

1. Purpose

Ensure an adequate supply of safe and wholesome drinking water to the buildings on all campuses at Memorial University of Newfoundland.

2. Objective

Systematically assess the key parameters of drinking water quality in all buildings at Memorial and ensure that the intake of drinking water falls within the Guidelines for Canadian Drinking Water Quality, published by Health Canada.

3. Definitions

Corrosion is the deterioration of a material that results from a chemical reaction with its environment, such as the deterioration of a plumbing pipe that results from contact with water.

Drinking water outlet is a fountain or kitchenette faucet where cold water is likely to be obtained for consumption. For the purpose of testing water quality, a drinking water outlet does not include a faucet located in a mechanical room, custodial closet, laboratory or washroom.

First-draw sample is a water sample that is taken after water has been standing motionless in plumbing pipes for a period of time, and includes the first drops of water that begin to flow from an outlet that has been opened. A first-draw sample is also known as a “zero minute” or “stand sample”. When sampling for lead in drinking water, a first-draw sample often shows worst case conditions and would not be representative of average intake at a drinking water outlet if lead leached from fittings and the faucet is the primary source of contamination.

Five-minute sample is a water sample that is collected after the water has been continuously flowing from an outlet at a rate that approximates normal use, for a period of five minutes. A five-minute sample is intended to verify the quality of the water upstream of the outlet.

Public drinking water supply is funded by the government and operated and maintained by any level of government (federal, provincial, municipal). A common type of public drinking water supply is a reservoir or lake. Examples of public drinking water supplies include Windsor Lake and Bay Bulls Big Pond on the Avalon Peninsula.

Private drinking water supply indicates a supply that is owned and operated by a non-government entity, such as a homeowner or commercial operation. A common source type for a private drinking water supply is a well or pond. An example of a private drinking water supply at Memorial is an artesian well at the Botanical Garden on Mount Scio Road in St. John’s.

4. Regulatory Requirements and Guidelines

- As an employer, Memorial is required to supply wholesome drinking water in accordance with the NL Occupational Health and Safety Regulations, section 66 - supply of drinking water.
- Municipal governments, such as the City of St. John’s, oversee the day-to-day operations of the public drinking water treatment facilities.

- The responsibility to provide safe drinking water to the public rests with the province of Newfoundland and Labrador.
- Health Canada publishes the Guidelines for Canadian Drinking Water Quality, which are developed by the Federal-Provincial-Territorial Committee on Drinking Water.

5. Responsibility

Facilities Management (FM) at Memorial has a responsibility to develop and implement a Drinking Water Quality Guide for Memorial in consultation with the University Health and Safety Committee. As part of the implementation of the Drinking Water Quality Guide, FM will develop plumbing profiles for each building, carry out preventive maintenance activities and monitor drinking water quality by collecting samples from drinking water outlets (focusing on unfiltered stations) and having the samples analyzed by a qualified laboratory. FM will also maintain documentation, communicate with key stakeholders and implement corrective measures that are necessary to ensure an adequate supply of safe and wholesome drinking water at Memorial.

The University Health and Safety Committee has a responsibility to review the Drinking Water Quality Guide that is proposed by FM and ensure that the guide is effective in ensuring that average intake of drinking water falls within the Guidelines for Canadian Drinking Water Quality that are published by Health Canada.

Environmental Health and Safety (EHS) at Memorial will assist FM in developing a drinking water quality guide and finding sources of reliable information. EHS will audit the implementation, review and revision of the Drinking Water Quality Guide on an annual basis for the purpose of quality assurance. A summary of the audit findings will be made available by the Office of the Chief Risk Officer.

6. Plumbing Profile

The creation of a plumbing profile in each building is necessary to identify factors that could affect water quality in the plumbing systems at Memorial, prioritize drinking water monitoring activities and address specific concerns. A plumbing profile may also be used to identify conditions that favour corrosion of the water distribution system within each building.

Key considerations in the development of a plumbing profile include the types of materials used in the service connection, potable water pipes, solder, faucets, valves, and water stagnation time in the system. See Appendix I, Plumbing Assessment Survey, for a list of questions published by Health Canada (2009) to assist in the development of a plumbing profile.

7. Preventive Maintenance

A preventative maintenance program is an essential component of drinking water system management. Preventive maintenance enhances public health protection, improves reliability of the drinking water system, and reduces the need for repairs. Preventive maintenance and water flushing are also important factors in preventing water stagnation and the buildup of contaminants in the plumbing system.

Key preventive maintenance and water flushing activities include the following:

- a. Flushing each fire hydrant once per year
- b. Flushing the water main entrance for each building once per year
- c. Cleaning a backflow preventer and sediment strainer in each building once every 6 months
- d. Flushing each part of the system that may have been affected by water main breaks or construction/renewal of water mains (as required).

8. Monitoring Program

Water quality monitoring will be coordinated by FM to evaluate adherence with the Guidelines for Canadian Drinking Water Quality (Health Canada, 2014). Monitoring will also be used to identify changes in water quality over time, evaluate corrosion of plumbing system components and estimate average exposure to drinking water contaminants, such as lead.

8.1 Sampling parameters and frequency

- a. Public drinking water supply

For buildings that are serviced by a public drinking water system, such as the central campus in St. John's, the water quality is monitored by a local municipality and the province of Newfoundland and Labrador at the source, throughout the treatment process and at various points in the distribution system. Corrosion and leaching within the plumbing system of each building can cause elevated solute concentrations relative to the public drinking water supply. As a result, for all buildings at Memorial that are serviced by a public drinking water supply, the primary focus of sampling is contaminants that may enter the drinking water as a result of corrosion and leaching within the plumbing system of each building.

The drinking water in each building at Memorial that is serviced by a public drinking water system will be tested for all standard metals and pH on an annual basis (see Table 1, [Appendix II](#) for list of metals included in a standard metal analysis). Sampling will be conducted at unfiltered water stations to determine the water quality in the plumbing system. In cases where it is necessary to sample at a filtered water station the water filter will be disabled. The pH of drinking water will be tested at the time when drinking water samples are collected for metal analysis. Testing for additional parameters, such as bacterial contaminants, is not necessary for buildings that have a public water supply given the water treatment and testing procedures used at the source by certified treatment facilities and testing carried out on a regular basis by local municipalities and the province of Newfoundland and Labrador.

Additional water samples will be collected from drinking water outlets if routine testing shows that the water quality does not meet the Guidelines for Canadian Drinking Water Quality (Health Canada, 2014). Reporting of sampling results, corrective measures and the provision of an alternative source of drinking water will proceed as specified in Section 9.

- b. Private drinking water supply

For buildings that have a private source of drinking water, such as a well, the routine collection of drinking water samples for the analysis of bacteriological parameters will take place once every three (3) months. For a private

source of drinking water all standard inorganic parameters and pH will be tested on an annual basis (see Tables 2 and 3, [Appendix II](#)).

Additional water samples will be collected from drinking water outlets if routine testing shows that the water quality does not meet the Guidelines for Canadian Drinking Water Quality (Health Canada, 2014). Reporting of sampling results, corrective measures and the provision of an alternative source of drinking water will proceed as specified in [Section 9](#).

8.2 Location

- a. A plumbing profile for each building will be used to identify conditions that favour corrosion of the water distribution system within each building, such as water stagnation (Section 6).
- b. On a routine basis, drinking water samples shall be collected at a representative number of drinking water outlets. It is not necessary to collect a sample at every drinking water outlet. The sampling locations will be selected based on the plumbing profile and initial survey results.

8.3 Water stagnation

The following water stagnation method would be appropriate when carrying out routine testing for metals and inorganic parameters in drinking water:

- a. Do not remove the aerator or screen at the drinking water outlet in preparation for water stagnation, flushing or water sample collection as it may affect sample results and would not reflect the true exposure to the individual drinking the water.
- b. Flush water at sample site for at least 15 minutes.
- c. Document the location where the water is flushed (building, room or hallway, faucet or fountain) how long the water is flushed for, the date and time.
- d. Post a sign and place a physical barrier, such as a garbage bag, over the water fountain or faucet where sampling will take place to prevent usage of the outlet during the stagnation period.
- e. Allow at least 6 hours, but not more than 24 hours of stagnation before beginning water sample collection.

8.4 Routine collection of drinking water samples

The methods that are used to collect water samples can have a considerable effect on the sampling results. The sample collection methods for routine testing for metals in drinking water and bacteriological samples are listed in [Appendix III](#). Samples that are not collected properly should be discarded. Routine sampling will be conducted at unfiltered locations. In the event that a filtered water station is the only available location in a building, the water filter will be disabled during collection.

8.5 Water sample containers

Before collecting water a drinking water sample, verify that the size of the water sample bottle(s) is acceptable to the laboratory that will conduct the analysis. For metal analysis, the container should be made of HDPE, LDPE, PP, or PS. For the collection of one (1) litre samples, more than one container may be used as long as the time taken to

switch from one (1) container to the next is minimized.

For samples that require the use of a preservative, if the water sample bottles do not already have preservative in them, it will need to be added by a competent person. Review the Safety Data Sheet (SDS) carefully and follow all recommended health and safety precautions when handling corrosive chemicals, such as nitric acid.

8.6 Transportation of water samples

Prior to sample collection, arrangements should be made for the efficient transportation of samples to the lab. Drinking water samples should be packaged and preserved as specified by the analytical lab.

8.7 Non-routine collection of drinking water samples

For the purpose of investigation, the collection of drinking water samples may be conducted using methods that are determined to be most appropriate. This may include the collection of small-volume samples at modified time intervals (e.g. 30 seconds). It may also include re-sampling collection methods involving a five minute flush with a 30 minute waiting period.

8.8 Field blanks

Field blanks for sampling quality control should be collected along with every set of samples. A set of samples includes drinking water that is collected in one building over a relatively short period of time. A field blank should be collected in the same type of container and treated in the same manner as the samples in a set, including cleaning procedures, sample volume, water source and addition of preservative. At least 1 field blank should be collected for every 15 sample locations. Field blanks will include the first-draw sample and the five-minute sample.

8.9 Analysis of drinking water samples

- a. Preference shall be given to qualified laboratories at Memorial for the routine analysis of drinking water samples. At the discretion of the University Health and Safety Committee, drinking water samples shall be sent for analysis by a laboratory that is accredited with the Canadian Association for Laboratory Accreditation and/or Standards Council of Canada.
- b. Analysis for metal content should be carried out by inductively coupled plasma mass spectrometry (ICP-MS).

9. Reporting and Corrective Actions

The results from routine drinking water sample collection and analysis for all Memorial buildings will be posted on the Memorial website annually for standard metal and standard inorganic parameters and quarterly for standard biological parameters, in accordance with the schedules for the routine collection of drinking water samples (Section 8.1).

The results from the collection of drinking water samples for investigative purposes will be posted as soon as possible after the results of investigative sampling are obtained and reviewed by Facilities Management.

It would not be unusual that a test result may exceed the Health Canada Water Quality Guidelines for lead in a standing sample. Generally, the flushed sample will indicate lower lead level readings. In the event that a flushed sample contains an exceedance above the Health Canada Water Quality Guideline actions will be taken immediately to protect health.

If a Health Canada Water Quality Guideline is exceeded at a drinking water outlet, then the corrective measures will be determined on a case-by-case basis depending on the exceedance, sampling methodology and results. Investigations into exceedances may include but are not limited to: checking and cleaning the aerator (if present) for sediment, conducting an analysis of sediment in aerator, replacing faucets at the drinking water outlet, investigating the plumbing profile and re-sampling drinking water in that location.

In the case of lead in drinking water, if the concentration is greater than 5 micrograms per litre but less than 10 micrograms/litre an investigation may be conducted to determine if it is possible to lower the lead concentration in water to as low as reasonably achievable.

In the case of lead in drinking water, if the concentration is above 10 micrograms per litre but less than 30 micrograms per litre (Government of Ontario, 2016), the following may be considered during the investigation:

- Complete two re-samples at the original sampling tap that have been taken a minimum of seven days apart but within 30 days of each other and submit these re-samples for laboratory testing. These re-samples would be taken following a minimum five-minute flushing and after a 30-35 minute waiting period. It is not necessary for the re-sampling process to take the sampling tap out of service for the 6-24 hours.

In the case of lead in drinking water, if the concentration of lead exceeds 30 micrograms per litre (Government of Ontario, 2010) then the following corrective actions should be carried out:

- Remove the drinking water outlet from service within 48 hours of receiving the results;
- Post a notice at the drinking water outlet within 48 hours of receiving the results;
- Provide an alternative source of drinking water or install certified drinking water treatment devices, such as filters that are certified to meet NSF/ANSI 53 – Drinking Water Treatment Unit Standard for Health Effects;
- Flush the water lines in the event of a local water main break or a prolonged period of stagnation; and
- Consult a competent person to identify possible sources of lead from debris buildup or lead fittings.

After initial corrective measures have been implemented, retesting should be carried out. Additional investigation



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and re-sampling should be carried out under the direction of FM until the sampling results are determined by FM to meet the Health Canada Guidelines for Drinking Water Quality.

10. References

Government of Newfoundland and Labrador, Department of Environment and Conservation Water Resources Management Division (2014). Drinking water quality monitoring manual physical and chemical parameters.

Government of Ontario (2009). A Manual for Operators of Schools, Private Schools and Day Nurseries with Excess Lead in their Drinking Water: A resource guide on how to locate the source and remedy the problem. Queens Printer for Ontario.

Government of Ontario (2010). Flushing and Testing for Lead in Drinking Water: What are my responsibilities under the Safe Drinking Water Act, 2002 and Ontario Regulation 243/07 (Schools, Private Schools and Day Nurseries)? A guide for Schools, Private Schools and Day Nurseries about flushing, sampling and testing for lead in drinking water. Queen's Printer for Ontario.

Government of Ontario (2016). Guide for schools, private schools and day nurseries on flushing and testing for lead. Queen's Printer for Ontario.

Health Canada (2009). Guidance on Controlling Corrosion in Drinking Water Distribution Systems. Federal-Provincial-Territorial (FPT) Committee on Drinking Water, Health Canada, Ottawa, Ontario.

Health Canada (2014). Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.

1. Appendix I

Plumbing Assessment Survey

The plumbing assessment survey is presented here, as published in the Guidance on Controlling Corrosion in Drinking Water Distribution Systems by Health Canada Federal-Provincial-Territorial Committee on Drinking Water Federal-Provincial-Territorial Committee on Health and the Environment, 2009. The following questions will help competent authorities determine whether lead is likely to be a problem in their facility/facilities and will help prioritize sampling efforts.

1. *When was the original building constructed?* Where any buildings or additions have been added to the original facility, a separate plumbing profile should be completed for each building, addition or wing.

2. *If the facility was built or repaired after 1990, were lead-free plumbing and solder used in accordance with the National Plumbing Code or the applicable provincial regulation?*

What types of solder have been used? Your local plumbing code authority or building inspectors may be able to provide guidance regarding when high-lead materials were last used on a regular basis in your area.

3. *When were the most recent plumbing repairs made?* Note locations.

4. *With what material is the service connection (the pipe that carries water to the school building from the public water system main in the street) made?* Note the location where the service connection enters the building and connects to the interior plumbing.

5. *What are the potable water pipes made of in your facility (options: lead; galvanized metal; plastic; copper; cast iron; other)?* Note the location of the different types of pipe, if applicable, and the direction of water flow through the building. Note the areas of the building that receive water first, and which areas receive water last.

6. *Do you have tanks in your plumbing system (pressure tanks, gravity storage tanks)?*

Note the location of the tanks and any available information about the tanks, such as manufacturer and date of installation.

7. *Was lead solder used in your plumbing system?* Note the location of lead solder.

9. *How many of the following outlets provide water for consumption?* Note the location.

- a. Water coolers
- b. Bubblers
- c. Ice makers
- d. Kitchen taps
- e. Drinking fountains or taps

10. *Have the brands and models of water coolers used in the building been checked to see if they may contain lead?*
11. *Do outlets that provide drinking water have accessible screens or aerators? (Standard faucets usually have screens. Many coolers and bubblers also have screens). Note the locations.*
12. *Have these screens been cleaned? Note the locations.*
13. *Can you detect signs of corrosion, such as frequent leaks, rust-coloured water, or stained dishes or laundry? Note the locations.*
14. *Is any electrical equipment grounded to water pipes? Note the locations.*
15. *Have there been any complaints about water taste (metallic, etc.) or rusty appearance? Note the locations.*
16. *Have any water samples been taken from your building for any contamination? Check building files, and check with your public water supplier.*
 - a. Name of contaminant(s)?
 - b. What concentrations of these contaminants were found?
 - c. What was the pH level of the water?
 - d. Is testing done regularly at your facility?
17. *Other plumbing questions:*
 - a. *Are blueprints of the building available?*
 - b. *Are there known plumbing “dead ends,” low-use areas, existing leaks or other “problem areas”?*
 - c. *Are renovations being planned for part or all of the plumbing system?*

2. Appendix II

Table 1. Standard Metal Analysis Parameters and Guidelines for Canadian Drinking Water Quality (Health Canada, 2014)

Metal	Guideline*	Type of Guideline
Total Aluminum (Al)	100	OG (applies to treatment plants using aluminum-based coagulants)
Total Antimony (Sb)	6	MAC
Total Arsenic (As)	10, ALARA	MAC
Total Barium (Ba)	1000	MAC
Total Beryllium (Be)	n/a	n/a
Total Bismuth (Bi)	n/a	n/a
Total Boron (B)	5000	MAC
Total Cadmium (Cd)	5	MAC
Total Chromium (Cr)	50	MAC
Total Cobalt (Co)	n/a	n/a
Total Copper (Cu)	1000	AO
Total Iron (Fe)	300	AO
Total Lead (Pb)	10	MAC
Total Magnesium (Mg)	none required	n/a
Total Manganese (Mn)	50	AO
Total Molybdenum (Mo)	n/a	n/a
Total Nickel (Ni)	n/a	n/a
Total Phosphorus (P)	n/a	n/a
Total Selenium (Se)	50	MAC
Total Silver (Ag)	none required	n/a
Total Sodium (Na)	200'000	AO
Total Strontium (Sr)	n/a	n/a
Total Thallium (Tl)	n/a	n/a
Total Tin (Sn)	n/a	n/a
Total Titanium (Ti)	n/a	n/a
Total Uranium (U)	20	MAC
Total Vanadium (V)	n/a	n/a
Total Zinc (Zn)	5000	AO

ALARA = as low as reasonably achievable

AO = Aesthetic Objective, a guideline to address parameters that may affect consumer acceptance of drinking water, such as taste, odour and colour.

OG = Operational Guideline, established based on operational considerations

MAC = Maximum Acceptable Concentration, a guideline based on health considerations.

n/a – Not applicable (no guideline published by Health Canada)

* - concentrations are µg/L unless otherwise specified.

Table 2. Standard Inorganic Parameters and Guidelines for Canadian Drinking Water Quality (Health Canada, 2014)

Parameter	Guideline	Type of Guideline
Alkalinity	n/a	n/a
Aluminum	100 µg/L	OG (applies to treatment plants using aluminum-based coagulants)
Ammonia	none required	none
Arsenic	10 µg/L, ALARA	MAC
Barium	1000 µg/L	MAC
Boron	5000 µg/L	MAC
Bromide	n/a	n/a
Cadmium	5 µg/L	MAC
Calcium	none required	n/a
Chloride	≤ 250	AO
Chromium	50 µg/L	MAC
Colour	15 TCU	AO
Conductivity	n/a	n/a
Copper	1000 µg/L	AO
Dissolved Organic Carbon	n/a	n/a
Fluoride	1500 µg/L	MAC
Hardness	none required	none
Iron	300 µg/L	AO
Lead	300 µg/L	AO
Magnesium	none required	n/a
Manganese	50 µg/L	AO
Mercury	1 µg/L	MAC
Nickel	n/a	n/a
Nitrate	45 as nitrate; 10 as nitrate-nitrogen	MAC
Nitrite	3 as nitrite; 1 as nitrite-nitrogen	MAC
pH	6.5-8.5	n/a
Potassium	n/a	n/a
Selenium	50 µg/L	MAC
Sodium	200'000 µg/L	AO
Sulphate	500'000 µg/L	AO
Total Dissolved Solids	500 mg/L	AO
Total Kjeldahl Nitrogen	n/a	n/a
Total Organic Carbon	n/a	n/a
Total Phosphorus	n/a	n/a
Turbidity	1.0 NTU	n/a
Uranium	20 µg/L	MAC
Zinc	500 µg/L	AO

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AO = Aesthetic Objective, a guideline to address parameters that may affect consumer acceptance of drinking water, such as taste, odour and colour.

OG = Operational Guideline, established based on operational considerations

MAC = Maximum Acceptable Concentration, a guideline based on health considerations.

n/a – Not applicable (no guideline published by Health Canada)

Table 3. Standard Bacteriological Parameters & Guidelines for Canadian Drinking Water Quality (Health Canada, 2014)

Bacteriological Parameters	Guideline	Type of Guideline
Escherichia coli (E.coli)	None detectable per 100 ml	MAC
Total coliforms	None detectable per 100 ml in non-disinfected groundwater leaving the well	MAC

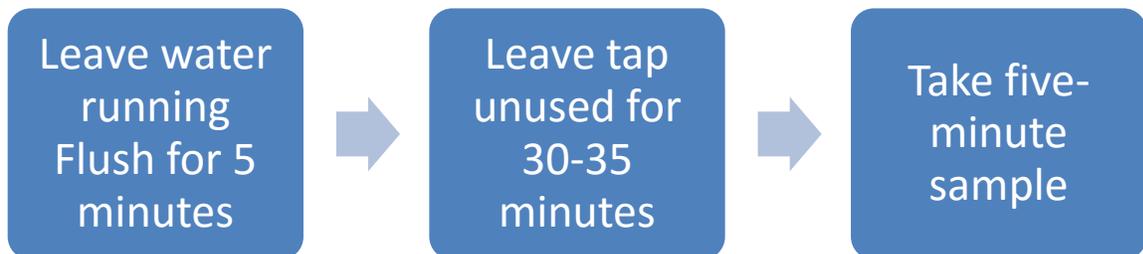
MAC = Maximum Acceptable Concentration, a guideline based on health considerations.

3. Appendix III

Water sample collection procedure for a standard metal analysis and standard inorganic parameters

1. Do not remove the aerator or screen at the drinking water outlet.
2. Flush water at sample site for at least 15 minutes.
3. Document the location where the water is flushed (building, room, hallway, faucet or fountain), date and time.
4. Post a sign and place a physical barrier such as a garbage bag over the water fountain or faucet where sampling will take place to prevent usage during stagnation period.
5. Allow at least 6 hours but not more than 24 hours of stagnation before beginning water collection.
6. Use clean, disposable gloves.
7. Label two (2) sterile sampling containers. The container should be made of HDPE, LDPE, PP or PS.
8. Label one container *first-draw* sample and label one *five-minute* sample.
9. Remove the lid of the first-draw sampling container.
10. Do not rinse the container if the preservative has already been added.
11. If the water sample bottle does not contain a preservative, it will need to be added by a competent person. Review the Safety Data Sheet (SDS) carefully and follow all recommended health and safety precautions when handling corrosive chemicals, such as nitric acid.
12. Place the open container under the tap.
13. Turn on the cold water tap and set the water flow rate to approximate normal use. Ensure that water does not splash out of sampling container.
14. Collect one (1) L of water and then remove the container from under the tap.
15. Close the lid, dry and label the container.
16. Do NOT turn off the water or adjust the water flow rate during sampling. Let tap flush for 5 minutes. Start timer.
17. When the timer reaches five (5) minutes, turn the tap off.
18. Leave the tap unused for 30 to 35 minutes.
19. While attending the unused tap, document sample details, including the date, time, building, room, outlet type (faucet or fountain) and timing of sample (e.g. 0 min). The presence of a strainer or aerator on a tap should be noted, as well as the presence of a filter or refrigeration unit.
20. Remove the lid of the second container and collect a one (1) L sample, as per steps 10 – 15.
21. Test pH of the water by following the manufacturer's instructions for a calibrated pH testing device.
22. Turn off the flow of water at the drinking water outlet.

Simplified Process for Water Sample Collection



4. Appendix IV

Water sample collection procedure for standard biological parameters*

1. Use clean, disposable gloves.
2. Use a sterile sampling container that has been provided or approved by the laboratory that will analyze the drinking water sample.
3. Do not open the container until you are ready to collect the sample.
4. Do not collect a water sample from a leaky faucet or a swing nozzle faucet (Figure 1) (this step applies to sampling for biological parameters).
5. Remove the aerator or screen at the drinking water outlet.
6. Clean the end of the tap using household bleach and a paper towel or cotton swab.
7. Allow cold water to flow for approximately five (5) minutes (long enough to clear the service line).
8. Open the container.
9. Do not remove the powder if it is already inside the container. Do not rinse the container.
10. Do not touch the inside of the screw cap or the mouth of the bottle.
11. Do not lay the cap thread-side down.
12. If the water sample bottle does not contain a preservative, it will need to be added by a competent person. Review the Safety Data Sheet (SDS) carefully and follow all recommended health and safety precautions when handling corrosive chemicals.
13. Reduce water flow.
14. Place the open container under the tap and fill to the indicator line.
15. Do not turn off the water or adjust the water flow rate during sampling.
16. Remove the container from under the water.
17. Close the lid.
18. Dry and label the container.
19. Document sample details, including the date, time, building, room, outlet type (faucet or fountain) and timing of sample (e.g. 0 min). The presence of a strainer or aerator on a tap should be noted, as well as the presence of a filter or refrigeration unit.
20. Keep the water sample refrigerated until delivery. Do not freeze.
21. Submit samples to analytical lab within time restriction specified by the lab.

* Procedure based on NL Public Health Laboratory instructions for water testing

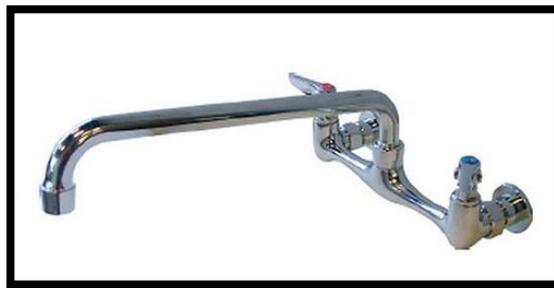


Figure 1. Example of a swing nozzle faucet (tapphong.com)