



### **PROJECT DESCRIPTION**

This was a collaborative study undertaken jointly by Coldwater Consulting Ltd. and Kilgour & Associates. The goal of the study was to assess contaminant loading of Venning's Bay (Severn Sound) from a proposed sewage lagoon outfall. This included provision of technical modeling and analysis work to support the client in ensuring that the geometry, location and operation of the diffuser were designed to comply with provincial water quality guidelines, particularly in terms of ammonium and phosphorous concentrations.

The physical processes associated with outfall performance are:

- Near-field mixing of the plume (dispersion and dilution), and
- Far-field dispersion and transport by ambient currents

Currents at the site are influenced by:

- Winds, and
- Seiching (fluctuations in lake level caused by a combination of winds and barometric pressure gradients)

In order to address these issues and to develop an outfall and diffuser design that can conform with provincial water quality requirements, analysis focused on:

- The application of three-dimensional computer models of wind-driven flows to predict circulation and transport patterns in the vicinity of the outfall;
- A plume fate model to examine the near-field diffusion of contaminants from the outfall diffuser; and
- A particle transport model to examine far-field diffusion and transport.

### **CLIENT**

private

### **LOCATION**

Vennings Bay, Ontario

### **DATE**

2009