

TROJAN UV[™]

CASE STUDIES

Environmental Contaminant Treatment



TrojanUV Solutions for Taste & Odor and Algal Toxins:
Treating Trace Contaminants and Disinfecting with
UV in Drinking Water

Taste and Odor Treatment with UV-Oxidation: Mississauga, Ontario Canada

The Regional Municipality of Peel is located in Southwestern Ontario, Canada and is the second largest Canadian municipality after the city of Toronto. The Peel Region includes the cities of Brampton, Mississauga, and Caledon which are located in the Greater Toronto Area (GTA) and is home to nearly 1,160,000 residents.

The Region of Peel draws its drinking water from Lake Ontario which is the smallest of the five Great Lakes. To meet the projected population increase from 1,160,000 people currently to an estimated 1,571,000 people in 2031, the Region decided to upgrade and expand its Lorne Park Water Treatment Plant (originally built in 1975).

Unlike many water treatment plants in Ontario, the Lorne Park WTP, when completed, will utilize two separate treatment trains: conventional (120 MLD) and membrane filtration (380 MLD). Ultraviolet light in combination with hydrogen peroxide (UV-oxidation) will be utilized on the membrane treatment train while UV alone will be employed on the conventional treatment train. The treated water from both systems is then blended and dosed with sodium hypochlorite before being distributed to customers. To deal with seasonal taste and odor (T&O) compounds produced

by algae blooms in Lake Ontario, the membrane plant will be equipped with a Trojan UV-Oxidation system. The purpose for combining membrane filtration and UV-Oxidation was to ensure that the residents of Peel receive the purest, most aesthetically-pleasing water possible. The TrojanUVSwift[™]ECT system provides an additional barrier to microorganisms such as *Cryptosporidium* and *Giardia* while destroying the algae-derived compounds 2-methylisoborneol (MIB) and geosmin. MIB and geosmin are responsible for periodic earthy/musty taste in the finished water. These compounds are small enough in molecular weight to pass through most membranes. The system was designed to meet and exceed the current and future Ontario Drinking Water Quality Standards. The treatment train at the membrane plant is as follows: [Membrane filtration](#), [UV-oxidation](#), and [granular activated carbon contactors](#).

THE TROJAN UV SOLUTION

In the fall of 2007, Trojan was selected to supply both UV portions of the Lorne Park Water Treatment Plant upgrade. For the conventional treatment train, the TrojanUVSwift[™] was selected to provide disinfection. For the membrane treatment train, the

TrojanUVSwift[™]ECT system was selected over other technologies (including ozone) to provide T&O treatment because the UV-Oxidation system offered flexible operation, guaranteed performance, and required a very small footprint. Footprint was important as the Lorne Park WTP is built almost entirely underground. The completed membrane-train UV-oxidation system consists of:

- The TrojanUVSwift[™]ECT UV systems
- Automated sleeve wiping system with ActiClean[™]
- A performance guarantee
- Trojan's patent-pending control system that optimizes the UV-oxidation process in real time
- Trojan's OptiView[™] UVT monitoring system

UV-OXIDATION SYSTEM DESIGN PARAMETERS

- **PEAK FLOW FOR DISINFECTION:** 390 MLD
- 83% (0.77 log) Reduction of Geosmin
- **DESIGN FLOW RATE FOR UV-OXIDATION:** 200 MLD
- 1.25 log reduction Geosmin
- 1 log reduction MIB
- 15 mJ/cm² minimum dose (1.7 log reduction of *Giardia*)