

Lakeview Water Treatment Plant

Application: Expansion of a conventional water treatment plant using UF membranes

Capacity: 96 MGD (363 ML/day)

Location: Mississauga, Ontario, Canada

Commissioned: June 2007



Image courtesy of CH2M Hill Canada

Introduction

Over the past 30 years, few municipalities in Canada have experienced the kind of rapid population and economic growth that the Region of Peel has. With the population increasing from about 330,000 to over one million residents, the municipality places a high priority on ensuring that new infrastructure expenditures are long-term investments.

The Region of Peel began discussions in 2002 to expand its Lakeview Water Treatment Plant (LWTP). Both Regional Council and senior management established key criteria for current and future expansions at the site. It was imperative that the expansion remain within the existing footprint of the plant, allow for sufficient capacity to service future needs, and produce the highest quality drinking water that would meet more stringent water

quality regulations and satisfy consumer demand for improved tap water aesthetic quality (i.e., taste, odor and color).

After an extensive pilot program, and in consultation with engineering and design firm CH2M HILL, the Region of Peel decided to implement a new, innovative, multi-barrier approach at its LWTP using ZeeWeed* hollow-fiber ultrafiltration (UF) membranes together with ozonation, and biologically active carbon (BAC) contactors.

The treatment process will provide more than 600,000 consumers with year-round aesthetically-pleasing drinking water that surpasses the requirements of the Ontario Safe Drinking Water Act for pathogen removal (*Cryptosporidium* and *Giardia*), removal of taste- and odor-causing compounds, disinfection-by-products and other contaminants.

The compact plant footprint allows for the preservation of green spaces around the plant and allows for the continued use of Region property at the site for public recreational purposes.

The treatment expansion will be integrated into the existing conventional Lakeview water treatment plant while the existing plant remains in operation. The original expansion capacity was increased from 69 MGD (262 ML/d) to 96 MGD (363 ML/d) without compromising the Region's ability to provide a high quality water of adequate capacity to its customers.

Upon completion of the expansion, this project will be one of the largest low-pressure, UF membrane plants in the world with a capacity of over 96 MGD (363 ML/d).

Process Overview

Water supply for the plant expansion is from the northern shore of Lake Ontario, characterized as moderately hard and usually low in turbidity and

a product of
ecomaginationSM



Find a contact near you by visiting www.gewater.com and clicking on "Contact Us".
* Trademark of General Electric Company; may be registered in one or more countries.

©2013, General Electric Company. All rights reserved.

organics, but turbidity can rise to high levels for up to a week.

Ozone and BAC will provide pretreatment for the raw water prior to UF. This pretreatment process will reduce turbidity and dissolved organic carbon, and provide taste and odor control.

The LWTP expansion will incorporate twelve ZeeWeed membrane process trains. Each train will consist of a 1,942 ft³ (55 m³) process tank that can hold up to seven ZeeWeed membrane cassettes. Eleven of the trains will operate at all times, with the twelfth train operating on demand.

The ZeeWeed UF membranes are immersed directly into the membrane tanks and draw water into the fibers using a slight vacuum. The membranes form a physical barrier to particles, preventing suspended solids, turbidity, algae and pathogens from passing into the permeate.

The operation of the system is highly automated and fibers can be easily cleaned with a clean-in-place backpulsing process that forces permeate water back through the membranes dislodging any particles that may adhere to the membranes.

Intermittent aeration of the membranes is also used to scour debris from the fibers. With regular maintenance and inspections, each membrane cassette will provide years of efficient and cost-effective operation.

