Drinking Water Manual

Bacteriological Water Quality
Public and Private Water Supplies
Drinking Water Manual

Part 1

Bacteriological, Sampling
&
Disinfection Standard

Department of Health and Community Services
Public Health Division

2011
Standards for Bacteriological Quality of Drinking Water

Objective: To reduce the risk of enteric illnesses that may be attributed to public water supplies, the following standards are applicable in the Province of Newfoundland and Labrador. If any of the criteria are exceeded, corrective action should be taken in the affected area immediately.

STANDARDS - BACTERIOLOGICAL:

Bacteriological standards are based on Guidelines for Canadian Drinking Water Quality 6th Edition, 1996 as revised, and shall be considered generally applicable to the Province of Newfoundland and Labrador. The Guideline notes that the maximum acceptable concentration (MAC) for the bacteriological quality of public, semi-public and private drinking water systems is no coliforms detectable per 100 mL. However, because coliforms are not uniformly distributed in water and are subject to considerable variation in public health significance, drinking water that fulfils the following conditions is considered to conform to this MAC:

1. No sample should contain *Escherichia coli* (*E. coli*).
2. No consecutive samples from the same site or no more than 10% of the samples from each distribution system in a given sample set should show the presence of total coliforms.

STANDARDS - SAMPLING:

The number of bacteriological samples to be taken is based on the following:

<table>
<thead>
<tr>
<th>Distribution systems serving:</th>
<th>No distribution system, potable water dispensing unit or very small system serving less than 100 people</th>
<th>1 sample per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5,000 population</td>
<td>4 samples per month</td>
<td></td>
</tr>
<tr>
<td>5,000 to 90,000</td>
<td>1 sample per 1,000 population per month</td>
<td></td>
</tr>
<tr>
<td>more than 90,000</td>
<td>90 plus one sample per additional 10,000 population per month</td>
<td></td>
</tr>
</tbody>
</table>

STANDARDS - DISINFECTION:

Continuous disinfection is required for community and public facility water systems. Chlorine is the most common chemical used for disinfection, and where used:

- All water entering the distribution system or public facility, after a minimum 20 minute contact time, shall contain a residual disinfectant concentration of free chlorine of at least 0.3 mg/L, or equivalent CT value;
- A detectable free chlorine residual must be maintained in all areas in the distribution system. For potable water dispensing units (PWDUs) where the finished water is continuously disinfected immediately before being dispensed to the public using ultra-violet (UV) radiation or any other approved method for that unit, no disinfection residual is required.

Water systems which are primarily disinfected by means other than chlorination, must be provided with a sufficient residual disinfectant as determined to be appropriate for that system.
Application of
Standards for Bacteriological Quality of Public Drinking Water Supplies

1) If the required continuous disinfection is not being provided, an immediate boil water advisory is recommended.

2) Bacteriological samples shall be taken at representative locations in the distribution system and must include the beginning and the end of the system, in accordance with the recommended number of samples. Disinfection residuals must be checked and recorded for each sampling point.

**Disinfection Residual**

3) If no disinfectant residual is detected at the sampling location, the operator of the system shall be advised of the fact that no residual is detected, and in consultation with the appropriate authorities and in accordance with existing guidelines, remedial action shall be initiated. This may include the issuing of a boil water advisory for the area affected by the lack of disinfectant residual.

**E. coli**

4) If the bacteriological test reveals the presence of *E. coli*, re-sampling of the site, as well as up and downstream locations, should be carried out within 24 hours. However, a boil water advisory may be recommended before the re-sampling results are known depending upon the extent of *E. coli* contamination in the initial testing, combined with knowledge of other problems pertaining to the water system. Regardless, if the repeat test reveals the presence of *E. coli*, a boil water advisory is recommended.

**Total Coliforms**

5) If the bacteriological test reveals the presence of total coliforms, but no *E. coli*, re-sampling of the site, as well as up and downstream locations, should be carried out as soon as is practically possible. If the consecutive test confirms the presence of total coliforms, but no *E. coli*, a boil water advisory is recommended for water systems that have only disinfection but no additional water treatment (such as coagulation, sedimentation, filtration or equivalent technologies) or have no significant operational procedures and controls over the water system. Regardless, remedial action shall commence in consultation with the water system operator.

**Rescinding Boil Water Advisories**

6. a. A boil water advisory should be rescinded when:

   i. The condition(s) which led to the boil advisory have been corrected; and
   ii. Two consecutive sets of samples, collected 24 hours or more apart, meet the bacteriological and disinfection standards.

   b. However, when a boil water advisory is issued because *E. coli* was detected in a set of samples and re-sampling could not be carried out within 24 hours (reason code F2E), the boil water advisory can be rescinded when:

      i. One set of satisfactory representative bacteriological samples, including samples collected at up and downstream locations, complies with the bacteriological standard;
ii. The water supply complies with the disinfection standard; and
iii. Other factors indicate the water is safe to drink.

c. However, when a boil water advisory is issued because the water distribution system is undergoing maintenance or repairs (reason code D1), the boil water advisory can be rescinded when:

i. One set of satisfactory representative bacteriological samples complies with the bacteriological standard (for water main breaks, a minimum of two representative samples shall be collected: one sample upstream and one sample downstream of the break);
ii. The water supply complies with the disinfection standard; and
iii. Other factors indicate the water is safe to drink.

If unsatisfactory bacteriological levels are detected during the one day initial sampling event, the two consecutive days of satisfactory bacteriological sample results, not taken less than 24 hours apart are necessary before rescission of the boil water advisory.

d. When a boil water advisory is rescinded after one set of satisfactory bacteriological sample results, a second day of confirmatory bacteriological samples must be collected as soon as practically possible following water distribution system repairs.

e. All appropriate municipal, provincial government and health authority officials must be advised of the decision to rescind a boil water advisory

**Results Reporting**

7. The reporting of results pertaining to these standards shall be done in accordance with the provincial “Guidelines for the Issuance of Boil Water Advisories”.
Application of

Standards for Bacteriological Quality of Private Wells

1. Drinking water samples from private wells submitted to the Public Health Laboratory or Government Service Centres for bacteriological analysis will be tested for the presence of both total coliform bacteria and the fecal indicator *Escherichia coli* (*E.coli*). If neither are detected the sample fully meets the standard.

2. If the bacteriological test reveals the presence of total coliforms, but no *E.coli*, in a 100 mL sample, the drinking water is considered substandard but not to pose an immediate health risk. Disinfection of the water source should be recommended to the owner. Retesting should be carried out following disinfection of the water source. Until disinfection is carried out and retest results are known, the water may be boiled before being consumed or an alternative safe source of drinking water may be used.

3. If the bacteriological test reveals the presence of *E.coli*, the drinking water is considered unsatisfactory and unsafe for drinking. It is recommended that the drinking water be boiled and that corrective action be taken to deal with fecal contamination entering the well. Retesting should be carried out following appropriate corrective action.

4. Reporting of the results will be carried out in accordance with the provincial document “Reporting of Bacteriological Results from Private Water Supplies”.
Standards for Chemical and Physical Monitoring of Drinking Water

Objective:
To help ensure that consumers of water provided by a public drinking water supply have clean and safe drinking water. Chemical and physical guidelines as specified in the Guidelines for Canadian Drinking Water Quality 6th Edition, 1996, as revised, shall be considered as objectives which are applicable to the Province of Newfoundland and Labrador. The Guidelines note that the maximum acceptable concentration (MAC) can be achieved by available water treatment methods at reasonable cost and it must also be reliably measurable by available analytical methods. If it is determined that water quality criteria are exceeded, priority should be given to meeting the Guideline objectives taking into account costs, the degree of exceedence and local factors.

Standards - Chemical and Physical Parameters:
The following standards for routine chemical and physical water quality monitoring are applicable in the Province of Newfoundland and Labrador. The minimum parameters to be monitored are shown in the table below. This table does not include all parameters in the Guidelines rather only those included in standard chemical analysis and metal scan packages. Some parameters are without MAC but are required for normal operational evaluation. The collected samples are to be analysed by accredited laboratories. If there is reason to suspect the presence of certain substances in a water supply system, additional parameters may be added as required by the Department of Environment.

<table>
<thead>
<tr>
<th>Chemical Parameters</th>
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<tbody>
<tr>
<td>Aluminum</td>
</tr>
<tr>
<td>Ammonia</td>
</tr>
<tr>
<td>Antimony</td>
</tr>
<tr>
<td>Arsenic</td>
</tr>
<tr>
<td>Barium</td>
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<table>
<thead>
<tr>
<th>Physical Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
</tr>
</tbody>
</table>

Standards - Sampling Location and Frequency

Samples for chemical and physical parameters shall be taken from the source water (lake, pond, river, reservoir, well or spring) and from the distribution system. The distribution system samples shall be taken at a point significantly beyond the point at which treated water enters the distribution system. Additional sampling locations may be identified if profiling/bench marking data is required for any of the parameters. All sampling shall be done by taking grab samples.

Samples are to be collected semi-annually with the exception of trihalomethane samples which are to be collected for each season of the year. Plant operators may be required to sample for operational parameters (aluminum, pH, fluoride, colour, residual chlorine, temperature and turbidity) on a weekly or bi-weekly basis.

It is essential that results of chemical and physical monitoring are provided to the operator of the water supply system and that the operator make those results available to the consumers. Where results show that the water exceeds the MAC or any aesthetic objectives, the water supply owner / operator shall develop an action plan in consultation with appropriate authorities for addressing non-compliance issues.
Drinking Water Manual

Part 2: SAMPLE SITE SELECTION

SAMPLING PROCEDURES

Public Health Division
Department of Health and Community Services

(Revised April 02, 2003; Revised September 2009)
# TABLE OF CONTENTS

## PART A: SAMPLING SITES AND SAMPLE COLLECTION

1. RESPONSIBILITY  
2. SAMPLING SITES  
3. SAMPLE COLLECTION PROCEDURE  
4. TESTING

## PART B: NUMBER OF SAMPLES

1. SAMPLING STANDARD  
2. EXAMPLES  
3. CHLORINE RESIDUAL TESTING  
4. SEMI-PUBLIC WATER SUPPLIES

REFERENCES
PART A: SAMPLING SITES AND SAMPLE COLLECTION

1. RESPONSIBILITY

Environmental Health Officers (EHOs) and/or Environmental Technicians with the Government Service Centre, Department of Government Services are responsible for:

- The collection of water samples, for bacteriological testing, from public water supply distribution systems.
- The testing of chlorine residuals in public water supply distribution systems (e.g., at entry to distribution system and throughout distribution system).
- Coordination of testing with regional testing sites and/or the Public Health Laboratory

Environmental Health Officers are responsible for:

- The interpretation of test results and appropriate follow-up action, including advice and consultation.

Regional management of the Government Service Centre are responsible for ensuring that EHOs/Technicians carry out sampling in accordance with this protocol and the Standards for Bacteriological Quality of Drinking Water (Part 1 of the Drinking Water Manual).

2. SAMPLING SITES

It is important that the water samples collected from the distribution system reflect the quality of the water supplied to consumers. The quality can vary greatly from one point in the distribution system to another, depending on the layout of the distribution system. A map or sketch of the water distribution system should be used to locate general sampling locations that will give samples that are representative of the various characteristics of the distribution system. Samples must be collected from locations that are representative of:

- dead-end pipes;
- main lines;
- branch lines;
- loops;
- various water sources;
- storage tanks;
- pressure zones; and
- other distribution configurations.
In addition, factors such as population density and accessibility need to be considered when choosing sampling locations.

Let’s consider the example of a branched distribution system as presented to the right (Distribution System 1). Water samples should be collected at the following locations for samples to be considered representative of the distribution system:

1) Location A: main line
2) Location B: branch line
3) Location C: dead end of main line
4) Location D: dead end of branch

For a looped water system as presented to the right (Distribution System 2), a minimum of two sample locations could be representative of the main loop (Location A) and branched loop (Location B) conditions.

Once general locations that will provide representative samples have been identified, specific sampling points from which the EHO/Technician will collect samples need to be selected. Sampling points should:

- be conventional-type water faucets, preferably in buildings in with consistent water use.
- be accessible during the time you normally collect samples,
- provide reliable results, and
- be free of conditions or equipment that could provide a sample that is not representative of the distribution system (see below).
Sampling points can be located in residences or in public or commercial buildings. The sampling sites should be permanent.

Because of the re-sampling requirements outlined in Part 1 of the Drinking Water Manual, Application of Standards for Bacteriological Quality of Public Drinking Water Supplies, you should identify three sampling sites for each general location — two "backup" sites are needed on either side of the primary site at each location. Both "backup" sites, one upstream and one downstream, should be located within five service connections of the primary site.

When choosing a sampling site, do not obtain the water sample from faucets that:

- are outdoors
- are seldom used;
- drip or leak (e.g., leak around stem);
- are dusty, dirty or corroded;
- are swing/swivel faucets with a single valve;
- are too close to the sink basin
- are pointed upwards
- are located in janitorial closets and commercial sinks
- cannot deliver a smooth stream of water;
- contain an aerator or screen (remove screen or aerator if this type of faucet is chosen);
- are connected to home drinking water treatment units, including water softeners

Samples should not be collected from drinking water fountains, flexible hoses or garden hoses. In addition, where possible choose a smooth-end faucet over a treaded-end faucet.
3. **SAMPLE COLLECTION PROCEDURE**

To ensure that the samples are representative of the quality of water delivered to consumers, the sample collection procedures outlined below are to be followed. This will help to ensure that samples are not contaminated during sample collection.

1. Collect samples only in special sterile water collection bottles available from the Public Health Laboratory. These bottles contain the chlorine neutralizing reagent sodium thiosulphate.

2. Bottles must not be rinsed before collecting the water sample.

3. The sample bottle must be kept closed until the EHO/Technician is ready to collect the sample.

4. Make sure taps/faucet are in good condition and remove any aerator or screen

   *Note: flaming or disinfection of the faucet is not necessary if you have chosen the sampling site by considering the guidance provided on page 3.*

5. Before collecting the sample, allow water to run to waste for 5 minutes to clear the water service line.

6. Adjust water flow so that a pencil width steady stream flows from the faucet. Do not adjust flow during sample collection.

7. Remove the screw cap from the bottle and hold on to it with the open end facing down. Do not:

   - lay the cap down
   - touch the inside of the cap
   - put the cap in your pocket

   *Note: the inside of the screw cap or the mouth of the bottle must not be touched when collecting a water sample. In addition, do not allow the screw cap or mouth of the bottle to come into contact with any surfaces that may introduce contamination.*

8. Holding the sample bottle near the base, fill the bottle to the 200ml mark on the bottle. Do not overfill the bottle
9. Immediately replace the cap and ensure that it is on securely. Shake the bottle.

10. Complete the label on the sample bottle and complete the requisition enclosed with the sample bottle.

11. Samples are to be delivered to the regional testing site or the Newfoundland Public Health Laboratory for bacteriological testing. Routine samples are not typically accepted on Friday or any day preceding a public holiday.

12. Water samples that can not be delivered to a regional testing site or the Newfoundland Public Health Laboratory within two hours of collection must be kept refrigerated and delivered within 30 hours of collection. A cooler with ice packs should provide sufficient refrigeration.

13. Samples must be tested within 30 hours of collection. Samples older than 30 hours are not suitable for testing.

4. BACTERIOLOGICAL WATER TESTING

Bacteriological water sample testing is carried out at regional testing sites in:

- Happy Valley-Goose Bay
- St. Anthony
- Corner Brook
- Grand Falls - Windsor
- Gander
- Clarenville

and at the Public Health Laboratory in St. John’s. Testing is carried out in accordance with the protocols developed by the Public Health Laboratory for the detection of coliform bacteria and *E. coli* (indicator organisms).

Where the GSC carries out non-routine sampling and the tests cannot be performed by a regional testing site or the Public Health Laboratory, a qualitative test method and field test kit should be utilized.
PART B: NUMBER OF SAMPLES

1. SAMPLING STANDARD

Bacteriological Sampling Standard:

The bacteriological water quality monitoring program requires monthly water samples to be collected from all public water supplies and the testing of the samples for total coliforms and *E. coli*. The number of samples to be collected monthly from public water is contained in the Sampling Standard of the Standards for Bacteriological Quality of Drinking Water. The Sampling Standard is provided in table 1 below.

<table>
<thead>
<tr>
<th>Distribution system</th>
<th>Sampling frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>No distribution system or very small system serving less than 100 people:</td>
<td>1 sample per month</td>
</tr>
<tr>
<td>Distribution systems serving:</td>
<td></td>
</tr>
<tr>
<td>Less than 5,000 population</td>
<td>4 samples per month</td>
</tr>
<tr>
<td>5,000 to 90,000</td>
<td>1 sample per 1,000 population per month</td>
</tr>
<tr>
<td>more than 90,000</td>
<td>90 plus one additional sample per 10,000 population per month</td>
</tr>
</tbody>
</table>

Distribution Systems:

The bacteriological sampling standard applies to distribution systems of public water supplies. The number of samples to collect is not based on the size of the community but rather is based on the number of people serviced by a particular distribution system. Water from drinking water source(s) is distributed to consumers by a series of water pipes commonly called a distribution system. The distribution system starts after appropriate water treatment (e.g., disinfection with adequate contact time) has taken place.
The number of samples collected from a community's public water supply system depends on the number of distribution systems (See Note #1 below) that make up the water and the population served by each distribution system (see page 10).

**Note #1:** You must know the number of distribution systems that make up a community’s public water supply system to determine the number of samples to collect.

If a community has one water source feeding drinking water into a common treatment plant for further distribution to consumers, then the community is considered to have only one distribution system (see figure 1).

Likewise, where a community with a number of water sources feeding drinking water into a common treatment plant for further distribution to consumers, the community is considered to have one distribution system (see figure 2).
Where a community has two (or more) water sources and the water sources are individually treated and the water is distributed to consumers using separate piping systems, the community is considered to have two (or more) distribution systems (see figure 3).
Environmental Health Officers/Technicians are likely to encounter community water supplies where there is more than one water source and the distribution systems are not separated as in shown in figure 3 above. This is represented in figure 4.

For situations that are similar to figure 4, chlorine residual testing must be conducted where water enters the distribution system from each source. The number of samples for bacteriological testing shall be determined based on the combined population served by the two distribution systems and the sampling locations should be representative of the system as a whole. Care must be taken in choosing sampling sites to ensure that water from each source is sampled and tested.

Environmental Health Officers/Technicians should consult with authorities in their local area to obtain information on the design of the community water supply/distribution system(s). Authorities who may be able to provide the information are listed below.

1. regional staff with the Department of Municipal and Provincial Affairs
2. regional staff with the Department of Environment
3. community council officials
Population Served

Once the Environmental Health Officer determines the number of distribution systems that make up a community water supply, the next step is to determine the population served by the distribution system(s).

*Note #2: You must know the size of the population served by each distribution system to determine the number of samples to collect from the community water supply.*

The population served by a distribution system can be determined by viewing the interdepartmental water database (MIMS).

Sampling, based on population served, should adhere to the *Sampling Standard*. The *Sample Standard* sets the minimum number of samples that need to be collected for distribution systems. Additional sampling may be necessary when there is evidence of problems with the water source and/or distribution system (e.g., treatment problems, unsatisfactory bacteriological results, etc.).
2. **EXAMPLES**

Several examples are provided below to assist EHOs/Technicians with determining the correct number of samples to collect from community drinking water supplies.

<table>
<thead>
<tr>
<th>Example 1: (see figure 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Population:</td>
</tr>
<tr>
<td>Water Supply Source:</td>
</tr>
<tr>
<td>Distribution System:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Number of Samples:</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Example 2: (see figure 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Population:</td>
</tr>
<tr>
<td>Water Supply Source:</td>
</tr>
<tr>
<td>Distribution System:</td>
</tr>
<tr>
<td>Number of Samples:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Example 3: (see figure 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Population:</td>
</tr>
<tr>
<td>Water Supply Source:</td>
</tr>
<tr>
<td>Distribution System:</td>
</tr>
<tr>
<td>Number of Samples:</td>
</tr>
</tbody>
</table>
**Example 4:** (see figure 3)

Community Population: 13,240
Water Supply Source:
- Drilled Well Field (1 chlorinator) serving 8,500 people
- Lake (separate chlorination unit) serving 4,740 people
- Two supplies are not interconnected in any way

<table>
<thead>
<tr>
<th>Number of Samples</th>
<th>Well fed distribution system: 8 per month</th>
<th>Lake fed distribution system: 4 per month</th>
</tr>
</thead>
</table>

**Example 5:** (see figure 4)

Community Population: 4,700
Water Supply Source:
- Two surface water supplies (individually treated)
- Distribution systems are interconnected

<table>
<thead>
<tr>
<th>Number of Samples</th>
<th>4 per month</th>
</tr>
</thead>
</table>
3. CHLORINE RESIDUAL TESTING

When samples are collected for bacteriological water analysis, a chlorine residual test must also be carried out. Chlorine residual testing is conducted to determine if a distribution system is in compliance with the Disinfection Standard of the Standards for Bacteriological Quality of Drinking Water. The Disinfection Standard states:

**Continuous disinfection** is required for community and public facility water systems. Chlorine is the most common chemical used for disinfection, and where used:

- All water entering the distribution system or public facility, after a minimum 20 minute contact time, shall contain a residual disinfectant concentration of free chlorine of at least 0.3 mg/L, or equivalent CT value.
- A detectable free chlorine residual must be maintained in all areas in the distribution system.

**Water systems** which are primarily disinfected by means other than chlorination must be provided with a sufficient residual disinfectant as determined to be appropriate for that system.

*Note:* The disinfection standard does not reflect the necessary CT value to inactivate protozoal cysts such as *Giardia* and *Cryptosporidium*. Treatment options such as filtration, in addition to disinfection, are often necessary to adequately protect against protozoan cysts.

Environmental Health Officers/Technicians are to use the Hach Pocket Colorimeter™ to test for chlorine residual. The Instruction Manual and the document “Instructions for Verifying the Repeatability of Results” (Part 2A of the Drinking Water Manual) are to be followed by EHOs/Technicians when using the instruments.
4. SEMI-PUBLIC WATER SUPPLIES

Semi-public water supplies include institutional water supplies and commercial water supplies. Currently, there is no requirement for routine bacteriological monitoring or continuous disinfection of these water supplies.

Where owners and operators of institutional and commercial water supplies have their supplies tested, Environmental Health Officers will be available to interpret results and provide appropriate advice.

During routine inspections of various public facilities (e.g., child care centres, food premises, schools, parks and campgrounds), EHOs/Technicians should collect bacteriological water samples as an audit of the water supply safety for the public facility.
REFERENCES


(Revised September 2009)
HACH
POCKET COLORIMETER™
for
CHLORINE RESIDUAL TESTING

PART 2A
INSTRUCTIONS FOR
VERIFYING THE
REPEATABILITY OF RESULTS

Government Service Centre
Revised: May 06, 2003
Accuracy Check Using Spec Secondary Standards

The Pocket Colorimeter™ is factory-calibrated and ready for use.

However, before using the Pocket Colorimeter™, and on a regular basis thereafter, Environmental Health Officers with the GSC, or other operator of the unit, must:

1. Ensure that the factory calibrations are being applied when the instrument is operated. A check of the factory calibration must be carried out.

2. Verify the consistent operation of the Pocket Colorimeter™ by checking the unit using Spec Secondary Standards.

The procedures provided in Part 1 and Part 2 below must be strictly followed. As well, please note that all operational procedures outlined in the Instruction Manual pertaining to care and handling of the equipment are necessary if these procedures are to be effective.
Part 1: Retrieval of Factory Calibration

EHOs, and other users, should ensure that the Pocket Colorimeter™ is operating properly using the factory calibration.

Please note that it is not necessary for EHOs to calibrate the colorimeter. If adjustments are required, please forward the unit to the Public Health Laboratory.

To retrieve the factory calibration, please follow the steps outlined below.

1. Press both the ZERO and READ keys simultaneously and hold them for three seconds.
   
   CAL will appear in the display, followed by a flashing 0.

2. While the display is flashing, press and hold the READ key for two seconds.
   
   The display will show dFL and the calibration mode is exited. dFL is displayed until the ZERO or READ key is pressed (which also performs the function of the pressed key) or until automatic shut-off occurs.

   The instrument will use the factory calibration to determine chlorine concentrations of your samples.

Notes:

A. To retrieve a low range factory calibration, the instrument must be in the low range mode (0 to 2.00 mg/L). The low range mode display shows 0.01 mg/L Cl\textsubscript{2} resolution.

B. To retrieve a high range factory calibration, the instrument must be in the high range mode (0 to 4.5 mg/L total chlorine test). The high range mode display shows 0.1 mg/L Cl\textsubscript{2} resolution.

C. To change between high and low range modes, press both the ZERO and READ keys simultaneously. After one second, release the ZERO key and hold the READ key until HI or LO appears in the display.

   Repeat until the instrument displays the desired mode. Release the key when the instrument is in the desired mode.

At anytime you believe the Pocket Colorimeter is not operating using the factory-calibration, the steps outlined above must be followed.
Part 2: Verifying the Repeatability of Results

Use Spec Secondary Standards to quickly verify/check the repeatability of results obtained with the Pocket Colorimeter™.

After initial readings for the Spec Secondary Standards are collected and recorded, they are to be re-checked bi-weekly to ensure the instrument is working consistently.

All results are to be recorded on the attached “Record of Applying Secondary Standards” data sheet.

Note: Before proceeding, make sure the instrument is in the low (LO) range mode.

1. Place the Spec blank into the cell holder with the alignment mark facing the keypad. Tightly cover the cell with the instrument cap.

2. Press ZERO. The display will show 0.00.

3. Place the STD 1 cell into the cell holder. Tightly cover the cell with the instrument cap.

4. Press READ. Record the concentration reading.

5. Repeat steps 3 and 4 with cells labeled STD 2 and STD 3.

6. Compare these readings with previous readings to verify the instrument is returning consistent measurements.

   If the displayed values are outside the acceptable error range, then contact the Public Health Laboratory. The expected variability or allowable error is provided with the Spec Secondary Standards.

The Expected Variability or Allowable Error for the Spec Secondary Standards should be recorded in the second row of the Record of Applying Secondary Standards.

Note: The standards do not ensure reagent quality nor do they ensure the accuracy of the test results. Analysis of real standard solutions using the kit reagents is required to verify the accuracy of the entire Pocket Colorimeter system. The Spec Standards should never be used to calibrate the instrument. The certificate of analysis lists the expected value and tolerance for each Spec Standard.
Public Health Laboratory Contact Persons:

Chief Microbiologist
Newfoundland Public Health Laboratory
Leonard A. Miller Centre
Forest Road
St. John’s, NL
Phone #:777-6535
Email:

Stores/Supply Manager
Newfoundland Public Health Laboratory
Leonard A. Miller Centre
Forest Road
St. John’s, NL
Phone #:777-7122
Email:
RECORD OF APPLYING SECONDARY STANDARDS

HACH POCKET COLORIMETER

Operator's/EHO's Name: ________________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Blank</th>
<th>Standard #1</th>
<th>Standard #2</th>
<th>Standard #3</th>
<th>EHO Signature</th>
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</thead>
<tbody>
<tr>
<td>May__ /2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>June 3</td>
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<tr>
<td>June 17</td>
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<td>July 2</td>
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<td>July 15</td>
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<td>July 29</td>
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<td>August 29</td>
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<td>August 12</td>
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<td>August 26</td>
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<td>September 9</td>
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<td>September 23</td>
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<td>October 7</td>
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<td>October 21</td>
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<td>November 4</td>
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<td>November 18</td>
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<td></td>
<td></td>
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<tr>
<td>December 2</td>
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<td></td>
</tr>
<tr>
<td>December 16</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Upon completion, fax this data sheet to Mr. Terry Battcock, Environmental Health Coordinator with the Government Service Centre in St. John’s, at 709-729-3980.

Revised: May 06, 2003
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
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<tr>
<td>RESPONSIBILITY</td>
<td>1</td>
</tr>
<tr>
<td>PART A: BACTERIOLOGICAL RESULTS REPORTING</td>
<td>2</td>
</tr>
<tr>
<td>PART B: PROCEDURES FOR ISSUING A BOIL WATER ADVISORY</td>
<td>5</td>
</tr>
<tr>
<td>PART C: CRITERIA FOR ISSUING A BOIL WATER ADVISORY</td>
<td>11</td>
</tr>
</tbody>
</table>
INTRODUCTION

This document shall be used by Environmental Health Officer (EHOs) with the Government Service Centre, Service NL, as part of their responsibilities to monitor the bacteriological quality of public water supplies. Specifically, the document provides guidance on reporting bacteriological water test results, criteria for issuing Boil Water Advisories and guidelines for the notification and the implementation of Boil Water Advisories.

RESPONSIBILITY

Environmental Health Officers (EHOs) and/or Environmental Technicians with the Government Service Centre, Service NL are responsible for:

- The collection of water samples, for bacteriological testing, from public water supply distribution systems.
- The testing of chlorine residuals in public water supply distribution systems (e.g., at entry to distribution system and throughout distribution system).
- Coordination of testing with regional testing sites and/or the Public Health Laboratory

Environmental Health Officers are responsible for:

- The interpretation of test results and appropriate follow-up action, including advisories (as outlined in the document) advice and consultation.

Regional management of the Government Service Centre are responsible for ensuring that EHOs/Technicians carry out sampling in accordance with this protocol and the Standards for Bacteriological Quality of Drinking Water (Part 1 of the Drinking Water Manual).
PART A: BACTERIOLOGICAL RESULTS REPORTING

The reporting of bacteriological water analysis results to communities and the Medical Officers of Health (MOH) of the applicable Regional Health Authorities must comply with the following procedures.

Satisfactory Results

For satisfactory routine bacteriological water results of community drinking water, the Environmental Health Officer will forward the report to the community official by mail as outlined in table 1 below.

Table 1: Reporting of Satisfactory Sample Results

<table>
<thead>
<tr>
<th>SATISFACTORY ROUTINE BACTERIOLOGICAL WATER RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REPORT TO</strong></td>
</tr>
<tr>
<td>Community Official</td>
</tr>
</tbody>
</table>

Regional Health Authorities will not be provided copies of satisfactory routine bacteriological water results.

Unsatisfactory Results

Results indicating that drinking water for a community may not be safe to consume must be reported to the community and Regional Health Authority immediately. This has to be done verbally and the Environmental Health Officer must talk to a live person. The verbal report is to be followed up with a written report. This is outlined in table 2. The specific criteria used to determine if a Boil Water Advisory is to be issued is provided in Part 1 of the Drinking Water Manual under “Application of Standard for Bacteriologica Quality of Public Drinking Water Supplies”
### Table 2: Reporting of Unsatisfactory Sample Results

<table>
<thead>
<tr>
<th>REPORT TO</th>
<th>TYPE OF REPORT</th>
<th>METHOD OF REPORTING</th>
<th>TIME FRAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community official responsible for water supply &amp; any community sharing the water supply.</td>
<td>Verbal</td>
<td>Telephone</td>
<td>Immediately, upon receiving the unsatisfactory results.</td>
</tr>
<tr>
<td></td>
<td>Paper Copy</td>
<td>MAIL (&amp; Fax)</td>
<td>Immediately</td>
</tr>
<tr>
<td>MOH, or designate, of the Regional Health Authority</td>
<td>Verbal</td>
<td>Telephone* (see option page 6)</td>
<td>Immediately, upon receiving the unsatisfactory results.</td>
</tr>
<tr>
<td></td>
<td>Paper Copy</td>
<td>MAIL (&amp; Fax)</td>
<td>Immediately</td>
</tr>
</tbody>
</table>

For community’s that share a water supply, in addition to notifying the community that operates the supply, the other communities sharing the supply must also be notified of the Boil Water Advisory. This is discussed in detail in Part B.
**Satisfactory Results, Following Boil Water Advisory**

When a Boil Water Advisory is in place, drinking water samples are only collected when corrective measures have been carried out. If these samples are satisfactory, results are to be presented to the community and MOH in the manner outlined in table 3.

Table 3: Reporting of Satisfactory Samples Taken to Remove a Boil Water Advisory

| SATISFACTORY BACTERIOLOGICAL WATER RESULTS TAKEN TO REMOVE* A BOIL WATER ADVISORY |
|---------------------------------|---------------------------------|-----------------------------|
| REPORT TO                       | TYPE OF REPORT | METHOD OF REPORTING | TIME FRAME |
| Community official responsible for water supply. | Verbal | Telephone | Immediately, upon receiving the satisfactory results. |
|                                 | Written | MAIL (& Fax) | Immediately |
| MOH, or designate, of the Regional Health Authority | Verbal | Telephone | Immediately, upon receiving the satisfactory results. |
|                                 | Written | MAIL (& Fax) | Immediately |

* In order to remove a boil water advisory, at least two consecutive sets of samples showing the absence of total coliform and *E. coli* must be obtained along with adequate disinfection and disinfection residuals. However, when boil water advisories are issued for reason codes F2E and D1 can be lifted after one set of samples is satisfactory. Additional details are provided in Part 1 of the Manual.

**Unsatisfactory Results, Following Boil Water Advisory**

If samples taken to determine whether or not a Boil Water Advisory can be removed are unsatisfactory, the Environmental Health Officer must follow the reporting procedure outlined in table 2.
PART B: PROCEDURES FOR ISSUING BOIL WATER ADVISORIES

Where, in the opinion of a Medical Officer of Health or an Environmental Health Officer, the quality of water in a public drinking water supply is, or may become, a health hazard (See part C for Boil Water Advisory Criteria), community officials must be NOTIFIED IMMEDIATELY that a Boil Water Advisory is necessary. In addition, the community officials must take the necessary steps to inform all users (the public) of the existing or potential health hazard and the need to boil drinking water.

Once the decision has been made to issue a Boil Water Advisory, it is paramount that the message to boil drinking water gets to the drinking water users - the public - immediately.

The responsibility for this rests with the owner/operator of the drinking water supply. The Boil Water Advisory must be implemented by one of the following, depending on the nature of the drinking water supply.

- municipal council
- local service district
- water committee
- other water purveyor/provider

If the owner/operator of the water supply does not implement a Boil Water Advisory recommended by the Environmental Health Officer of the Government Service Centre and/or the Medical Officer of Health of the Regional Health Authority, then these two agencies will implement the Advisory.

1. Notification

Once a decision to issue a boil water advisory has been made (by EHO and/or MOH) it is critical that the owner/operator of the water supply, municipal officials in communities that are sharing the water supply and the consumers of the water be notified immediately. The notification procedure is presented in table 4.

In order to implement a Boil Water Advisory, the owner/operator of a water supply, and or municipal officials in communities sharing the water supply, must be notified immediately that the GSC or Regional Health Authority has recommended a Boil Water Advisory. Immediate notification must be done verbally (e.g. talk to a “live” person) and followed-up with a letter.

GSC OFFICES MUST MAINTAIN AN UP-TO-DATE COMMUNITY CONTACT LIST TO ENSURE THAT THE APPROPRIATE PEOPLE IN A COMMUNITY ARE NOTIFIED TO IMPLEMENT THE BOIL WATER ADVISORY (E.G., COMMUNITY CLERKS, MANAGERS, COUNCILLORS, OPERATORS OF WATER SYSTEM)
Table 4. Notification of Boil Water Advisory

<table>
<thead>
<tr>
<th>Decision to Issue Boil Water Advisory</th>
<th>Department/Agency to Notify</th>
<th>Time (format)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Municipality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communities Sharing System</td>
<td></td>
<td>Immediately (by phone)</td>
</tr>
<tr>
<td>Consumers</td>
<td></td>
<td>Immediately (see section 2.3-2.5)</td>
</tr>
<tr>
<td>GSC (Environmental Health Officer)</td>
<td></td>
<td>Immediately (by phone)</td>
</tr>
<tr>
<td>Regional Health Authority (MOH)</td>
<td></td>
<td>Immediately (by phone)</td>
</tr>
<tr>
<td><strong>GSC/EHOs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality / LSD / Water Committee - include communities with shared systems (Person to Implement Advisory)</td>
<td></td>
<td>Immediately (by phone), talk to a “live” person. Follow-up with letter</td>
</tr>
<tr>
<td>Regional Health Authority (MOH or Secondary Contact)</td>
<td></td>
<td>Immediately (by phone)* Follow-up with letter or email</td>
</tr>
<tr>
<td>Municipal Affairs (Regional Engineer)</td>
<td>Next working day (email) Copy of letter</td>
<td></td>
</tr>
<tr>
<td>Environment Conservation (Reg. Water and WasteWater Spec.)</td>
<td>Next working day (email) Copy of letter</td>
<td></td>
</tr>
<tr>
<td><strong>Regional Health Authority</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipality/LSD/Water Committee - include communities with shared systems (Person to Implement Advisory)</td>
<td></td>
<td>Immediately (by phone) Follow-up with letter</td>
</tr>
<tr>
<td>Government Service Centre (Environmental Health Officer)</td>
<td></td>
<td>Immediately (by phone) Fax copy of letter</td>
</tr>
<tr>
<td>Municipal Affairs (Regional Engineer)</td>
<td>Next working day (email) Copy of letter</td>
<td></td>
</tr>
<tr>
<td>Environment Conservation (Reg. Water and WasteWater Spec.)</td>
<td>Next working day (email) Copy of letter</td>
<td></td>
</tr>
</tbody>
</table>

* Option (in consultation with Regional Health Authority):

Where technology permits, an e-mail to key personnel in health can replace the direct telephone call. In the Regional Health Authorities e-mail the MOH, Environmental Health Coordinator/Director/Manager, Communicable Disease Nurse and the MOH’s secretary.
2. Implementation of Boil Water Advisory

The steps provided in Table 5, below, should be taken immediately to implement an effective Boil Water Advisory.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recommend to the operator (e.g., council) of the drinking water system that a boil water advisory be implemented immediately. This should include a recommendation for communities sharing the system to implement a boil water advisory, as well.</td>
<td>GSC/EHO</td>
</tr>
<tr>
<td>2</td>
<td>Prepare boil advisory notice for the operator (see sample notice in Part 5 of Manual).</td>
<td>GSC/EHO</td>
</tr>
<tr>
<td>3</td>
<td>Provide instructions on how to implement the boil water advisory to ensure consumers are informed (see pamphlet <em>Boil Water Advisories: Instructions on How to Effectively Implement a Boil Water Advisory</em>, sample warning signs and sample public service announcement).</td>
<td>GSC/EHO</td>
</tr>
<tr>
<td>4</td>
<td>Alert / inform water consumers to boil water before consuming (see pamphlet <em>What You Should Know About Boil Water Advisories</em>).</td>
<td>Municipality: drinking water system operator</td>
</tr>
<tr>
<td>5</td>
<td>Monitor the effectiveness of the boil water advisory. Check status of BWA monthly (see sample letter in Part 5 of Manual).</td>
<td>Municipality: drinking water system operator, GSC/EHO</td>
</tr>
<tr>
<td>6</td>
<td>On a monthly basis, follow-up on the boil water advisory by notifying consumers to continue to boil.</td>
<td>Municipality: drinking water system operator</td>
</tr>
</tbody>
</table>

1. The operator of the drinking water system and municipal officials in communities sharing the system, if applicable, must be informed immediately upon a decision to implement a Boil Water Advisory. This shall take place verbally (talk to a “live” person) and followed up with a letter. A sample letter is attached.

2. The GSC should prepare a Boil Water Advisory notice and provide it to the drinking water system operator by fax or hand delivery. A sample notice is available in Part 5 of the Manual. The Boil Water Advisory notice should give specific directions as to how to effectively boil drinking water and what water to boil.

**Note:** If hand delivery or a fax is not possible, boil water advisory information will be provided to the operator over the phone. The advisory will then be mailed.
2. Implementation of Boil Water Advisory (continued)

3. The GSC will provide the system operator and, if applicable, municipal officials in communities that share the system, with information on how to effectively implement a boil water advisory. The pamphlet *Boil Water Advisories: Instructions on How to Effectively Implement a Boil Water Advisory* should provide the direction that is needed.

In addition, the pamphlet *What You Should Know About Boil Water Advisories* will provide more specific direction for the public upon the issuance of a Boil Water Advisory.

4. The owner/operator of the drinking water system, and other municipal officials, will take the necessary steps to alert all water consumers that a boil water advisory has been implemented. A sample public service announcement and warning signs are provided in Part 5 of the manual.

5. The Government Service Centre on behalf of the Medical Officer of Health will monitor how effective the community council/local service district/water committee was in implementing the Boil Water Advisory and notifying water consumers. This is especially necessary in facilities catering to a segment of the population at an increased risk to waterborne illness and facilities serving a large number of people. Examples of these facilities are provided below.

   - hotels, restaurants & food manufacturers
   - clinics, hospitals and nursing homes
   - day care centres and schools
   - other public buildings

6. For Boil Water Advisories that remain in effect for more than a month, consumers must be provided with monthly reminders, by the owner/operator of the water supply, that the Boil Water Advisory is still in effect. This would ensure that people do not forget to continue to boil drinking water.

7. A Boil Water Advisory Status letter (see Part 5 of the Manual) is to be sent out monthly to municipalities that are on long term boil water advisories. The letter reminds municipal officials to call the EHO once corrective action has been taken and to tell residents and businesses that the boil water advisory is still in place.
3. **Interdepartmental Communication**

Effective interdepartmental communications is critical to the implementation of a Boil Water Advisory. The inter-departmental / inter-agency notification of the issuance of a Boil Water Advisory should adhere to the following criteria.

- A copy of the Boil Water Advisory Notification Letter will be sent to the appropriate regional official with the Department of Municipal Affairs and the Department of Environment and Conservation.

- The GSC will, as soon as possible/practical, notify the Regional Health Authority about a recommendation for a community to implement a boil water advisory.

- EHOs, upon issuing a Boil Water Advisory, will input the necessary information into the MIMS Drinking Water Database as soon as possible.

4. **Removal of Boil Water Advisory**

Criteria for the removal of a Boil Water Advisory are usually the return of conditions to acceptable limits. These conditions are usually appropriate levels of chlorine to ensure adequate disinfection and bacteriological test results consistent with the provincial Standards for Bacterial Quality of Drinking Water (Part 1 of Drinking Water Manual).

If waterborne illness was the reason for the issuance of the Boil Water Advisory, a return of illness levels to pre-outbreak levels may be one of the criteria used to remove the Boil Water Advisory.

The process of removing a boil water advisory is provided in more detail in Part 1 of the Manual under “Application of Standards for Bacteriological Quality of Public Drinking Water Supplies”.

Removal of a boil water advisory should be considered when:

a) two (2) consecutive samples are negative for total coliform organisms and *E. coli* bacteria (see exception in Part 1 for F2E and D1, and note that consecutive samples cannot be collected closer than 24 hours apart and not greater than two weeks apart); and

b) the cause of the problem, such as inadequate chlorination, is remedied; and

c) where a disease outbreak has occurred, all indications are that the outbreak has been resolved and there is no further disease linked to the waterworks system.
With respect to a boil water advisory resulting from a communicable disease outbreak suspected to be caused by water, the absence of new cases may indicate the effectiveness of the advisory but not the elimination of the risk factor. In these cases, before removing the boil water advisory, the following must be considered:

- Water treatment deficiencies have been corrected;
- Source water quality has returned to normal;
- Tap water quality is within acceptable limits;
- Epidemiological evidence confirms that the outbreak is over;
- Potential cross-connections have been investigated and necessary remedial action taken.
- The outbreak has been shown not to be caused by water;
- Potential other causes of the outbreak have been investigated and necessary remedial action taken.
PART C: CRITERIA FOR ISSUING A BOIL WATER ADVISORY

Authority to Issue Boil Water Advisory

When the municipality and/or the monitoring agencies, Government Service Centre and Regional Health Authority, feel that there is a potential or actual communicable disease health hazard from a community’s drinking water supply, a Boil Water Advisory should be issued.

For most communities, boil water advisories are issued by the council, local service district or water committee on advice from the Regional Health Authority and/or the Government Service Centre. Rarely, a community may be unwilling to issue a Boil Water Advisory but this can be accomplished by using the Health and Community Services Act, Section 5, where a health officer or inspector can issue an order and give directions in the interest of public health.

When to Issue a Boil Water Advisory

This section provides Environmental Health Officers and management of the Government Service Centre with information needed to determine if circumstances surrounding a community drinking water supply necessitate the issuance of a boil water advisory.

Generally, the reasons for which a boil water advisory will be recommended are:

- No disinfection (e.g., no chlorination)
- Inadequate chlorine levels (e.g., insufficient contact time)
- Unsatisfactory bacteriological test results (e.g., E. coli present)
- Waterborne disease (e.g., giardiasis)
- Gross contamination of water source (e.g., runoff from flooding)

The general reasons for issuing boil water advisories have been subdivided into “standard reasons” for issuing boil water advisories. These reasons are presented in table 6. EHOs are to include one of the boil water advisory “standard reasons” as part of the information that is submitted to compile the public water supply boil water advisory database.
### Table 6: Standard Reasons for Issuing Boil Water Advisories

<table>
<thead>
<tr>
<th>Standard Reasons for Issuing Boil Water Advisories</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply has no disinfection system</td>
<td>A</td>
</tr>
<tr>
<td>Chlorination system is turned off by operator, due to taste.</td>
<td>B1</td>
</tr>
<tr>
<td>Chlorination system is turned off by operator, due to perceived health risks.</td>
<td>B2</td>
</tr>
<tr>
<td>Chlorination system is turned off by operator, due to lack of funds to operate.</td>
<td>B3</td>
</tr>
<tr>
<td>Disinfection system is off due to maintenance or mechanical failure.</td>
<td>C1</td>
</tr>
<tr>
<td>Disinfection system is off due to lack of chlorine or other disinfectant.</td>
<td>C2</td>
</tr>
<tr>
<td>Water distribution system is undergoing maintenance or repairs.</td>
<td>D1</td>
</tr>
<tr>
<td>A cross connection is discovered in the distribution system.</td>
<td>D2</td>
</tr>
<tr>
<td>Inadequately treated water was introduced into the system due to fireflows, flushing operations, minor power outage or other pressure loss.</td>
<td>D3</td>
</tr>
<tr>
<td>Water entering the distribution system or facility, after a minimum 20 minute contact time does not have a free chlorine residual of at least 0.3 mg/l or equivalent CT value.</td>
<td>E1</td>
</tr>
<tr>
<td>No free chlorine residual detected in the water distribution system.</td>
<td>E2</td>
</tr>
<tr>
<td>Insufficient residual disinfectant in water system disinfected by means other than chlorination.</td>
<td>E3</td>
</tr>
<tr>
<td>Total coliform detected AND repeat samples can not be taken as required.</td>
<td>F2T</td>
</tr>
<tr>
<td><em>Escherichia coli</em> (E. coli) detected AND repeat samples can not be taken as required.</td>
<td>F2E</td>
</tr>
<tr>
<td>Total coliforms detected and confirmed in repeat sample.</td>
<td>F3</td>
</tr>
<tr>
<td><em>Escherichia coli</em> (E. coli) detected in an initial sample(s) is considered extensive and the water system has other known problems.</td>
<td>F4</td>
</tr>
<tr>
<td><em>Escherichia coli</em> (E. coli) detected and confirmed in repeat sample.</td>
<td>F5</td>
</tr>
<tr>
<td>Viruses detected (eg, Hepatitis A, Norwalk).</td>
<td>F6</td>
</tr>
<tr>
<td>Protozoa detected (eg, <em>Giardia, Cryptosporidium</em>).</td>
<td>F7</td>
</tr>
<tr>
<td>Water supply system integrity compromised due to disaster (e.g. contamination of water source from flooding, gross contamination, major power failure, etc.).</td>
<td>G</td>
</tr>
<tr>
<td>Waterborne disease outbreak in the community.</td>
<td>H</td>
</tr>
</tbody>
</table>

Revised: December 2009
No disinfection

A boil water advisory is to be implemented when the source drinking water is not continuously disinfected (e.g., chlorinated). This would include drinking water systems where:

- a chlorination unit is not installed to treat drinking water
- a community is unwilling to chlorinate
- chlorine disinfectant is not available
- chlorination equipment is not working
- the chlorination equipment is not operated due to a lack of training
- the chlorination system is not working because of power failures

Inadequate Chlorination

To protect public health, raw water from a community drinking water source must be continuously disinfected (e.g., chlorinated) and a chlorine residual must be maintained in the water distribution system. An Environmental Health Officer III will look for:

- a free chlorine residual at the entry to the distribution system.
- a chlorine residual (free or total) detectable at bacteriological water sample collection points throughout the distribution system.

To increase chlorination in the distribution system, the EHO, along with the operator, Medical Officer of Health and officials with the Departments of Environment and Conservation and Municipal and Provincial Affairs, should consider the following options to achieve a satisfactory chlorine residual.

- flushing of distribution lines (Note: this may impact on back siphonage)
- increasing amount of chlorine injected into the system
- swabbing
- pigging
- installation of booster pump
- pretreatment (e.g., filtration before chlorination to reduce chlorine demand)
- checking integrity of system (e.g., operator to check for leaks)
- checking for increase in water usage (e.g., industrial use consuming large amounts of water)

Where a chlorine residual is not detected throughout the distribution system, the EHO should consult with the MOH as to the course of action to take (e.g., issue BWA or work with community to achieve a residual in the distribution system). A relatively short period of time (7 to 10 days) should be given to achieve residual chlorine in the distribution system. The length of time given, if any, should be based on a decision by the MOH and EHO.
Unsatisfactory Bacteriological Test Results

Samples collected for bacteriological water analysis must meet with the bacterial standard of the *Standards for the Bacteriological Safety of Drinking Water*. With respect to unsatisfactory bacteriological test results, the standards should be applied as follows.

→ If the bacteriological test reveals the presence of *E. coli*, re-sampling of the site, as well as up and downstream locations, should be carried out within 24 hours. However, a boil water advisory may be recommended before the re-sampling results are known depending upon the extent of *E. coli* contamination in the initial testing, combined with knowledge of other problems pertaining to the water system. Regardless, if the repeat test reveals the presence of *E. coli*, a boil water advisory is recommended.

→ If the bacteriological test reveals the presence of total coliforms, but no *E. coli*, re-sampling of the site, as well as up and downstream locations, should be carried out as soon as is practically possible. If the consecutive test confirms the presence of total coliforms, but no *E. coli*, a boil water advisory is recommended for water systems that have only disinfection but no additional water treatment (such as coagulation, sedimentation, filtration or equivalent technologies) or have no significant operational procedures and controls over the water system. Regardless, remedial action shall commence in consultation with the water system operator.

Rescinding Boil Water Advisories (see Part 1 of Manual)

a. A boil water advisory should be rescinded when:
   
i. The condition(s) which led to the boil advisory have been corrected; and  
   ii. Two consecutive sets of samples, collected 24 hours or more apart, meet the bacteriological and disinfection standards.

b. However, when a boil water advisory is issued because *E. coli* was detected in a set of samples and re-sampling could not be carried out within 24 hours (reason code F2E), the boil water advisory can be rescinded when:
   
i. One set of satisfactory representative bacteriological samples, including samples collected at up and downstream locations, complies with the bacteriological standard;  
   ii. The water supply complies with the disinfection standard; and  
   iii. Other factors indicate the water is safe to drink.

c. However, when a boil water advisory is issued because the water distribution system is undergoing maintenance or repairs (reason code D1), the boil water advisory can be rescinded when:
   
i. One set of satisfactory representative bacteriological samples complies with the bacteriological standard (for water main breaks, a minimum of two representative samples shall be collected: one sample upstream and one sample downstream of the break);
ii. The water supply complies with the disinfection standard; and
iii. Other factors indicate the water is safe to drink.

If unsatisfactory bacteriological levels are detected during the one day initial sampling event, the two consecutive days of satisfactory bacteriological sample results, not taken less than 24 hours apart are necessary before rescission of the boil water

d. When a boil water advisory is rescinded after one set of satisfactory bacteriological sample results, a second day of confirmatory bacteriological samples must be collected as soon as practically possible following water distribution system repairs.

e. All appropriate municipal, provincial government and health authority officials must be advised of the decision to rescind a boil water advisory

**Evidence of Waterborne Disease**

A boil water advisory must be issued when there is evidence, through disease surveillance of the Regional Health Authority or Department of Health and Community Services, that cases of communicable disease are caused by consuming drinking water.

**Gross Contamination of Drinking Water Source**

Certain circumstances may lead to the microbiological contamination of a drinking water source which could result in disinfection being ineffective. The gross contamination of a drinking water source could be caused by the following.

→ flooding
→ sewage waste
→ industrial waste
→ agricultural waste
→ or other activities in the watershed

**Summary**

For Environmental Health Officers and GSC management, a recommendation for a community to issue a boil water advisory will most often be based upon a determination that the drinking water is bacteriologically unsatisfactory and/or the drinking water is not adequately disinfected.
Drinking Water Manual

Part 4 A

Private Water Samples

Reporting Bacteriological Test Results

Department of Health and Community Services
Public Health Division

2012
TABLE OF CONTENTS

PRIVATE WATER SUPPLY
BACTERIOLOGICAL STANDARD  PAGE 1

REPORTING RESULTS TO
PRIVATE WELL OWNERS  PAGE 2

REPORTING RESULTS TO
MEDICAL OFFICERS OF HEALTH  PAGE 3

APPLICATION OF THE
BACTERIOLOGICAL STANDARD  PAGE 4
Private Water Supply
Bacteriological Standard

The bacteriological standard for Newfoundland and Labrador is:

Bacteriological standards are based on Guidelines for Canadian Drinking Water Quality 6th Edition, 1996 as revised, and shall be considered generally applicable to the Province of Newfoundland and Labrador. The Guideline notes that the maximum acceptable concentration (MAC) for the bacteriological quality of public, semi-public and private drinking water systems is no coliforms detectable per 100 mL. However, because coliforms are not uniformly distributed in water and are subject to considerable variation in public health significance, drinking water that fulfils the following conditions is considered to conform to this MAC:

- No sample should contain Escherichia coli (E.coli).
- No consecutive samples from the same site or no more than 10% of the samples from each distribution system in a given sample set should show the presence of total coliforms.

Private bacteriological water sample results will be reported as either unsatisfactory, substandard or satisfactory. Each category is described below.

Unsatisfactory Result:

A private well water sample is considered unsatisfactory, and unsafe for drinking, when the fecal coliform E. coli is present.

An unsatisfactory result indicates fecal contamination of the well. The drinking water should be boiled and corrective action should be taken to deal with fecal contamination entering the well. Retesting should be carried out following appropriate corrective action.

Substandard Result:

A private well water sample is considered substandard, but not an immediate health risk, when testing reveals total coliforms but no E. coli.

A substandard result indicates that surface water may be getting into the well and therefore at risk of fecal contamination, or that a bacterial growth has developed
within the well or plumbing system. Suitable disinfection of the well should be undertaken and the water retested to ensure there is no fecal contamination. Until disinfection is carried out and retest results are known, the water may be boiled or an alternate safe source may be used.

**Satisfactory Result:**

A private well water sample is considered **satisfactory** when total coliforms and *E. coli* are absent.

A satisfactory result meets with the provincial standard for the bacteriological quality of drinking water.

**Reporting Bacteriological Results to Private Well Owners**

Environmental Health Officers with the Government Service Centre, upon receipt of:

1. an unsatisfactory bacteriological water quality test result from a private water supply will:
   ♦ immediately telephone the owner of the private water supply about the test result and provide appropriate advice to protect the health of those consuming the drinking water.
   ♦ forward the results in the mail along, within two working days, along the pamphlet “*Guide to Safe Drinking Water*”

2. a substandard or satisfactory bacteriological water quality test result from a private water supply will:
   ♦ forward the results in the mail within two working days.
   ♦ include a copy of the pamphlet “*Guide to Safe Drinking Water*” with the test results.
Reporting Bacteriological Results to MOH/Health Region

Environmental Health Officers with the Government Service Centre will report private bacteriological water quality test results to Medical Officers of Health, or designate, when:

◆ there are developing patterns with respect to *E. coli* presence in groundwater in a community or portion of a community.

◆ *E. coli* is present in a private well serving more than one home.
Application of Standards for Bacteriological Quality of Private Wells

1. Drinking water samples from private wells submitted to the Public Health Laboratory or Government Service Centres for bacteriological analysis will be tested for the presence of both total coliform bacteria and the fecal indicator *Escherichia coli* (*E. coli*). If neither are detected the sample fully meets the standard. The drinking water is considered satisfactory and is safe for private consumption. Routine sampling is recommended.

2. If the bacteriological test reveals the presence of total coliforms, but no *E. coli*, in a 100 mL sample, the drinking water is considered substandard but not to pose an immediate health risk. Disinfection of the water source should be recommended to the owner. Retesting should be carried out following disinfection of the water source. Until disinfection is carried out and retest results are known, the water may be boiled before being consumed or an alternative safe source of drinking water may be used.

3. If the bacteriological test reveals the presence of *E. coli*, the drinking water is considered unsatisfactory and unsafe for drinking. It is recommended that the drinking water be boiled and that corrective action be taken to deal with fecal contamination entering the well. Retesting should be carried out following appropriate corrective action.

Reporting of the results will be carried out in accordance with the provincial document “Reporting of Bacteriological Results from Private Water Supplies”.
Table of Contents

1. Boil Water Advisory Notification Letter

2. Boil Water Advisory Status Letter

3. Boil Water Advisory Removal Letter

4. Sample Boil Water Advisory Notice

5. Sample Public Service Announcement

6. Boil Water Advisory Instructions (for Municipalities)

7. Boil Water Advisories for Consumers

8. Warning Signs (3)
SAMPLE BWA NOTIFICATION LETTER

(Insert date)

Dear: (insert name and address of appropriate person(s))

Note: be sure to send the BWA Notification Letter to communities sharing water supply systems

Subject: Boil Water Advisory

(Insert name of Municipality/Local Service District)

(Insert name of Water Supply)

This letter is a follow-up to our telephone conversation on (insert date and time) concerning the issuance of a Boil Water Advisory for the public water supply of (insert name of municipality or local service district, name of water supply and specific section of distribution system, if applicable).

A Boil Water Advisory is recommended for the following reason(s):

- (enter reason code(s) and description of the code as per the most recent version BWA reason codes).

Results of most recent bacteriological and chlorine test results are attached (insert this sentence and test results if applicable to the issuing of the BWA).

As the operator/owner of a public water supply, you must immediately alert all users of your water supply that drinking water must be boiled before being consumed. As well, consumers should be informed about the boil water advisory at regular intervals. For advisories that remain in effect for more than one month, a monthly reminder to continue to boil drinking water should be forwarded to water consumers.

To help with notifying consumers about the boil water advisory, please refer to the attached boil water advisory notice, boil water advisory pamphlets, sample warning signs and public service announcement. Pamphlets are available online for printing at http://www.health.gov.nl.ca/health/publichealth/envhealth/drinkingwater.html#q1-4. In addition, you can call (enter office phone number) to obtain multiple printed copies.

The boil water advisory shall remain in effect until the reason for issuing the advisory has been corrected and the following criteria have been met:

1. At least two (2) successive satisfactory bacteriological water analyses are obtained (absence of total coliform and E. coli in 100 ml of samples).
2. Satisfactory free chlorine residual is maintained at the entry to the distribution system.
3. Free chlorine residual is detectable & maintained throughout the distribution system.

Please note that you must contact me, or the nearest Government Service Centre location, to make arrangements for re-sampling of your drinking water once corrective measures have been taken.

If you have any questions, please do not hesitate to give me a call at (enter telephone number of Environmental Health Officer).

Sincerely yours,

(Signature of EHO)

Environmental Health Officer
SAMPLE BOIL WATER ADVISORY STATUS LETTER

[insert date]

Dear: [insert name and address of appropriate person(s)]

Note: be sure to send the BWA Status Letter to all communities sharing water supply systems

Subject: Status of Boil Water Advisory

[Insert name of Municipality/Local Service District]
[Insert name of Water Supply]

This letter is a follow-up to the Boil Water Advisory issued for the public water supply of [insert name of municipality or local service district, name of water supply and specific section of distribution system, if applicable] on [enter date BWA was issued].

As you are aware a Boil Water Advisory was issued for the following reason(s):

- [enter reason code(s) and description of the code as per the most recent version BWA reason codes].

The boil water advisory was to remain in effect until the reason for issuing the advisory has been corrected and the following criteria have been met.

1. At least two (2) successive satisfactory bacteriological water analysis are obtained (absence of total coliform and E. coli in 100 ml samples).
2. Satisfactory free chlorine residual is maintained at the entry to the distribution system.
3. Free chlorine residual is detectable & maintained throughout the distribution system.

As of today's date, I have not been notified by you whether or not the appropriate corrective action has been taken. At this time, I would appreciate being informed about the status of the corrective action. You can either phone me at [enter phone number] or email me at [enter email address] with this information.

If the corrective action has not been taken, the Boil Water Advisory will continue. Please ensure that steps are immediately taken to remind your residents and the businesses in your community about the necessity to continue to boil drinking water. If required, a Boil Water Advisory Notice, applicable boil water advisory pamphlets, sample warning signs and a sample public service announcement can be supplied to you upon request.

If the corrective action has been carried out, I will make arrangements for bacteriological and disinfectant residual testing that may lead to the removal of the Boil Water Advisory.

If you have any questions, please do not hesitate to give me a call at the number provided above.

Sincerely yours,

[Signature of EHO]

Environmental Health Officer
SAMPLE BWA REMOVAL LETTER

(Insert date)

Dear: (insert name & address of appropriate person(s))

Note: be sure to send the BWA Notification Letter to communities sharing water supply systems

Subject: Removal of Boil Water Advisory
(Insert name of Municipality/Local Service District)
(Insert name of Water Supply)

This letter is a follow up to our telephone conversation on (insert date and time) concerning the removal of the Boil Water Advisory issued on (insert date that the boil water advisory was issued) for the public water supply of (insert name of municipality or local service district, name of water supply and specific section of distribution system, if applicable).

Removal of the Boil Water Advisory is recommended at this time because the reason(s) for issuing the advisory, (enter reason code(s) and description of the code as per the most recent version BWA reason codes), has been corrected and the following criteria have been met.

1. Two (2) successive satisfactory bacteriological water analyses have been obtained (absence of total coliform and E. coli in 100 ml of samples).
2. Satisfactory free chlorine residual is maintained at the entry to the distribution system.
3. Free chlorine residual is detectable & maintained throughout the distribution system.

Regular bacteriological monitoring of the public water supply will now commence on a monthly basis.

If you have any questions, please do not hesitate to give me a call at (enter telephone number of Environmental Health Officer).

Sincerely yours,

(Signature of EHO)
Environmental Health Officer
BOIL WATER ADVISORY

INFORMATION FOR THE PUBLIC

The Municipality of ______________________ has issued a Boil Water Advisory (enter name of municipality)

for ________________________________ as of __________________ (enter the area encompassed by the boil water advisory) (date)

The boil water advisory has been issued for the following reason(s):
⇒
⇒
⇒

Consumers are advised to bring water that you might ingest to a rigorous rolling boil for one (1) minute.

For example, boil water used for:
⇒ drinking ⇒ cooking
⇒ brushing teeth ⇒ washing fruits and vegetables
⇒ making ice ⇒ making coffee/tea and other hot drinks

⇒ making juice from concentrate and powders
⇒ making infant formula and cereal

For further information about the Boil Water Advisory, please call:

Municipal office:

Government Service Centre:

Regional Health Authority:

NOTE: If using a home water treatment unit (e.g. filter), please read and follow the manufacturer’s instructions.
PUBLIC SERVICE ANNOUNCEMENT

BOIL WATER ADVISORY

TO BE READ BY THE ANNOUNCER:

The Municipality (or Local Service District) of Insert name(s) of municipality is (or are) advising residents and businesses, effective immediately, to boil their drinking water. This would include water used for:

- drinking
- brushing teeth
- making ice
- making juices and other drinks from concentrate or powders
- cooking
- making coffee, tea, etc.
- making infant formula and cereal
- washing fruits and vegetables

Please bring water to a rigorous rolling boil for one (1) minute.

The Municipality (or Local Service District) of Insert name of municipality will advise residents when the boil water advisory is no longer in effect.

In the interest of protecting public health, your attention to this boil water advisory is appreciated.

More information can be obtained by contacting insert telephone number.
Boil Water Advisory
Instructions

Why should I implement a “Boil Water Advisory”?  

A boil water advisory recommended by the Medical Officer of Health or an Environmental Health Officer must be acted upon immediately. A boil water advisory is necessary because of the potential for disease-causing microbes to be present in the drinking water you are supplying to the public.

What should I do first?

As the owner or operator of the drinking water supply, you must immediately alert all users of your water supply that drinking water must be boiled before being consumed.

Alert users not to drink the water without first boiling it!

Who should be alerted?

You must notify everyone receiving water from your drinking water supply. Your drinking water supply may be providing water to:

- the general public (those living in homes and apartments)
- workplaces
- public buildings such as hospitals, personal care homes, schools, child care centres, clinics, food premises, hotels and tourism establishments

It is extremely important to remember to contact the operators of all public facilities (schools, child care centres, hospitals, personal care homes, etc.) to notify them of the Boil Water Advisory!

How can consumers be alerted?

Consumers can be alerted in a number of ways. A few are listed below. A combination of these may be necessary to inform all consumers.

- use local media outlets (e.g. radio, television and newspapers)
- deposit boil water advisory notices in peoples’ mailboxes
- place warning signs on water taps at places where water is made available to consumers (e.g. gas stations, restaurants, campgrounds, schools)
- knock on individual doors and inform people verbally
How should I follow up on the advisory?

Inform consumers at regular intervals about the boil water advisory. For advisories that remain in effect for more than one month, a monthly reminder to continue to boil drinking water should be forwarded to water consumers.

What should consumers be told during an advisory?

Following the initial alert notification, consumers should be kept informed of the progress of a boil water advisory. You should develop a communication plan to ensure that consumers are given accurate information about the boil water advisory in a timely fashion.

Who is available to help?

Don’t forget that help is available from Government officials. A technical support team should be formed to work on solutions to the problem(s) which led to the Advisory. Regional staff from the following departments/agencies should be consulted.

1. Government Service Centre
2. Regional Health Authority
3. Department of Environment and Conservation
4. Department of Municipal Affairs

Where can I find out more?

If you have any questions about drinking water safety, please do not hesitate to contact the Government Service Centre or Regional Health Authority nearest you.
Boil Water Advisories

Why are boil water advisories issued?
- inadequate disinfection of the community supply
- unsatisfactory bacteriological water quality
- reports of illness associated with drinking water
- repairs to the water system
- unusual occurrences, such as flooding

How long should the water be boiled?
All drinking water must be brought to a rigorous rolling boil for one (1) minute. Boiling for one minute will kill any disease-causing organisms in your water.

Should water used for additional purposes be boiled?
Boil water used for any activity where you might ingest the water, such as:
- drinking
- brushing teeth
- cooking
- washing fruits and vegetables
- making ice
- making coffee/tea
- making infant formula and cereal
- making juices and other drinks from concentrate or powders

Existing beverages and ice cubes made from water of questionable quality should be discarded. Ice cube trays and beverage containers should be sanitized before using again.

CAUTION!
Exercise caution when handling boiled water. To avoid scalding place the pot on the inside burner out of the reach of children. As well, do not put more water in the pot then you can comfortably lift.
What should I do if I don’t wish to boil tap water?

Commercially pre-packaged bottled water can be used in place of boiled water. This may be expensive.

**WARNING !
Water that looks safe may contain harmful disease causing micro-organisms. Don’t drink water from roadside springs, ponds, brooks, etc. without boiling the water or treating the water in another effective way.**

Can I shower if there is a boil water advisory in place?

Yes, you can shower but do not drink shower water. The ingestion of water may result in illness, if the water is contaminated. Care should be taken while bathing young children to ensure they do not accidentally consume the water.

Can the water be used for hand washing?

Yes, tap water can be used for hand washing. Use hot water and soap.

Can the water be used for washing dishes and clothes?

Yes, dishes and clothes can be washed in tap water.

**Important!**
If you use a water treatment unit, please follow the manufacturer’s instructions.

What should I do in the event of a waterborne illness outbreak?

In the event of a waterborne illness outbreak, follow additional precautions that may be recommended by the Medical Officer of Health. Anyone with health concerns or experiencing symptoms such as diarrhea, nausea, cramps, or vomiting should seek the advice of their doctor.

Where can I find out more?

If you have any questions about drinking water safety, please do not hesitate to contact the Government Service Centre or Regional Health Authority nearest you.
WARNING!
Do Not Drink This Water

Department of Health and Community Services
Department of Government Services
Regional Health Authorities
WARNING!
This Water Is Considered Unfit For Drinking or Domestic Use

Department of Health and Community Services
Department of Government Services
Regional Health Authorities
WARNING!
This Water Must Be Boiled Before Drinking

Department of Health and Community Services
Department of Government Services
Regional Health Authorities
Drinking Water Manual

Part 6:

Upstream/Downstream Sampling of Water Distribution Systems

Department of Health and Community Services
Public Health Division

(December 18, 2003)
**Issue:**

To ensure there is consistency in the manner in which Boil Water Advisories are issued in Newfoundland and Labrador, clarification on issuing boil water advisories based on repeat sample results from “upstream” and “downstream” locations is provided below.

**Issued Reviewed By:**

This issue was reviewed by the Drinking Water Technical Working Group in November 2003 and the following clarification and guidance is provided.

1. **Application of Standards**

The following statement is from the “Application of Standards for Bacteriological Quality of Public Drinking Water Supplies”.

“If the bacteriological test reveals the presence of total coliforms, but no E. coli, **re-sampling of the site, as well as up and downstream locations, should be carried out as soon as is practically possible.** If the consecutive test confirms the presence of total coliforms, but no E. coli, a boil water advisory is recommended for water systems that have only disinfection but no additional water treatment (such as coagulation, sedimentation, filtration or equivalent technologies) or have no significant operational procedures and controls over the water system. Regardless, remedial action shall commence in consultation with the water system operator.”

2. **Situations to Consider**

**A.** Bacteriological testing identifies coliform bacteria in a sample collected from sampling site #1.

Re-sampling two days later occurs at sampling site #1 and at sites upstream (site #2) and downstream (site #3) locations.

The re-sampling results identify coliform bacteria at site #1 again but not at sites #2 and #3.

**Action:**

**Boil Water Advisory not issued and remedial action can commence at site #1 for a site specific problem.**

**B.** Bacteriological testing identifies coliform bacteria in a sample collected from sampling site #1.

Re-sampling two days later occurs at sampling site #1 and at sites upstream (site #2) and downstream (site #3) locations.

The re-sampling results identify coliform bacteria at site #2 but not at site #1 or site #3.

**Action:**

**Given that re-sampling has identified coliform bacteria at another site in the distribution system, a boil water advisory is recommended.**
Drinking Water Manual

Part 7:

PROTOCOL
for
COMMUNITIES SWITCHING
to
ALTERNATE WATER SUPPLIES

Prepared by:
Safe Drinking Water Technical Working Group
February 24, 2004
1. **Criteria for Issuing a Non-consumption Advisory (NCA)**

Due to a number of reasons, several municipalities in Newfoundland and Labrador may be forced to switch from their approved municipal water supply to a water supply with unknown water quality. Several reasons for switching to an alternate water supply are listed below.

1) Insufficient quantity of water for municipal users (e.g. water shortage).
2) Unexpected gross contamination of approved water source.
3) Failure of infrastructure at the inlet to the water treatment facilities

In situations where the municipality has no choice but to resort to using an unapproved source as a temporary water supply it is paramount that the health of the public be considered when making such changes. Until the alternate water supply has been reviewed and water quality testing carried out, the municipality shall advise all water supply users not to consume the water. This advisory is known as a “Non-consumption Advisory”(NCA).

**Public Health Officials will act on the side of caution when alternate water supplies are used and the chemical quality of the water is unknown. A ‘Non-consumption Advisory’ is to be issued.**

The issuance of a “Non-consumption Advisory” is necessary until water supply regulators and public health officials are satisfied that:

1) The chemical quality of the alternate water supply will not pose a threat to the health of consumers; and
2) Treatment technologies for the alternate supply will be effective at removing (e.g., killing) potential pathogens from the alternate water supply.

For the most part, the necessity to resort to an alternate water supply occurs suddenly without much time to consider issues such as chemical quality and disinfection processes. When this situation occurs, a “Non-consumption Advisory” should be issued immediately.

2. **Planning to Avoid Non-consumption Advisory**

In many cases the communities that may have to resort to using an alternate supply are known. To prevent the issuance of a “Non-Consumption Advisory”, municipalities that are aware of potential problems with their approved water supply should consult with the Departments of Environment, Municipal & Provincial Affairs and Government Services to facilitate the review of an alternate supply that will provide water of an acceptable quality. This effort may avoid the issuance of a “Non-consumption Advisory” for the municipality.
3. Notification of Non-consumption Advisory

Once a decision to issue a “Non-consumption Advisory” has been made (by public health officials and water supply regulators) it is critical that the owner/operator of the water supply and the consumers of the water be notified immediately.

In order to implement a “Non-Consumption Advisory”, the owner/operator of a water supply must be notified immediately by public health officials (EHOs and/or MOHs) that they are recommending a “Non-consumption Advisory”. Immediate notification must be done verbally (e.g. talk to a “live” person) and followed-up with a letter.

Once the decision has been made to issue a “Non-Consumption Advisory”, it is paramount that the message “not to consume drinking water” gets to the drinking water users immediately.

The rapid dissemination of information about the advisory to water consumers/users in the community is necessary to ensure public understanding of the event and that the public is aware of measures they can take to protect their health.

4. Removing Non-consumption Advisory

The “Non-consumption Advisory” will be removed by Environmental Health Officers of the Department of Government Services acting on behalf of the Medical Officer of Health, when:

1) The municipality resorts back to the approved water supply and chlorine residual levels and bacteriological quality of drinking water in two consecutive sample sets, not taken within 24 hours apart, are satisfactory; or

2) Water supply regulators and public health officials, upon review of the alternate water supply data, including chemical test results, and water treatment methods are satisfied that the alternate water supply does not pose a threat to the health of water consumers.
**Introduction**

To ensure that water supply owners/operators and water consumers are notified in a timely fashion about unacceptable/uncertain physical, chemical and/or radiological water quality, these Guidelines for Issuing Drinking Water Non-Consumption Advisories have been developed.

Drinking water testing and/or investigation may identify drinking water sources with unacceptable chemical and/or radiological quality with one or more parameters exceeding established health-based guidelines. In addition, physical or other contamination, with unknown/uncertain health impacts, may occur.

**Guidelines for Canadian Drinking Water Quality**

The Guidelines for Canadian Drinking Water Quality are published by Health Canada on behalf of the Federal-Provincial-Territorial Committee on Drinking Water (CDW).

The Guidelines are based on current, published scientific research related to health effects, aesthetic effects, and operational considerations. Health-based guidelines are established on the basis of comprehensive review of the known health effects associated with each contaminant, on exposure levels and on the availability of treatment and analytical technologies.

The CDW establishes the Guidelines specifically for contaminants that meet all of the following criteria:

1. Exposure to the contaminant could lead to adverse health effects;
2. The contaminant is frequently detected or could be expected to be found in a large number of drinking water supplies throughout Canada; and
3. The contaminant is detected, or could be expected to be detected, at a level that is of possible health significance.

Drinking water chemical and radiological parameters for which there is a health-based guideline are listed in tables 4 and 7 respectively of the Guidelines for Canadian Drinking Water Quality. The up-to-date list of parameters and their Maximum Acceptable Concentration (MAC) can be found at:

**Chemical parameters:**

**Radiological parameters:**

The technical documents for specific chemical and radiological parameters are available at:

**Decision to Issue Advisory**

1. **Chemical or Radiological Parameters**

The decision to issue a non-consumption advisory based on the presence of a chemical or radiological drinking water parameter, or parameters, above the Maximum Acceptable Concentration (MAC) should be made by the regional Medical Officer of Health (MOH), or designate.

The following factors should be considered when issuing non-consumption advisories:

- Level above the MAC
- Number of occurrences above the MAC
- Seasonality of occurrences above MAC, if applicable
- Availability of safe alternate water supplies
- Potential for consumers to use water sources that may pose a greater and more immediate risk to health

2. **Unknown Physical or Other Contaminant**

The decision to issue a non-consumption advisory based on the presence of an unidentified physical or other contaminant/substance in a drinking water supply or distribution system should be made by the regional Medical Officer of Health (MOH), designate.

**Communicating the Advisory**

**Government to Municipality**

The non-consumption advisory should be communicated to the water supply owner/operator (e.g., municipal council office) by the regional MOH, or designate, immediately following the decision to issue the advisory.

The advisory should be provided verbally over the phone to a live person and followed-up with a written fax and e-mail, if applicable, to the water supply owner/operator.

**Municipality to Residents**

The water supply owner/operator (e.g., city, town or local service district officials) has the responsibility to notify consumers (residents, businesses and institutions) about the advisory.

The notification should be done immediately. The notification should be followed-up on a regular basis to ensure that consumers are reminded of the need to take measures to protect their health.
Environmental Health Officers with the Department of Government Services will monitor the effectiveness of the notification.

**Contents of Advisory**

A non-consumption advisory should:

- State that people should not consume drinking water from a specific drinking water supply because testing or investigation has identified a contaminant, or contaminants, that may be harmful if consumed; or because an unidentified physical or other contaminant is present in the water.
- State that people should find an alternate safe supply for drinking and provide examples of alternatives such as bottled water, if available.
- Provide specific instructions/advice to vulnerable groups who may be at a greater risk for harm from consuming the water.
- Include recommendations/advice related to dermal (e.g., bathing) and inhalation (e.g., water vapours from showering) routes of exposure to the drinking water parameter(s) of concern.

**Rescinding an Advisory**

A non-consumption advisory should be rescinded when:

- Test results confirm that contaminant(s) are below the MAC; and/or
- Effective treatment has been installed to remove the contaminant(s) of concern.
- The condition(s) that led to the advisory have been resolved.

**Public Awareness Information**

Health Canada, the Department of Health and Community Services and the Department of Environment and Conservation have fact sheets on a number of parameters (e.g., lead and arsenic) that may be found in unacceptable levels in public water supplies.

Links to these sources of information are provided below:

http://www.hc-sc.gc.ca/hl-vs/iyh-vs/vsenvir/index2-eng.php
http://www.health.gov.nl.ca/health/publichealth/envhealth/drinkingwater.html