



**PROBLEM:** Rags, FOG, debris and solids plugging membrane bioreactor

**SOLUTION:** Bandscreen Monster®

**CONSULTANT:** Aqua Engineer & Jacep Pacific

## Monster Solutions

# Fine Screen Retrofit Cuts Upgrade Costs by \$1 Million

**Oahu, HI** – Hawaii typically conjures up images of azure seas, swaying palms and pristine beaches.

Behind the romance of this tropical paradise is a reality that faces most wastewater treatment professionals today – a rising population placing increased demands on treatment facilities and tougher regulatory requirements.

To preserve Hawaii's natural beauty, keep up with growth and ensure regulatory compliance, the US Army Schofield Barracks, Hawaii's largest Army post, recently upgraded their wastewater treatment facility located on the island of Oahu. The result was improved efficiency and water quality, and decreased environmental impact on the region.

The project was spearheaded by Aqua Engineers of Kauai following a contract with the Army to privatize the facility. Key to the project's ultimate success was technology from JWC Environmental, Costa Mesa, California and GE Water and Process Technologies, a unit of General Electric Company.

Wayne White, Aqua Engineer's Plant Engineer for Schofield, explained that goals for the upgrade were specific and challenging. "We needed to upgrade the plant from R2 quality effluent to R1 quality effluent suitable for re-use in agriculture and irrigation applications," says White. "We also needed to increase plant capacity by roughly 30% – from 3.2 to 4.2 million gallons per day (MGD). An additional requirement to provide surge capacity of 15 MGD to handle Oahu's frequent rainstorms further increased the design challenge. And, the total project was to be completed without major capital expenditure."

Aqua Engineers recommended General Electric's ZeeWeed® Membrane Bioreactor (MBR) technology to achieve the R1 quality effluent desired. This advanced wastewater treatment system combines rugged hollow-fiber, ultrafiltration mem-

branes with biological processes resulting in superior effluent quality and reduced chemical consumption. As specified by the membrane manufacturer, the MBR required 2mm screening in front of the membranes in order to protect them from clogging and damage.

"Protecting the membrane is critical in these types of MBR systems," explains Kenny Oyler, Director of Monster Separation Systems® for JWC, the manufacturer that supplied the screens for the project. "Our Bandscreen Monster provides excellent membrane protection because the entire screening operation is done on the inside of the screen. This prevents any debris from bypassing through and getting to the membrane itself. If that were to happen, the debris could go all the way through the process and wrap itself around a membrane, causing it to either plug or break."

Originally, the project design called for building a completely new separate screening facility downstream from the existing installation to accommodate the new screens.

However, in working with JWC, the need for a separate screening structure was eliminated.

"With JWC's help, we found a different way of using the existing infrastructure, which enabled us to replace the old 6mm screens with the new 2mm ones in the same channel," recalls White. "This was a significant design change that saved about one million dollars in infrastructure and screen costs."

While a number of screen manufacturers were considered, Aqua Engineers selected JWC Environmental's Bandscreen Monster and Screenings Washing Monster® as the equipment most suitable for the project.

"JWC's Monster screens could handle the 15 MGD per screen requirement for storm surge capacity and were priced less than competitive screens," says White. "The stainless steel material is also more desirable for the humid environment. Ultimately though, it was the fact that JWC's screens could fit the existing channel like a glove that really won out," he emphasizes. "Other companies offered custom capabilities up to a point, but were still too large and required channel improvements."



Elaborating on the retrofit aspect of the screen, JWC's Oyler commented that "the screen's retrofit ability was key to the installation success. It was absolutely critical that we fit the screen into the existing envelope without making any changes to the concrete or any other structure," he notes. "When the equipment arrived at the scheduled time, we were able to put it right into the channel without any modifications. The smooth operation pleased everyone involved."

JWC's Bandscreen Monster offers high capture rates and is able to remove a wider variety of solids, particularly small solids, trash and hair, better than traditional screens. It is frequently specified to protect high-tech Membrane Bioreactors so they can run more efficiently and with less maintenance. Unwanted solids are captured on the UHMW plastic panels (with 2, 3 or 6mm openings) and lifted to the discharge level where a spray system washes solids into the Screenings Washer Monster for washing, dewatering and compacting.

Used in conjunction with the Bandscreen Monster, the Screenings Washer Monster was also employed. This self-contained, hopper-fed system grinds, washes, compacts and dewateres screenings. The removed solids contain up to 50-percent dry solids, are 80-percent compacted and are significantly lighter and cleaner than typical screened solids. This unique process of grinding prior to solids separation removes virtually all of the soft organics (fecal) from the discharged product, which reduces odors and landfill costs.

In comparison to the previous screens used prior to the upgrade, which only dewatered, the combined Monster equipment collects, washes, and grinds the screenings to produce a product that is relatively dry and free of organic products. Not only did the screens reduce the size of materials passing through the screen from 6mm to 2mm, they also eliminated the odor, resulting in a much better quality of waste product going to the landfill.

Using the latest water treatment technologies available from GE and JWC Environmental, Aqua Engineers improved the local water quality and made more than one billion gallons of high quality, recycled water a year available for beneficial non-potable uses.

The Schofield Barracks wastewater treatment plant upgrade enabled the plant to provide

premium quality recycled water to irrigate lawns, golf courses, parks and other sites on base, positively affecting the nearly 28,000 military personnel, their families, and civilians who work on base and nearby.

Aqua Engineer's president and CEO, Eas-sie Miller, praised the team effort involved in completing the upgrade, which has turned the plant into an asset and made it the largest, privately owned R-1 facility in Hawaii. "The upgrade enables the military to conserve water, decrease pollution, and contribute to sustainability goals."

U.S. Army Garrison, Hawaii (USAG-HI), was also enthusiastic about the project goals and results. "We're committed to doing the right thing for the right reason," said Col. Howard J. Killian, former commander, USAG-HI. "Everything has value, even wastewater; it's just a matter of figuring out how to use that value. The wastewater treatment facility is just one example of how we're trying to capture that lost value."

The Schofield Barracks wastewater treatment facility upgrade was awarded a 2007 Global Ecomagination Leadership Award for employing the latest technology to achieve significant environmental and operating improvements to meet community needs.

**"JWC's Monster screens could handle the 15 million gallons per screen requirement for storm surge capacity"**

**"The screen's retrofit ability was key to the installation success."**



Wayne White, Schofield Plant Manager (back) and David Kane, Chief Operator (front).



Trust Monster Quality™



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