**Information Report**

| To:        | Mayor and Members  
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| From:      | Elizabeth Richardson, MD, MHSc,  
|------------|-----------------------------|
|            | FRCPC Medical Officer of Health  
|            | Public Health Services       |

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| Date:      | September 20, 2006  |

| Re:        | Public Health Services Recreational Water Quality Monitoring Program and Pier 4 Beach Water Quality Improvement Project PH06011a (City Wide) |

**Council Direction:**

N/A

**Information:**

This report provides an update on the Pier 4 Beach water quality improvement project implemented by Public Health Services, Public Works, and the Canadian Centre for Inland Waters (CCIW) during the 2005 swimming season and its progress during the 2006 swimming season.

**Project Description**

The recreational swimming areas at the two Hamilton Harbour beaches (Pier 4 and Bayfront) have been historically plagued with significantly high Escherichia coli bacteria concentrations during the summer swimming season. This has resulted in the almost constant posting of warning signs, rendering the beach area unsafe for recreational use. The source of high E.coli levels is not believed to be from human origins as the nearby combined sewers have been diverted to the sewage treatment plant. Studies done by the CCIW lend support to the hypothesis that waterfowl may be the source of the E.coli, and that excluding waterfowl from these swimming areas might improve the recreational water quality.

Historically, Public Works undertook the following activities to deter geese from inhabiting the Hamilton Harbour:

- Pyrotechnics and frightening methods;
- Egg oiling;
- Introduction of birds of prey;
Habitat modification and naturalization of shorelines; and
Supervised working dogs, trained to chase, not injure, geese.

During the 2005 and 2006 swimming seasons, these activities were expanded at Pier 4 Beach in three ways:

1. A buoy line was installed to deter geese from swimming into the beach area.
2. A temporary fence was installed around the perimeter of the beach to deter birds from walking into the area.
3. Visible fecal matter was removed through daily raking of the sand.

Overhead wires were considered as an additional measure that could be implemented over the bathing and beach areas were the above measures not successful.

**Project Impact**
The following graph illustrates the concentrations of E.coli bacteria in the water at Pier 4 Beach over the past three swimming seasons, showing the apparent positive effect of the Pier 4 Beach water quality improvement project. When levels of E.coli exceed 100 bacteria per 100 ml of water, the beach is considered unsafe for swimming. The bird exclusion activities were initiated during the latter portion of the 2005 swimming season and continued throughout the 2006 swimming season, with a corresponding increase in the percentage of days Pier 4 Beach was bacteriologically safe for swimming.
Historically, the safety of the water at Harbour Beaches worsens as the swimming season progresses. The change in water quality at the Pier 4 Beach in August 2005 and during the 2006 swimming season is significantly different and improved from historic trends.

Evidence collected during the 2005/06 swimming seasons suggests that when barriers and bird exclusion methods are implemented, E.coli levels decreased to levels safe for recreational use.

It is important to note that Hamilton Harbour was closed for swimming for three weeks during the months of July and August due to the presence of blue green algae.

The barrier and bird exclusion methods will be implemented again in 2007 for further analysis to determine if there is a relationship between the implementation of these bird exclusion activities and an improvement in water quality and recreational opportunities at Pier 4 Beach.

The possibility of implementing a similar approach for bird control at Bayfront Beach for the 2007 or 2008 swimming season will be pursued.

Further review of this program will occur over the winter months, and a report outlining the recommended approach for the 2007 swimming season will be brought to the Board of Health in the spring.

Elizabeth Richardson, MD, MHSc, FRCPC
Medical Officer of Health
Public Health Services