

EMERGENCY RESPONSE & CONTINGENCY PLAN



REGIONAL DISTRICT OF NANAIMO

WATER SYSTEMS



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Table of Contents

Prime Responsibilities	1
Emergency Response and Recovery Actions	1
Communication Checklist	2
- RDN Priority Contacts	2
- Key Communication Options	2
Emergency Contact Numbers	3-8
Emergency Response <u>ACTION PLANS</u>	9
- Backflow or Back Siphonage	9
- Bacteria Count (RDN Lab)	10
- Broken/Leaking Water Main	11
- Chlorine - High Levels	11
- Chlorination Failure	12
- Contamination of Source	12
- Drought Management Plan	13
- Flood Conditions	13
- Illness or Quarantine	14
- Isolate Water Treatment Plant	14
- Loss of Source	15
- Power Failure, Pump Failure	15
- Turbidity (Elevated)	16
- UV Failure	16
Appendices	
- Boil Water Info for the General Public	18-30

Prime Responsibilities

- Provide safe drinking water.
- Provide potable water for sanitation purposes.
- Provide water for fire suppression.
- Prevent unnecessary loss of stored water.
- Restore the integrity of the entire water system as soon as possible.
- Maintain integrity and quality of supply.

Emergency Response and Recovery Actions

- Analyze the type and severity of the emergency.
- Provide emergency assistance to save lives.
- Reduce the probabilities of additional injuries or damage.
- Provide situational reporting to appropriate agencies as required.
- Perform emergency repairs based on priority demand.
- Return system to normal levels (recovery).
- Evaluate response and preparedness plan.
- Revise plan as necessary.
- Provide maps, notices, and direction necessary for water recovery.

Communication Checklist

In an emergency it will be important to contact the key people shown below. This will help reduce confusion and assist in ensuring any important messaging is done so correctly and quickly.

IF REQUIRED, CONTACT EMBC or Island Health BEFORE
MAKING THE FOLLOWING CONTACTS AS PER THE EMERGENCY PLANS

RDN Priority Contacts

MANAGER OF WATER SERVICES

MURRAY WALTERS
(250) 668-4199

WATER SERVICES PROJECT ENGINEER

ROCKY CHOWDHURY
(250) 268-5410

COMMUNICATIONS COORDINATOR

REBECCA TAYLOR
(250) 713-2400

MANAGER OF EMERGENCY SERVICES

ERICA BEAUCHAMPS
(250) 668-2167

Key Communication Options

Management Support

- Contact Electoral Area Director
- Contact the local radio station and provide a brief message if public health and safety are at risk. Follow up with a press release and post on social media.

Field Staff Support

- Post notices on household front doors.
- Attach warning signs to existing Watering Restriction signs in each community.
- Put up roadside signage at the entrance to the community.

Administrative Support

- Provide information message on the RDN web site and social media.
- Review after-hours office and voice mail messaging.
- Provide notification to other RDN staff.

Emergency Contact Numbers

Personnel Contacts

NAME	POSITION	PHONE / CELL
Heather D	Chief Operator	(250) 248-4914
Dave W	Utilities Technician II	(250) 248-4914
Brian H	Utilities Technician III	(250) 248-4914
Brad L	Utilities Technician III	(250) 248-4914
Lyndon J	Utilities Technician II	(250) 248-4914
Greg R	Utilities Technician II	(250) 248-4914
Jenna K	Utilities Technician I	(250) 248-4914
Cole L	Utilities Technician I	(250) 248-4914
Murray Walters	Manager of Water Services	(250) 668-4199
Rocky Chowdhury	Project Engineer, Water Services	(250) 268-5410
Deb Churko	Engineering Technologist	(778) 674-1700
Joe McCallum	Engineering Technician	(250) 816-0721
Dion Klassen	Bylaw Officer	(250) 668-9064
	<i>(Emerg. Coord. Alternate- 24hrs)</i>	
Chris Basara	Bylaw Officer	(250) 713-4872
	<i>(Emerg. Coord. Alternate- 24hrs)</i>	

After-Hours Emergency Contact Numbers

Water Services (on-call)	(800) 862-3429
Utilities Page (ID 12094)	(250) 480-6061
Wastewater Services (on-call)	(250) 927-1330 or (250) 862-3429
RDN Horne Lake and Descanso Bay Campgrounds	(250) 228-0057

Electoral Area Directors

Electoral Area	Director	Phone	E-mail Address
Vice Chair	Tyler Brown	250-713-5781	tyler.brown@nanaimo.ca
A (Chair)	Jessica Stanley	250-268-7359	jessica.stanley@rdn.bc.ca
B	Vanessa Craig	250-741-4589	vanessa.craig@rdn.bc.ca
C	Lauren Melanson	250-268-1429	lauren.melanson@rdn.bc.ca
E	Bob Rogers	250-468-9986	bob.rogers@rdn.bc.ca
F	Leanne Salter	250-248-8097	leanne.salter@rdn.bc.ca
G	Lehann Wallace	250-951-5327	lehann.wallace@rdn.bc.ca
H	Stuart McLean	250-240-2263	stuart.mclean@rdn.bc.ca

Government Agency Contacts

Ministry of Forests, Lands, and Natural Resource Operations	(250) 751-3100
Ministry of Water, Land & Resource Stewardship	(250) 387-6121
RAPP Line (Report All Poachers & Polluters)	(877) 952-7277
Department of Fisheries and Oceans	(250) 754-0230
Emergency Management BC (EMBC) / Dangerous Goods Spill	(800) 663-3456
Island Health Parksville HPES.Parksville@islandhealth.ca	(250) 947-8222
Island Health Nanaimo HPES.Nanaimo@islandhealth.ca	(250) 755-6215
Environmental Health Officer (EHO) Viviana Hu (Hsin.Hu@islandhealth.ca) Parksville	(250) 947-9187
EHO Claire Webb (Claire.Webb@islandhealth.ca) Whiskey Creek, Horne Lake	(250) 947-9185
EHO Jasmine Lee (Jasmine.Lee@islandhealth.ca) Errington, Coombs, French Creek	(250) 947-9186
EHO Anthony Griffin (Anthony.Griffin@islandhealth.ca) Cedar/Yellowpoint	(250) 755-6250
EHO Morgan Martin (Morgan.Martin@islandhealth.ca) South Nanaimo	(250) 731-1732
Island Health - Drinking Water Consultant (Stacey.Sowa@islandhealth.ca)	(250) 755-3362
Island Health - Team Lead for Drinking Water (Shaun.Malakoe@islandhealth.ca)	(250) 755-6284
Island Health - Public Health Engineer (Darrell.Belanger@islandhealth.ca)	(250) 331-8587
Island Health - Medical Health Officer (Sandra.Allison@islandhealth.ca)	250-739-7579, 800-204-6166
City of Parksville	(250) 248-5412
<ul style="list-style-type: none"> • Chief Operator, Scott Churko • Senior WTP Operator, Kevin Larson 	(250) 927-1856 (cell) (250) 951-4120
Town of Qualicum Beach	(250) 752-6921
<ul style="list-style-type: none"> • Chief Operator, Chris Stanger 	(250) 228-0872 (cell)
District of Lantzville	(250) 390-4006
<ul style="list-style-type: none"> • Superintendent, Fred Spears 	(250) 713-0980 (cell)
North Cedar Improvement District	(250) 722-3711

Government Agency Contacts Cont'd

Islands Trust Organization (Main office)	Gabriola Isl	(250) 247-2063
<ul style="list-style-type: none"> • Trustee Scott Colbourne • Trustee Kees Langereis 	Gabriola Isl	(778) 679-1110
	Gabriola Isl	(250) 247-8281

Emergency Services

Hospital	Nanaimo	(250) 754-2141
	Parksville	(250) 248-2332 (Nan hospital)
	Oceanside Ctr	(250) 951-9550
	Gabriola Clinic	(250) 247-9922
Ambulance	Nanaimo	911 or (250) 758-8181
	Parksville	911 or (250) 248-3511
Police	Nanaimo	911 or (250) 754-2345
	Parksville	911 or (250) 248-6111
	Gabriola Isl	911 or (250) 247-8333
Fire Department	Parksville	911 or (250) 248-3242
	Errington	911 or (250) 248-5601
	Coombs-Hilliers	911 or (250) 752-2144
	Nanoose Bay	911 or (250) 468-7141
	Qualicum Beach	911 or (250) 752-6921
	Dashwood	911 or (250) 752-5434
	Cedar	911 or (250) 722-3122
Gabriola Isl	911 or (250) 247-5601	

Priority Services

BC Hydro (Qualicum Beach number)	(250) 752-8012 or
BC Hydro (Power Outages to Critical Infrastructure)	(866) 693-7007
Telus	(250) 811-2323 or
<ul style="list-style-type: none"> • Amarjit Mann cell 250-927-0913 • Mark Vonhagen cell 250-927-3462 	(250) 741-7713 or 741-7716
FortisBC (Terasen Gas)	(250) 248-4880
Shaw Cable (Nanaimo)	(250) 754-5571
CP Rail	(800) 716-9132
French Creek Pollution Control Centre	(250) 248-5794
Chlorine Manufacturer (ClearTech)	(800) 387-7503

Community Contacts

Mosaic Forest Management (Emergency Number)	(877) 437-8111
District 69 School Board Office	(250) 248-4241
Nanoose Bay Elementary School	(250) 468-7414
Nanoose Children's Centre	(250) 468-1784
Nanoose Place	(250) 468-5339
Nanoose Post Office	(250) 468-7722
Canadian Forces Base Nanoose CFMETR (MP Stn- 24hr)	(250) 468-5060
Descanso Bay Reg Park- RLC Brad Ashdown	(250) 228-0057
Horne Lake Reg Park- RLC bradashdown@rlcparks.ca	(250) 228-0057

Excavation Services

Shoreline Equipment (Doug Penny)	(250) 468-7759 or 755-9502
Rite on Time Excavation & Trucking (Cody)	(250) 927-1645
Degnen Excavators (Gabriola Isl)	(250) 247-8817

Electrical Contractors

Raylec Power servicerequest@raylecpower.ca	(250) 400-4266
Canem Electric	(250) 468-1887
Denmar Electric info@dmel.ca	(250) 758-8464
Ron Ruckman (Descanso Bay/Gabriola Isl)	(250) 247-0050

Other Services

Plumbing Services (Maci Motor - Pump Repair)	(250) 248-4423
JC Plumbing (Descanso Bay/Gabriola Isl)	(250) 247-7574 or 713-6700
EPCOR (Parksville)	(250) 951-2460
Sand and Gravel (Ozero)	(250) 752-1482
Sand and Gravel (Lussier & Sons)	(250) 468-9994
Sand and Gravel (DBL)	(250) 248-3693
Mainroad Contracting Road Maintenance Hotline	(877) 215-6006
Mainroad Contracting (Parksville) midisland@mainroad.ca	(250) 586-8884
Mainroad Contracting (Nanaimo/Cedar) rheaslip@mainroad.ca	(877) 215-6006

Other Services

Bureau Veritas (Water Testing Lab)		(250) 385-6112
Pump Truck (Action Tank Service)		(250) 248-3833
Pump Truck (Coast Environmental)		(250) 390-5080
Pump Truck and Toilet Rentals (A-1 Septic)		(250) 248-4438
Portable Washrooms (Coast Toilet Rentals)		(250) 753-7552
Bulk water supply (BC Water Service)		(250) 954-3628
Bulk water supply (Island Water Hauling)		(250) 363-6363
Bulk water supply (VIP Water Inc)		(250) 748-7309
Summer Rain Water Delivery (Gabriola Isl)		(250) 247-9136
Running Water Enterprises (Red Williams)		(250) 947-5197
Drillwell Enterprises		(250) 746-5268
Red Williams Well Drilling Ltd.		(250) 248-5552
Hot Earth Geothermal (Derek Tomlinson)		(250) 713-3330
Bottled water supply (Water Pure & Simple)		(250) 752-1373
Gross Environmental (Vac Truck)		(250) 268-2160
Pipe Eye Video Inspection	(250) 753-2550 or	(888) 756-2033
McRae's		(250) 883-7867
Badger Daylighting		(250) 217-2187
SPR Traffic Control		(250) 655-5041
KMF Traffic Solutions		(250) 668-0195
JSK Flagging		(250) 618-0232
DOMCOR		(888) 636-6267
Ace Flagging		(250) 720-7620

Suppliers

Northstar Propane (Coombs)	(833) 548-3748
Flocor	(250) 758-1551
Fred SurrIDGE (piping)	(250) 954-0368
Four Star Waterworks (piping)	(250) 954-3546
EMCO Water Works	(250) 756-3344
Iconix Water Products	(250) 746-8877
Andrew Sheret (Parksville)	(250) 954-9997
Andrew Sheret (Nanaimo)	(250) 758-7383
Sunbelt (Equipment Rentals)	(250) 248-1100
Irritex Pumps and Irrigation (pumps)	(250) 248-7028
Windsor Plywood (miscellaneous building supplies)	(250) 752-3122
Albertsons Hardware (miscellaneous building supplies)	(250) 248-6888
Robinson Rentals	(250) 753-2465
United Rentals	(250) 758-3911

Media Services

Rebecca Taylor, RDN Communications Coordinator	(250) 713-2400
Radio Station (CKWV) Nanaimo and Parksville	(250) 758-1131
TV Station (CHEK)	(250) 383-2435
Newspaper (PQ News and The Weekender)	(250) 248-4341
Gabriola Sounder	(250) 247-9337
Nanoose Business Service Directory	(250) 729-1529

Emergency Response *ACTION PLANS*

Emergency (Listed Alphabetically)	Actions	Contact
Backflow or Back Siphonage	<ul style="list-style-type: none"> - Notify Env. Health Officer - If microbiological contamination, notify users to boil water - If chemical contamination, notify users “Do Not Use” - Isolate the affected area - Use alternate supply if necessary (i.e. truck-in water to fill reservoir) - Verify integrity of distribution syst. - Check for cross connections - Check for pressure losses - Complete repairs - Purge and disinfect lines - Sample and re-sample 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel

Emergency (Listed Alphabetically)	Actions	Contact
<p>Bacteria Count (RDN Lab)</p>	<ul style="list-style-type: none"> - Notify Env. Health Officer - If Total coliforms found, verify integrity of treatment process - Verify chlorine residual present - Flush watermain in suspect area - Re-sample - If E.Coli found, post signs and/or deliver notices to boil water - Isolate the affected area - Increase disinfectant dosage in affected area - Flush watermains in affected area - Verify chlorine residual present - Verify integrity of distribution system - Check for cross connections - Check for pressure losses - Use alternate supply if necessary (i.e. truck-in water to fill reservoir) - Re-sample 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel - Communications Coordinator - Electoral Area Director

Emergency (Listed Alphabetically)	Actions	Contact
<p>Broken Water Main (also Leaking Water Main)</p>	<ul style="list-style-type: none"> - Isolate the affected area - Throttle back the water main but keep positive pressure - Prevent backflow into main - Notify Env. Health Officer - Notify local fire chief - Post notice on social media - Arrange alternate water supply if necessary - Obtain utility clearance for excav. - Arrange for traffic control - Notify users of interruption - Complete repairs - Swab and flush the repaired section - Sample to verify disinfection residuals - Take bacteriological samples - Clean up site, restore surfaces - Enter the repair in asset database 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel - Electoral Area Director - Local Fire Chief - Communications Coordinator - Receptionists
<p>Chlorine- High Levels</p>	<ul style="list-style-type: none"> - Verify integrity of chlorinator - Reduce the chlorine dosing rate - Notify users of high chlorine level - Notify Env. Health Officer - Arrange for repairs - Post notice on social media - Flush distribution system, if necessary - Follow dechlorination procedure for water discharged near creeks - Verify chlorine residuals present - Arrange alternate water supply if necessary (i.e. bottled water) 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel - Communications Coordinator

Emergency (Listed Alphabetically)	Actions	Contact
Chlorination Failure	<ul style="list-style-type: none"> - Shut off well pumps and monitor reservoir levels - Batch chlorinate in reservoir (if no UV present) - Arrange chlorinator repairs - Notify Env. Health Officer - If no chlorine residual in distribution system, notify users (use Boil Water Notice) - Post notice on social media - Arrange for alternate disinfection if necessary (i.e. trucking chlorine from another RDN site) - Arrange alternate water supply if necessary (i.e. bottled water) 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel - Chlorinator Manufacturer
Contamination of Source (Spills, Accidents, Vandalism)	<ul style="list-style-type: none"> - Shut down pumps - Verify source of contamination - Notify Env. Health Officer - Notify users “Do Not Use” - Contact local media - Post notice on social media - Arrange alternate source if necessary – i.e., bottled water - Contact environmental consulting firm (with P.Geo or P.Eng) to determine extent of contamination and plan for remediation 	<ul style="list-style-type: none"> - Island Health - EMBC, RCMP - MOE - RDN Supervisory personnel - Communications Coordinator - Schools and community centres

Emergency (Listed Alphabetically)	Actions	Contact
Drought Management Plan	<ul style="list-style-type: none"> - Monitor local well levels, streamflow, prov. drought rating, and prov. wildfire rating - Review history, predict shortages - Promote conservation strategies - Post notices on social media - Maintain storage for fire flows - Implement watering restrictions - Reduce flows from all wells - Adjust chlorine dosing levels 	<ul style="list-style-type: none"> - Island Health - EMBC (Emergency Management BC)
Flood Conditions	<ul style="list-style-type: none"> - For well supplies, ensure well casing stickup is over 200 yr flood level, and a surface seal in place - Monitor turbidity - For surface water supplies, monitor turbidity levels and continue treatment if <1NTU - If source water is compromised, shut off supply pumps - Notify Env. Health Officer - Notify EMBC - Notify users Do Not Use - Post notice on social media - Contact local media - Arrange alternate source if necessary – i.e., bottled water 	<ul style="list-style-type: none"> - Island Health - EMBC (Emergency Management BC) - Ministry of Environment - RDN Supervisory personnel - Communications Coordinator

Emergency (Listed Alphabetically)	Actions	Contact
Illness or Quarantine	<ul style="list-style-type: none"> - Notify Env. Health Officer - Clean and sanitize work surfaces - Follow CDC health guidelines for self-quarantine if required - Use social distancing practices - Avoid sharing equipment, computers, keys, vehicles - Vary shifts if necessary - Administrative staff to work from remote location if possible - Keep at least 1 months' worth of disinfection supplies and spare parts on hand in case of delivery delays or shortages - Employ multiple operators in each water system - Train all operators in all operational duties, in all water systems, where possible - Seek advice from senior operators and manager by phone 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel - Emergency Ops Center (EOC) - Communications Coordinator - Employee and family resource programs
Isolate Water Treatment Plant	<ul style="list-style-type: none"> - Notify Env. Health Officer - Shut down water treatment plant - Close valve on Nanoose Road to bypass treatment plant - Arrange for alternate disinfection, if necessary - Post notice on social media - Call for repairs 	<ul style="list-style-type: none"> - Island Health - Ministry of Environment - RDN Supervisory personnel - Local Fire Chief - Communications Coordinator

Emergency (Listed Alphabetically)	Actions	Contact
Loss of Source (Loss Of Reservoir or Supply Lines)	<ul style="list-style-type: none"> - Notify Env. Health Officer - Ensure pumps are shut off (to protect pump) - Notify users of interruption - Post notice on social media - Arrange alternate source (i.e. trucked-in water from another RDN water system) - Arrange for temporary storage cistern - Call for repairs 	<ul style="list-style-type: none"> - Island Health - Ministry of Environment - RDN Supervisory personnel - Local Fire Chief - Communications Coordinator
Power Failure	<ul style="list-style-type: none"> - Call BC Hydro. Ask how long? - Install back-up generators & fuel supply at each pumphouse - Use a portable back-up generator where necessary - Check on-site generators for effective operation & fuel supply - Notify Env. Health Officer - Notify users of interruption if necessary - Post signs and/or deliver notices - Post notice on social media - Arrange alternate source (i.e. trucked-in water from another RDN water system) - Arrange for temporary storage cistern if necessary - Arrange alternate disinfection if necessary (i.e. batch chlorinate in reservoir) 	<ul style="list-style-type: none"> - BC Hydro - Island Health - RDN Supervisory personnel - Local Fire Chief
Pump Failure	<ul style="list-style-type: none"> - Notify users of interruption - Call for repairs - Notify Env. Health Officer - Arrange alternate source (i.e. trucked-in water from another RDN water system) 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel

Emergency (Listed Alphabetically)	Actions	Contact
Turbidity (Elevated)	<ul style="list-style-type: none"> - Use Turbidity Decision Tree (attached on Page 34) - If source water has elevated turbidity, notify Env. Health Officer - Use alternate source if necessary (i.e. truck-in water from other RDN water system) - If elevated turbidity is within distribution system, flush affected area, notify Env. Health Officer - Monitor turbidity 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel
UV Failure	<ul style="list-style-type: none"> - Maintain disinfection residual with chlorine - Check if UV unit is working and clean the UV bulb - Arrange for UV repairs - Notify Env. Health Officer - Use alternate source if necessary (i.e. bottled water) - Sample for disinfection by-products such as trihalomethanes - Issue a Water Quality Advisory if UV units are non-functional 	<ul style="list-style-type: none"> - Island Health - RDN Supervisory personnel - UV Manufacturer - Communications Coordinator

APPENDICES

Boil Water Info for the General Public

18-30

BOIL WATER NOTICE INFORMATION FOR THE GENERAL PUBLIC DURING A BOIL WATER NOTICE CAUSED BY: INADEQUATE DISINFECTION

This information is provided as a guide to help individuals reduce the risk of becoming ill from ingesting non-potable water. Individuals who follow these guidelines will greatly reduce their chance of becoming ill.

What is a Boil Water Notice?

A Boil Water Notice is a public announcement advising water system users that they should boil their tap water for drinking and other domestic purposes. It is a notice intended to protect the Publics' health from waterborne infectious agents that could be present or are known to be present in the community's drinking water supply.

What is the difference between a Boil Water Notice and a Boil Water Order?

A Boil Water Notice is a notice issued to the public as a health warning. In most cases it is the water supplier who notifies the public.

A Boil Water Order is legal document issued to the water supplier by the Health Authority requiring the water supplier to notify the public of a boil water notice.

What are the health risks during a Boil Water Notice?

The health risks are associated with ingesting water that contains microbiological agents that can cause disease. These pathogenic (disease causing) agents could include *Giardia*, *Cryptosporidia*, *E. coli*, *Campylobacter*, *Salmonella* and *Hepatitis A*. Boiling tap water for one minute is sufficient to destroy pathogens that could be present in the water.

There are numerous factors that influence whether a person becomes ill. First, there must be pathogens present in the water you consume. Not every glass of water is likely to contain pathogens. Even if the water you consume contains pathogens, those pathogens that are present must be viable. That is, they must be in a state where they can cause an illness and they must be present in large enough numbers to cause an illness. The number of pathogens needed to cause illness depends on the type of pathogen present, a person's size, age, and immune status.

The incubation period (time for symptoms to develop) will vary depending on the type of pathogen. For example, Giardia (beaver fever) could take up to four weeks to develop symptoms whereas E. coli could take up to ten days and as little as two days. For more information on waterborne diseases go to the following BC Health File: <https://www.healthlinkbc.ca/>

Any persons believing that they are ill should see their doctor. Patients are sometimes requested to submit samples for laboratory analysis to assist in waterborne outbreak investigations.

It is important to note that Boil Water Notices are specific to microbiological threats. They are not appropriate to address threats from chemical contamination. Boiling chemically contaminated water will only result in the chemical becoming more concentrated or release the chemical into the air where it could be inhaled.

When there is a threat to a water supply from a chemical contaminated a more appropriate public health notice of "Do Not Drink the Water" would be issued.

What am I trying to kill when I'm boiling the water?

Boiling water is recommended to kill pathogenic microbes that may be present in contaminated water. Bacteria such as *E. coli* and *Salmonella* are killed rapidly at temperatures over 60°C and a temperature of 72.4°C for 1 minute is needed to inactivate cryptosporidium. *Hepatitis A* and *Norovirus* are rapidly inactivated at temperatures above 65°C.

Based on the above information there is no need to boil water for prolonged periods of time. Although heating water to boiling is not needed it is the only end point easily recognized by the public without the use of thermometers. It is therefore recommended that the public bring the water to a rolling boil for one minute to ensure that all pathogens have been inactivated.

One minute should be added to the above boiling times if the water is cloudy or highly colored to ensure proper mixing and that all pathogens have been exposed to the high temperature. When boiling water at altitudes above 2000m (6,500 ft), water should be boiled for 2 minutes.

How can the water become contaminated?

The water can become contaminated in a variety of ways. Some of these include:

- Heavy rainfall can wash contaminants into the water source
- Accidental spills in the water supply
- Breakdown of the disinfection process
- Break in water supply mains
- Vandalism
- Connections within the water system between potable and non-potable piping.

Is it necessary to boil all the water in the home during a boil water notice?

No, it is not necessary to boil all your water. Water used for bathing, showering, laundry, toilet flushing and mopping of floors does not need to be boiled. During bathing, young children should be cautioned against swallowing the bath water or alternatively young children could be sponge bathed.

All other water should be boiled. Simply put, any water that has a chance of being ingested should be boiled. This would include water used for drinking, beverage concentrates, ice cubes, washing fruits and vegetables, or brushing teeth.

Severely immune-compromised individuals should always boil their tap water for the purposes above. See the link to BC Health Files below (updated in 2019).

<https://www.healthlinkbc.ca/healthlinkbc-files/disinfecting-drinking-water>

Infant formulas should always be prepared by using boiled tap water or bottled water that is boiled. See the link to Island Health below.

<https://www.healthlinkbc.ca/healthlinkbc-files/making-storing-formula>

Drinking water for pets including dogs, cats, birds and reptiles should also be boiled.

How should tap water be boiled properly?

Tap water should be boiled for at least one minute. Use any clean pot or kettle. Kettles that have automatic shut offs are acceptable.

How should tap water be boiled properly? *(continued)*

Health Canada suggests that microwave ovens can also be used using microwave-safe containers but cautions against forming superheated water (water heated above its boiling point without the formation of steam). When using microwaves, Health Canada suggests inserting a glass rod, wooden or plastic spoon in the container to prevent forming superheated water.

After boiling, let the water cool by leaving it on the counter or in the refrigerator in covered containers. Once the water is boiled, it can be stored in food grade containers at room temperature or in the refrigerator.

Shaking the water in the container or pouring the water between two containers and/or adding a pinch of salt can bring back flavor after boiling.

Are there alternatives to boiling water?

Yes, there are. Although there are alternatives, not all of them will be feasible or practical in all situations. In part, it will depend on how much water you need and what you need it for. Safe alternatives to boiling water include:

- Using commercially prepared bottled water
- Obtaining water from an approved source that is not on a boil water notice, or
- Using bleach to disinfect small quantities of tap water. See the following chart or website for a guide to using bleach.

<https://www.healthlinkbc.ca/healthlinkbc-files/disinfecting-drinking-water>

Disinfection using unscented household bleach (5% chlorine) works best with warm water. Add bleach to the water, shake or stir for thorough mixing and then let it stand for at least 30 minutes before drinking.

Gallons of water to disinfect (equivalent shown in brackets)	Amount of Household bleach (5%) to add*
1 gal. (4.5 litres)	2 drops (0.18 mL)
2 ½ gal. (10 litres)	5 drops (0.4 mL)
5 gal. (23 litres)	11 drops (0.9 mL)
10 gal. (45 litres)	22 drops (1.8 mL)
22 gal. (100 litres)	¾ teaspoon (4 mL)
45 gal. (205 litres)	1 ½ teaspoons (8 mL)
50 gal. (230 litres)	1 ¾ teaspoons (9 mL)
100 gal. (450 litres)	3 ½ teaspoons (18 mL)
220 gal. (1000 litres)	8 teaspoons (40 mL)
500 gal. (2200 litres)	6 tablespoons (90 mL)
1000 gal. (4550 litres)	6 ½ ounces or 12 tablespoons (180 mL)

A slight chlorine odour should still be noticeable at the end of the 30-minute waiting period if you have added enough bleach. If not, repeat the dosage and allow the water to stand an additional 15 minutes. If the water has too strong a chlorine taste, allow the water to stand exposed to the air for a few hours or pour it from one clean container to another several times.

The disinfection action of bleach depends as much on the waiting time after mixing as to the amount used. The longer the water is left to stand after adding bleach, the more effective the disinfection process will be.

NOTE: Bleach does not work well in killing off *Cryptosporidium* parasites.

The amount of bleach needed to kill *Cryptosporidium* makes the water almost impossible to drink. If *Cryptosporidium* is in the water, boiling is the best way to ensure that the water is safe to drink.

I have my own water treatment device do I still need to boil my water?

If the device is designed to improve taste or reduce odour such as an activated carbon filter the answer is **YES** you should still boil your water.

If the device is designed to improve the chemical quality of the water such as reducing the iron content then the answer is **YES** you should still boil your water.

If the device is designed to improve water that is already potable the answer again is **YES** you should still boil your water.

There are numerous filters on the market designed to remove microorganisms and particulates. Most of these filters are not capable of removing viruses. Therefore, you should boil your water if you have a unit that cannot remove viruses.

If the device is designed to disinfect (destroy pathogens) water such as in an ultraviolet light (UV) disinfection unit you **might not** need to boil your water. There are numerous ultraviolet units; some are designed to disinfect raw water and some are designed to disinfect water that has already been disinfected at a central facility. For example, if the unit is classified by the National Sanitation Foundation (NSF) as meeting NSF Standard 55 Class A, it is designed to disinfect raw water. However, if the water within the distribution system is too turbid or cloudy, even a UV unit meeting NSF Standard 55 Class A may not work properly and you should still boil your water.

Reverse osmosis (RO) units are designed to filter water at the molecular level and should provide water that is free of pathogens. Thus, you **do not** have to boil your water if you have a reverse osmosis water treatment device.

There are many types of units on the market each designed to address specific water quality issues. It is recommended that you check with the unit's manufacturer to know exactly what your unit can do.

Can I purchase water from vending machines?

It depends on how the water is treated. Local vending machines that use local water would only be acceptable if the vending machine can kill pathogens that might be present in the water. Check with the store or manufacturer to see if the unit is capable of providing water that is safe to drink.

Warning signs should be posted on vending units that are not capable of providing safe water. Alternatively, the machine should be turned off.

Are there any people or groups of people at higher risk?

Yes. These people include any individual whose immune system is not fully developed or whose immune system is under stress such as infants, the elderly, immune compromised individuals and individuals already suffering from an illness. For more information go to the following BC Ministry of Health websites:

BC Health File: weakened immune systems

<https://www.healthlinkbc.ca/healthlinkbc-files/disinfecting-drinking-water>

BC Health File: preparing infant formula

<https://www.healthlinkbc.ca/healthlinkbc-files/making-storing-formula>

Boil water or provide an alternative safe supply of water that is used for:

- Drinking purposes- This includes all beverage concentrates such as fruit juice and iced tea
- Food preparation- This includes washing of fruits and vegetables
- Food contact surfaces

**Boil water or provide an alternative safe supply of water that is used for:
(continued)**

Food contact surfaces are all those surfaces that food comes into contact with during the food preparation process. These surfaces include counter tops, cutting boards and chopping blocks. Food contact surfaces should be washed with clean water and then sanitized using an acceptable sanitizing agent. Sanitizing agents for food contact surfaces include bleach (12-15 mL of 5% bleach per litre of water), iodophors, quaternary ammonia compounds or hydrogen peroxide (3% solution).

- Oral hygiene (brushing teeth)
- Infant formula; see BC Health File; preparing infant formula at <https://www.healthlinkbc.ca/healthlinkbc-files/making-storing-formula>
- Ice making

It is important to note that freezing does not destroy most pathogens. Bacteria and viruses can survive in frozen products for long periods of time. Discard any ice made from contaminated or potentially contaminated water.

Hand washing

Using warm water and soap should be sufficient. Applying a hand sanitizer after washing with tap water would add an extra barrier of protection.

Dishwashing by hand

Dishes washed by hand should be sanitized for two minutes in a separate sink using a bleach solution (2 mL of bleach per litre of water) after the dishes have been washed and rinsed. The dishes should then be left to **air dry** prior to being used. Attempting to wash and sanitize dishes in the same sink at the same time is not recommended because soap, grease and food particles interfere with the sanitizing process.

Mechanical dishwashers

Most residential home-style dishwashers do not provide a high enough temperature to kill all pathogens. Dishwashing units that reach 82 degrees Celsius (180 Fahrenheit) for twelve seconds (or an equivalent time-temperature relationship) during the final rinse cycle will destroy pathogens.

To optimize the disinfection process while using a residential dishwasher you should consider:

1. Using the highest temperature setting possible.
2. Running dishes through the dishwasher twice.
3. Sanitizing dishes afterwards in a sink containing a weak bleach solution (see dishes washed by hand above).
4. Letting the dishes air dry prior to use

Fruit and vegetable washing

Thoroughly wash all produce with potable water especially those that are going to be eaten raw. This is a common sense practice that should be applied even when there is no public boil water notice.

Coffee Machines

Coffee machines usually produce water around 70 to 80 degrees Celsius, which is sufficient to destroy pathogens. However, a sufficient amount of time is needed to ensure that all harmful organisms are destroyed. Therefore, let the coffee stand for at least five minutes before drinking.

Home canning

To be safe, postpone home canning until the boil water notice has been rescinded.

Beer and wine making

To be safe, postpone beer and wine making until the boil water notice has been rescinded.

When will the Boil Water Notice be rescinded?

Only when the water supplier can provide potable water will the Health Authority rescind the Boil Water Notice. Once or more of the following usually achieves confirmation that the water is once again safe to drink.

These include:

- Identifying and fixing the source or sources of the problem,
- Implementing procedures to eliminate or reduce the chance for reoccurrence
- Performing water quality tests
- Flushing and disinfecting distribution lines and water storage facilities

Precautions to consider when the Boil Water Notice is lifted

- Flush all water-using fixtures for 1 minute
- Run cold-water faucets and drinking fountains for 1 minute before using water
- Drain and flush all ice-making machines in your refrigerator
- Run water softeners through a regeneration cycle
- Drain and refill hot water heaters set below 45 deg C (normal setting is 60 deg C)
- Change any pre-treatment filters (under sink style and refrigerator water filters, carbon block, activated carbon, sediment filters, etc.)

Can I speak to a person in Public Health if I have a question about the Boil Water Notice?

Yes you can. For further information contact Island Health Officers at the following locations:

- Victoria ph. 250-519-3401
- Nanaimo ph. 250-755-6215, 6475 Metral Drive, Nanaimo, BC
- Parksville ph. 250-947-8222, 489 Alberni Hwy, Parksville, BC
- Courtenay ph. 250-331-8518

After hours Medical Health Officer on call is 1-800-204-6166.

Additional information can be found at the following BC, Canadian and US websites. These are:

BC Health File: How to disinfect drinking water

<https://www.healthlinkbc.ca/healthlinkbc-files/disinfecting-drinking-water>

BC Health File: Weakened immune systems and water-borne infections

<https://www.healthlinkbc.ca/healthlinkbc-files/preventing-water-borne-infection>

BC Health File: Drinking Water Health Topics

<https://www.healthlinkbc.ca/>

BC Health File: Cryptosporidiosis

<https://www.healthlinkbc.ca/healthlinkbc-files/cryptosporidium-infection>

BC Health File: Giardiasis

<https://www.healthlinkbc.ca/healthlinkbc-files/giardia-infection>

US EPA how to boil water and use bleach

<https://www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water>

US Centre for Disease Control; preventing cryptosporidiosis infection

<https://www.cdc.gov/parasites/crypto/index.html>

US Centre for Disease Control; Giardia fact sheet

<https://www.cdc.gov/parasites/giardia/prevention-control-general-public.html>

US Centre for Disease Control; Drinking bottled water

<https://www.cdc.gov/healthywater/drinking/bottled/index.html>

US Centre for Disease Control; Private Water Systems

<https://www.cdc.gov/healthywater/drinking/private/index.html>

Information sources for developing this package includes

- BC Ministry of Health
- Health Canada
- Alberta Environmental Health
- Washington State Department of Health
- BC Centre for Disease Control
- US EPA (Environmental Protection Agency)
- US Center for Disease Control
- NSF (National Sanitation Foundation)
- DWO (Drinking Water Officer's) Guide