

## BY-LAW NO. 12346

### A By-law to amend Building By-law No. 10908 Regarding Non-potable Water Systems and New Requirements for Other Water Systems

THE COUNCIL OF THE CITY OF VANCOUVER, in public meeting, enacts as follows:

1. This by-law amends the indicated provisions of Building By-law 10908.
2. In Sentence 1.1.1.1.(1) of Division A of Book II, Council strikes out “renewal or repair” and substitutes “renewal, repair, or operation”.
3. In Article 1.4.1.2. of Division A of Book II, Council adds the following definitions in the correct alphabetical order:

*“Accredited Laboratory* means a laboratory approved by the BC Provincial Health Officer for drinking water microbiology testing.

*Alert* means a bell, horn, speaker, light or text display that provides audible, tactile or visible outputs, or any combination thereof.

*Alternate water source system* means a system designed to collect, treat, and use non-potable water from alternate water sources in lieu of *potable* water, but excludes a system in a *building* containing no more than four *dwelling units* and no other *major occupancies*, or a *laneway house*, and excludes the use of rain barrels of up to a cumulative capacity of 500 litres.

*Blackwater* means waste water from water closets, urinals and other sanitary fixtures designed for carrying human waste, kitchen sinks, utility sinks, medical sinks, laboratory sinks, and industrial processes, but does not include *clear-water waste*.

*Cistern* means a tank for storing non-potable water as part of an *alternate water source system*.

*Cooling tower* means a cooling tower, evaporative condenser, or fluid cooler that is part of a recirculated *water system* incorporated into a *building’s* cooling, industrial process, refrigeration, or energy production system.

*E. coli* means *Escherichia coli*.

*Greywater* means waste water from all sources except *blackwater* and *clear-water waste*.

*Groundwater* means a freestanding body of water in the ground.

*Operating permit* means permission or authorization in writing by the *Chief Building Official* to install or retain existing equipment or systems for which an operating permit is required under this By-law.

*Perimeter drainage water* means water collected from the foundation of a structure.”.

4. In Article 1.4.1.2. of Division A of Book I and Book II, Council amends the definition of “permit” by adding the words “, but does not include an *operating permit*” after “to occupy any *building* or part thereof”.

5. In Note 2 of Table 10.3.1.3.A of Division B of Book I, Council adds the words “when a *non-potable* water source is used” after “complies with this requirement”.

6. In Division B of Book I, Council:

a) strikes out Article 10.3.1.5. Geoexchange Systems; and

b) renumbers Article 10.3.1.6. Vehicle Wash Facilities and Article 10.3.1.7. Non-recirculating Applications as Article 10.3.1.5 and Article 10.3.1.6., respectively.

7. In Article 10.3.1.6. of Division B of Book I, Council:

a) in Sentence (c), strikes out the word “or”;

b) in Sentence (d), strikes out “.” and substitutes “,”; and

c) adds the following new Sentences:

“e) machinery powered by water,

f) non-recirculating ponds, waterways, water features, ornamental fountains, or swimming pools,

g) non-recirculating systems or equipment that use water for thermal conditioning of building surfaces or roofs, except that this does not apply to emergency fire protection of buildings, or

h) non-recirculating systems or equipment that use water for melting or thawing.”.

8. In Division B of Book II, Council inserts the following row into Table 1.3.1.2. in correct alphabetical order:

“NSF/ANSI 14-2017 Plastics Piping System Components and Related Materials 2.7.2.1.(1)”.

9. In Division B of Book II, Council inserts the following into Article 1.3.2.1. in correct alphabetical order:

“NSF NSF International (789 North Dixboro Road, Ann Arbor, Michigan 48105 U.S.A.; www.nsf.org)”.

10. In Division B of Book II, Council inserts new Sentences 2.6.2.1.(3) and Sentences 2.6.2.1.(4) and renumbers the remaining Sentences accordingly:

“**3)** An *operating permit* shall be obtained for the installation of a water treatment device or apparatus, or the retention of an existing water treatment device or apparatus,

except for a water treatment device or apparatus installed in a *building* containing no more than four *dwelling units* and no other *major occupancies*, or a *laneway house*.

**4)** The *operating permit* number assigned to a water treatment device or apparatus shall be posted on a sign or plate that is securely fastened to the water treatment device or apparatus in a location that is conspicuously visible and constructed of a durable, weather resistant material.

**5)** The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.”

11. In Division B of Book II, Council strikes out Subsection 2.7.2. and substitutes the following:

**“2.7.2. Piping Identification**

**2.7.2.1. Piping Identification**

- 1) All non-*potable* water distribution system piping shall be purple in colour and conform to the requirements of NSF-rw and NSF/ANSI Standard 14.
- 2) All other non-*potable* water piping shall conform to the requirements of CAN/CSA-B128.1.”.

12. In Division B of Book II, Council strikes out Subsection 2.7.4. and substitutes the following:

**“2.7.4. Alternate Water Source Systems Installed Prior to January 1, 2019**

**2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019**

- 1) An *operating permit* shall be obtained.
- 2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.
- 3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.
- 4) Water quality shall comply with the water quality standards, testing, documentation, and reporting requirements set out in Articles 2.7.7.1. and 2.7.7.2.
- 5) If a test result shows that the water quality fails to meet any of the standards set out in Table 2.7.7.1., the response set out in Table 2.7.4.1. shall be undertaken.

Table 2.7.4.1. Required Response to Failure to Meet Water Quality Standards Forming part of Sentence 2.7.4.1.(5)		
Parameter	Test Result	Required Response
<i>E. coli</i>	100 or more Colony Forming Units (CFU) per 100 mL	1. Immediately supply the <i>alternate water source system</i> with <i>potable</i> water only; and 2. Immediately notify the <i>Chief Building Official</i>
Turbidity	> 15 Nephelometric Turbidity Units (NTU)	
Temperature	> 25 degrees Celsius	

- 6) The *alternate water source system* shall be maintained in accordance with any manufacturer's specifications.
- 7) If the *alternate water source system* is in use, cross connection control tests shall be performed as required by CAN/CSA-B128.1.

**2.7.4.2. No Other Requirements**

- 1) *Alternate water source systems* installed prior to January 1, 2019 need not comply with any other requirements set out in Subsections 2.7.5. through 2.7.8.

**2.7.5. Alternate Water Source Systems**

**2.7.5.1. Alternate Water Sources**

- 1) An *alternate water source system* shall collect only rainwater from roof surfaces or similar areas that do not allow the passage of vehicular traffic and are above grade, and where hydrocarbon-based fuels, hazardous materials, or fertilizers are not stored or used on such surfaces, or *clear-water waste*, or both.
- 2) An *alternate water source system* shall not collect *perimeter drainage water*, *groundwater*, *storm water*, *greywater*, or *blackwater*.

**2.7.5.2. Mandatory and Optional Uses**

- 1) An *alternate water source system* shall use treated non-*potable* water in lieu of *potable* water for the mandatory uses set out in Table 2.7.5.2.
- 2) An *alternate water source system* may use treated non-*potable* water in lieu of *potable* water for the optional uses set out in Table 2.7.5.2.
- 3) Non-*potable* water shall not be used in lieu of *potable* water for any other uses.

Table 2.7.5.2.  
Mandatory and Optional Uses for Treated Non-potable Water  
Forming part of Sentences 2.7.5.2.(1) and (2)

Non- <i>potable</i> Water Source	Mandatory Uses for Treated Non- <i>potable</i> Water	Optional Uses for Treated Non- <i>potable</i> Water
Rainwater from roof surfaces or similar areas that do not allow the passage of vehicular traffic and are above grade, and where hydrocarbon-based fuels, hazardous materials, or fertilizers are not stored or used on such surfaces	Water closets, urinals and trap primers	Irrigation of non-food purpose plants, make-up water for boilers, and make-up water for cooling towers
<i>Clear-water waste</i>	Water closets, urinals and trap primers	Irrigation of non-food purpose plants, make-up water for boilers, and make-up water for cooling towers
<i>Perimeter drainage water</i>	Not permitted	Not permitted
<i>Groundwater</i>	Not permitted	Not permitted
<i>Storm water</i>	Not permitted	Not permitted
<i>Greywater</i>	Not permitted	Not permitted
<i>Blackwater</i>	Not permitted	Not permitted

**2.7.5.3. Occupancy**

- 1) Before occupancy of a *building* is permitted, an *alternate water source system* shall be commissioned in accordance with Article 2.7.5.4., and

an *operating permit* shall be obtained in accordance with Article 2.7.5.5.

**2.7.5.4. Commissioning**

- 1) In order to commission an *alternate water source system*
  - a) the *non-potable* water shall be tested by an *accredited laboratory* for *E. coli* weekly for a period of four weeks with samples being drawn from the sampling port as referenced in Sentence 2.7.6.9.(1), and test results shall be provided to the *Chief Building Official*,
  - b) written confirmation that the *alternate water source system* operates in conformance with the operating manual shall be provided to the *Chief Building Official* by the *registered professional of record*, and a cross connection control test shall be performed and witnessed by the *Chief Building Official*.

**2.7.5.5. Operating Permit**

- 1) An *operating permit* shall be obtained for an *alternate water source system*.
- 2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.
- 3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

**2.7.5.6. Continued Operation**

- 1) Once an *operating permit* has been issued, an *alternate water source system* shall operate continuously unless written approval to discontinue its use has been obtained from the *Chief Building Official* or *City Engineer*.

**2.7.6. Design**

**2.7.6.1. Professional Design**

- 1) An *alternate water source system* shall be designed by a *registered professional* and shall be designed to prioritize the use of *non-potable* water.

**2.7.6.2. Pipe Sizing**

- 1) Distribution piping shall be sized in conformance with the IAPMO Water Demand Calculator.

**2.7.6.3. Continuity of Supply**

- 1) A secondary water supply shall be provided.

**2.7.6.4. Backflow Prevention**

- 1) An *air gap* at least two times the size of the discharge opening shall be installed for the *potable* water make-up supply.

**2.7.6.5. Removal of Particulates and Impurities**

- 1) Provision shall be made upstream of the *cistern* to remove the accumulation of particulates and impurities before they enter the *cistern*.

**2.7.6.6. Cistern Security**

- 1) *Cisterns* shall be secured to prevent tampering and unintended or unauthorized entry either by a lockable device or another *approved* method, and all penetrations shall be sealed to prevent insect or vermin entry.

**2.7.6.7. Minimum Withdrawal Level**

- 1) Water shall be withdrawn a minimum of 0.3 m from the base of the *cistern*.

**2.7.6.8. Water Metering Requirements**

- 1) A water meter shall be installed and located within 1.5 m of the *potable* water make-up supply and shall be capable of recording the volume of *potable* water being supplied.
- 2) A water meter shall be installed and located on the non-*potable* water outlet prior to distribution and shall be capable of recording the volume of non-*potable* water being supplied to the distribution piping.

**2.7.6.9. Water Quality Sampling Locations**

- 1) A sampling port, and provision for continuous in-line measurements required in order to conform with Table 2.7.7.1., shall be installed and located downstream of the water meter at the non-*potable* water outlet and prior to distribution.

**2.7.6.10. Alerts**

- 1) All monitoring devices referred to in Sentence 2.7.6.9.(1) above shall be capable of activating an *alert* that is designed to activate

continuously for the duration of the *alert* condition whenever the water quality fails to meet the standards set out in Table 2.7.7.1.

**2.7.6.11. Power Interruption**

- 1) If a *building* is required to have an emergency system generator, provision shall be made for the continued operation of any mandatory uses for non-*potable* water listed in Table 2.7.5.2. in the event of a power interruption.

**2.7.7. Water Quality Standards**

**2.7.7.1. Water Quality Standards, Testing, and Documentation**

- 1) Water quality shall meet the standards set out in in Table 2.7.7.1.
- 2) Water quality shall be tested as set out in Table 2.7.7.1.
- 3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1. Water Quality Standards, Testing, and Documentation Forming part of Sentences 2.7.7.1.(1), (2), and (3)				
Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non- <i>potable</i> water source	Temperature	< 20 degrees Celsius	Continuous	Daily
Any non- <i>potable</i> water source	Turbidity	< 10 Nephelometric Turbidity Units (NTU)	Continuous, and one laboratory sample tested every three months	Daily, plus all laboratory tests
Any non- <i>potable</i> water source	<i>E. coli</i>	< 100 Colony Forming Units (CFU) per 100 mL	One laboratory sample tested by an accredited laboratory every three months	All laboratory tests



**2.7.7.2. Water Quality Reporting**

- 1) Water quality reports containing all documentation required by Sentence 2.7.7.1.(3) shall be submitted to the *Chief Building Official* before the end of the third month following the issuance of an *operating permit*, and then every three months thereafter.

**2.7.7.3. Required Response to Failure to Meet Water Quality Standards**

- 1) If a test result shows that the water quality fails to meet a standard set out in Table 2.7.7.1., the response set out in Table 2.7.7.3 shall be undertaken.

Table 2.7.7.3. Required Response to Failure to Meet Water Quality Standards Forming part of Sentence 2.7.7.3.(1)		
Parameter	Test Result	Required Response
Turbidity	Between 10 and 15 Nephelometric Turbidity Units (NTU)	Take the appropriate corrective action as set out in the operating manual.
Temperature	Between 20 and 25 degrees Celsius	
<i>E. coli</i>	100 or more Colony Forming Units (CFU) per 100 mL	<ol style="list-style-type: none"> <li>1. Immediately supply the <i>alternate water source system</i> with <i>potable</i> water only;</li> <li>2. Immediately notify the <i>Chief Building Official</i>; and</li> <li>3. Take the appropriate corrective action as set out in the operating manual.</li> </ol>
Turbidity	> 15 Nephelometric Turbidity Units (NTU)	
Temperature	> 25 degrees Celsius	

**2.7.8. Operating Manual and Maintenance**

**2.7.8.1. Operating Manual**

- 1) An operating manual shall be supplied to the *owner* or representative of the *owner* by the designer of the *alternate water source system* and shall be stamped by a *registered professional of record*, and shall include the following
  - a) address and location of the *alternate water source system*,
  - b) system designer contact details,
  - c) a simplified process flow diagram,

- d) a schematic of the entire system showing locations of all system components,
- e) instructions on operating, maintaining, and inspecting the system,
- f) required frequency of maintenance and inspections,
- g) instructions on deactivating and restarting the system for repair or other purposes,
- h) details on the corrective action that shall be taken if the water quality fails to meet the standards set out in Table 2.7.7.1., and
- i) safety data sheets.

**2.7.8.2. Maintenance**

- 1) *Alternate water source systems* shall be maintained in accordance with the operating manual and any manufacturer’s specifications.
- 2) Cross connection control tests shall be performed as required by CAN/CSA-B128.1.
- 3) A maintenance log shall be maintained and shall include
  - a) the address and location of the *alternate water source system*,
  - b) the name and contact information of the *owner*,
  - c) a record of inspections and any maintenance performed within the last 24 months,
  - d) details of any changes or alterations made to the system at any time after commissioning,
  - e) a record of water quality test results as set out in Article 2.7.7.1., including the name of the person and company conducting the test,
  - f) copies of water quality reports prepared and submitted in accordance with Article 2.7.7.2 within the last 24 months, and
  - g) if a water quality test fails to meet a standard defined in Table 2.7.7.1., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.

**2.7.8.3. Request for Operating Manual or Maintenance Log**

- 1) The operating manual and the maintenance log shall be made available on such request to the *Chief Building Official* or *City Engineer*.”.

13. In Division B of Book II, Council:

- a) adds a new Section 2.8. as follows:

**“2.8. Building Mechanical Systems**

**2.8.1. Geoexchange Systems**

**2.8.1.1. Geoexchange Systems**

- 1) Make-up water for a closed loop geexchange (geothermal) ground heat exchanger shall be provided by a feeder tank isolated from the domestic water supply.
- 2) The use of a direct connection to the domestic water supply as a source of make-up water for a closed loop geexchange (geothermal) ground heat exchanger is prohibited.
- 3) Methanol shall not be used for geexchange (geothermal) applications.
- 4) An open loop geexchange (geothermal) system serving a *building* containing no more than four *dwelling units* and no other *major occupancies*, or a *laneway house*, shall not be installed.
- 5) An open loop geexchange (geothermal) system shall not discharge into the sewer.”; and

b) renumbers the existing Section 2.8. Objective and Functional Statements, as Section 2.9.

14. In Division B of Book II, Council adds a new Subsection 2.8.2. as follows:

**“2.8.2. Cooling Towers**

**2.8.2.1. Cooling Towers**

- 1) An *operating permit* shall be obtained for the installation of a *cooling tower*, or the retention of an existing *cooling tower*.
- 2) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.
- 3) If a *cooling tower* is removed or its use is permanently discontinued, it shall be safely drained, thoroughly sanitized, and the make-up water line shall be disconnected and capped.”.

15. In Division B of Book II, Council adds a new Subsection 2.8.3. as follows:

**“2.8.3. Decorative Water Features**

**2.8.3.1. Indoor and Outdoor Decorative Water Features**

- 1) An *operating permit* shall be obtained for the installation of an indoor or outdoor decorative water feature, or the retention of an existing indoor or outdoor decorative water feature, including green walls with an integrated water system, except for an indoor or outdoor decorative water feature in *building* containing no more than four *dwelling units* and no other *major occupancies*, or a *laneway house*.
- 2) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with

regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

- 3) If a decorative water feature is removed or its use is permanently discontinued, it shall be safely drained, thoroughly sanitized, and the make-up water line shall be disconnected and capped.
- 4) Where an outdoor decorative water feature is provided as an auxiliary system to a *building*, then the outdoor decorative water feature shall be considered part of the *building* for the purposes of this Article.”.

16. In Article 1.5.2.10. of Division C of Book II, Council:

- a) adds the words “, and Operating Permits” to the title of the Article; and
- b) adds a new Sentence (2) as follows:

“2) The *Chief Building Official* may issue an *operating permit* to install or retain existing equipment or systems for which an *operating permit* is required under this By-law in accordance with the provisions of Subsection 1.6.9.”.

17. Council adds a new Subsection 1.6.9. to Division C of Book II as follows:

**“1.6.9. Operating Permits**

**1.6.9.1. Operating Permit Required**

- 1) No person shall install or retain existing equipment or systems for which an *operating permit* is required under this By-law, without an *operating permit*.

**1.6.9.2. Compliance with Permit Conditions**

- 1) No person shall install or retain existing equipment or systems for which an *operating permit* is required under this By-law, in contravention of the conditions of an *operating permit*.

**1.6.9.3. Application Requirements**

- 1) To obtain an *operating permit*, the *owner* shall file an application in writing in the form prescribed by the *Chief Building Official*.
- 2) The application for an *operating permit* shall be accompanied by the *operating permit* fees and any documentation required by the *Chief Building Official* to verify that the requirements of this By-law are being met.

**1.6.9.4. Permit Expiry**

- 1) An *operating permit* shall expire and the rights of the *owner* under the *operating permit* shall terminate on the expiry date noted on the *operating permit*.

**1.6.9.5. Operating Permit Fees**

1) *Operating permit* fees are as set out in the Schedule of Fees at the end of this Part.”.

18. In Clause 1.7.2.2.(1)(a) of Division C of Book II, Council adds “, including *operating permits*,” after “the necessary *permits* have been obtained”.

19. In the Schedule of Fees of Division C of Book II, Council adds the following at the end of the Schedule:

“PART C – OPERATING PERMITS

Every applicant for an OPERATING PERMIT shall, at the time of application, pay to the City the fee set out hereunder:

For each OPERATING PERMIT .....\$00.00”.

20. A decision by a court that any part of this By-law is illegal, void, or unenforceable severs that part from this By-law, and is not to affect the balance of this By-law.

21. This By-law is to come into force and take effect on January 1, 2019, except that section 10 comes into force and takes effect on June 3, 2019, section 14 comes into force and takes effect on January 1, 2020, and section 15 comes into force and takes effect on July 1, 2020.

ENACTED by Council this 18<sup>th</sup> day of December, 2018

Signed \_\_\_\_\_ “Kennedy Stewart”  
Mayor

Signed \_\_\_\_\_ “Katrina Leckovic”  
City Clerk