

26,478



Progressive ENGINEER

Online Magazine & Information Source

- [The Magazine](#)
- [Road to Recovery](#)
- [Articles & Extras](#)
- [News & Research](#)
- [Resources](#)
- [Products](#)
- [Departments](#)

News

News
Research
Editors Notes
Hanley Wood Market Intelligence Data
Surveys

[Videos, Web Seminars, & White Papers](#)

[Free Market Research](#)

[Public Works Jobs Online](#)

[Search](#) for jobs online

[Search the Manual](#)

[About the Manual](#)

[Calendar](#)

[Associations](#)

[Free E-Newsletter Sign-Up](#)

[Advertise](#)

[MEDIA KIT](#)

Next-generation recycling

A West Coast city shaves the cost of installing one of the nation's largest membrane bioreactor systems by one-third.

Thanks to their small footprint and process refinements since the technology was introduced to the U.S. market more than a decade ago, submerged membrane bioreactors are increasingly popular in areas where water is scarce, space is at a premium, and discharge standards exceed federal requirements.

Santa Paula, Calif., is one such area.

Located 65 miles northwest of Los Angeles and 14 miles east of the Pacific Ocean, the city of 30,000 is at the geographical center of Ventura County. Surrounded by rolling hills and rugged mountain peaks in addition to orange, lemon, and avocado groves, the "Citrus Capital of the World" lies in the heart of the rich agricultural Santa Clara River Valley.

Built in 1939, the city's activated sludge 2.5-mgd water recycling facility had become noncompliant even after several upgrades. After receiving \$8 million in fines for 3,000 violations, the city decided it was time for a new facility, one that would generate revenue by selling water to local farmers.

In California, water for surface irrigation must be disinfected tertiary recycled water whose effluent turbidity doesn't exceed 2 nephelometric turbidity units (NTU). When consultants estimated that a facility meeting those standards would cost \$80 million, the city considered a new financing model to keep costs down. Proponents say that design-build-operate-finance is less risky than projects funded by tax-exempt financing.

Passed in 1996, California Code 5956 streamlines the public-private partnership process for infrastructure projects. As one of the state's least compliant wastewater sites, Santa Paula's facility was a prime candidate for design-build-operate-finance.

In 2008 the city entered into a 30-year concession with Santa Paula Water LLC — a joint venture of water recycling company Pacific Environmental Resources Corp. (PERC) and an investment fund managed by Alinda Capital Partners LLC — making the new plant the largest waste-water project under the 14-year-old law.

Vice President of Infrastructure Development Steve Owen says that PERC estimated the design-build-operate-finance project-delivery method lowers the facility's cost to \$57 million.

Of the plant itself, which has common-wall box construction that allows the head works building to sit directly above the lift station, he says: "It's a paradigm shift in the industry, applying tried-and-true technology in a different way." The rotary drum thickeners sit directly above the digesters, eliminating the need to install hundreds of feet of pipe.

"This 1-acre site houses a wastewater treatment plant in a 14,000-square-foot building," he says.

The 3.4-mgd facility is expected to be 15% more energy efficient than the old plant. Based on Koch Membrane Systems' 1,500 m² Puron module, the system uses a single header with reinforced hollow fibers that are fixed only at the bottom. The sealed upper end of the fiber is allowed to float freely, eliminating the build up of hair and fibrous materials that typically clog the upper ends of membrane fibers in membrane modules that have both top and bottom headers.

Solids and particulates, including bacteria, are retained by the membrane and remain on the outside, while permeate is drawn through the membrane to the inside of the fibers. The outside-to-inside flow pattern provides a high flow-rate with up to half the energy of older technology. In addition, the free-floating, fiber tip central air scour nozzles reduce air scour requirements.



Santa Paula's water-recycling plant uses 5 fewer acres than a conventional treatment facility requires, so the city built an educational center where the public can learn how wastewater is recycled. Illustrations: Koch Membrane Systems



The \$58 million water recycling facility is designed to produce an effluent that meets or exceeds all current environmental wastewater quality standards mandated by the U.S. EPA and the California Regional Water Quality Control Board.

Sponsored Web Events

[Helac Construction Attachments, PowerTilt and PowerGrip](#)



In this video PowerTilt and PowerGrip are being used for demolition, land clearing, grading and excavating, erosion control, underground utilities, specialty applications and landscaping.

Bulb Eater

It's the Brightest Way to Dispose of Fluorescent Lamps



800.909.9709
Air Cycle Corporation

Sponsored Web Events

[Fleet Decision Modeling: Life Cycle Cost Analysis](#)

Scheduled to begin operating no later than Dec. 15, the facility will produce a finished effluent with biochemical oxygen demand and total suspended solids concentrations less than 5 milligrams per liter (mg/L), total nitrogen less than 8 mg/L, and turbidity less than 0.2 NTU.

All of the effluent will be sent to three new percolation ponds designed to recharge the aquifer before being piped to local farms.

- Michael Fielding

Sponsor Spotlight

ADVERTISEMENT

Ads by Google

[Download Water Standards](#)

Water & Wastewater Standards Industrial, municipal, irrigation
webstore.ansi.org/

[Greywater Reuse](#)

Commercial greywater harvesting systems approved for California
Wahaso.com

[Coca-Cola Recycling](#)

Interjecting new life into recycling. Learn more here!
LivePositively.com/JoinUs



As the stewards of constituents tax dollars, purchasing officials who apply Life Cycle Costing in the public sector will have the ability to better manage the limited resources available while continuing to provide quality products and services for all..

Ads by Google

[Download Water Standards](#)

Water & Wastewater Standards Industrial, municipal, irrigation
webstore.ansi.org/

Sponsored Links

[Download NSF Standards](#)

Download NSF Water Standards for public health, safety, environment
webstore.ansi.org/

[Siemens Water Remediation](#)

Water is a scarce resource: See how Siemens can help to preserve it!
www.usa.siemens.com/water

[Wastewater Package Plants](#)

Complete Turn-Key Water Reuse Hotels, Restaurants, Subdivisions
h2o-envirotek.com

[\\$79 Junk Removal](#)

We Have The Best Prices In The Area Along With High Quality Service!
www.cleanup-america.com/

[Commercial Reuse Systems](#)

Harvest Shower & Sink Water to Irrigate & Flush in California
Wahaso.com

[Home](#) . [About](#) . [Site Map](#) . [Subscribe](#) . [Advertising Info](#) . [Privacy Statement](#) . [Contact Us](#)



PUBLIC WORKS Online is part of the [Hanley Wood network](#) of construction-industry Web sites:



Hanley Wood, LLC. Unauthorized reproduction prohibited.