

What's in the Water?

Karen Boyles, EPHO

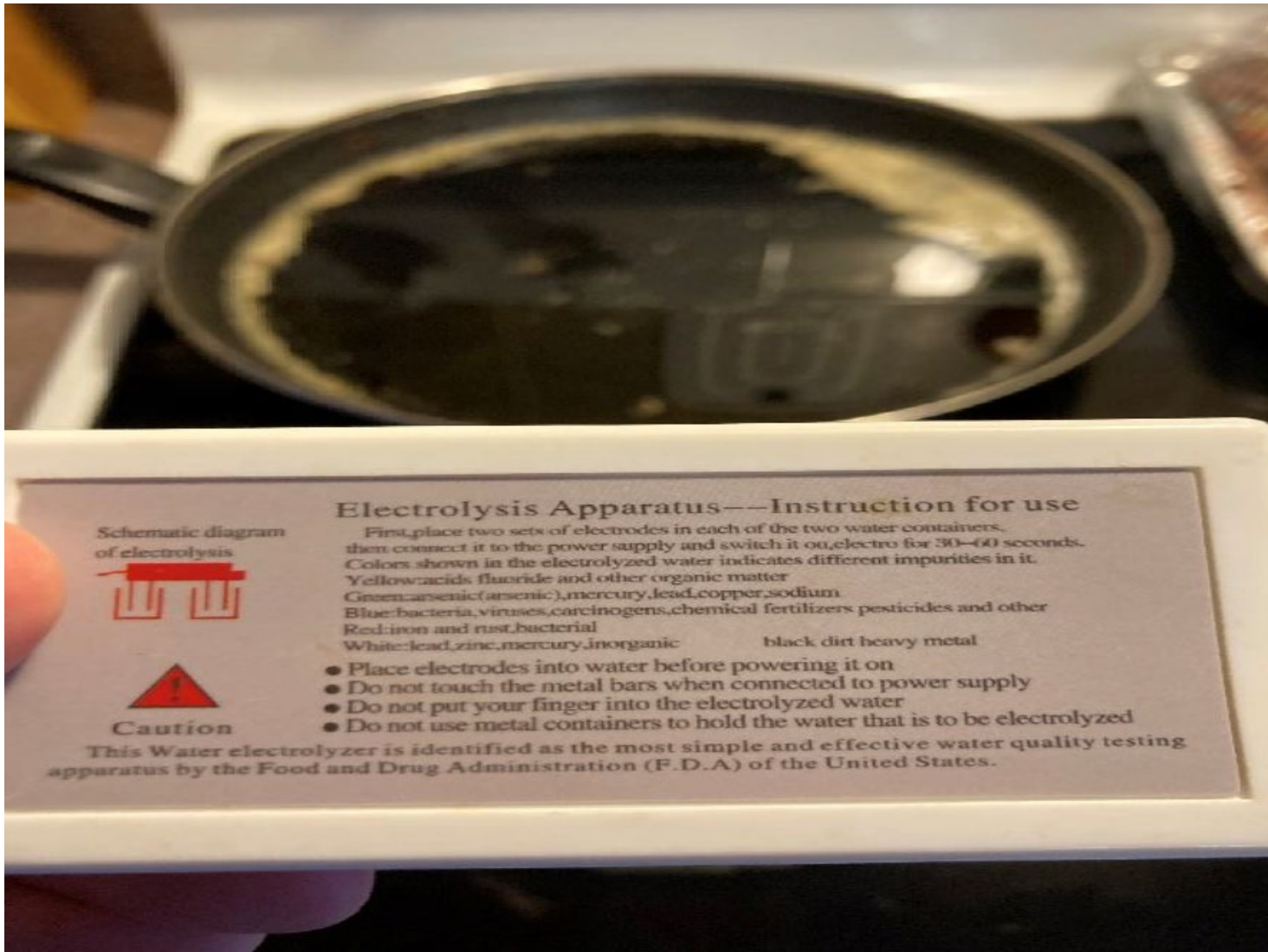
Indigenous Services Canada



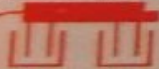
Scenario 1- Devices



Scenario 1



Schematic diagram
of electrolysis



Caution

This Water electrolyzer is identified as the most simple and effective water quality testing apparatus by the Food and Drug Administration (F.D.A) of the United States.

Electrolysis Apparatus—Instruction for use

First, place two sets of electrodes in each of the two water containers, then connect it to the power supply and switch it on, electro for 30–60 seconds. Colors shown in the electrolyzed water indicates different impurities in it.
Yellow: acids fluoride and other organic matter
Green: arsenic (arsenic), mercury, lead, copper, sodium
Blue: bacteria, viruses, carcinogens, chemical fertilizers pesticides and other
Red: iron and rust, bacterial
White: lead, zinc, mercury, inorganic black dirt heavy metal

- Place electrodes into water before powering it on
- Do not touch the metal bars when connected to power supply
- Do not put your finger into the electrolyzed water
- Do not use metal containers to hold the water that is to be electrolyzed

Scenario 1 – Final results

After using an electrolysis apparatus, the home occupant noticed discolored water. This device has four metallic probes connected to a power source. When the probes are inserted into a glass of water and the device is plugged in, the electrical current causes the probes to corrode and rust, resulting in discolored water. This can create the perception that there is an issue with the water.

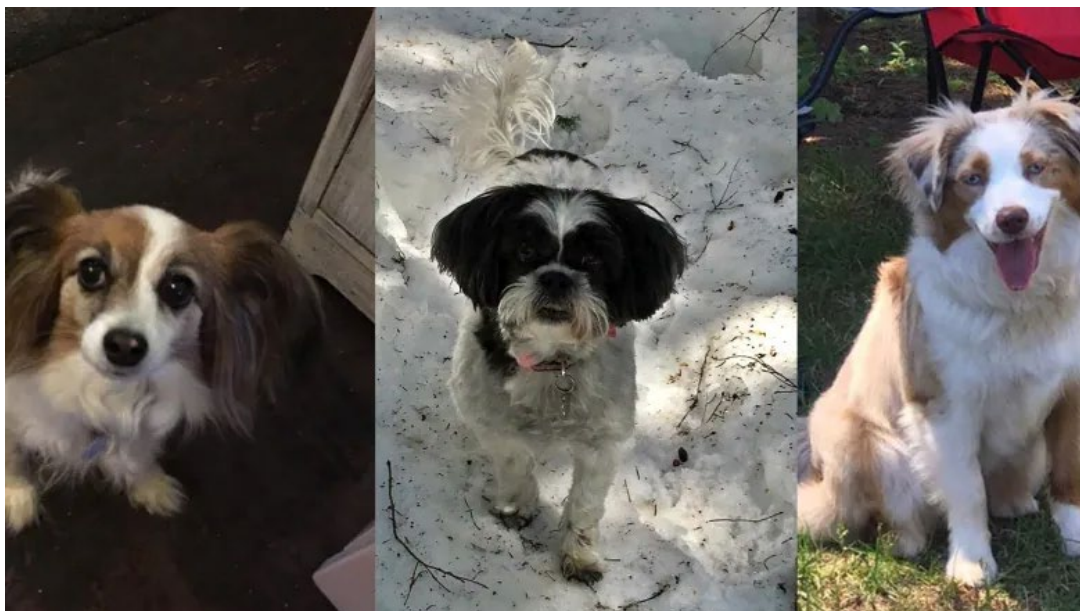
To verify that the water is potable, samples of the water were sent to accredited laboratories for analysis. The results for each parameter analyzed were compared against either the respective *Maximum Acceptable Concentration* (MAC) or *Aesthetic Objective* (AO) as listed in Health Canada's *Guidelines for Canadian Drinking Water Quality* (GCDWQ).

All test results were within the *Guidelines for Canadian Guidelines for Drinking Water Quality* (GCDWQ), please see tests results attached. The water is safe to drink and there are no concerns.

Scenario 2

All three dogs died immediately after visiting the water's edge in the Fredericton area.

Two dogs ate some aquatic plants onshore at Carleton Park on Fredericton's north side. The third dog was swimming near Hartt Island RV Resort, 14 kilometres west on the St. John River.



PROTECTING YOUR PETS

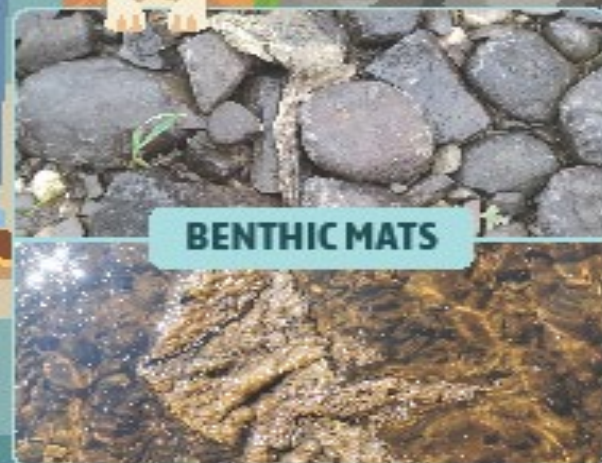
FROM CYANOBACTERIA (BLUE-GREEN ALGAE)

WHAT IS IT AND WHAT DOES IT LOOK LIKE?

Cyanobacteria can be found in lakes, rivers and wetlands. Under certain conditions, they can form surface blooms or benthic mats.

SURFACE BLOOMS can look like scum, foam or paint streaks on the water's surface, and can appear blue-green, green, red or brown.

BENTHIC MATS look like clumps of vegetation that can appear brown or dark green in the water. They may be attached to rocks or aquatic vegetation, or floating in the water. If they wash up on shore, they may appear brown or grey once they have dried.



WHY IS IT DANGEROUS FOR DOGS?






Some cyanobacteria produce toxins that could be harmful to a dog's liver and brain. Dogs are attracted to the odour, and if ingested, they may:

-  Vomit and be sick
-  Have a seizure
-  Experience breathing difficulties
-  Have diarrhea
-  Collapse and become unconscious
-  Die



CALL A
**VETERINARIAN
RIGHT AWAY**
if you suspect cyanobacteria poisoning

HOW DO I AVOID CYANOBACTERIA?

-  Always check the water and shoreline.
-  Do not let dogs drink or swim in water where visible blooms or mats are present.
-  Do not let dogs eat benthic mats or vegetation floating in the water or along the shore.
-  On hot days, consider walking your dog in the morning or evening.
-  Always take fresh water on walks for you and your dog.



For **MORE INFORMATION**
or to **REPORT CYANOBACTERIA**

visit www.gnb.ca/algae



Scenario 3

An elderly individual felt ill 10 days following a precautionary BWA that was applied as infrastructure upgrades were being conducted on a community. Day 10, they traveled by plane to another province within Canada. The following day, the individual's health got worse with symptoms of nausea and diarrhea. When taken to the hospital four days later, the doctor advised the BWA may have been the cause.

The precautionary BWA lasted three days. All routine water samples taken by both the EPHO and CBWM were analyzed by an accredited laboratory, and results were zero or absent prior to, during and after the BWA.

The moral of this story. Be vigilant and sample weekly as required. The data available confirmed that it wasn't in the water.

Scenario 4

Ring Ring: Dear Band Office, I have a rotten egg smell coming from my water.

Band Office: Ok, I will have the Environmental Public Health Officer test your water.

What are some possible causes?

Scenario 5

Ring Ring: Dear Band Office, I have a black stuff in my sink, I think it is coming from the water.

Band Office: Ok, I will have the Environmental Public Health Officer test your water.

What are some possible causes?

Scenario 6



The oily substance has the rainbow pattern that you see when there is a film of oil on water.

Is it possible that this is a natural occurrence of some oil deposits, or should I investigate it as an environmental contaminant?

There is a road about 30 yards uphill from this spot, and for years it used to be a dirt road that the city sprayed oil on to keep the dust down.

Scenario 6

What is a water sheen? A sheen is a shiny or iridescent appearance on the surface of the water. Sheens can be caused by petroleum products finding their way into the water, or they can be the result of naturally occurring phenomena.

Naturally Occurring sheens

Organic Sheens

Stagnant Water Bodies

Algae Blooms

Iron oxide bacteria

Natural surface scum

Scenario 6

Just a couple of inches down, there is no free oxygen and the anaerobic bacteria rule a world of drowned muck.

Because methane is a small, easily evaporated molecule, most of the methane produced by the anaerobes in their mud world escapes into the atmosphere. But some small percentage of it gets converted into larger hydrocarbons that are less likely to evaporate. They still are lighter than water, however, so they float on the surface. There is little difference between these naturally produced compounds and hydrocarbons like gasoline or oil, so the sheen on the water looks the same as if someone had spilled gas or oil.

Scenario 6

Another possible source for oil on the water of a marsh is oil released directly by plants, or oil released when plants and animals die. Because there is so much living and dying of plants and animals in a marsh, there is a fair amount of oil produced.

It is always possible that a gasoline or oil spill nearby caused this sheen. Lakes with heavy boat traffic are always subject to spilled gas and oil. Or it could be oil washed off from the oiling of the road, as you suggest.

Scenario 6

The stick test

The easiest way to tell the difference between naturally occurring sheens and petroleum-based pollutions is with something called “the stick test.”

- Take a stick or rock and use it to break up the sheen in the water.
- Oil sheens will swirl and elongate before reforming together.
- Organic sheens will break up into irregularly shaped platelets that resist reforming and tend to have a mirrored appearance.
- In some cases, sheens caused by pollution may be difficult to break up and may adhere to the tool used for dispersal.

Scenario 6

The shake test

Natural foam can be distinguished from detergents by using “the shake test.”

- If safe to do so, take a medium sized (0.5-1 litre) sample of foamy water.
- Shake the sample of water vigorously for at least 30 seconds.
- Natural foam will dissipate under agitation, detergent foam will increase.

Scenario 7

Several cases of swimmer's itch reported at Dartmouth's Birch Cove Beach



Scenario 7

The Halifax Regional Municipality is warning beachgoers that several cases of swimmer's itch have been reported at Birch Cove Beach in Dartmouth, N.S.

A news release from the municipality says the beach will remain open, but swimmers should rinse well with water after using the lake.

HRM says the presence of swimmer's itch is not indicative of high bacteria levels in the water.

Swimmer's itch is an allergic reaction caused by the bites of a microscopic parasite carried in bird waste and certain species of aquatic snail.

"The bites leave an itchy rash on affected parts of the body. While not dangerous on their own, bites can become infected if scratched and turned into open wounds. If contact is made with affected water, skin should be rinsed with clean water as soon as possible," said HRM in the news release.

Birch Cove Beach is a supervised beach and its water quality is tested regularly.

Scenario 8



Samples were collected and submitted to the QE11 lab for testing of legionella as per request from provincial public health.

Additional samples were also collected for Total Coliform, E.coli, Staphylococcus and Pseudomonas.

Scenario 8



Location	Ideal	Result	
Swimming Pool Free Chlorine (ppm)	2.0-4.0	2.0	Satisfactory
Hot Tub Free Chlorine (ppm)	3.0- 5.0	1.2	Unsatisfactory
Swimming pool pH	7.4- 7.6	7.4	Satisfactory
Hot Tub pH	7.4-7.6	7.8	Unsatisfactory

THANK YOU

QUESTIONS

References

[Water Sheen Facts: Identifying Water Sheens \(gov.bc.ca\)](#)

[Recreational water quality and health: Hazards - Canada.ca](#)

[27-21-2861-Legionella-Infographic-EN-Final \(canada.ca\)](#)