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2025 Beach Monitoring Report – Hamilton Public Health

Background

This annual report provides an update of Hamilton Public Health's (HPH) recreational water quality monitoring at Hamilton's public beaches. The Ontario Public Health Standards (OPHS) specify the public health programs and services Boards of Health must deliver. Program and topic-specific protocols under the OPHS further define the minimum responsibilities every Board of Health in Ontario is accountable to provide. To assist in the prevention and reduction of water-borne illness and injury related to recreational water use at a public beach, Boards of Health are directed by the Recreational Water Protocol (2019) and the Operational Approaches for Recreational Water Guideline (2018). Both documents guide the delivery of the local Beach Water Quality Monitoring Program in Hamilton.

In 2025 HPH conducted routine beach surveillance at seven public beaches in Hamilton. A public beach is "any public bathing area owned and operated by a municipality where the public has access and there is reason to believe that there is recreational use of the water" (MOHLTC, 2019). The seven monitored beaches in Hamilton were Beach Boulevard, Van Wagner's, and Confederation Park Beaches along Lake Ontario, as well as Binbrook, Christie and Valens Conservation Area beaches, and Pier 4 Park Beach in Hamilton Harbour. Bayfront Park Beach remained closed to users due to a history of poor water quality. Routine beach inspections are conducted before the swimming season begins and throughout the summer, to monitor the safety of the public swimming areas and to establish strategies for the management of health hazards.

Beach Water Quality Monitoring

HPH monitors the safety of public beaches by collecting and testing the beach water for *E. coli* bacteria during the swimming season, typically between the Victoria Day long weekend in May and the Labour Day long weekend in September. Beach water quality is monitored for both *E. coli* bacteria and blue-green algae (BGA) blooms.

E. coli

E. coli is naturally found in the intestines of humans and warm-blooded animals. High numbers of *E. coli* in the water indicate the presence of faecal contamination and the potential presence of other harmful microorganisms such as *Cryptosporidium, Giardia, Shigella,* norovirus and *E. coli* 0157:H7 (CDC, 2017). These organisms have the potential to cause a variety of infections including gastrointestinal, skin, ear, respiratory, eye, neurologic and wound infections (CDC, 2017).

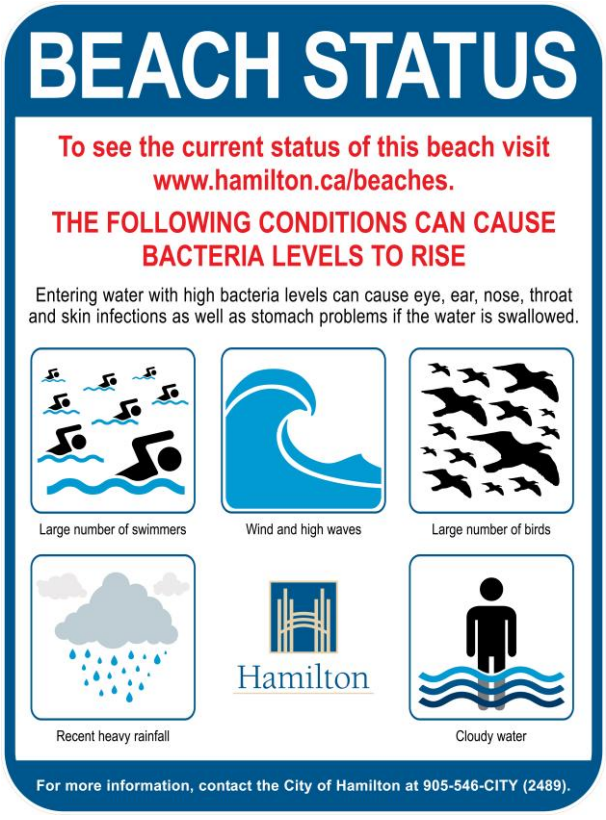
The Operational Approaches for Recreational Water Guideline (2018) states that a minimum of five samples at different points must be collected at each beach and the geometric mean of *E. coli*

concentrations must be used to assess recreational water quality and guide public health action. Samples are collected by HPH staff and analysed at the Public Health Ontario regional laboratory in Hamilton. The maximum acceptable concentration of *E. coli* at a beach is a geometric mean of 200 *E. coli* colony-forming units (CFUs) per 100 ml of water (MOHLTC, 2018). *E. coli* concentrations above this level could represent an increased risk of infection to swimmers.

HPH updates the City of Hamilton's Beach Water Quality Website (www.hamilton.ca/beaches) and the Safe Water Information Line outgoing phone message (905-546-2189) to reflect the current beach water quality status. When the geometric mean (GM) of *E. coli* concentrations is above 200 CFUs per 100 ml of water, results are updated to advise potential users that the water may pose a health risk and the beach is deemed unsafe for swimming. The beach will also be posted as unsafe for swimming if any single sample taken has a test result that is above 400 CFUs per 100 ml of water (MOHLTC, 2018).

Considering that sampling frequency is conducted on a weekly basis at a minimum, conditions such as wave and wind activity, number of birds, recent heavy rainfall, and cloudiness can influence beach water quality on a day-to-day basis. In 2022, new signs (**Figure. 1**) were developed and posted permanently at all public beaches to help further inform the public and guide their decision on beach water quality.

Fig. 1: 2022 Permanent Beach Signs



Cyanobacteria (Blue-green Algae)

Cyanobacteria or blue-green algae (BGA) are microorganisms which occur naturally in aquatic environments and flourish in warmer, slow-moving, or still waters with high nutrient levels and sufficient levels of sunlight (Miller and Russell, 2017). Some cyanobacteria produce microcystin toxins which are the most commonly produced toxin of the cyanobacterial toxins. Microcystin toxins are tasteless, colourless, and odourless, and are toxic to both humans and animals. Typical exposure routes are through skin contact, or through ingestion and/or inhalation while swimming. Short-term exposure can cause skin irritation, rash, vomiting, and fever, while long-term exposure (mostly through drinking contaminated water) can lead to tumour formation with microcystin-LR being a possible human carcinogen (Miller and Russell, 2017).

HPH monitors public beaches for the presence of microcystin toxins throughout the swimming season. The Health Canada Guidelines for Canadian Recreational Water Quality (2012) recommends the microcystin concentration in recreational water should be less than 10 µg/L. When potential toxin-producing cyanobacterial blooms are observed at a public beach, HPH uses ABRAXIS® Microcystins Test Strips to measure the concentration of microcystin toxins in the water. When elevated concentrations of microcystins are detected, the beach is closed, and a swimming advisory is issued.

HPH issues a media release and closure signs are posted at the affected beach. In addition, the City of Hamilton's Beach Water Quality website and the Safe Water Information Line's outgoing phone messages are updated. PHS does not routinely monitor for *E. coli* bacteria when a beach has been closed due to microcystin toxins.

2025 Beach Water Quality Monitoring Results

The 2025 beach monitoring program took place over an approximate 15-week period, starting immediately following the Victoria Day weekend in May until the end of August. **Table 1** on the following page summarizes the data for the 2025 swimming season at each public beach. The far-right column indicates the total percentage of days the beach was open for swimming. In Hamilton Harbour, Pier 4 Beach's water quality was acceptable for swimming 58% of the season. Confederation Park beach was open 80% of the season, Van Wagner's beach was open 72% and Beach Boulevard beach was open 88% of the season. Binbrook, Christie and Valens Conservation Area beaches were open 91%, 89% and 96% respectively.

Table 1: Beach Water Quality Summary 2025

Name of Beach	Total # of Days in Bathing Season	# of Days Beach Posted due to *E. coli*	# of Days Beach Closed due to BGA	Total # of Days Beach Closed	Total # of Days Beach Open	% of Days Beach Open
Hamilton Harbour						
Pier 4 Beach	104	25	19	44	60	**58%**
Lake Ontario Beaches						
Beach Boulevard	104	12	0	12	92	**88%**
Van Wagner's	104	29	0	29	75	**72%**
Confederation Park	104	21	0	21	83	**80%**
Conservation Area Beaches						
Binbrook Conservation	104	9	0	9	95	**91%**
Christie Conservation	104	0	11	11	93	**89%**
Valens Conservation	104	4	0	4	100	**96%**

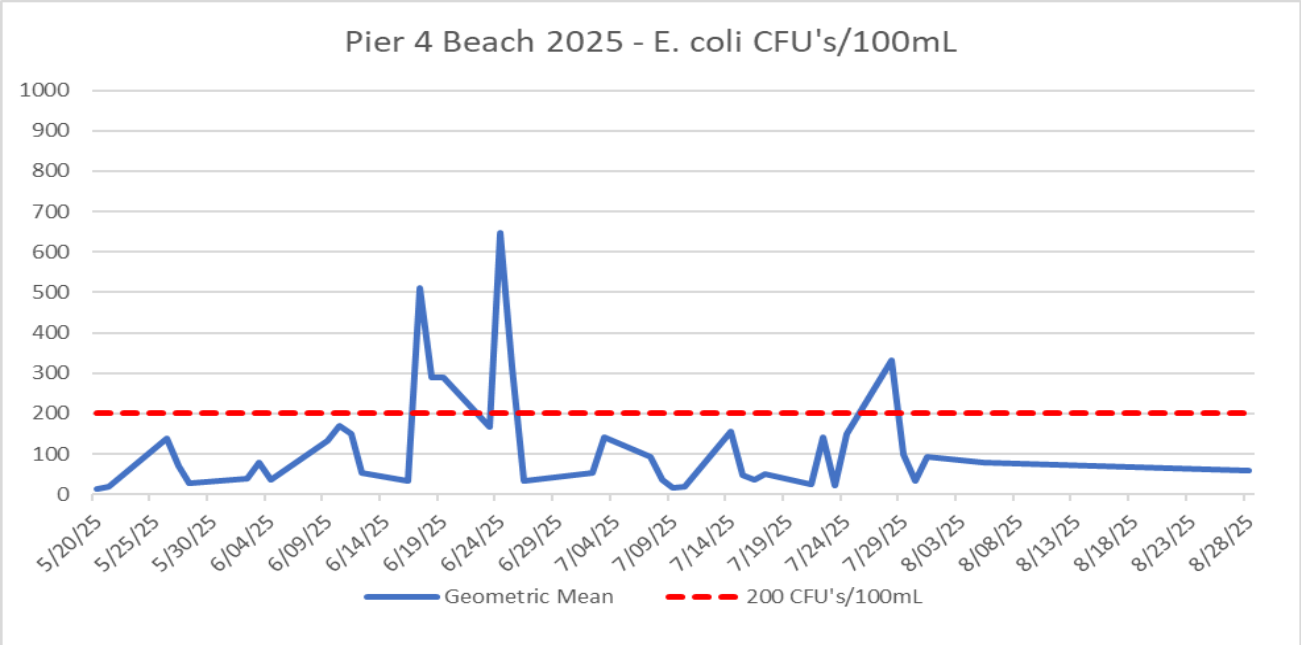
Pier 4 Park Beach

Pier 4 Park Beach was open for swimming 58% of the season in 2025. The beach was posted as either unsafe for swimming due to high levels of *E. coli* bacteria or closed due to toxin-producing BGA for the remaining 42% of the season. Blue-green algae was observed at Pier 4 Beach and tested for microcystin levels on August 7th, 2025. Microcystin test results were >10 ug/L, and the beach was closed to users. Blue-green algae arrived earlier in 2024 on July 4th, and later in 2023 on August 29th. The 2025 sampling season resulted in a longer beach season for Pier 4 by approximately 4 weeks compared to 2024.

As shown in **Figure 2**, in 2025, the *E. coli* concentration at Pier 4 beach was below or hovered near the threshold of 200 CFUs per 100 mL of water for most of the season, except on 6 occasions, with the highest geometric mean of 648 CFUs on June 24th. Pier 4 beach was posted on numerous separate occasions for having a single sample test greater than 400 CFUs per 100 mL, with the highest sample being greater than 1000 CFUs/100mL. There were 11 occasions in the 2025 sampling season in which at least one single sample was greater than 400 CFU/100mL while the geometric mean was below 200 CFU/100mL; resulting in Pier 4 Park Beach being posted for unsafe swimming conditions.

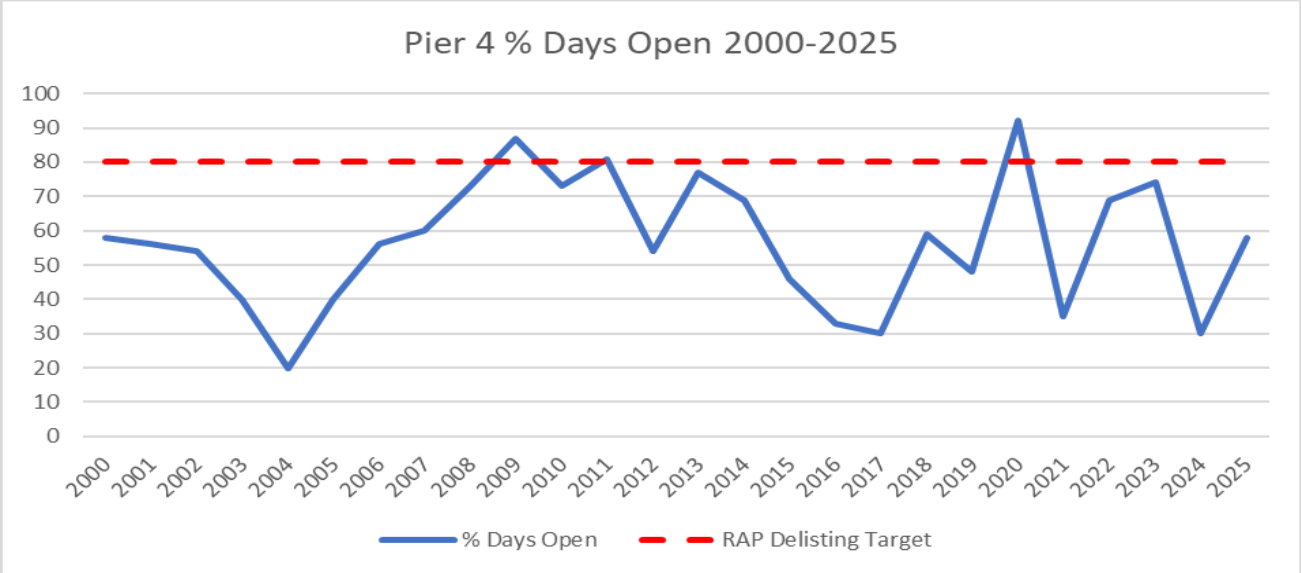
As HPH does not monitor for *E. coli* concentrations while BGA is present, it is unknown how many further days the beach would have been posted due to high E. coli concentrations, had the beach not been closed due to BGA.

Figure 2



The percentage of days that public beaches are open during the swimming season is an indicator of the recreational quality of the water at Hamilton's public beaches. Hamilton Harbour remains on the Great Lakes Areas of Concern (AOC) List. As a result, stakeholders have developed a Remedial Action Plan (RAP) for Hamilton Harbour to identify the challenges in the harbour and how they may be addressed. One criterion that needs to be satisfied before the Hamilton Harbour can be delisted from the AOC List, is that harbour beaches must be open for swimming 80% of the time during the swimming season. **Figure 3** below illustrates the percentage of days open at Pier 4 beach from the years 2000-2025 related to the 80% criterion.

Figure. 3



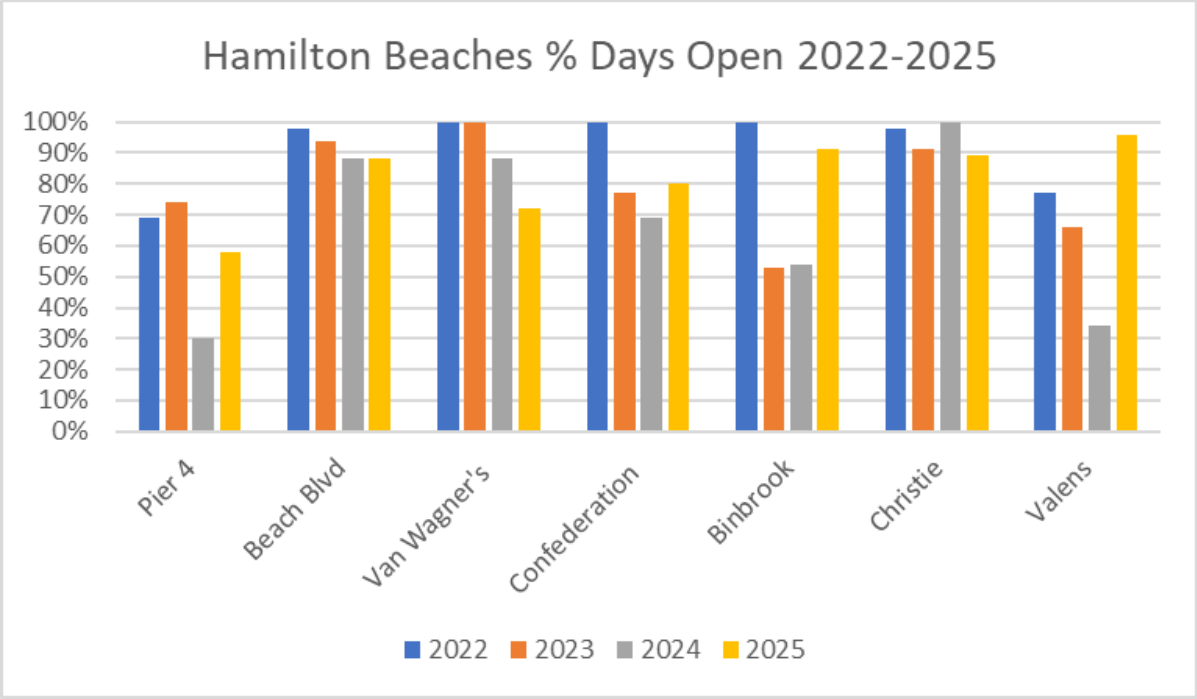
Pier 4 Beach reached a record low of only 20% days open in 2004 which prompted additional research on the issue of bacteriological water quality at Pier 4 Beach and the introduction of bird exclusion measures in 2005. After the introduction of bird exclusion measures the water quality

increased each year and percentages of days open continued to increase. Bird exclusion measures have continued to effectively evolve. However, the increasing occurrence of toxin producing BGA over the last decade has resulted in lengthy closures of the beach and has significantly decreased the percentage of days open. The negative impact of BGA on beach closures can be seen in the above chart when, in 2020 Pier 4 beach was open for swimming 92% of the season; the only year in over a decade in which visible algal blooms were absent for the entire season.

Lake Ontario Beaches

Lake Ontario beaches were open an average of 80% of the season in 2025 (**Figure 4**). The water quality at Beach Boulevard, Van Wagner's and Confederation Park Beaches is historically very good, with beaches consistently open between 80-100% of the time during previous swimming seasons. Swimming advisories are generally rare at Lake Ontario beaches and when they do occur, they are of short duration, usually lasting only one or two days. Additionally, *E. coli* concentrations are consistently very low, often reported at the minimum reporting level of < 10 *E. coli* CFUs per 100 mL of water. As Public Health Ontario's minimum reporting level is < 10 *E. coli* CFUs per 100 mL of water, the actual geometric means may be even lower than what is listed below. Lake Ontario also does not typically have water quality problems related to BGA, allowing for a consistent and lengthy swimming season.

Figure. 4



A blue-green algae bloom was confirmed at Beach Blvd on August 27th in 2024. This resulted in a shorter beach season and contributed to a decrease in percentage of days open when compared with the data from 2023. The Lake Ontario beaches did not have any closures due to BGA during the 2025 sampling season of May to September. Hamilton Public Health will resume beach water quality monitoring in 2026, immediately following the Victoria Day long weekend.

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