



WATER RESOURCES

Assimilative Capacity / River Mixing Zone Studies

C.P. Rail Toronto Yard Lagoon

Client: Canadian Pacific Railway

Canadian Pacific Railway (CPR) has operated the Toronto Railyard in Toronto, Canada since 1954. The Yard serves as a primary switching, maintenance and classification facility. A stormwater management facility is operated in the 60 hectare site to provide quality/quantity control prior to discharging to the Malvern Branch of Highland Creek.

Although Lagoon upgrades were completed to reduce effluent Oil and Grease, the Ontario Ministry of the Environment's 1997 amendment to the Certificate of Approval also added criteria for total suspended solids (TSS).

The criteria specified that effluent TSS concentration for any discharge greater than 25L/s must be less than 25 mg/L. Although the lagoon was retrofitted using the Ministry's standard methodology, the effluent continued to exceed the TSS discharge criteria as a result of the high proportion of very fine sediment.

GREENLAND was retained (2004) to complete an assimilative capacity study in support of CPR's application for amendment of its current Certificate of Approval. Our approach included:

- Development of aquatic habitat tolerance level criteria;
- Obtaining continuous stream flow and water quality data from the local Conservation Authority's **HSPF** hydrologic model;
- Relating flow and TSS concentrations in the Malvern Branch of Highland Creek with flow and TSS in Lagoon effluent using Environment Canada's climate data and hydrologic models;
- Statistically evaluating the frequency of various effluent discharge concentrations and corresponding flow rates to determine whether the lagoon is providing a net dilution or strengthening of TSS in the receiving waters; and,
- Water quality and stream flow monitoring to verify estimates generated by the computer modeling and mass balance calculations.

