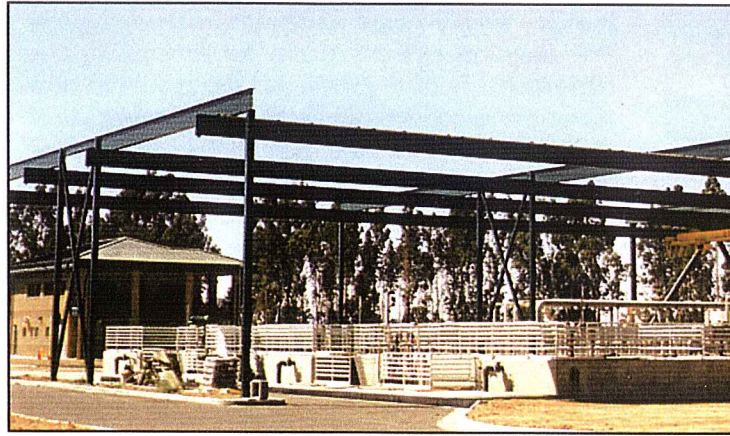


American Canyon Wastewater Treatment Plant



American Canyon Wastewater Treatment Plant



ZeeWeed® Membrane Tank

Application

Water reuse with Title 22 discharge standards

Capacity

3.75 MGD (14,000 m³/d)

Commissioned

August 2002

Location

American Canyon, California



Aerial View of Wastewater Plant

The Problem

With ongoing concerns about water shortages, and a population that is expected to double by the year 2025, the City of American Canyon required a treatment facility that would meet their present and future needs.

The City wanted to reuse a portion if not all of the effluent from the plant, to reduce the amount of fresh water drawn from the Napa River for vineyard and golf course irrigation. To do so, the plant would have to achieve the State of California's stringent Title 22 water reuse standards.

The Solution

Developed by the California Department of Health Services (DHS), Title 22 requirements encompass the overall design, construction, operation and maintenance of the distribution system and reuse areas. Only a few companies have been formally recognized by the DHS to be able to achieve these difficult requirements, with ZENON being one of them.

Working with the project's consulting engineer, HydroScience Engineering, the City of American Canyon reviewed several treatment options and decided that membrane bioreactor (MBR) technology would best suit their needs. In July of 2000, the City awarded a contract to ZENON to supply a ZeeWeed® MBR system capable of treating an average dry weather daily flow of 2.5 MGD (9,500 m³/d), and average wet weather flow of 3.75 MGD (14,000 m³/d).

The MBR process selected is based on the ZeeWeed® immersed membrane. The membrane forms a physical barrier to biomass, bacteria and viruses, retaining them in the process tank, while allowing a high quality effluent to pass.

Typical Treated Water Results

	Raw Water Quality	Treated Water Quality
BOD (mg/L)	200	< 5
TSS (mg/L)	220	< 2
Turbidity (NTU)	N/A	< 0.2



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The ZeeWeed® MBR system is modular. Individual ZeeWeed® membrane modules are combined to form cassettes to meet the required treatment capacity. The advantage to a growing City is that plant expansion can be in stride with actual community growth, drastically reducing up-front development costs.

Process Overview

The American Canyon MBR facility treats two distinct feed sources, municipal sewage and industrial wastewater.

The sewage flows through the headworks, which consists of 3 mm fine screens and a grit removal tank, to the anoxic zone by gravity.

There are four process trains, each consisting of an anoxic zone and aerobic zone containing the membranes. Three process trains treat the municipal sewage, while the fourth treats either municipal or industrial wastewater.

Effluent is drawn through the membrane fibers via a low-pressure suction created by permeate pumps, one per process train.

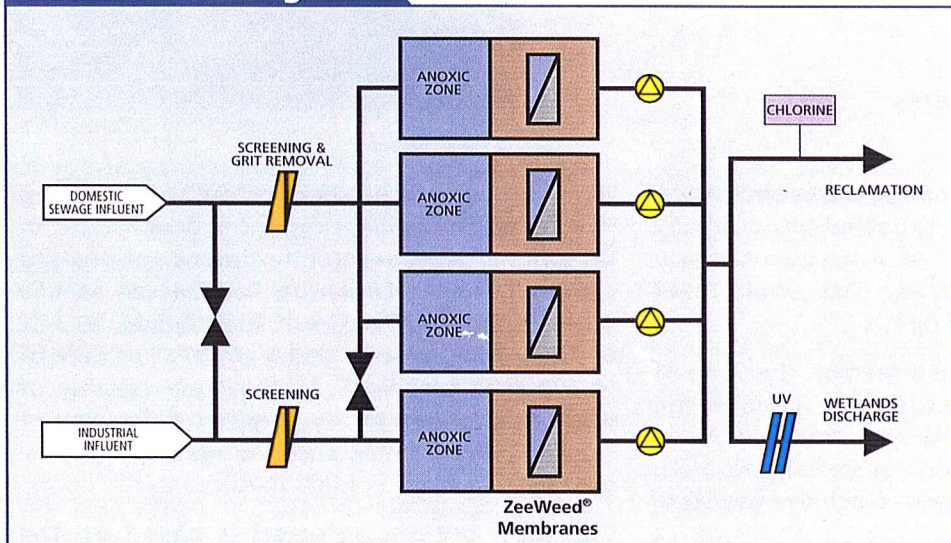
The effluent from the plant is either treated with sodium hypochlorite for bacteria re-growth control and stored in a 1.5 million gallon reuse tank, or treated with an ultraviolet (UV) polishing step, and discharged to the Napa River.

"In addition to providing a wastewater treatment process that produces effluent quality far superior to any conventional method, ZENON has also proven to be a thoroughly responsive manufacturer and supplier. All of the ZENON plants we have been involved with both as designers, and as operators, have been huge successes."

*Sim Blake, HydroScience Engineers, Inc.
Design engineer on the American Canyon project*

System Summary	
Membrane Type	ZeeWeed® 500
Process Trains	4
Total Membrane Cassettes	40
ZeeWeed® Process Footprint	8,000 ft ²
Overall Plant Footprint	750,000 ft ²

Process Flow Diagram



ZENON is a global leader in the development and manufacturing of membrane technologies and systems for water treatment, wastewater treatment and water reuse. With thousands of installations worldwide, ZENON is providing cost-effective and reliable solutions to challenges faced by municipalities, industry and government agencies.

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Represented by:



Water for the World

This product is protected by the following US patents as well as equivalent patents in other countries:
5,204,001 5,401,400 5,472,607 5,639,373 5,248,424 5,403,479 5,558,774 9,904,387

ZeeWeed® MBR for Wastewater Treatment

For over 20 years, ZENON has been commercialising the unique **ZeeWeed® MBR** (membrane bioreactor), which produces a high quality effluent and simplifies wastewater treatment. The **ZeeWeed® MBR** system replaces conventional filtration and combines clarification, aeration, and sludge digestion into one simpler and smaller process step.

The patented process incorporates **ZeeWeed®** immersed membranes. By immersing the **ZeeWeed®** membranes directly in a process tank, both capital and operating costs can be reduced.

The ZeeWeed® Membrane

ZENON's immersed hollow-fiber membrane operates under a slight suction, drawing clean water to the inside of the membrane fiber, while leaving biomass and impurities in the process tank.

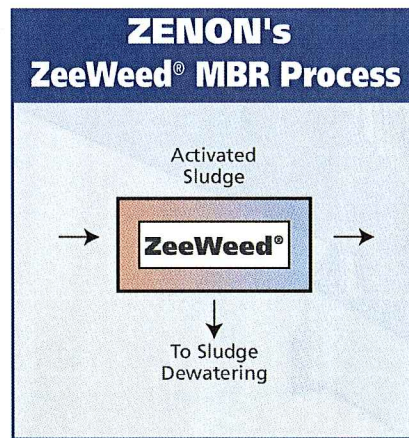
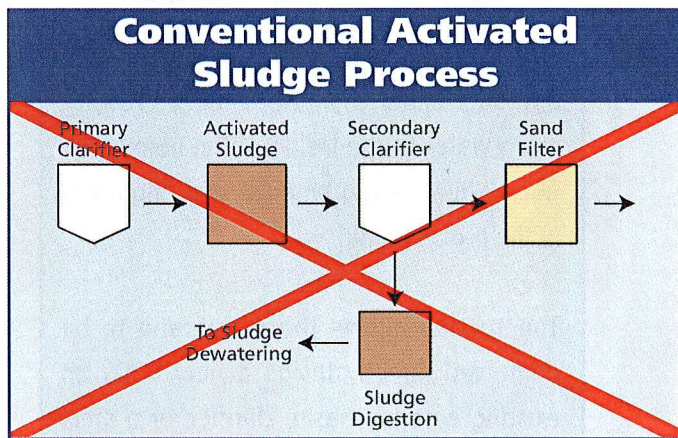
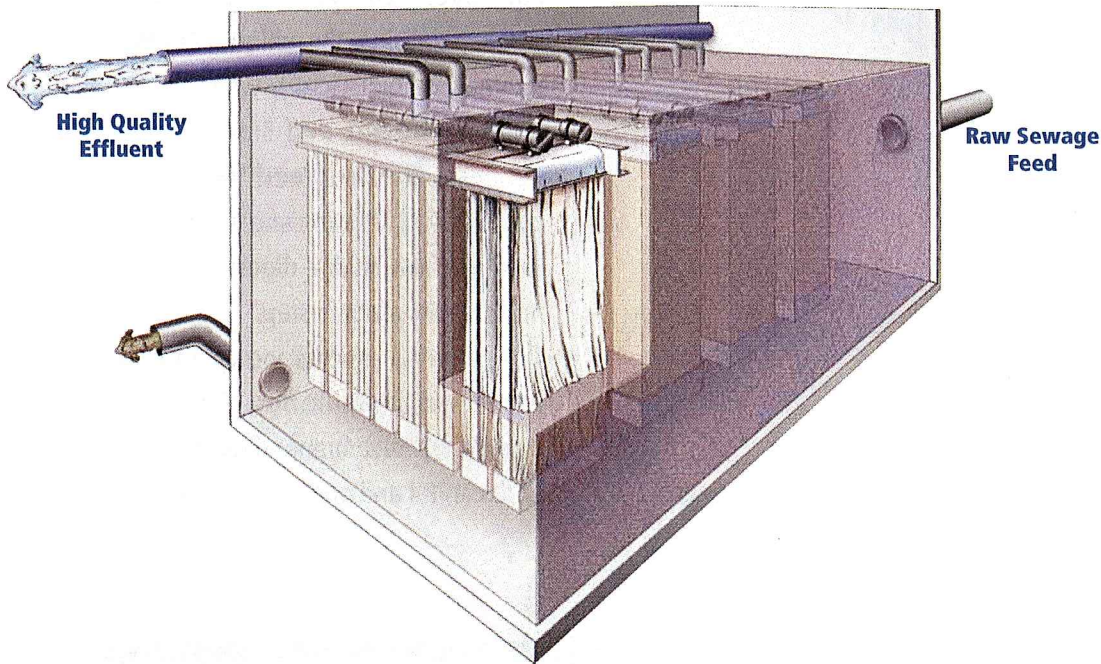
The suction allows the membrane to be immersed directly inside a new tank, an existing aeration basin, clarifier, or a steel tank provided by ZENON.



Water for the World

The ZeeWeed® MBR Advantage:

- Fits in existing process tanks or clarifiers (ideal for plant expansion)
- Extremely small footprint (1/10th the size of a conventional tertiary plant)
- Resistant to process upsets
- Easy to operate
- Reduces sludge volumes in plants with high SRT
- Produces tertiary quality effluent in a single step
- Modular and easily expandable



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