

Environmental Best Management Practices

For



PRIVATE SWIMMING POOLS, HOT TUBS/ SPAS IN THE CITY OF TORONTO



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Introduction

The City of Toronto's Environmental Monitoring & Protection Unit, within Toronto Water Division, has developed the Environmental Best Management Practices (BMP) for the operation, maintenance, and seasonal closure of private swimming pools and hot tubs/spas (herein referred to as "pool" or "pools"). This document provides guidance and information in respect to private pool wastewater discharges to meet the compliance requirements of the City of Toronto's Municipal Code Chapter 681- Sewers. This BMP, when followed will improve the environmental effects of pool discharges by minimizing the effects of the wastewater discharged to City sewers. If a pool owner, operator, or service contractor adopts the guidance of this Best Management Practice and continually meets the requirements of such BMP, they will be deemed to comply with the discharge limit requirements of Toronto Municipal Code Chapter 681- Sewers (referred to as Sewer Use Bylaw).

The Best Management Practice (BMP) is intended for guidance purposes only and, in the event of a conflict between the BMP and any applicable Federal, Provincial or Municipal acts, by-laws, regulations, directives or orders (collectively referred to as "Laws"), such Laws take precedence.

1.1 Why is the Wastewater from Swimming Pools a Concern?

While a single, residential pool might contribute small quantities of chemical pollutants to a sewer system, collectively the thousands of individual residential pools in the City of Toronto, as a whole, can be a significant contributor. It is therefore critical that each and every pool owner, operator, or service contractor take appropriate measures to reduce substances of concern that are discharged into sewers.

The potential chemical pollutants in the pool wastewater are:

1.1.1 Pools Using Chlorine or Bromine

There are potentially three contaminants or subject pollutants that can have a negative impact on the aquatic life if pool water is discharged to the storm sewers.

Chlorine/ Bromine: Are substances toxic to aquatic life.

Copper based algaecides: Effects on aquatic organisms: Copper sulphate is highly toxic to fish. Even at recommended rates of application, this material may be poisonous to trout and other fish, especially in soft or acidic waters. Copper sulphate is known to be toxic to aquatic invertebrates.

Note: Sometimes, silver is used in algaecides. However, the concentration of silver is very low and does not pose an environmental risk to aquatic life.

Nonylphenol and its Ethoxylates: Based on available technical information and a pollution prevention plan submitted by a Toronto pool chemical manufacturer, these two chemical substances could be present in the pool discharges. These are subject pollutants in Toronto's Sewer Use By-Law and some are on Environment Canada's Priority Substances List. Nonylphenols and nonylphenol ethoxylates are endocrine disrupters which have estrogenic or feminizing effect on aquatic life.

1.1.2 Salt Water Pools

The main component of salt water pools is salt (sodium chloride). Salt water concentration is often in the range of 2500 - 4000 parts per million in the pool water, which is generally higher than in-stream concentrations of chloride from winter road salt applications. Salt water devices use low amounts of electrical currents, known as electrolysis to transform salt into chlorine and sodium ions. Essentially, by using salt, chlorine is generated as chloride ions that produce hypochlorous acid. Even though these pools do not use chlorine, for the purpose of shocking the pool or super chlorination, chlorine granules or tablets are still required.

The pollutants of concern for salt water pools are essentially the same as the conventional chlorine pools. In addition to these, the salt itself is corrosive and will cause degradation of storm sewers and soil.

2 Background

Federal and Provincial governments regulate and limit the quality and quantity of substances of concern discharged into the environment via municipal sewer systems. As a result, municipalities have by-laws within their jurisdictions that control the quality and quantity of those substances discharged into sewer systems by wastewater generators. The objective of the municipal by-law is to prevent or limit discharges so as to:

- to protect public health and safety,
- to protect natural environment, and
- to maintain sewer systems and sewage treatment processes
- comply with Federal and Provincial legislation

3 Scope

This document (BMP) is intended to assist the private pool owners, operators, service contractors to meet with compliance requirements.

4 Licensing

Licensing of private pools operating in the City of Toronto is not applicable.

5 Summary of Regulatory Requirements

A summary of some, but not all, regulatory requirements and guidelines pertaining to the pools are set out below. This summary is for information purposes only and not to be relied upon. Reference should be made to actual legislation for specific requirements.

5.1 Federal Government

5.1.1 Chlorine:

5.1.1.1 Canadian Water Quality Guidelines for Aquatic Life (CWQAL):

Canadian Council of the Ministers of the Environment (CCME) has published guidelines on chlorine and its impact on aquatic life. The paper details the impact of reactive chlorine (includes free available chlorine and combined available chlorine) on aquatic life. The

Canadian water quality guidelines for reactive chlorine species for the protection of aquatic life were developed based on the 1991 protocol (CCME 1991).

Release of chlorinated drinking water into the ambient environment can occur through pools discharges.

As the different chlorine species can exist simultaneously, but are difficult, if not impossible, to reliably differentiate currently at low concentrations, a guideline has been derived for reactive chlorine species. **A guideline of 0.5 µg/L (0.0005 mg/L) for reactive chlorine species** is recommended for the protection of freshwater life. If chemical speciation identification is available, the guideline applies to the sum of all reactive chlorine species (i.e., hypochlorous acid, monochloramine concentrations, and others).

5.1.2 Nonylphenol and Its Ethoxylates

Nonylphenols (NPs) and Nonylphenol Ethoxylates (NPEs) are present in pesticides and algaecides as binding agents. They can potentially enter the environment through the discharge of swimming pool water. The degradation products of NPEs are persistent in the environment. The water CWQGAL for NPs and NPEs is 1.0 µg/L or 0.001 mg/L. NPs & NPEs are not considered bioaccumulative.

5.1.3 Copper

Copper (Cu) is an essential trace element that can be toxic to aquatic life at high concentrations as stated in Canadian Sediment Quality Guidelines for the Protection of Aquatic Life paper (CSQGPAL). This paper goes on into detailing that copper tends to accumulate in sediment therefore, organisms living in, or are in contact with bed sediments, sediments act as an important route of exposure to aquatic organisms. Canadian interim sediment quality guidelines (ISQGs) and probable effect levels (PELs) for copper was used to evaluate the degree to which adverse biological effects are likely to occur as a result of exposure to Copper in sediment. Adverse biological effects for Copper include decrease invertebrate diversity, reduced abundance, increased mortality, and behavioural changes (Environment Canada 1998). This study has shown that not only that ISQG and PELs is a useful tool for assessing the eco-toxicological significance of copper in sediments but also the toxicological data associated with Copper exposure increases as concentrations of copper increase in the range of sediment types.

5.2 Provincial Government

In Ontario, **Spills** - Part X of the [Environmental Protection Act](#) (EPA) imposes certain duties on persons who cause a spill or are in control of a material that is spilled. In addition to containing and cleaning up the spill, they shall also report the spill to the Ministry of the Environment (MOE), the municipality and the owner of the material spilled. The [Spills Regulation](#) (O. Reg. 360) defines those duties and rights of parties subject to Part X.

The [Ontario Fire Code](#) (O. Reg. 388/97) has specific requirements on the storage, handling and identification of corrosive and oxidizing materials.

The Provincial Governments offers the following information to pool owners:

Pools and spa water containing chlorine can be toxic to aquatic life. Pool backwash water containing sediment can cause sediment pollution of surface waters. The drawdown of pools prior to winter may release a large volume of water to the surface water or to combined sewers. Outdoor swimming pools require regular maintenance, involving chemical treatment, backwashing (rinsing the filter with clean water), and winterizing. Chemical additives include

chlorine or bromine to maintain pool quality, and products such as pH-up or muriatic acid, which are occasionally used to maintain acid balance.

5.3 Municipal Government

The sewer use By-law – the City of Toronto Municipal Code Chapter 681 regulates discharges to sanitary and storm sewers within its jurisdiction. The intent of the sewer use By-law is to protect:

- all aquatic receiving environments including creeks, rivers and Lake Ontario
- public health and safety in Toronto
- sanitary and storm sewer systems
- efficiency of the sewage treatment processes
- biosolids quality; and
- promote responsible waste management practices

5.4 Discharge Prohibition

- Discharge of wastewater from Salt Water pools to storm sewer is prohibited
- All salt water pools shall be discharged to the sanitary sewer
- Salt water pool owners must obtain a permit from Toronto Buildings to connect the discharge to the sanitary sewer.

6 Best Management Practices

This Section defines the Best Management Practices (BMPs) that can assist to reduce the discharge of pollutants, comply with regulations and improve overall environmental performance.

Specifically for pools, the following best practices have been specified to help decrease the contaminants discharged and meet with compliance requirements. Owners, operators, and service contractors are also encouraged to influence their suppliers by requesting more environmentally friendly products.

6.1 Objectives of the BMPS

- Reduce the amount of wastewater that will be discharged from a pool during the season and at the fall closing of pools.
- Ensure that the discharged wastewater meets the requirements of Toronto Municipal Code Chapter 681, Article I - Sewers.

6.1.1 Discharge Wastewater Criteria to Toronto Storm Sewers

The following discharge limits apply to any pool discharges entering Toronto storm sewers

- Chlorine – 0.01 mg/L (milligrams per Litre)
- Bromine – 0.01 mg/L
- Copper – 0.04 mg/L
- Salt (Sodium Chloride) - Nil
- pH – 6 to 9.5

6.1.2 Prohibition of Pool Water Discharge to Toronto Ravines and / or Valleys

Under no circumstances is pool water discharge allowed to flow onto adjacent lands or in a manner that causes or may cause erosion of the walls or slopes of a ravine or valley. Pool water entering ravines and / or valleys contributes to erosion and destabilization of ravines and valleys. Also, it can damage vegetation maintaining ravines and valleys. Neither this BMP nor the Sewer Use By-law permit the discharge of pool water to ravines or valleys.

6.2 How to comply with Pool Wastewater Discharge Requirements?

6.2.1 Chlorine/ Bromine

In certain cases the chlorine / bromine would have dissipated completely in the fall months. However, use one of the two methods to ensure that the concentrations are below 0.01 mg/L.

6.2.1.1 Pool Method Test

- Recommend DPD (N, N-diethyl - p – phenylendiamine) Test
- If chlorine/ bromine levels are below 10 ppm, calculate amount of neutralizer to reduce the chlorine / bromine residual to acceptable level.

6.2.1.2 Wastewater Method Test

- Recommend DPD (N, N-diethyl - p – phenylendiamine) Test
- If chlorine/ bromine levels are below 10 ppm, Place dechlorination tablet in the wastewater.
- Test wastewater to ensure neutralization.

Note: If chlorine / bromine residual in the pool is over 10 mg/L or 10 parts per million (ppm), let the pool water stand for a week before trying to neutralize the wastewater. This way you will save on chemicals and avoid unnecessary chemicals discharged to storm sewers.

6.2.2 pH Balance

Maintain proper pH in the pool water before the wastewater is discharged to the sewers. For storm sewer discharges, the pool water pH should be more than 6 and less than 9.5 which represent the allowable discharge level in the Sewer Use By-law.

6.2.3 Algaecides & Fungicides

Note:

1. Avoid use of algaecides or fungicides, if possible.
 2. Avoid use of copper based algaecides as in addition to copper they may also contain NPs & NPEs.
- You can determine the levels of algaecide in the pool water by doing a quaternary algaecide or a poly quaternary algaecide test.
 - As the levels of algaecides will dissipate over time, it is recommended not to add any algaecide two weeks prior to the pool closing.

- If algaecides are present in the pool, the pool water **CANNOT** be discharged into the storm sewers.

6.2.4 Copper

- **Copper concentration must be below 0.04 mg/L** for discharge to storm sewer.
- Use a copper test kit to determine concentration in the pool water.
- If the copper concentration is above 0.04 mg/L, the pool water **CAN NOT** be discharged to the storm sewer and **MUST** be discharged to the sanitary sewer or on the owner's property or use a hauled sewage hauler, approved by the Ontario Ministry of the Environment, permitted to discharge the pool water to the City's wastewater Treatment Plants
- For sanitary sewer discharge the copper concentration shall be less than 2.0 mg/L.

6.2.5 Sodium Chloride (Salt)

- If sodium chloride (salt) is present in the pool water, it **CAN NOT** be discharged to the storm sewer.
- If sodium chloride is present in the pool water, it shall either be discharged on the owner's property or into the sanitary sewer. A permit from the Building Division is needed for pool water to be permanently discharged to sanitary sewer connection.
- If the discharge to sanitary sewer or owner's property is not possible, the pool water shall be trucked away for off-site disposal, using a hauled sewage hauler, approved by the Ontario Ministry of the Environment.

6.3 Managing Pool Wastewater

6.3.1 Water on Winter Covers

- Rain water or snowmelt water on the pool covers can be discharged to the storm sewer, as long as the water is free of debris and leaves are removed from the water before discharge.

6.3.2 Wastewater Discharge

6.3.2.1 Wastewater from the Pools

- **Discharge to Owner's Property** - Ensure that the water is absorbed on the owner's property and there is no run-off on to the neighbour's property or on the road.
- **Discharge to Sanitary Sewer** - Pool water can be discharged to the sanitary sewer by way of temporary or permanent connection. For permanent connections a permit from the Building Division is required. Ensure to control the flow so as not to flood/ block the drain or otherwise cause a hazard to persons or property
- **Discharge to Storm Sewer** – If the pool water meets all the criteria as described in this BMP, it can be discharged to the storm sewer under following conditions:
 1. Run the water directly into the storm catch basin or as close as possible.
 2. Ensure that the water is free of any debris
 3. Pool water **SHALL NOT** be discharged:
 - (a) into a storm drainage system, unless otherwise permitted under § 681-11.T (3) of the Municipal Code; or

in a manner that may cause or causes the wastewater to flow onto an adjoining property; or

(b) over a valley or ravine wall or slope in a manner that may cause or causes the erosion or instability of the valley or ravine wall or slope; or

(c) in a manner other than is permitted under § 681-11.T (2) or (3) of the Municipal Code.

6.3.2.2 Discharge of Filter Backwash

- The backwash water from the filter shall only be discharged to the sanitary sewer; or
- On the owners property in such a manner that it does not flow onto the street or into a neighbour's property; or
- To the storm sewers ONLY IF the backwash water is filtered before it is discharged into the storm sewers. The backwash water must also meets all the criteria and conditions described in this BMP and the Municipal Code Chapter 681-Sewers.

Chlorine-0.01 mg/l

Bromine-0.01 mg/l

Copper – 0.04 mg/l

Salt (Sodium Chloride)-Nil

pH- 6 to 9.5

6.4 Service Contractor Employee Awareness and Education; Private Pool Owner Responsibilities

The service contractor of a private pool operation shall ensure that all employees:

- are well trained in using existing and new equipment and processes, and are aware of the “best available technologies (BAT)” or the most practical technologies suitable to the pool operation & maintenance,
- are familiar with the health and safety hazards associated with the products and processes (WHMIS), and the potential environmental pollution/impact,
- have ready access to Material Safety Data Sheets (MSDS) of all the products being used, and know the location of spill response materials and personal protective equipment (PPE).
- are fully aware of the discharge requirements of this BMP and the Sewer Use Bylaw in relation to pool water discharges.

The owner/ operator/ service contractor of a private pool shall ensure that:

- they understand and implement the requirements of this BMP for the type of pool used and,
- are fully aware of the discharge requirements of this BMP and the Sewer Use Bylaw in relation to pool water discharges.

6.5 Spill Response

The owner/operator/ service contractor of a private pool shall:

- Report a spill to provincial and municipal authorities if a spill occurs and chemicals have entered natural environment such as a stream, river or lake, and/or sewer systems:
 - **Ministry of Environment** 24-hour reporting number: **416-325-3000**
 - **Toronto Water** 24 hour reporting number: **416-338-8888**

7 Implementation Plan of Best Management Practice

The implementation plan of this document by the City of Toronto includes the following components:

- Education
- Industry/Business' Adoption and Practice
- Inspection
- Monitoring
- Enforcement
- Administration
- Review and Update

8 Inspections, Monitoring, and Enforcement

The City of Toronto's Environmental Monitoring & Protection Unit and its Provincial Offences Officers may carry out inspections and examination of records or other documents. The Officer may take samples of wastewater for analysis as provided under the City of Toronto Municipal Code Chapter 681. Corrective measures can be ordered by the General Manager if it is determined that the BMP implementation procedures are not being properly followed. Where corrective measures are not implemented as required by the General Manager of Toronto Water in accordance with the requirements of Toronto Municipal Code Chapter 681, this BMP shall be deemed to have not been complied with and § 681-11 T (3) of Municipal Code Chapter 681-Sewers for adherence to this BMP shall not apply and shall be deemed to have not been met.

9 More Information

For more information about the BMP, please contact:

City of Toronto – Toronto Water Division
Environmental Monitoring & Protection
Pollution Prevention Group
30 Dee Avenue
Toronto, Ontario M9N 1S9
Email: p3help@toronto.ca
www.toronto.ca/water

Contact Information for:

Pool and Hot Tub Council of Canada
242 Applewood Cres., Unit 10
Vaughan, ON
L4K 4E5

Phone: (905) 761-7920
Toll Free: (800) 879-7066
Fax: (905) 761-8837
e-mail: office@poolcouncil.ca

10 Appendix I – Glossary of Terms

Best Management Practice (BMP): Best Management Practices (BMP) means an integrated plan to control and reduce the release of restricted and prohibited waste into the sewage works to a practicable extent and in accordance with applicable Laws, through methods including physical controls, pre-treatment processes, operational procedures and staff training.

Contaminant: A substance that is not naturally present in the environment or is present in elevated amounts, which, if in sufficient concentration, can adversely affect human health, flora, fauna and/or the environment.

Milligrams per Litre (mg/L): The weight of a substance in milligrams in one litre of wastewater (may also be referred to as parts per million or ppm, e.g. 1 mg/L = 1 ppm).

MSDS: Material Safety Data Sheet

Sanitary Sewer: A collection system for domestic, commercial, institutional and industrial wastewater or any combination thereof.

Storm Sewer: A pipe conduit, drain or other equipment or facilities for the collection and transmission of stormwater or uncontaminated water.

Wastewater: The spent or used water from a pool.