

APPENDIX-K

QA/QC PLAN OF DRINKING WATER QUALITY MONITORING

QA/QC of Water Supply to the Hamlet of Cape Dorset in Baffin Region

The population of the Hamlet of Cape Dorset in 2009 is 1471 and annual water consumption is 46,033.80 cubic meters. The source is the natural lake. Water is extracted to the Treatment Plant through a pipe of about 2km long. The water supply line, intake line and drain line are heat traced with electric heating cables and for the case of the intake and supply lines, the heating cable placed inside the pipe.

Water is disinfected inside the Treatment plant with chlorine following the guidelines given to them by the Department of Health and Social Services of Government of Nunavut. Hamlet is responsible to supply safe drinking water to the community. The regular water quality is monitored by the hamlet and QA/QC is followed along with the Department of Health and Social Services.

Hamlet tests Chlorine residual contents in the water of each water truck before delivery to satisfy the National Drinking Water Guidelines. Five samples are collected from five different locations and sent to Iqaluit Environmental lab through the local health centre. Hamlet follows the guidelines given to them by the Department of Health and Social Services for sampling, preservation, and shipping.

The Environmental health officers also sample at least twice annually from the field and ship the samples with them to the lab.

The Lab conducts testing on the microbiological parameters and finds the quality of water is always in good standing order.

The QA/QC plan and Procedure of the lab, sampling etc along with the hamlet is attached.

Environmental Health

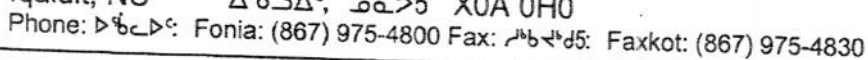
Guidelines for Drinking Water Delivery

An adequate supply of **safe** drinking water is important to ensure the good health and well-being of your community.

The following are guidelines for the safe delivery of drinking water:

1. A water delivery truck for the bulk delivery of drinking water must not be used for any other purpose, except with the prior written approval of a health officer.
2. All equipment on a water delivery truck which is in contact with drinking water, including but not limited to hoses, valves, couplers, fittings, nozzles and pumps, shall be constructed of materials that are suitable (e.g., corrosive resistant) for drinking water use; and shall be maintained in a clean and sanitary condition.
3. When a water truck intended to deliver potable water is stored in a garage or similar structure, it and any related water delivery equipment shall be kept in an area separated from any source of contamination, including any sewage transporting equipment.
4. When the water delivery truck is not in use, being cleaned, or drained dry;
 - a) delivery hoses should be capped at both ends or as otherwise recommended by the hose manufacturer, and
 - b) delivery hoses and related couplers fittings and nozzles shall be placed in the hose compartment.
5. Immediately prior to the first delivery of each day, the delivery hose nozzle and/or coupler shall be disinfected by spraying with a solution of 15 millilitres of household bleach (5.25% sodium hypochlorite) per litre of water (2.4 ounces per Imp. gallon) using a spray bottle or other similar device.
6. Should the water delivery nozzle and/or coupler come into contact with the ground or any other source of contamination, it shall immediately be cleaned of debris and then disinfected by spraying with a solution of 15 ml of household bleach (5.25% sodium hypochlorite) per litre of water (2.4 oz per Imp. gallon) using a spray bottle or other device.
7. Drinking water shall not be retained in a water delivery truck longer than 24 hours after the time of loading, upon which time any remaining water in the tank shall be drained; and shall not be used for drinking water.
8. An air gap must be maintained between the fill pipe and the water tank at all times.
9. All drinking water shall be chlorinated and shall have a **free chlorine residual concentration** of no less than **0.4 milligrams per litre (mg/L) at the time of loading** into the water delivery truck and a free chlorine residual concentration of no less than **0.2 mg/L at the time of delivery**.
10. A chlorine test kit must be available for the purpose of measuring chlorine residuals. **A free residual concentration of 0.2 mg/L must be measured from the delivery hose nozzle** after a thorough mixing of the chlorine and water and 20 minutes of contact time after the mixing.
11. The potable water hauler shall be trained and tested in the accepted method(s) of adding chlorine and testing for chlorine residuals and be familiar with the material safety data sheets (MSDS).
12. There shall be **no dipping** into the filled water tank for the purposes of obtaining a water sample for testing purposes.
13. Accurate records shall be maintained of raw water quality, finished water quality, and amounts of chemicals used.
14. Water samples must be collected and submitted once per month for bacteriological testing (see **Water Sampling** sheet attached). The following samples are recommended:
 - a) 1 raw water sample (untreated source water)
 - b) 1 sample from each water truck delivery hose

Please refer to the *Public Water Supply Regulations* pursuant to the *Public Health Act* for additional information.



For more information on drinking water disinfection, Please contact an Environmental Health Officer at (867) 975-4800.

CHLORINE MIXING INSTRUCTIONS FOR CALCIUM HYPOCHLORITE 65 %

1. Put on rubber apron, rubber gloves, and face shield.
2. Read manufacturer's safety data sheet for Calcium Hypochlorite.
3. Close valves on tanks.
4. Fill mix tank on work bench with (120) litres of water.
5. Add four (4) kilo-gram (bottles) of calcium hypochlorite 65% to water.
6. Mix solution for two (2) hours.
7. Fill feed tank by opening valve at bottom of mix tank.
8. Rinse mix tank and agitator with water.
9. Reintroduce clear one inch pipe from mix tank in feed tank.
10. Test first truck of day for adequate chlorination by using HATCH Colorimeter test kit. Let the sample sit for 20 minutes then test for FREE CHLORINE per the manual. The chlorine dosage should read between 0.5 and 1.0 mg/litres before delivery.
11. Adjust the stroke and/or rate of the injection pump to either increase or decrease the chlorine dosage if required. Retest FREE CHLORINE after adjusting the stroke and/or rate.



Instructions:

1. Drain any water from the tank.
2. Close any drains and add 5 gallons of warm water to the tank.
3. Add 2 cups of liquid household bleach (i.e. javex) for disinfection.
4. Using a new or clean brush (mop or long handled brush is recommended), thoroughly clean the entire inside.
5. Drain the tank and flush the interior with fresh (treated) water. Ensure all dirt, etc. has been removed.
6. Refill tank with treated water for storage and use.

NOTE:

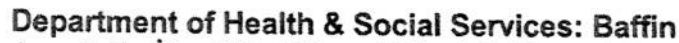
Tank cleaning and disinfection is recommended once per year or more often if necessary.



To ensure safe drinking water, follow the procedures outlined below at least twice a year or as required:

1. If there is excessive rust present in the interior, please ensure that this rust is scraped out.
2. The interior should then be rinsed in order to remove particles of rust.
3. Fill tank with water and add 1 gallon of 5% chlorine bleach (Javex) per 1000 gallons of water.
4. If possible, drive the truck around town to allow for proper mixing and to ensure the surface area in the interior is superchlorinated.
5. Let this solution stand for 12-24 hours to ensure proper contact time for super-chlorination.
6. Drain truck completely and fill with drinking water.
7. Contact the Environmental Health Officer to submit a water sample for bacterial analysis.

Ensure that during the super-chlorination procedure the hose is also filled with chlorinated water for complete sanitation.



Okoa Kavamat Monakhikakvilikiot Olasilikiot

P.O. Box 1000 Stn 1046; 00000 1000; C.P. 1000 Stn 1046

Phone: 867-975-4800 Fax: 867-975-4830

To disinfect drinking water from a lake, river, stream, snow, or ice source, make sure you **BOIL THE WATER FOR AT LEAST 1 MINUTE** to kill any harmful bacteria, viruses, or parasites.



WATER SAMPLING

1. Samples must be submitted at least once per month. Please send a sample from each water truck, one from the water storage tank(if applicable), a raw water sample, and one from any public building (school, health center etc.)
2. When sampling, be careful not to let the mouth of the bottle or lid touch anything including the sampler's fingers as they are often contaminated with bacteria.
3. Fill the bottle to the 200 mL line from a water tap, valve, or water truck delivery hose nozzle. When sampling from a water tap, remove screen, aerator, or other attachment from tap and allow the cold water to run for 2-3 minutes before collecting. **Do not dip** into the filled water truck tank to take a sample.
4. **Do not overfill** the bottle or rinse it out as it has been treated with sodium thiosulphate that will spill out with excess water. This chemical combines with your free chlorine – disabling it and preserving any bacteria present.
5. Ensure each attached sample form includes:
 - a. Date and time sample was taken.
 - b. Sample point location (e.g. Community X water truck # 3).
 - c. Name of person who took the sample.
 - d. Where to send sample results.
6. Sample must be kept cold but not frozen and may be sent via the health centre lab box if they can spare the space. You will have to discuss this possibility with the Nurse In Charge to obtain approval for this. Otherwise, it is the water plant operator's responsibility to ensure the samples are transported under refrigeration to:

**Environmental Health Department
Health and Social Services, Baffin
P.O. Box 1000, Station 1046
Iqaluit, NU X0A 0H0**

7. Samples **must** arrive at the Environmental Health Office within 24 hours of sampling otherwise the results may not be accurate. Please fax or phone notice to the Environmental Health Officer when you are sending samples.

- Phone: 867-975-4800 Fax: 867-975-4833

Community Water Sample Submission 2010

[illegible]

UV Sterilizer Log

November 2010

[illegible]

December 2010

[illegible]

Daily Temperature Log - Refrigerator

January 2010

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Temperature above 4°C																															
Temperature = 0°C to 4°C																															
Temperature below 0°C																															
Corrective Action Taken																															
Cleaning Conducted																															
Initial																															

Notes:

February 2010

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
Temperature above 4°C																														
Temperature = 0°C to 4°C																														
Temperature below 0°C																														
Corrective Action Taken																														
Cleaning Conducted																														
Initial																														

Notes:

Daily Temperature Log - Incubator

January 2010

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Temperature above 35°C																															
Temperature = 35°C ± 0.5°C																															
Temperature below 35°C																															
Corrective Action Taken																															
Cleaning Conducted																															
Initial																															

Notes:

February 2010

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
Temperature above 35°C																														
Temperature = 35°C ± 0.5°C																														
Temperature below 35°C																														
Corrective Action Taken																														
Cleaning Conducted																														
Initial																														

Notes: