

**AUTOMATION IN ACTION**

# WATER TREATMENT PLANT CHALLENGE

## Pumping out a powerful solution for Metro Vancouver

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**A**s the second largest secondary treatment facility in Canada, Metro Vancouver Regional District's Annacis Island Wastewater Treatment Plant (MV AIWWTP) in Delta, B.C., presently serves about 1.3 million people in 14 member municipalities in the Fraser Sewerage Area (FSA).

The pumping facility at the Annacis Island plant is a critical part of the infrastructure, as collection and conveyance systems transport the FSA wastewater to the plant. The three 1,200-horsepower influent pumps and four 684-horsepower trickling filter pumps have been in service for about two decades and were at their end-of-life stage. These large pumps regulate the level of raw sewage in the wet well, conveying it

into the treatment plant. Should these fail during high flow situations, there are overflow gates, but these bypass raw wastewater into the Fraser River, which would lead to consequential fines and penalties due to its environmental impact. The trickling filter pumps power the flow of the partially treated waste over trickling filters for secondary treatment, which capture most of the bacteria before the final purification processes.

MV AIWWTP decided an upgrade project was needed, but replacing the pumps, power distribution and control equipment without taking the facility offline was a critical element. It recently called on the knowledge and solutions of Rittal, E.B. Horsman & Son, and 3 Phase Power Systems to help develop and enhance a complex pumping system for efficient performance while meeting the

challenge of rising energy costs.

3 Phase Power, a specialist of industrial power system design with more than 20 years of experience, faced three major challenges during the quotation, design, manufacturing and implementation stages of this project.

- *Maximizing space and protecting equipment*

The first challenge was the available footprint. The footprint restriction was challenging to the point that installing traditional power distribution and control equipment would be difficult. The selected enclosures had to contain all the critical equipment in a small area, while keeping the components environmentally safe and secure. The proposed layout for the project needed to be readily understandable and demonstrate how the specifications could be condensed into the available space.

- *Timely delivery and innovative solutions*

The second challenge was being able to reliably ensure that the required materials

would be available within the tight timeline that was required. To accomplish this, 3 Phase Power required partners in British Columbia that had the infrastructure in place to deliver the project seamlessly. It required access to the most innovative solutions, as well as ingenious methods for power systems and wiring.

### • *Crucial timing, avoiding fines and high costs*

Finally, the replacement had to occur during the summer months, when water levels are lower due to lack of precipitation. Waste overflow results in steep fines from the government and must be avoided. The provider was required to deliver in the small window for installation, or else the project would have to be put off for a full year, until the water table was low enough again.

### **Pumping out solutions**

From the beginning of the bid process, 3 Phase Power knew it would have to meet the strict requirements for footprint, space, deliverables and timing. Its first step was to work with Rittal EPLAN. With this software, the project team was able to work within the proposed footprint and include the proposed panels, in a 3D drawing, as a visual, and at the time of the bid, they submitted 3D drawings, bills of materials of the enclosures, ratings and manuals altogether.

When 3 Phase Power won the bid, it turned to manufacturing partner Rittal — a provider of enclosures, climate control and distribution systems and software — to provide the integrated solutions in a timely manner and E.B. Horsman & Son for material supply and logistics. Established in 1900, E.B. Horsman & Son is an independently owned electrical distributor with 22 locations in Western Canada. To fit the power distribution product into the space of the enclosure, the Rittal Maxi-PLS busbar system was used instead of traditional cabling. Paired with 3 Phase Power's VACON VFDs for load sharing, the ampacities of the Maxi-PLS busbar provided the necessary power, along with the brackets and busbar support which bolted into the Rittal TS 8 enclosures. As a result, the equipment not only fit into a much smaller space required by the project, but also provided the essential and documented CSA approvals.

“The key to the quick turnaround time and ease of build was due in part to the modularity and system-based design of the Rittal solution. The Maxi-PLS busbar system, which is CSA certified to 3200A, is



An aerial view of the Annacis Island Wastewater Treatment Plant in Delta, B.C.

designed to easily mount into the frame of standard off-the-shelf TS8 modular enclosures,” said Craig Torrance, director-sales, Rittal Systems.

3 Phase Power says VACON incorporates the latest in VFD technology and has actively developed benchmark applications tailored for water and wastewater handling. These applications include pump control, hose filling, pump supervision, and multiple pump control applications.

Throughout the process, Rittal and E.B. Horsman & Son stayed ahead of the curve by closely coordinating the ins and outs of the logistics and delivery. The parties managed the flow of product through three different delivery stages, all with one purchase order.

“They knew the critical dates, timelines and were always mindful of them,” said 3 Phase Power's Dwayne Donaldson, senior designer and project manager. “E.B. Horsman & Son even staged product delivery from Rittal at their location, so if we were ahead of schedule we could pull things in.”

Tyson Carvell, E.B. Horsman & Son VP marketing, added, “E.B. Horsman & Son was happy to coordinate the material supply, provide logistics and stay on top of the order to ensure that the project moved along smoothly.”

Each part of the project had to be precisely timed because of the narrow window for installation. However, the most critical part was the installation itself. Watching for the right conditions and maintaining a water level low enough to stop the pumps for installation were imperative. 3 Phase Power managed the installation without a hitch, with the timing of the deliverables managed perfectly.

### **Planning jointly for the future**

For future projects, 3 Phase Power is already planning on Rittal. “We've been using Rittal

enclosures solely for five years or so, and I would be very, very unhappy if we had to switch,” said Donaldson. “The entire plan became a faster project with Rittal, E.B. Horsman & Son, Rittal EPLAN and the use of the Maxi-PLS busbar locked into Rittal TS 8 enclosures, compared to doing it the traditional way.

“There were some challenges dealing with the MV AIWWTP. Right from the bidding process, our ability to use Rittal EPLAN to model out and relay to the customer what the build was going to look like, showing them the confidence that we knew would fit into their footprint upfront, helped us win the bid,” he continued. “The customer wanted data sheets and a lot of upfront information on the project. Going from a preliminary bill of materials to a full bill of materials to get the project and product moving was very quick and easy. It was a great example of three organizations — 3 Phase Power, E.B. Horsman & Son, and Rittal — all working together from EPLAN to procurement to management. And we all came out with a win.”

Torrance concluded, “It was a real pleasure dealing with 3 Phase Power as they knew exactly what they wanted, and worked side by side with Rittal and E.B. Horsman & Son all the way to put together an innovative solution that worked for MetroVan.” | MA

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