceeded expectations in its energy efficiency and cost savings, according to Marian Clayton, director of marketing at PERC Water, a private water recycling company that built, manages, and operates the facility.

The initial expectation was to reduce energy consumption by 15% compared to the city's original WWTP, but "that was before we had actually run the facility," Clayton said. "Now that the facility has been up and running for almost a year, we found that it has been on average more than 35% more energy-efficient than we anticipated."

According to a March 2010 PERC Water press release, because of the facility's energy-saving technologies, such as its membrane scouring system and lighting design, the city saved on average more than $10,000 a month during the first 7 months of operation.

A unique problem with a creative solution

The City of Santa Paula built its new water recycling facility because it was mandated by the state to replace its 70-year-old WWTP. The plant had "reached the end of its useful life and accrued more than $8 million in compliance-related fines," according to a December 2010 PERC Water press release.

"The city, for some years before, had tried to procure the [new] project through a design-bid-build scenario," explained Bob Nespeca, vice president of asset management at PERC Water. With this delivery method, the city would have supplied all the funding, hired an engineering firm to design plans, and later had contractors bid on the project, with the project going to the lowest bidder. But because of financial constraints and the

sinking economy, “the city just came to the realization that they did not have the financial wherewithal to complete the project, nor did it have the staffing to do so,” he said.

So the city came back to the marketplace with a modified approach known as a design-build-operate-finance contract, Nespeca explained. This is how PERC Water, along with the independent infrastructure-funded firm, Alinda Capital Partners LLC (New York), became involved.

The Santa Paula facility is the first of its kind to be built under *California Government Code Sec. 5956*,which permits the use ofprivate investment to build, operate, and maintain public infrastructure. The City of Santa Paula created a public–private partnership with Santa Paula Water, which is an alliance between PERC Water and Alinda. Under the partnership, Santa Paula Water agreed to finance construction of the facility through private equity as well as operate it.

This unique project delivery method has proven to be a success for all parties involved, Clayton said.

“The way the deal works is for 30 years the facility is owned by a private company and is paid for by the city through a service fee,” Nespeca said. “That service fee covers the operational costs of the facility, capital replacements, and the capital reimbursement of the original construction. So at the end of the 30 years, the city becomes — with no money down — the owner of the facility.”

Clayton said the new delivery method has taken some getting used to for everyone involved.

“This was something that was new that hadn’t really been done with this type of infrastructure, and it hadn’t been done before in California,” Clayton said. “So the biggest struggle with this project has been educating and continuing to educate people about the [design-build-operate-finance] structure.”

Smooth sailing

Though adapting to the new delivery method was challenging, the construction itself went a lot smoother.

Clayton said construction began in July 2008, was completed by December 2009, and the facility was at full flow by May 13, 2010.

“The date we had contracted to have it up and running was Dec. 15, 2010,” Clayton said. “So we finished 7 months in advance.”

The new facility includes an energy-saving lighting system that incorporates natural lighting, LED lamps, mercury-vapor exterior lights, and electronic ballasts for fluorescent lamps, light sensors, and automatic dimming devices. Also, because membrane scouring and aeration usually account for nearly half of a WWTP’s power consumption, the company chose energy-efficient equipment for these systems.

Nespeca said the team decided to go with a different blower than it had originally chosen for the project. “It was an upgrade,” he said. “It was just more efficient equipment that burned less power.”

The planners also decided to incorporate green infrastructure. The decorative water feature in front of the facility is actually a stormwater retention basin, Nespeca said.

This type of green infrastructure is “sort of a trademark of all projects we do,” Nespeca said.

Nespeca said PERC Water also hopes to eventually incorporate solar energy at the facility by installing solar arrays near the plant.

“This land is available because the city had anticipated a much larger footprint [for the plant],” Clayton explained.

So far the wastewater treated at the facility is being sent into the ground through percolation ponds, Nespeca said. Santa Paula’s effluent is California Title 22 certified so it can be used for various industrial uses, he explained. Nespeca added that the city is in the process of designing a reuse system that will include storage tanks and pumps. The reuse system will use the water to irrigate citrus and avocado groves throughout Ventura County.

—LaShell Stratton-Childers , *WE&T*