

PROBLEM

Failing shoreline septic systems within the village of Cheltenham have resulted in high phosphorus loadings to the Credit River, and exceedances of Provincial Water Quality Objectives (PWQO's). In an effort to remedy the problem and allow for future development, a waste treatment plant for the area was proposed with a new point source discharge into the Credit River. A voluntary program to disconnect existing septic systems and connect to the new conveyance system was proposed. The Ministry of the



Environment (MOE) required phosphorus from the new plant discharge to be offset by the removal of phosphorus from other sources along the Credit River. The amount of phosphorous diverted per participant, and information on the success of similar disconnection programs was needed. From this information, the aquatic impacts could be accurately gauged.

APPROACH

Jagger Hims Limited was approached to conduct a comprehensive literature review to assess the phosphorus offset effectiveness and impacts of removing failed septic systems from riverfront areas. Sampling was conducted in order to determine the amount of phosphorus impacting the Credit River from leaking septic systems and the anticipated impacts on the watershed and greater ecosystem.

RESULTS

Models of effective programs, primarily from the U.S., and the associated phosphorus loading reductions were documented. The critical importance of soil type in the determination of phosphorus plume mobility was also provided. Case studies showing the reversal of enhanced eutrophication of water systems from offsets of phosphorus were also cited. A calculation of the net reduction of phosphorus loading per shoreline septic system disconnection was also detailed, in addition to the predicted impacts on aquatic organisms.

SOLUTION

A determination of the impacts of septic system removal from the shoreline and phosphorus offset for each diversion was factored into the plant technology and discharge criteria planning.