



**Environmental  
Hydraulics  
Group**

**Coastal & River  
- Environment**

**Project: Spatial Flow Patterns in Peninsula  
Harbour – Field Tests**

**1992-012**

**Location: Marathon, Ontario**

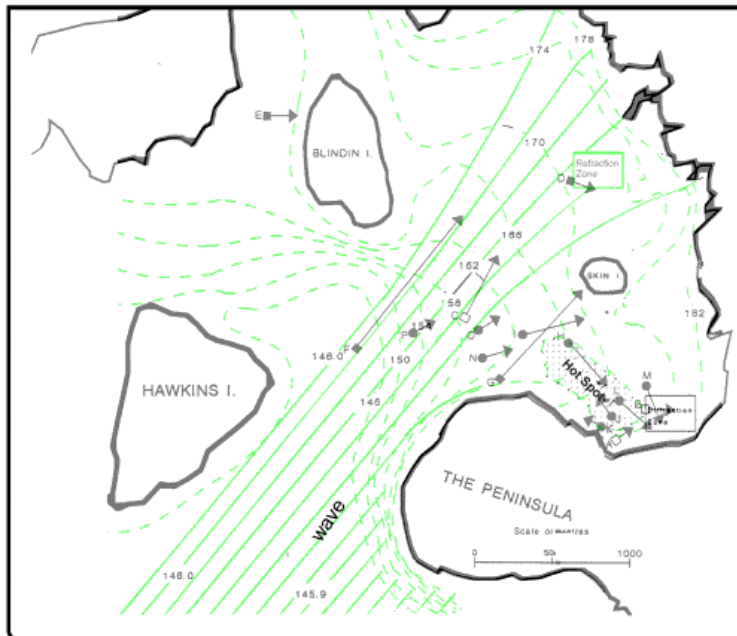
**Client: Department of Fisheries and Oceans**

**Completed: March 1993**

**Description:** The Department of Fisheries and Oceans authorized Environmental Hydraulics Group to prepare a report on the flow pattern in the vicinity of Jellicoe Cove in Peninsula Harbour, near the Town of Marathon, Ontario, in the northern part of Lake Superior. This area was one of the "areas of concern" identified by the International Joint Commission for preparation of Remedial Action Plans (RAP).

Water and sediment contamination had been identified in the area from previous industrial discharges and activities. An area 13.7 ha had been designated a 'hot spot' due to the presence of high mercury levels (>6  $\mu\text{g}/\text{gm}$ ) identified in sediments at the bottom of the harbour. A larger area of methyl mercury approximately centred around the "hot spot" had also been identified, leading to suspicions of contaminant migration by sediment movement from the "hot spot".

### PENINSULA HARBOUR



**Scope of Work:** was as follows

- Review reports, plans, and the available literature related to the site physical condition;
- Obtain sediment samples and current data within the study area, with a focus on the "hot spot" area.
- Conduct laboratory tests to determine sediment size and distribution;
- Estimate the current, wind and wave influence on the feasibility of using clay to cap the "hot spot"; and
- Report on the analysis, technical discussions, conclusions and recommendations.

**Benefit to the Client:** The following conclusions and recommendations were based on the field investigations and hydraulic analysis conducted:

- Longshore currents within the study area were generally weak, occurring at the east end of the Cove and against the wave direction during field investigations.
- The surrounding islands and land of the harbour provided a barrier and hence a reduction of wave energy.
- Wave energy was greatest in the fall and early winter prior to lake freezing.
- Particle size analysis indicated that sediments from the "hot spot" were predominantly very fine to fine grain sands. If left un-capped, contaminants could be moved readily under average and extreme wave conditions.

