

## 6.6 PROTOCOL FOR BACTERIOLOGICAL SAMPLING

### Overview

Samples are typically analyzed for a combination of the following bacterial parameters: total (rarely) and fecal coliforms, *Escherichia coli* (*E. coli*), fecal streptococci, and enterococci. Due to the high risk of potential contamination of the sample during collection, care must be taken when collecting bacteriological samples to ensure sterile conditions. Sample containers should be filled as per laboratory instructions and samples should be kept out of the light and chilled on ice (do not allow to freeze). Always collect bacteriological samples first, if sampling from a boat, obtain the sample from the upstream side of the boat.

Bacterial samples are time-sensitive; it may not be possible to transport samples to a laboratory for analysis in time. A mobile bacteriological water quality kit can be purchased from suppliers and can be used to analyze total coliform, fecal coliform, *E. coli*, and fecal streptococci. The kit comes with two incubators that can plug into vehicle cigarette lighters, a binocular microscope, Petri dishes, squared filter paper, media, filtration equipment, sterilizing alcohol, and flame.

### Sources

Environment Canada and B.C. WLAP (2005), Alberta Environment (2006 a), EMAN-N (2005)

### Special safety concerns

The sampler should not exceed a depth where there exists a reasonable possibility that water might unexpectedly enter the gumbboot or hip-wader. Ensure any safety policies are adhered to when sampling, including all appropriate safety gear worn (i.e. personal flotation device). In some cases, the sampler should also be tethered to either another person or a stable object.

### At a glance

#### Beach/shore sampling

**1** Wade out to knee deep water, aiming for beyond the point where wave action affects the lake bottom (avoid contamination by suspended sediments). Avoid disturbing the sediment/substrate. Wait 2 to 3 minutes to ensure any sediment disturbed by wading has settled.

**2** Always hold bottle upright and by the base. Keep sample bottle closed until needed. Holding the bottle upright and by the base, in one continuous motion submerge till the bottle opening is approximately 30 cm below the water surface or other specified depth, facing towards the current.

**3** Uncap and fill the sample bottle as required by the laboratory, cap and bring to the surface. Immediately place the bottle in a closed cooler with ice packs or hot water bottles,

depending on the season.

**4** If necessary, sample bottle can be filled from a clean (sterile) intermediate container.

**5** Take several individual samples along the length of the beach.

### Sampling from boat

**1** Sample from the bow of the boat to prevent potential contamination from the boat or the outboard motor.

**2** Keep sample bottle closed until needed. Take a sample at arms length from the boat and sample facing towards the current (the direction the boat is facing). Always hold bottle upright and by the base. In one continuous motion submerge till the bottle opening is approximately 30 cm below the water surface or other specified depth.

**3** Uncap and fill the sample bottle as required by the laboratory, cap and bring to the surface. Immediately place the bottle in a closed cooler with ice packs or hot water bottles, depending on the season.

**4** If necessary, the sample bottle can be filled from a clean (sterile) intermediate container.

### Sampling at depth

**1** Sample from the bow of the boat to prevent potential contamination from the boat or the motor. Ensure that the person in the stern is providing counterbalance (working over the opposite side of the boat).

**2** Collect a sample of water at the desired depth with a depth sampler.

**3** Do not rinse the bottle or touch the inside of the bottle or cap, and always hold bottle upright and by the base. Keep sample bottle closed until needed.

**4** Fill the sample bottle as required by the laboratory and immediately cap the bottle securely.

**5** Immediately place the bottle in a closed cooler with ice packs or hot water bottles, depending on the season.

## Other sources

B. C. WLAP 2003, Newfoundland and Labrador Environment and Conservation (1999), Environment Canada (1999) draft, NB 2000, Saskatchewan (Undated), Environment Canada 2002 (a)