

Doubling Up

Hawaii plant upgrade to provide expanded services, meet future wastewater treatment demands and stimulate job creation

NAME:

Waimea Wastewater Treatment Plant

LOCATION:

Waimea, Hawaii

PLANT SIZE:

300,000 gpd; 700,000-gpd new expansion capacity

INFRASTRUCTURE:

Grit removal, flow equalization, MBBR biological system, DAF units, UV disinfection, aerobic digestion, dewatering



A serious upgrade to the Waimea WWTP will ultimately allow it to comply with Hawaii SWTR criteria.



The plant will be upgraded to 700,000-gpd capacity and will include a process train that discharges R-1 quality effluent.



The expansion will provide more efficient wastewater treatment, allow additional users to connect to service and provide a greater opportunity for water reuse.

After nearly 35 years of operation, Kaua'i County Waimea Wastewater Treatment Plant (WWTP), located in the district of South Kohala, Hawaii, is finally receiving a much-needed boost—an upgrade and expansion that will more than double the plant's treatment capacity to 700,000 gal per day (gpd).

The Waimea WWTP is a 300,000-gpd facility that provides wastewater collection and treatment for Waimea community residents and businesses. The WWTP has a conventional activated sludge system that discharges the treated effluent either into an injection well or to be recycled as irrigation water for agriculture purposes.

Addressing Growing Needs

Built in the 1970s, the plant has been operating at 90% capacity for several years. New connections have not been allowed until the WWTP is upgraded, which has impacted the further growth of the community.

In November 2009, Briant Consulting Inc., a construction subsidiary of Kaua'i-based Aqua Engineers Inc. and Hawaii's largest water and wastewater management company, was awarded the contract to upgrade the plant.

The primary objective of the project is to upgrade the existing WWTP to comply with requirements of the Hawaii Department of Health Surface Water Treatment Rule (SWTR). Under this rule, all surface water sources must meet SWTR's filtration criteria, disinfection criteria, monitoring requirements and reporting requirements.

In April 2010, a groundbreaking and blessing for the expansion of the WWTP was held. The event marked the start of the expansion, Phase 1 project.

"The WWTP will be upgraded to a design capacity of 700,000 gpd. The facility will be gutted and replaced with a process train that discharges R-1 quality effluent as defined by the State of Hawaii Department of Health—this is equivalent to California Title 22 effluent quality—and the upgrade of the effluent quality to R-1 will make the effluent available for a broader range of uses, such as landscape irrigation, as opposed to the current R-2 effluent quality, which limits landscape irrigation," said Edward Tschupp, chief, Wastewater Management Div., for the County of Kaua'i Department of Public Works.

According to Tschupp, the process train will include screenings and grit removal, flow equalization, an MBBR biological system, DAF units for clarification, disk filters, UV disinfection, aerobic digestion and a screw press for biosolids dewatering.

"This process train is the first in the U.S. for producing unrestricted reuse effluent quality. Additionally, a photo voltaic array system will be installed to offset the power consumption of the facility, reducing its demand on the local utility power," Tschupp said.

Overcoming Challenges

Like every project, the Waimea WWTP does not come without its challenges. One of the biggest challenges is the plant site, which is located in a floodplain.

"We are required to design the facility to mitigate the flood issues of the site. A perimeter flood wall and relocation of the existing motor control center above the flood level is being designed to protect the electrical equipment during flood events. Additionally, because the site is located in a flood-prone area, the underlying soils are extremely soft and a drilled shaft foundation system will be required to support the loads of the new process structures and associated equipment," Tschupp said.

Keeping the plant operational during the expansion project presents yet another challenge. "We phase the construction work in such way that the existing plant does not have any wastewater spills or interruptions during the construction of the upgrade work," Tschupp said.

Status Check

Currently, the project is 95% complete with the treatment plant design, which is being reviewed by the County of Kaua'i Building Department. Construction for the backup injection well and monitor wells is underway, which is part of the initial phase for the construction improvements for the overall project. The remainder of the in-plant work has yet to begin and is pending final plan approval from the county.

Community Benefits

According to Tschupp, the expansion will provide the local community with a larger, more efficient and upgraded wastewater treatment facility. The plant will provide the required infrastructure to allow additional users to connect and provide the area with greater opportunity for future growth. The higher-quality effluent will provide greater opportunity to recycle and reduce the use of potable water for irrigation purposes.

Additionally, because the project is funded by roughly \$7.4 million in federal American Recovery and Reinvestment Act stimulus funds and another \$8.2 million from the State Revolving Fund, the jobs created by the construction of the facility upgrade will employ many local construction workers during this tough economic time.

The completion date of the project is scheduled for Nov. 30, 2011. **WWD**

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