

MAINTENANCE AND MONITORING OF WATER QUALITY IN PUBLIC SPAS

Summary of Best Operating Practices

This information sheet is intended for operators of public spas (whirlpool baths and hot tubs) open to the general public or restricted groups and also for operators of private spas open exclusively to building or mobile home park residents and their guests. These spas are typically run by tourism establishments, sports centers, water parks, schools, or not-for-profit organizations. They may also be operated by provincial or municipal authorities. All these pools are subject to the *Regulation respecting water quality in swimming pools and other artificial pools*. **It is important to refer to this regulation to ensure that all its requirements are respected.** Some of the recommendations described in this sheet may be stricter than the requirements set out in the regulation. This reflects the particular characteristics of these facilities, which are more subject to water quality problems.

This information sheet on maintaining and monitoring water quality in spas summarizes best operating practices designed to help maintain water quality in these facilities. Further information on these measures is available in the detailed information sheet on best operating practices.

Staff who maintain and operate spas work to reduce the risk of outbreaks of recreational water illnesses (RWI). Although most of these illnesses are caused by microorganisms, some can be due to exposure to certain chemicals. Aspects related to the safety and construction of these facilities fall under the jurisdiction of Régie du bâtiment du Québec (RBQ). If you have any questions about these issues, we recommend you read the regulations administered by that agency. Best operating practices include the following:

- Train staff responsible for maintaining the pool.
- Maintain free available chlorine residual concentrations between 2.0 and 3.0 mg/L or total bromine concentrations between 3.0 and 5.0 mg/L.
- Keep pH between 7.2 and 7.8 (ideally between 7.2 and 7.5).
- Water temperature should never exceed 40 °C.
- Use automatic dosage and continuous monitoring of residual disinfectant concentrations and pH. Residual disinfectant concentrations should be checked every two hours. If a continuous measurement and recording device has been installed, the results should be confirmed through manual testing for comparative purposes at least once before, during, and after each daily use period. Manual dosage of chemicals is not recommended. Manual monitoring of disinfectant concentrations and pH is not advisable either, but if used, residual disinfectant concentrations should be monitored more frequently, i.e., before the facility opens, hourly during opening hours, and upon closure.

- Water clarity and temperature (and chloramines, if required) must be measured at least once before, during, and after each period the facility is open.
- Check disinfectant and pH measuring equipment daily.
- If an oxidation-reduction potential (ORP) meter is used, readings must be higher than 750 mV.
- The use of stabilized chlorine or cyanuric acid is prohibited in indoor and partially covered spas and is not recommended for use in outdoor spas.
- Ensure that the water is up to standard for all parameters covered under the *Regulation respecting water quality in swimming pools and other artificial pools* before opening the facility to users. A number of conditions require the immediate closure of the pool and application of remedial measures:
 - Incident involving vomiting, fecal matter, or bleeding
 - Water temperature higher than 40 °C
 - Free available chlorine residual or total bromine concentration above 5 mg/L
 - Equipment malfunction
 - Second noncompliant bacteriological test result
 - Free available chlorine residual or total bromine concentration below 0.8 mg/L
 - pH higher than 8
 - Turbidity above 5 NTU
- Keep a daily log with the latest test results for free available chlorine residual (or total bromine), pH, and other parameters (water clarity, temperature, alkalinity, chloramines, cyanuric acid, fecal coliforms or *Escherichia coli*, and turbidity) measured according to the sampling frequency stipulated in the regulation; an estimate of the total number of bathers during the day, any events that could have compromised water quality, and maintenance operations carried out during the day.
- Post the log, the *Safe bathing in public hot tubs* poster, and other rules for using the spa where they will be readily visible to users. Ensure that spa users are properly informed. For the log, you may notify users of its existence and make it available by request.
- Ensure that the filtration, disinfection, and water recirculation systems are working properly at all times according to the manufacturer's recommendations. The recirculation system should be designed to handle the number of bathers who use the pool. All the water in the pool must be recirculated at least every 30 minutes in these types of facilities. If more bathers will be using the pool, the water must be recirculated every five minutes. The filtration, disinfection, and recirculation systems must remain in operation 24 hours a day, except when maintenance operations require that they be shut down.
- Check the automatic chemical injection systems several times a day as well as the level of the chemicals in the injection tank. Backwash and rinse

the sand filters and replace cartridge filters as recommended by the manufacturer.

- Ensure that the maximum number of bathers is not exceeded.
- Replace 30 liters of water per day per user. This partial drainage once a day can involve 20 to 50% of the spa's total water volume. A complete change of water may be necessary on high traffic days.
- Apply a "preventive shock treatment" (at least 10 mg/L of chlorine for one to four hours) when the spa is closed to the public, on a daily or weekly basis depending on water quality and how often the pool is drained. Water pH must be maintained between 7.2 and 7.5 during this operation. Check if the equipment can handle frequent disinfection procedures.
- Completely empty the pool and clean it, at least once a week if possible. After emptying the pool, clean, disinfect, and rinse the bottom, walls, gutters, pipes, and prefilters. Inspect all equipment components. Wash the filters as recommended by the manufacturer.
- Check that the water recirculation system poses no risk of trapping users (secure drain covers, automatic shutdown system for pumps accessible to users, etc.).
- In rental buildings (cottages, condos, etc.), the spa must be drained, cleaned, disinfected, refilled, and drained again at least after each rental period. Make sure that the equipment is completely dry, including inside pipes, before storing it.
- Clean and disinfect surfaces around the pool and washroom facilities (showers, toilets, sinks, etc.) on a daily basis and ensure that the premises are well ventilated.
- Draw up written instructions describing the procedures to follow if an incident involving vomiting or defecation occurs or in any other situations that require the pool to be closed and remedial measures taken.
- Schedule the replacement of equipment parts (e.g., pumps) before they break down.
- Develop a communications plan enabling the supervisor or monitor to report operational problems in an efficient manner.
- Post procedures recommended by the Workplace Hazardous Materials Information System (WHMIS) for using and storing chemicals for operators and monitors.
- Waste water must be treated before being released into the natural environment. Prior approval for the release must be obtained from Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP).

Other Measures for Promoting Water Quality and User's Safety

- Set up a schedule of five-minute break periods on high traffic days to ensure that chlorine residual concentrations are maintained (for example,

three 15 minute bathing periods per hour alternating with five-minute break periods).

- Secure the spas when not in use (locked cover, gate, etc.)
- Position access to showers near the spas.
- Install a clock near the spa to facilitate compliance with maximum bathing periods for users.
- Regularly check the condition of drain covers to protect users from accidents caused by drain suction.
- Post hygiene and safety instructions contained in the *Safe bathing in public hot tubs* poster produced by Ministère de la Santé et des Services sociaux (MSSS) as well as rules about the maximum number of bathers allowed where they will be readily visible to users.
- Other rules for users can also be posted, for example:
 - ❖ Avoid bathing alone in the absence of a monitor.
 - ❖ Tie up long hair and remove jewelry and accessories that can be sucked into drains.
 - ❖ Do not block suction drains.