

## **Cleaning Your Small Reservoir**

A critical component in the delivery of safe potable water to the end users of your water system is ensuring the reservoir is kept clean and sanitary. The information presented in this document is intended to assist small water system operators with the procedures of cleaning and disinfecting their reservoir. Contact your local Environmental Health Officer if you have any questions or require more details.

### ***Why is it done?***

- Over time sediment from the source water builds up in the reservoir
- Bacteria and other microorganisms adhere to the interior wall of the reservoir, begin to grow and may impact water quality
- The structural and sanitary integrity of the reservoir can be evaluated

### ***When should one clean and disinfect a reservoir?***

- The water system has not been used for some time (seasonal facilities)
- Work has been performed on the system (repairs, upgrades)
- Water treatment has malfunctioned – see your Emergency Response Plan (ERP)
- Water sampling results confirm the presence of contamination or contamination is suspected - ERP
- During the year as part of a preventative maintenance program

It is important that the water used to flush the reservoir is of the best possible quality.

- For systems with treated water, that means the treatment unit is fully operational and the water is free from turbidity or known contamination.

### ***What do I use?***

The most common disinfectant used is unscented regular household bleach that is close to 6% chlorine content per volume. The calculations below are based on 5-6% chlorine content.

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Please note that there are different types of bleach available for purchase. If you use commercial grade bleach (12% chlorine content per volume) you will need to use ½ of the volume calculated below. If you use an inexpensive no name bleach brand (3%) you will need to double the calculated volume.

Bleach also loses its strength over time so ensure your supply is fresh. You may need to obtain chlorine test strips to confirm the level of chlorine in the system during this procedure (if you don't have any of these strips they may be obtained for a nominal fee from your local Health Authority office).

***What is the procedure for reservoir cleaning?***

- Ensure all users are notified in writing in advance of any routine scheduled maintenance, as an alternate supply of potable water may need to be on hand.
- Initially, the reservoir should be drawn down as low as possible using the existing reservoir pumping system – remove as much water as possible. Do not allow sediments to be drawn out of the reservoir into the distribution system.
- Wash and remove dirt from the inside surfaces of the tank by means of a high-pressure hose. Scrubbing, sweeping or any other equally effective means may be required to dislodge any dirt or foreign material from the tank. **DO NOT ENTER A CONFINED SPACE. PLEASE CONTACT WORKSAFEBC FOR INFORMATION REGARDING THIS MATTER.**
- Remove wash water and sediments from the bottom of the tank – a vacuum system can remove these. Do not allow the sediment to enter the distribution system. Rinse the tank again and remove any remaining wash water.
- Disinfect the inside surfaces of the tank as follows:

Chlorination method #1:

- a) Start filling the tank with potable water. When the water depth is between 1 and 3 feet, add the necessary amount of bleach as determined below:

You will need to add 8 L of household bleach (5-6% chlorine content per volume) to every 4500 L (1000 gal) of water to fill the reservoir. This will give 100 parts per million (ppm) chlorine solution.

- b) Continue filling the reservoir to capacity so the bleach and the water mix well.
- c) Let the chlorine solution sit in the water tank for at least 20 minutes.
- d) Completely drain the chlorine solution from the tank to waste. Do not allow this heavily chlorinated water to enter the distribution system and do not drain this water into any fish bearing streams.
- e) Finally, refill the reservoir and bring it back on-line.

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Chlorination method #2:

- a) Mix up 80 mL (3 oz) of household bleach in 20 L (5 gal) of water and mix well. This will give a 200 ppm chlorine solution.

- b) Apply this solution (via suitable brushes or spray equipment) directly to the surfaces of the reservoir that will be in contact with the water when it is full (this shall include inlet and outlet piping).
  - c) The disinfected surfaces shall remain in contact with the strong solution for at least 30 minutes, after which potable water shall be used to fill the reservoir (the water should have a chlorine concentration of 10 ppm or 10 mg/L at this point). If this concentration is not achieved, add additional chlorine to meet this requirement. Let the water stand in the reservoir for 3 to 6 hours.
  - d) Bring the reservoir back on-line and once the chlorine has dropped below 2 ppm, users can begin to utilize the water for domestic purposes once again.
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- It is recommended that you obtain sodium thiosulfate to help neutralize the high chlorine levels in any wastewater prior to its disposal.
  - If the above cleaning and disinfecting process has occurred as part of an on-going maintenance program, the reservoir may be brought on-line and put into use immediately. However, if cleaning/disinfecting is due to unsatisfactory bacteriological results (i.e. positive for E.coli result), tampering/vandalism, etc, then satisfactory bacteriological testing and acceptable aesthetic water quality results will be required prior to delivering this water to the distribution system.
  - Cleaning and disinfecting of the water tank should occur as needed (i.e. annually).
  - Following the cleaning operation, the vent screen, overflow screen and any other screened openings shall be checked and put in satisfactory condition to prevent birds, insects and other possible contaminants from entering the facility. Once completed, any materials used in the operation of storage facility shall be clean and sanitary. In such instances, care shall be taken to minimize the introduction of dirt or other foreign material.

Contact your local Environmental Health Officer for more information.