



Upgrades to  
water pollution  
control plant  
mean clean water  
for drinking  
and recreation  
for years to come



# RAISE A GLASS

By Theresa Rogers

**SUMMER IS COMING AND FOR MANY ONTARIANS**, that means time spent at a lake camping, fishing or swimming. Lake Simcoe is one provincial lake which serves these recreational purposes but it's also a source of drinking water for eight municipalities and an important fish and wildlife habitat.

Keeping the lake clean for generations to come is a priority. The Keswick Water Pollution Control Plant (WPCP), which sends treated effluent into Lake Simcoe, was recently expanded to provide additional treatment capacity for the Town of Georgina in York Region. Hatch Mott MacDonald was retained to oversee the initiative with responsibility for engineering and project management. The goal was to expand the plant while satisfying strin-

gent requirements on what is allowed to flow back into the lake.

The expanded Keswick WPCP is required to meet very low Total Phosphorus effluent limits due to lake eutrophication (occurs when excess nutrients enter the water and encourage the growth of algae and other aquatic plants. Overcrowding occurs as plants compete for sunlight, space and oxygen) concerns. Key elements of the expansion include an ultrafiltration (UF) membrane system, the first tertiary UF membrane system in Ontario. It acts like a filter, says Glen Douglas, Project Manager. "It's a separation process which takes out most of the phosphorus, bacteria and suspended solids that could enter the lake and retains them." The tertiary treatment process was also expanded to

include ultraviolet disinfection. Other upgrades such as the addition of a diesel standby generator with emissions control bring the plant into the modern day.

Prior to the expansion of the Keswick WPCP, the average treatment capacity was 12,070 m<sup>3</sup>/d. This is enough capacity to service a population of approximately 23,400. The recently completed expansion project increased the average treatment capacity by approximately 50 per cent to a flow of 18,000 m<sup>3</sup>/d, which is equivalent to a service population of approximately 49,300.

Despite those numbers, Douglas says the highlight of the project is the filtration membranes. "They represent the best available technology capable of reliably and consistently achiev-

## FACTS

- Lake Simcoe is a source of drinking water for eight municipalities.
- Treatment capacity was increased 50% from 12,070 m<sup>3</sup>/d to 18,000 m<sup>3</sup>/d.
- The upgraded and expanded plant reduced the total phosphorus loading to Lake Simcoe by 667 kg per year.
- Capital cost: \$60 million.





ing the very low phosphorus limits required at the Keswick WPCP to protect the Lake Simcoe watershed.”

The frigid winter temperatures of the past couple of years posed the biggest challenge for the team. Last year, for example, water temperatures to the membranes dipped as low as eight degrees. This is colder than typically experienced, however, it did not prevent the system from producing an effluent quality that met the Ministry of Environment and Climate Change compliance and objective limits, Douglas says.

“Basically, as temperature decreases, it affects the membrane performance, reducing the flux or the flow that can go through the membrane,” he says. “To compensate, we had to add more surface area (more membranes) to address the cold temperatures. The design incorpo-

rated the flexibility to accomplish this by providing additional space in the membrane tanks.”

Since then, the cold weather membrane performance conducted at the Keswick WPCP has set the benchmark for tertiary membrane wastewater treatment technology application in Ontario.

Douglas is proud of these innovations and the plant’s performance. He says that by using innovative technologies, growth in the community can be accommodated in a manner that is still protective of the environment.

“We recognize that the Lake Simcoe watershed is a valuable resource for the community and protecting it was a high priority for this project. The community should be proud of this state-of-the-art facility and the high level of treatment it provides to protect the environment.”

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