

PUBLIC HEALTH ENGINEERING GUIDELINE: DESIGN GUIDELINES FOR MOBILE CAMPS SUPPLIED BY HAULED WATER – 2009

Introduction

This document sets out guidelines for the minimum requirements when providing potable water to a small temporary industrial camp with a single cistern on water hauled from an approved source. Final approval of the proposed drinking water systems by the Issuing Official under the *Drinking Water Protection Act* is still required.

Questions on this document may be directed to the Northern Health Regional Public Health Engineer:

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Water Source

Water hauled by approved water hauler from approved water source.

Cistern

1. A positive pressure should be maintained in the distribution system. Keeping the water storage tank at the highest possible point in the camp would help.
2. A ground level or underground cistern / water tank must be flood-proofed; inlets to the cistern should be above ground and not subject to surface contamination.
3. Cistern should be insect-proofed. Air vents should be fly-tight.
4. Cistern and all connecting pipes should be built or coated with material approved for potable water use (NSF61 or equivalent) or of approved food-grade material.
5. Drinking water containers like water bladders or cisterns should be kept clean and should be disinfected when camps are first set up. The attached information, *Cleaning and Disinfecting Your Drinking Water Small Storage Tank*, may be used for reference.

Chlorination

1. A minimum of 0.2 mg/ of residual free chlorine must be maintained at the furthest point of the distribution system.
2. The levels of residual free chlorine must be measured and recorded *at least daily*. Any changes in the trend should be investigated. If in doubt, consult the Drinking Water Officer.
3. A chlorine test kit that can measure below 0.1 mg/L of free chlorine should be used. Meters with digital readouts are easy to use and are recommended.

Control of Cross-Connection and Other Contamination

1. Potable water from the cistern and other non-potable water must be separated physically, preferably right from the source with separate pumps. This is to reduce the risks of untreated water being pumped into the potable water system.
2. Signs to clearly indicate the water is non-potable must be posted at all taps and water outlets for non-potable water.
3. For filling up non-potable water containers (fertilizers, for example), an air gap must be provided between the top of the container and the end of the hose. In addition, hose bibb vacuum breakers (anti-siphon valves) should be installed on all taps.
4. Attention should be given to possible contamination of drinking water through splashing from the ground or cross-contamination from drinking bottles. All hose ends must be kept out of dirt by securing them above ground. Proper faucets and filling stations should be provided.
5. Permanent signs are attached to any taps *not* connected to the drinking water cistern to clearly indicate that the water is *not potable*.

Disinfection of Water System

The water supplier must ensure that, following completion of construction at each campsite, all works are adequately flushed and disinfected. All equipment, including water containers, hoses are to be flushed, super-chlorinated by keeping them under a minimum of 10 mg/L of free chlorine for 24 hours before they are used at each camp location. After disinfection, the water must be tested for bacteriological quality by a lab accredited by the BC Provincial Health Officer (on-line, Google: *PHO approved labs*).

Note: To have 10 mg/L residual free chlorine, add about 500 mL of 5% bleach solution to 500 gallons (2000 L) of clean water.

Information to be submitted for Construction Permit Application

1. Schematic layout plan of the proposed water system for the whole camp, showing location of the cistern and the distribution system as well as any non-potable water system,
2. Sectional plans of the cistern if underground.
3. Specifications of the cistern and connection pipes.
4. Quality assurance plan including proposal for monitoring and record keeping.
5. Specifications of the free chlorine test kits (DPD or digital)
6. Source of hauled water and the hauler's name, with copies of the hauler's operating permit.
7. Name and qualification (water related certification) of the water system operator.

CLEANING AND DISINFECTING YOUR DRINKING WATER SMALL STORAGE TANK

Ensure all materials used for storage tanks are intended for the use of potable water. If materials not suitable for potable water contact are used, harmful chemicals such as heavy metals or hydrocarbons could leach into your drinking water. Storage tanks should be sealed and kept fly-tight (insect-proof) to prevent onsite contamination.

Delivered water should be potable (safe for human consumption) and obtained from an approved source. Surface water is continually susceptible to contamination from wild life, aquatic life, domesticated animals and humans. All surface water used for domestic use should be treated to ensure a safe supply. The water hauler is required to disinfect this water for your safety.

Storage tanks should be cleaned and disinfected at least twice a year (spring and fall). This is to remove algae (plant growth which produces bad tastes and odours), silt, and bacteria which may be harmful.

Procedure

- 1) Drain water from tank.
- 2) Physically scrub or pressure washes the interior walls to remove sediment and grime.
- 3) Rinse the inside surfaces of tank with clean potable water. Drain wash water.
- 4) Fill tank with clean potable water.
- 5) Add the required amount of unscented household bleach to the water in the storage tank (see table below). Mix well.
- 6) To disinfect the plumbing lines and fixtures, open all taps in distribution system until chlorine smell is apparent at each outlet. Close taps.
- 7) Let chlorine solution sit in the water system for **at least 12 hours**. Do not consume this highly concentrated solution.
- 8) Drain the water tank but not into a septic system or fish-bearing stream.
- 9) Refill with fresh potable water.
- 10) Open valve to distribution lines. Run water from the taps until there is no smell of chlorine.

Dosage of Household Bleach (~5% chlorine) required* for Cleaning and Disinfecting of Water Holding Tanks			
Tank Size		Amount of Household Bleach	
Litres	Imp. Gallons	metric	Cups
225	50	225 mL	1
450	100	450 mL	2
900	200	900 mL	4
1150	250	1.2 L	5
2300	500	2.3 L	10
4500	1000	4.5 L	20
6800	1500	6.8 L	30
9100	2000	9.1 L	40
11400	2500	11.4 L	50

* to obtain approx. 50 ppm free chlorine in clean water