BC resort installs flexible MBR wastewater treatment system

By Christopher Lewis

Due to the growing tourism industry in British Columbia, Cultus Country Resort, located just 60 miles east of Vancouver, is in need of wastewater treatment. For water systems and utilities company Corix, an opportunity to build and operate a wastewater treatment plant in their native Canada was too good to turn down.

Corix has extensive experience in the water treatment industry and has now turned its interests to designing, building, and operating their own membrane bioreactor (MBR) plants in Canada. Because Eimco Water Technologies is also interested in the Canadian market, the two companies started talking. Some of the factors considered in the decision-making process included current and future permit compliance issues, fluctuating loading conditions, and treatment capacity.

After considering bids from several vendors, including at least two Canadian companies, Cultus Country Resort selected the team of Corix and Eimco Water Technologies to install an MBR system using Kubota submerged membrane equipment. Cultus is Eimco Water Technologies' first fully designed Enviroquip™ MBR system for a wastewater treatment plant in Canada.

When asked about some of the reasons that led to the selection of this system, Corix Engineer John Sainas stated, "in BC all developers must complete an environmental study. The environmental study mandates what treatment quality is required. For this developer the fact that there were water wells in the area was key in setting low effluent specs (BOD/TSS < 10/10 and 2.2 FC). While there are other ways to achieve this, membranes are in vogue and their dependability is proven."

Additionally, because Corix will operate the facility, Mr Sainas adds, "it was really our ability to work on an OEM basis with Eimco Water Technologies that was the key."

The process

Cultus Country Resort serves summer tourists to British Columbia's beautiful Cultus Lake. The harsh Canadian winters minimize tourism during the cold season, and consequently, the selected wastewater treatment system would have to be flexible enough to handle a wide range of hydraulic demands.

Using the concept of biohydraulics, the Enviroquip system was designed to exceed biological treatment objectives over the range of expected operating conditions. The Cultus Country WWTP is comprised of two independent process trains that include one anoxic zone and one MBR zone and uses the Storm Master™ configuration. With Storm Master, the plant is capable of transforming into a sludge thickening system during the low flow winter months. This capability minimizes hauling requirements and will thus save the plant thousands of dollars in hauling costs.

The Storm Master design is an important feature of the Cultus Country Resort WWTP because it further reduces overall plant operating costs by putting off-line membrane capacity to beneficial use. During extremely low flows, one of the process trains is used to treat incoming wastewater while another is used to digest and thicken solids to 3% before further treatment. As flows increase, the plant computer brings all trains on-line to treat peak flows.

Flexibility and reliability

Using Kubota submerged membrane units, the Enviroquip system is designed to handle average daily flows of 200 m^3/day (~53,000 gpd) with the ability to expand to 300 m^3/day (~80,000 gpd) with the addition of two more Kubota ES-200s. Additionally, because tourism in this region of Canada is at its apex in the summertime, an unusual step was taken to incorporate the proprietary flux enhancing polymer MPE50™ during the summer time to increase membrane flux as opposed to more typical scenarios that see higher flows during the colder months (rainy seasons).

Because Eimco Water Technologies can take advantage of membrane thickening capabilities, extreme ranges of low and high flows are handled with ease.

The ability to accommodate such a wide range of operating conditions gives operators time and confidence to manage system upsets. Additionally, the ability to operate the plant manually, in the event of an emergency, provides another level of reliability that can be invaluable.

Christopher Lewis is with Enviroquip, a Division of Eimco Water Technologies.
E-mail: guy.beauchesne@glv.com