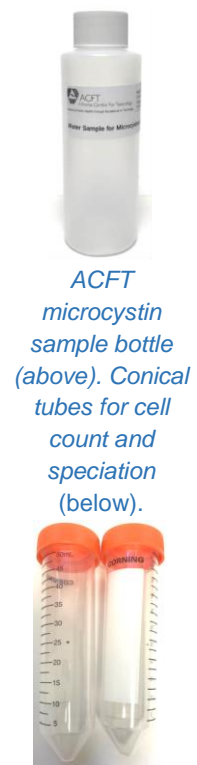


How to Collect Cyanobacteria (Blue-green Algae) Water Samples

This document is meant to help beach operators collect cyanobacteria (commonly called blue-green algae) samples at public beaches. The two types of samples that are submitted for cyanobacteria testing are:

1. Microcystins – a type of toxin (harmful substance) that some types of cyanobacteria produce; and
2. Cell Count and Speciation – a count of how many cyanobacteria cells are in one milliliter of water and identification of the types of cyanobacteria present.

| Materials supplied by AHS (per sampling event) | |
|--|------------------------------------|
| One 125 mL Alberta Centre for Toxicology (ACFT) plastic bottle with a white cap – for microcystin sampling | |
| Two 50 mL conical tubes with orange caps – for cell count and speciation sampling | |
| Two plastic resealable sample bags | |
| Alberta Centre for Toxicology requisition form titled “Laboratory Requisition for Microcystins Analysis” | |
| Materials supplied by sampler (each sampling event) | |
| Large pail | Plastic or metal probe thermometer |
| Plastic wine thief | Aluminum foil |
| Lugol’s solution | Cooler |
| Ice packs | Life jacket/PFD |
| Shoulder length gloves (vet use) | Hip waders |
| Camera or phone with camera | |



Important Note: if a bloom is present, be sure to prevent direct contact with the water as some types of cyanobacteria may cause skin irritation. The use of hip waders and arm length plastic gloves (available from veterinary supply stores) will help prevent contact with the bloom. A cyanobacteria reference guide with pictures can be found in the Frequently Asked Questions document located on www.ahs.ca/bqa.



Sample collection site locations. Photo courtesy of Cheryl Galbraith, EPH

Composite Sampling Method: Water samples from 10 different locations are combined, thoroughly mixed, and treated as a single sample. This type of sample is used because cyanobacterial blooms are not evenly spread through the water. In the picture (left), 10 sample sites are used to make the composite for the cyanobacteria sample.

How to Collect Cyanobacteria (Blue-green Algae) Water Samples | 2

Collection Procedure:

| | |
|---|---|
| <ol style="list-style-type: none">1. At the beach where the sample is to be collected, rinse the pail and wine thief thoroughly with lake water.2. Collect water samples from 10 different locations using the wine thief and deposit each sample into the pail. Sample spots are chosen randomly, but usually include 5 spots that are knee deep and 5 spots that are mid-thigh deep (see picture on page 1).3. Mix the contents by swishing the pail well.4. Using the contents of the pail:<ul style="list-style-type: none">o fill the ACFT bottle $\frac{3}{4}$ full (approximately 100 mL).o fill the 2 conical tubes (with orange caps) to the 49mL mark. Add 1-2 mL of Lugol's solution.5. Ensure all caps are "finger tight". Do not overtighten caps as this can cause cracking.6. Label all three bottles with the Lake Name, beach name, access number, and collection date. | <ol style="list-style-type: none">7. Stick a sample ID label (M*****; attached to the requisition form) onto each bottle and each cap, and in the top right corner of the requisition form.8. Wrap the 125 mL ACFT microcystin bottle in aluminum foil.9. Complete the requisition form in full.10. Place the ACFT microcystin bottle in one plastic bag and put the completed requisition in the front pouch of this bag. Place the two conical tubes in another plastic bag.11. Store the bottles in the cooler with ice packs.12. Take photographs of the sample site (both beach and water). These may be requested by AHS for assessment of the results.13. Transport the samples to an Environmental Public Health office. Consult with your local Public Health Inspector regarding accepted days and times for sample drop off. |
|---|---|

Sample Preparation Notes:

- **If a cyanobacteria bloom is suspected to be present in the water**, consult your local public health inspector. If requested, use a wide mouth bottle to collect some of the surface scum. Follow steps 5-14 in the Collection Procedure above using the water from the surface scum. Note that the sample type must be indicated as "grab" on the requisition form instead of "composite". Grab samples do not replace routine weekly composite sampling activities. Please ensure routine sampling is also completed.
- Labels can be made to assist with the sampling process.
 - o Sample bottle labels: Include the water body name, beach name, beach access number, and date. The date will need be filled in by the collector.
 - o Requisition form labels: Include the water body name, beach name, and beach access number. They also may include the collector's name and phone number.

How to Collect Cyanobacteria (Blue-green Algae) Water Samples | 3

Indicate which sample types are being requested. Routine testing includes "microcystins" and "cyanobacterial cell count"

Place the sample ID label here

Place pre-printed label here or fill out by hand

Date & time must be filled out

Indicate if a composite or grab sample was collected (usually composite)

Indicate water body source type and mark "raw" for treatment

Record visual observations at the time of sampling for turbidity (how clear or murky the water is), colour, and whether there is evidence of a

Other Observations:
 Wind Direction - Record the direction from which the wind is blowing.
 E.g. wind blowing from the north to the south is a north wind
 24 Hour Rainfall - current and historical weather station data available from: <http://agriculture.alberta.ca/acis/alberta-weather-data-viewer.jsp>
 Water Temperature – as measured with a plastic or metal probe thermometer

F-BA15018-170426

Laboratory Requisition For Microcystins Analysis

Alberta Centre for Toxicology
University of Calgary
HMRB-B19, 3330 Hospital Drive NW
Calgary, Alberta T2N 4N1

ID LABEL

Sample types collected during this sampling event (check all that apply):

Microcystins Cyanobacterial cell count Cyanobacterial genes (qPCR) Fecal (thermotolerant) coliform

Waterbody name: Stormy Lake Collection date: Oct. 1, 2017

Beach name: Campground Beach Collection time: 13:05

AHS Beach Access #: 9621522 Nearest town: Clearwater, Ab

Collector name: John Smith GPS (dec. degrees): 56.99128, -112.845

Phone number: (780) 456-7890 Email: john.smith@ahs.ca

Additional Information (please select ONE box only from each category)

Source: Lake Reservoir River Pond Other

Type: Composite Grab Treatment: Raw Public treated Private treated

| Visual Inspection of Water (please select ONE box only from each category) | | | Other Observations (please select ONE box only from each category) | |
|---|--|--|---|---|
| Turbidity | Colour | Evidence of cyanobacterial bloom | Wind Direction | 24 Hour Rainfall |
| <input type="radio"/> Clear | <input type="radio"/> Colourless | <input checked="" type="radio"/> No evidence | <input type="radio"/> No wind | <input type="radio"/> Yes Amount: _____ mm |
| <input checked="" type="radio"/> Slight | <input checked="" type="radio"/> Brown | <input type="radio"/> Particles in water | <input checked="" type="radio"/> N | <input checked="" type="radio"/> No |
| <input type="radio"/> Moderate | <input type="radio"/> Green | <input type="radio"/> Streaks on surface | <input type="radio"/> E <input type="radio"/> SE | <input type="text" value="18"/> °C <input type="text" value="0.5"/> m |
| <input type="radio"/> Total | <input type="radio"/> Other | <input type="radio"/> Scums on surface | <input type="radio"/> S <input type="radio"/> SW | |
| | | | <input type="radio"/> W <input type="radio"/> NW | |

Additional comments

Alberta Health Services



How to Collect Cyanobacteria (Blue-green Algae) Water Samples | 4

- Store the Lugol's solution wrapped in aluminum foil (to protect from sunlight) and in the refrigerator when not in use. This is a non-toxic substance used to preserve the sample. The Safety Data Sheet (SDS) for the solution should be supplied with the sample bottles.
- Incomplete requisition forms lead to either samples not being tested by the laboratory or a lack of information to properly interpret the sample result.
- Sample results will be sent to Alberta Health Services for interpretation and distribution to beach operators.

For more information, please contact your nearest Environmental Public Health office.

Edmonton Main Office
Calgary Main Office
Lethbridge Main Office

780-735-1800
403-943-2288
403-388-6689

Grande Prairie Main Office
Red Deer Main Office
www.ahs.ca/eph

780-513-7517
403-356-6366

©2019 Alberta Health Services, Safe Healthy Environments

PUB-0434-201906



This work is licensed under a [Creative Commons Attribution-Non-commercial-Share Alike 4.0 International license](https://creativecommons.org/licenses/by-nc-sa/4.0/). You are free to copy, distribute and adapt the work for non-commercial purposes, as long as you attribute the work to Alberta Health Services and abide by the other license terms. If you alter, transform, or build upon this work, you may distribute the resulting work only under the same, similar, or compatible license. The license does not apply to content for which the Alberta Health Services is not the copyright owner.

This material is intended for general information only and is provided on an "as is," "where is" basis. Although reasonable efforts were made to confirm the accuracy of the information, Alberta Health Services does not make any representation or warranty, express, implied or statutory, as to the accuracy, reliability, completeness, applicability or fitness for a particular purpose of such information.