

DRINKING WATER SAFETY

in Newfoundland and Labrador

2019
Annual Report


Newfoundland
Labrador



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EXECUTIVE SUMMARY

The Multi-Barrier Strategic Action Plan (MBSAP) has three levels with various components in each level enhancing the safety of public drinking water systems in Newfoundland and Labrador as highlighted below. This report describes the initiatives, activities and accomplishments pertaining to the MBSAP for drinking water safety of public drinking water systems for the 2018–19 fiscal year. This is the 18th annual report prepared by the Department of Municipal Affairs and Environment, Government of Newfoundland and Labrador.

Highlights of MBSAP component indicators for the 2018–19 fiscal year include:

Level I Source Protection and Distribution

- 324 protected public water supply areas in the province
- 111 land use referrals reviewed for proposed activities concerning protected public water supply areas
- 54 permits issued for development activity in a protected public water supply area
- Five watershed management committees
- 497 disinfection systems, 140 drinking water treatment systems, 20 water treatment plants (WTPs), and 31 potable water dispensing units (PWDUs)
- 128 permits issued to construct water and sewer infrastructure
- \$43,072,359 approved for water infrastructure projects

Level II Monitoring and Enforcement

- 194 active boil water advisories (BWAs) as of March 31, 2019
- 18,850 bacteriological samples and 3,597 chemical and physical water quality samples were collected
- Bacteriological and chemical drinking water quality exceedances recorded (Table 11)
- 1,157 seasonal community updates were available through the water resources portal
- 19 regulatory inspections/investigations performed
- 21 education and 93 on-site training seminars conducted
- 542 certified water or wastewater system operators
- 249 participants at the 2019 Annual Drinking Water Safety Workshop
- Corrective measures undertaken (Table 16)

Level III Public Policy

- Development and Delivery of Community Workshop and Mentoring Program for the Reduction of Boil Water Advisories in Newfoundland and Labrador
- Revised drinking water quality guideline for lead adopted

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MESSAGE FROM THE MINISTER

As the Minister of Municipal Affairs and Environment, I am pleased to present the 2019 Annual Report on Drinking Water Safety in Newfoundland and Labrador. The Provincial Government is committed to protecting and supporting the safety of clean drinking water supplies for Newfoundlanders and Labradorians.

Newfoundland and Labrador's Drinking Water Program is guided by the framework under the Multi-Barrier Strategic Action Plan, and it provides a comprehensive and adaptive outline for managing and ensuring the safety of public drinking water systems. This plan is a joint effort between the departments of Municipal Affairs and Environment, Health and Community Services, and Service NL, as well as Regional Health Authorities, and the owners and operators of public water supply systems.

Work has been ongoing on the development of an action plan to further protect drinking water systems. The plan will address infrastructure, expertise, and technology to ensure that our provincial drinking water systems are safe and sustainable, with the mission of reducing the number of long-term boil water advisories to the greatest extent possible.

The department works with communities to reduce long-term boil water advisories and protect the integrity of their drinking water systems. There are currently 542 certified water or wastewater system operators providing monitoring and enforcement for our drinking water supplies.

The province is reducing boil water advisories by training and assisting operators in maintaining water systems; funding a regional water operators pilot program with the Regional Service Boards; offering optimal cost-shared ratios for communities to improve water systems; and providing funding for water treatment systems and potable water dispensing units.

I commend staff of the department and our partners for their tireless commitment and dedication to provide clean, safe and reliable drinking water to the people of Newfoundland and Labrador.

Sincerely,

A handwritten signature in black ink, appearing to read 'Derrick Bragg', written over a light blue background.

Honourable Derrick Bragg
Minister of Municipal Affairs and Environment

Drinking
Water Safety in
Newfoundland
and Labrador

2019
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INTRODUCTION

This report highlights the initiatives, activities and accomplishments of the departments that implemented the Multi-Barrier Strategic Action Plan (MBSAP) in the 2018–19 fiscal year (April 1, 2018, to March 31, 2019). The report describes the three levels of the MBSAP and their various components (Figure 1). It illustrates how government is implementing the MBSAP.

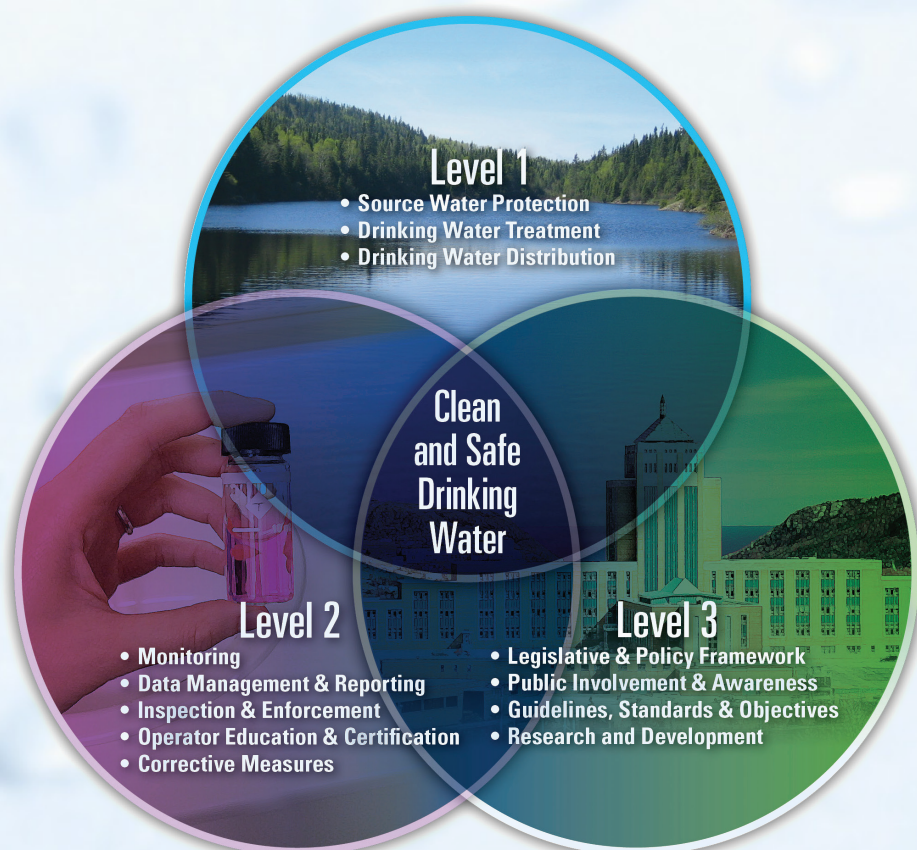
The MBSAP is considered to be the most effective method of managing drinking water systems and has been implemented by other jurisdictions throughout Canada.

The implementation of the MBSAP involves the collaborative efforts of three provincial government departments:

1. Municipal Affairs and Environment (lead department)
2. Health and Community Services
3. Service NL

In this report, indicators are reported for various components of the MBSAP. Information is reported for the current fiscal year alongside of previous fiscal years in order to evaluate performance of the existing drinking water framework. In addition, illustrations of technical work related to drinking water in this province are highlighted.

Figure 1: The Multi-Barrier Strategic Action Plan



LEVEL I

The components of the first level of the MBSAP protect drinking water from the source to the tap.

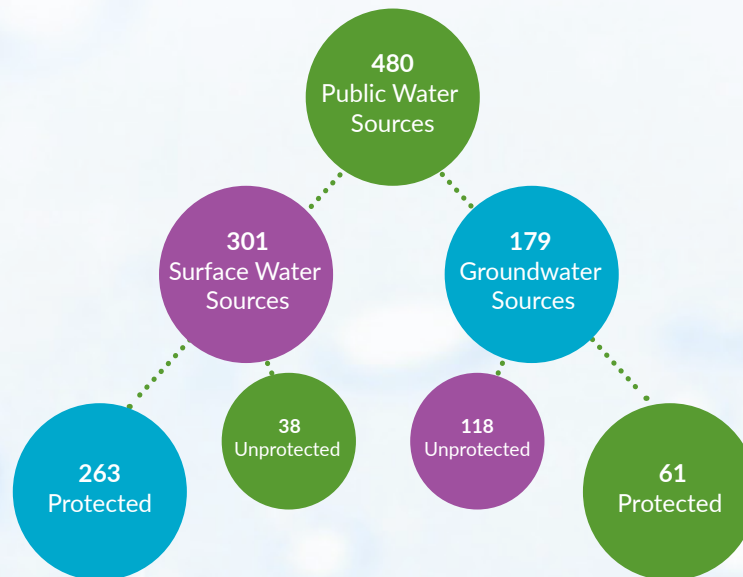
The three components of Level I of the MBSAP are:

1. source water protection
2. drinking water treatment
3. drinking water distribution

Source Water Protection

Protected public water supply areas (PPWSAs) are protected under Section 39 of the Water Resources Act. These PPWSAs service a population of 414,393, representing ninety-four per cent of the population serviced by public drinking water systems. Figure 2 shows the status of public water sources for fiscal year 2018–19.

Figure 2: Status of Public Water Sources



The Department of Municipal Affairs and Environment encourages all communities to begin the protection process for new or existing drinking water sources if they have not already done so.

Watershed Management

The Water Resources Management Division (WRMD) regulates development activities within protected public water supply areas. WRMD uses a number of tools to monitor such activities, including:

- referrals from the Interdepartmental Land Use Committee (ILUC), Fisheries and Land Resources (Crown Lands Administration Division), Natural Resources and other divisions within MAE (Environmental Assessment (EA) and Local Governance and Planning Division)
- permits for development activity
- watershed management plans
- watershed management committees
- community monitoring and inspections
- regulatory inspections

Referrals

In the 2018–19 fiscal year, the WRMD processed 111 referrals from various departments for proposed activities concerning PPWSAs as outlined in Table 1.

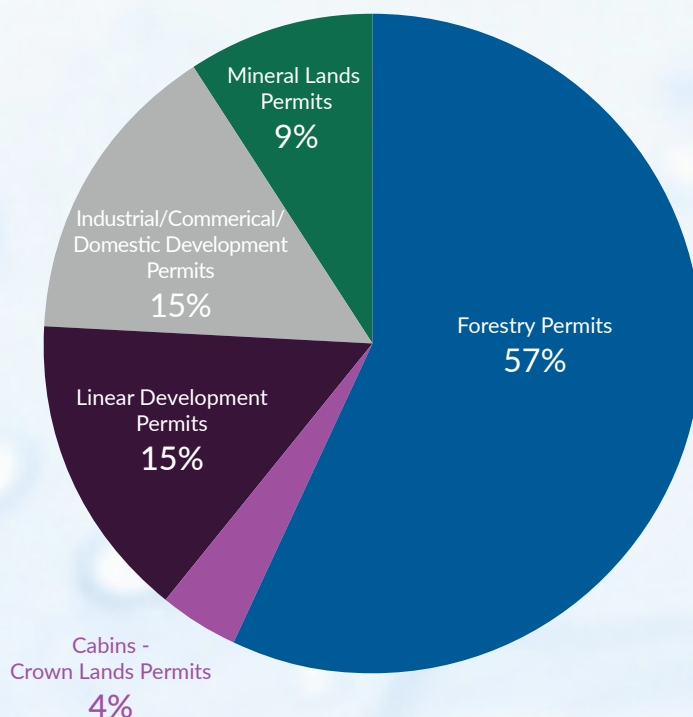
Table 1: Number of Referrals Processed

Type of Referral					Total
Fisheries and Land Resources (Crown Lands)	Natural Resources	ILUC	Municipal Affairs and Environment (Environmental Assessment)	Other	
54	50	6	0	1	111

Activity Permits

All activities in a PPWSA (either a protected public water supply area, or a wellhead protected water supply area) require a permit under the Water Resources Act. During the 2018–19 fiscal year, 54 development activity permits were issued. Figure 3 illustrates the distribution of development permits by type. Figure 4 shows the total number of permits issued for development activities within a PPWSA for each fiscal year since 2014-15.

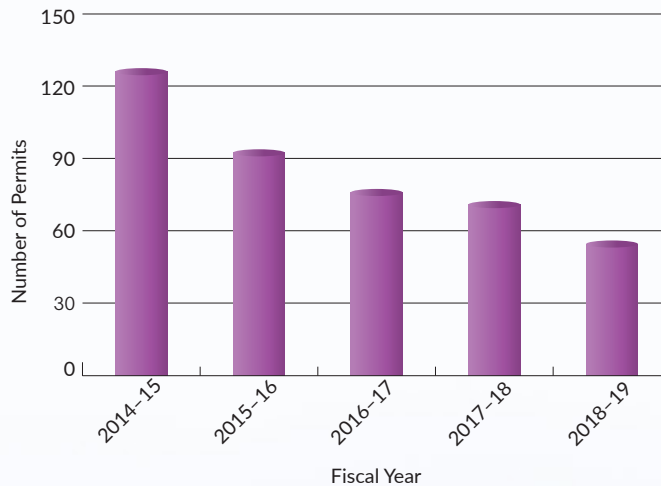
Figure 3: Type of Development Permits



The top developmental activities for which permits were issued include:

1. forestry activities
2. industrial/commercial/domestic developments and linear development permits

Figure 4: Permits Issued per Fiscal Year



Watershed Management Committees

Watershed management committees are formed to oversee land use management, potential development, and resource use conflict inside a PPWSA. Some committees develop watershed management plans (WMP) to help manage the watershed. The active watershed management committees in the province during 2018-19 were located in:

- Clarenville
- Corner Brook (WMP)
- Gander (WMP)
- Grand Falls-Windsor
- Steady Brook (WMP)

Drinking Water Treatment

Water treatment strategies are used to address different water quality issues and to treat the water before it is consumed.

Disinfection

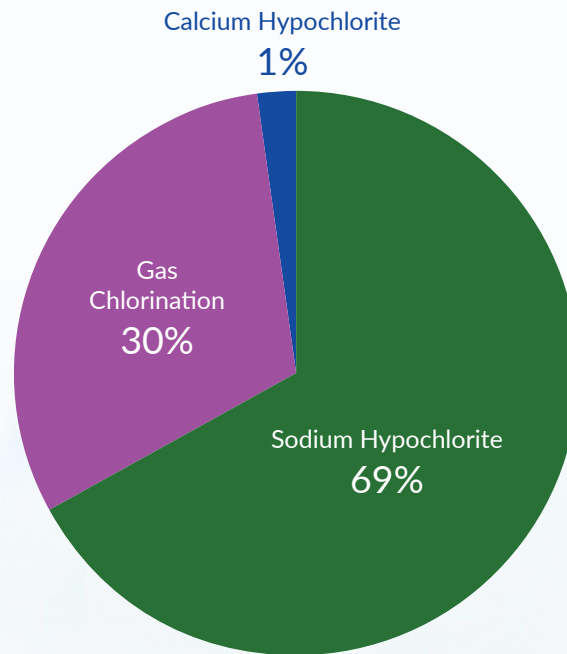
The most critical aspect of water treatment is disinfection as it ensures the pathogenic safety of drinking water. While there are several forms of disinfection used in the treatment of drinking water, chlorination is the most commonly used disinfection method in the province. The different disinfection methods used in the province are listed in Table 2.

Table 2: Number of Disinfection Systems in Newfoundland and Labrador

Type of Disinfection System					
Chlorination	Ultraviolet Light	Mixed Oxidants	Ozone	Chloramines	Hydrogen Peroxide
450	33	8	3	2	1

There are a number of different chlorination system types in the province. Figure 5 illustrates the distribution of these systems in 2018-19.

Figure 5: Chlorination Systems Used in Newfoundland and Labrador



Parameter Specific Drinking Water Treatment

Mitigative measures have been implemented in numerous drinking water systems to alleviate water quality challenges related to various local parameters (e.g., pH). Table 3 shows the number and type of drinking water treatment systems operational in the province as of the 2018-19 fiscal year.

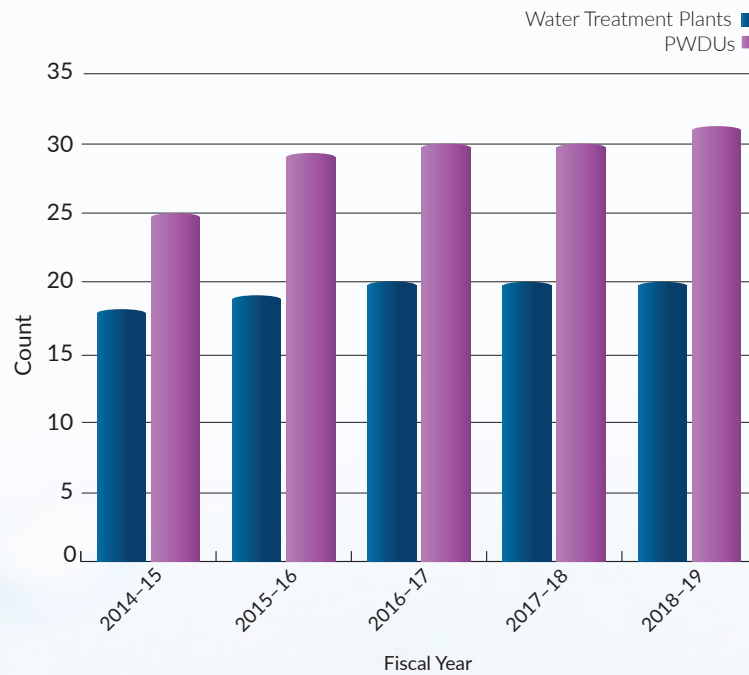
Table 3: Number of Water Treatment Systems in Newfoundland and Labrador

Type of Drinking Water Treatment System						
pH adjustment	Micron/pressure filters	Infiltration galleries	Arsenic removal	Iron/Manganese removal	Lead removal	Strontium removal
57	41	25	10	5	1	1

Water Treatment Plants

As of March 31, 2019, 51 water treatment plants are in place in Newfoundland and Labrador (this number includes 31 potable water dispensing units). Figure 6 illustrates the total number of water treatment plants in Newfoundland and Labrador for each fiscal year since 2014-15.

Figure 6: Water Treatment Plants per Fiscal Year



Drinking Water Distribution

The drinking water distribution system is the largest component of physical infrastructure that ensures drinking water safety. It includes all the pipes, valves, service lines, pumping stations, fire hydrants, and storage facilities required to deliver clean and safe drinking water.

In fiscal year 2018-19, there were 512 public water distribution systems in the province. Table 4 shows the breakdown of the number of water distribution systems for 2018-19. Sixty-five per cent of public water distribution systems fall into the “≤ 500” classification.

Table 4: Public Water Distribution System Classes for 2018-19

Size (population serviced)	> 50,000	15,001 - 50,000	1,501 - 15,000	501 - 1,500	≤ 500	Unknown	Total
Count	1	5	37	81	333	55	512

During the 2018-19 fiscal year, the Department of Municipal Affairs and Environment approved \$43,072,359 for water related projects. Table 5 provides a breakdown of initiatives from April 1, 2018 to March 31, 2019.

In 2018-19, the Department issued seven permits to operate for drinking water systems and 128 permits to construct under Sections 36, 37, 39 and 48 of the Water Resources Act. The total number of active permits to operate for drinking water systems at the end of the 2018-19 fiscal year was 324. Figure 7 shows the number of permits to construct issued for each fiscal year since 2014-15.

Table 5: Funding Approved for 2018-19

Category	Funding (\$)*
New Water Supply Infrastructure	\$5,947,841
Upgrades to Water Supply Infrastructure	\$7,081,274
New Water Distribution	\$2,770,000
Upgrades to Water Distribution	\$10,505,493
New Drinking Water Treatment	\$ 933,795
Upgrades to Drinking Water Treatment	\$1,037,739
Joint upgrades/extensions to water distribution/ sewage collection systems	\$14,345,217
DWSI/PWDU**	\$220,000
Studies	\$231,000
Total	\$43,072,359

*Provincial share less GST amounts shown.

**Drinking Water Safety Initiative/Potable Water Dispensing Units.

Figure 7: Number of Permits to Construct per Fiscal Year



LEVEL II

The standard of performance achieved in Level I of the MBSAP is verified through the components of Level II. The five components in Level II of the MBSAP are:

1. monitoring
2. data management and reporting
3. inspection and enforcement
4. operator education, training, and certification
5. corrective measures

Monitoring

Drinking water quality monitoring consists of regular sampling and testing of drinking water from both the source and the tap. The extensive monitoring program for drinking water quality in the province is a joint responsibility shared by the Departments of Municipal Affairs and Environment, Health and Community Services, and Service NL.

Bacteriological and Chemical Water Quality

Bacteriological Water Quality

Through the Department of Service NL, Environmental Health Officers and Environmental Technicians collect tap water samples from public drinking water supplies for analysis of bacteriological parameters. The parameters monitored include total coliforms and Escherichia coli (E. coli). During 2018-19, 18,850 public water supply bacteriological samples were collected and tested. Figure 8 shows the total number of bacteriological samples that were collected and tested for each fiscal year since 2014-15.

Figure 8: Bacteriological Samples Tested per Fiscal Year



The number of bacteriological samples tested at each regional drinking water testing facility is shown in Table 6.

Table 6: Number of Bacteriological Samples Tested in Each Region for 2018–19

Region					Total
St. John's	Eastern	Central	Western	Northern	
8,167	1,091	4,011	4,221	1,360	18,850

Bacteriological Parameters: Results

Based on the analysis of bacteriological parameters for public drinking water samples taken during the 2018–19 fiscal year, 656 public water supply samples tested were found to be unsatisfactory in terms of total coliforms. An unsatisfactory result indicates the presence of total coliforms and/or E. coli bacteria counts in the sample. Table 7 shows the per centage of samples found to be unsatisfactory for total coliforms at each regional drinking water testing facility for the fiscal year 2018–19 .

Table 7: Per centage of Unsatisfactory Samples by Region for Total Coliforms for 2018–19

Sample Numbers by Region	Region				
	St. John's	Eastern	Central	Western	Northern
Unsatisfactory samples	175	59	179	235	8
Per cent of Exceedances by Region (%)	27	9	27	36	1
Per cent of Samples Collected with an Exceedance (%)	2	5	4	6	0.6

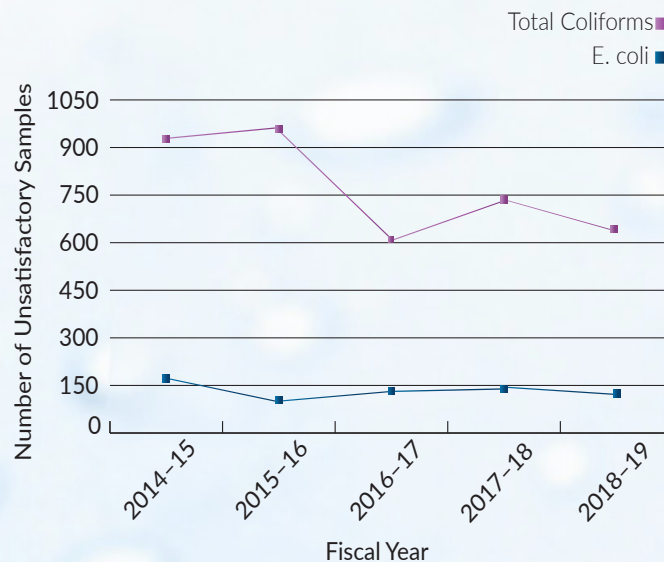
There were 109 bacteriological samples tested that were found to be unsatisfactory in terms of E. coli. Table 8 shows the per centage of samples found to be unsatisfactory for E. coli., at each regional drinking water testing facility, for the fiscal year 2018–19.

Table 8: Per centage of Unsatisfactory Samples by Region for E. coli for 2018–19

Sample Numbers by Region	Region				
	St. John's	Eastern	Central	Western	Northern
Unsatisfactory samples	24	6	26	53	0
Per cent of Exceedances by Region (%)	22	5	24	49	0
Per cent of Samples Collected with and Exceedance (%)	0.3	0.5	0.6	1.3	0

The number of unsatisfactory samples for total coliforms and E. coli for each fiscal year since 2014–15 is shown in Figure 9.

Figure 9: Unsatisfactory Bacteriological Samples per Fiscal Year

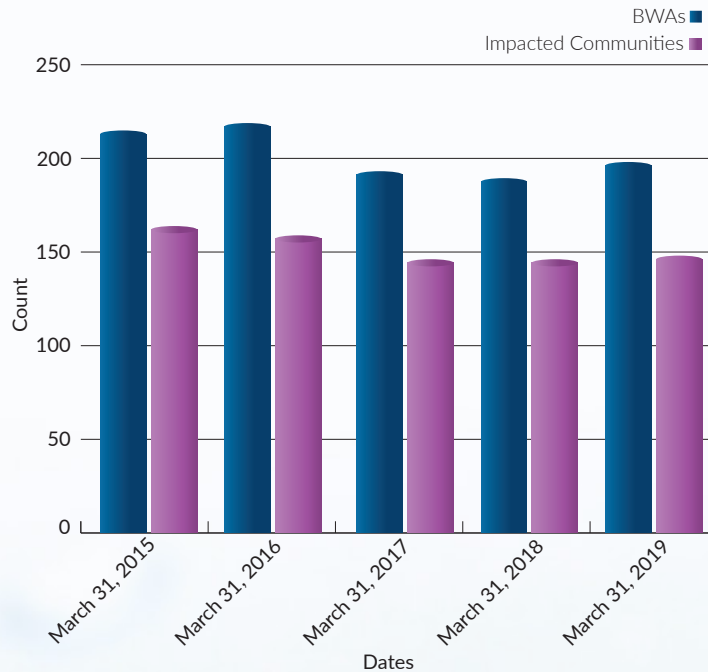


*Escherichia coli (E. coli) is considered a good indicator of recent fecal contamination of drinking water and the possible presence of disease causing microorganisms.

Boil Water Advisories

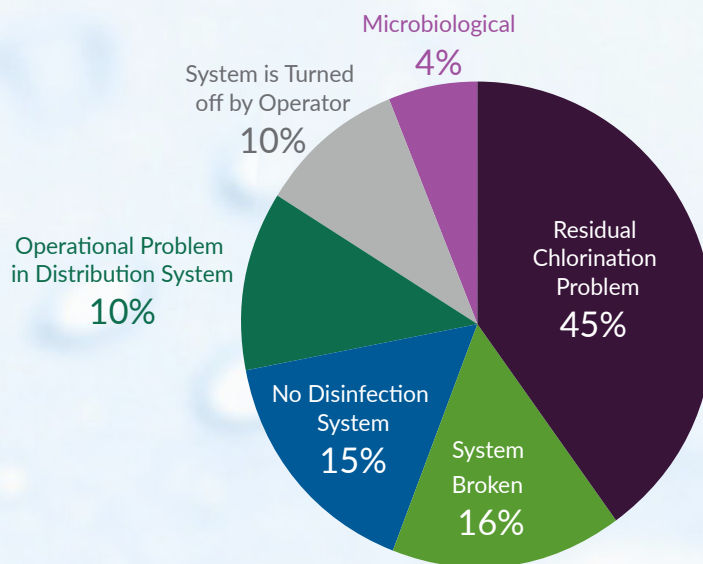
Boil water advisories are preventative measures for protecting public health from waterborne microbiological contamination that may, or are known to be, present in drinking water. A BWA is also issued when water quality is questionable due to operational deficiencies (such as inadequate chlorine residual), no disinfection system, or the water in a community's water system is contaminated with bacteriological indicators (such as total coliforms). Figure 10 shows a comparison of BWAs at the end of each fiscal year since March 31, 2015.

Figure 10: Number of BWAs and Number of Communities Affected



On March 31, 2019, 194 BWAs were in effect (this includes long-term BWAs), affecting 148 communities in the province, with an impacted population of 57,616 (13% of total population). Figure 11 illustrates the distribution of existing BWAs by reason used to issue the advisory for the 2018–19 fiscal year.

Figure 11: Reasons for BWAs



Long term BWAs are BWAs that have been in effect for a period of five years or greater at the end of the March 31, 2019. A total of 131 BWAs have been in effect for a period of five years or greater.



BWA Reduction Initiative Workshop – Grand Falls - Windsor

HIGHLIGHT

Boil Water Advisory Reduction Initiative: Community Workshops

In April 2015, the Government of Newfoundland and Labrador announced a new Community Sustainability Partnership. One of the capacity supports announced as part of this partnership was the Boil Water Advisory (BWA) Reduction Initiative. This initiative involves the development of solutions by external consultants with the goal of reducing the number of BWAs. During 2018-19, the initiative included the development and delivery of four community workshops (St. John's, Clarenville, Grand Falls-Windsor, and Deer Lake).

The key goals of the workshops were to provide communities on active BWAs with the technical knowledge and resources to address the cause of their BWA, identify the barriers that are preventing them from having the BWA lifted, and provide direction on how to build their financial and managerial capacity. The workshop included informational presentations, hands-on demonstrations, and group brainstorming activities. The workshops attracted 92 participants including community representatives (elected officials, staff, and water system operators) and multiple government departments.

The community workshops were developed and delivered by Wood Environment and Infrastructure Ltd., in conjunction with the Department of Municipal Affairs and Environment. Videos of the workshop sessions held in St. John's are available on the Department's website ([youtube.com/user/NLWaterResources](https://www.youtube.com/user/NLWaterResources)).

Chemical and Physical Water Quality

The number of chemical and physical water quality samples taken by region for 2018–19 are presented in Table 9. Analysis of chemical and physical parameters is performed by an accredited lab ensuring that the laboratory provides quality and competency in its sample analysis.

Table 9: Number of Samples Taken by the Department for 2018–19

Region	Source	Tap	THM	HAA	Total
Eastern	88	368	434	432	1,322
Western	39	305	354	355	1,053
Central	53	206	333	332	924
Labrador	12	66	104	104	286
Other (Special)	9	1	1	1	12
Total	201	946	1,226	1,224	3,597

In 2018–19, the department collected 3,597 samples. Table 10 shows the number of samples scheduled and the number actually taken for 2018–19.

Table 10: Number of Samples Scheduled and Collected by the Department for 2018–19

Type of Sample	Scheduled	Collected
Tap	953	946
Trihalomethanes	1,295	1,226
Haloacetic acids	1,295	1,224
Source	279	201
Total	3,822	3,597

The reasons that some samples were not taken are as follows:

- town was not chlorinating at the time of sampling (THM and HAA samples)
- water supply not operating at the time of sampling (tap, THM and HAA samples)
- no sample location available at the time of sampling (very small systems)
- source inaccessible

Every year, the department schedules special parameter monitoring. In 2018–19, a special parameter monitoring program was conducted for manganese speciation. An event based sampling program was also conducted for high precipitation events.



Debris Observed During Event-based Sampling

HIGHLIGHT

Event Based Sampling of Surface Water Drinking Water Supplies

Event based sampling is the collection of water quality data during periods of increased water runoff and discharge, with a primary objective of determining potential changes in water quality parameters. When extreme events occur, the samples collected can create outliers which in turn establish better representative data sets. A discharge event can be caused by various factors (e.g., heavy rainfall and runoff, excessive snowmelt) and may affect the water quality dataset when compared to the historical data record.

Event based samples have been taken by the Department of Municipal Affairs and Environment since 2016 to compare to the historical dataset that has been routinely collected since the 1980s. Five communities, Torbay, Grand Falls-Windsor, Hughes Brook, Meadows and Clarendville, have been sampled during increased water discharge events and were analyzed using a variety of different statistical methods to determine if there are significant differences in water quality parameters between the event based samples and the historical dataset.

For the purposes of this study, an event-based sample was typically collected when there was a rainfall event of approximately 20 mm or greater. If there was a significant and rapid snowmelt in the spring, a sample would also be collected to represent this melt-runoff event.

From statistical analysis it was determined that:

- Turbidity increased in all types of surface water sources after an event, and increased more significantly in stream/river type sources.
- Iron increased in all types of surface water sources after an event, and increased more significantly in stream/river type sources.

It is important to design drinking water treatment systems for the worst-case drinking water quality conditions that can be expected and that may not be represented in the historical dataset. The Water Resources Management Division is continuing their event sampling protocol for the above listed communities to continue to collect data. It is also important to understand the impacts that climate change may have on drinking water quality in the province.

Chemical and Physical Parameters: Results

Results for chemical and physical parameters are sent to the department when laboratory analysis is complete. The department then evaluates the results by comparing them to current Guidelines for Canadian Drinking Water Quality (GCDWQ). Water quality results are compared to the GCDWQ to identify exceedances in chemical and physical parameters that may pose a risk to human health or aesthetic approval of drinking water.

Table 11 summarizes the tap water bacteriological, chemical and physical parameter exceedances for fiscal years 2016–17, 2017–18 and 2018–19. When an exceedance is confirmed for a parameter that may pose risk to human health, an exceedance report is promptly provided to the community, as well as the departments of Health and Community Services and Service NL. Exceedances for aesthetic parameters are also reported to communities, along with all other parameter results, in quarterly drinking water quality updates. Communities and the public can access this drinking water quality data through the WRMD's Water Resources Portal online at: maps.gov.nl.ca/water/. WRMD's sampling and reporting procedures are in the Drinking Water Quality Monitoring Manual, which can be viewed at: gov.nl.ca/mae/waterres/quality/drinkingwater/chemical/

Data Management and Reporting

The large volume of data acquired during the implementation of the various components of the MBSAP must undergo a stringent quality assurance/quality control (QA/QC) process before it can be compiled, analyzed, and reported to the public. The WRMD strives to collect quality data and report it to the public in an open and timely manner. Table 12 summarizes the reports used to communicate the results from programs related to drinking water quality.

Table 11: Exceedances per Fiscal Year

Department	Exceedances					
	Parameters		2016-17*	2017-18	2018-19	Per cent of Samples Collected with Exceedances for 2018-19 (%)
Service NL	Bacteriological	Escherichia coli	117	137	109	0.6
		Total coliforms	611	730	656	3.5
Municipal Affairs and Environment	Chemical and Physical	Turbidity	70	71	96	8.4
		Arsenic	6	4	5	0.4
		Barium	0	0	0	0
		Fluoride	1	1	1	0.09
		Lead	8	4	1	0.09
	Disinfection By-Products	Trihalomethanes (THMs)	62	145	112	9.1
		Haloacetic Acids (HAAs)	62	144	134	11
	Aesthetic	Colour	312	478	437	38
		pH	254	294	221	19
		Total Dissolved Solids	11	15	16	1.4
		Chloride	6	11	6	0.5
		Sodium	6	9	2	0.2
		Sulphate	1	1	2	0.2
		Copper	6	6	1	0.09
		Iron	97	135	71	6.2
Manganese		63	78	48	4.2	

*Exceedance in some parameters are lower than previous years as statistics reflect an interruption in chemical water testing in the central region during the reporting time frame.

HIGHLIGHT

Revised Lead Guideline for Canadian Drinking Water Quality (GCDWQ)

Lead is a metal found naturally in the environment. There are very few areas in Newfoundland and Labrador that have high natural levels of lead in the source drinking water. Lead is usually found in drinking water as a result of leaching from service lines and plumbing system components. Historically, lead has been used extensively in service lines, solders and fittings, making its presence in drinking water more likely in older homes and neighbourhoods (Health Canada, 2016). Service lines and fittings in the home or building being serviced are more likely to have lead components than the public portion of the drinking water distribution system.

A revised Canadian Drinking Water Quality Guideline (GCDWQ) for lead was adopted by Health Canada on March 8, 2019. The previous guideline was a maximum acceptable concentration (MAC) of 0.01 mg/L. The new guideline is a MAC of 0.005 mg/L. Health Canada revised the previous guideline value (0.01 mg/L) for lead because new scientific studies have shown that health effects can occur from exposure to lead at much lower levels than previously thought.

Leaching of lead from pipes and fixtures is affected by pH levels in water as they affect the corrosiveness of the water; the lower the pH, the more corrosive the water. Many waters in the province have naturally low pH. Drinking water systems with chlorine gas disinfection systems also tend to have lower pH as the chlorine gas suppresses pH. Several communities in the province have pH adjustment systems to help raise the pH of their drinking water. PWDUs have also proven effective at lowering lead levels in drinking water.

Temporary methods to reduce your intake of lead from drinking water include:

- Let your drinking water run for two or three minutes in the morning, or after being away from home for over a day.
- Use water from the cold tap for drinking, cooking or making baby formula, as water from hot water tanks may have higher levels of lead.

Available corrective measures to permanently reduce lead in drinking water systems include:

- Removal of components with lead content in the distribution system such as lead pipes, brass valves, brass water meters, etc.
- Removal of lead components in the user system (i.e., service line to the plumbing in the home, building or institution; lead soldering, fixtures, etc.)
- Installation of pH adjustment system
- Addition of corrosion inhibitor system
- Installation of lead removal system (only applicable for naturally occurring lead in the source)

More information on lead and lead monitoring in drinking water systems is available at:
gov.nl.ca/mae/files/waterres-training-operator-onsite-training-lead-monitoring.pdf

Table 12: Types of Public Reports Produced by the Department

Type	Description
<p>Seasonal Community Drinking Water Quality Updates</p>	<p>As of May 1, 2016, the department switched from paper reporting to a paperless format for all communities with public drinking water systems. Communities are now sent an email when seasonal data is updated. The data is available on the Water Resources Portal. These reports clearly indicate any parameters that exceed the Guidelines for Canadian Drinking Water Quality. The province recommends that communities post these reports in public locations. In the 2018–19 fiscal year, 1,157 seasonal community updates were available through the portal.</p>
<p>Exceedance Reports</p>	<p>Exceedance reports are provided to communities when a chemical analysis result is above the Guidelines for Canadian Drinking Water Quality for a contaminant. These reports are faxed or mailed to the affected community as soon as the department receives the results. In the 2018–19 fiscal year, seven exceedance reports (five arsenic, one lead, one fluoride) were sent to communities.</p>
<p>Annual Drinking Water Safety in Newfoundland and Labrador Report</p>	<p>The Annual Drinking Water Safety in Newfoundland and Labrador Report has been published each year since 2001. It outlines accomplishments and activities under the Multi-Barrier Strategic Action Plan for drinking water safety in a particular fiscal year.</p>
<p>Web Documents on Drinking Water Quality</p>	<p>The WRMD’s website is an important tool used to communicate with the public. It is updated regularly with new information on drinking water quality and related topics. The “News and Highlights” page, lists the most current information and is available at: gov.nl.ca/mae/waterres/whatsnew/</p>

Inspection and Enforcement

The Water Resources Act states that a permit holder shall allow inspectors to carry out inspections of an activity for which a license or permit has been issued. Investigations can also occur once the department is made aware of a contravention of the Water Resources Act or associated regulations and permits. Departmental staff conduct inspections of water supply systems under construction, the operation of water treatment and distribution systems, groundwater wells being drilled, and activities taking place in PPWSAs to ensure that they comply with the terms and conditions of the permit. Communities should conduct routine surveillance and monitoring for approved development activities within PPWSAs to ensure existing activities are being conducted in an environmentally acceptable manner and that there are no development activities taking place without prior approval from the department. Investigations are typically issue-specific.

In the 2018–19 fiscal year, departmental staff carried out a total of 19 inspections/investigations. In addition, staff visited public water supplies two to four times a year during scheduled monitoring work. Table 13 presents a breakdown of inspections for 2018–19.

Table 13: Inspections by the Department for 2018–19

Protected Surface Water Supplies	Water and Sewer	Protected Groundwater Supplies*	Total
4	12	3	19

*Groundwater source sampling was completed in 2018-19, however, wellhead inspections were not completed due to staffing changes.

One of the department’s main goals is to ensure communities achieve clean and safe drinking water in a sustainable and efficient manner. When non-compliance with the Water Resources Act or conditions of a permit is reported, the WRMD responds to enforce the permit.

Operator Education, Training, and Certification

Certified operators are integral to the proper operation and maintenance of the systems that supply clean and safe drinking water to the consumer. Through continuing education, training, and certification, the department addresses the need for qualified drinking water treatment and distribution system operators in this province. During the 2018–19 fiscal year, 21 drinking water related classroom seminars were held at 12 locations across the province.

Operator Training

The operator training program provides municipal drinking water system operators with hands-on training opportunities. The program utilizes three mobile training units that have been equipped with various equipment and tools used in the operation and maintenance of drinking water systems. Training sessions are delivered on-site in the operator’s community to maximize accessibility to the training opportunities. During 2018–19, the province’s three operator trainers conducted 93 on-site training sessions throughout the province. These sessions were attended by a total of 204 participants.

Operator Certification

Certification is an essential component for the operation of a safe drinking water system. There are 542 certified water or wastewater operators in Newfoundland and Labrador. Sixty-six operators achieved their first level of certification in 2018–19. Table 14 contains the total number of operator certificates issued by classification.

Table 14: Total Number of Operator Certificates Issued for 2018–19

Water Distribution	Water Treatment	PWDU	Very Small Water Systems	Wastewater Collection	Wastewater Treatment	Total Certificates
35	16	1	3	26	14	95

Table 15 summarizes the number of communities in Newfoundland and Labrador that employ at least one certified operator divided by classification.

Table 15: Number of Communities Employing Certified Operators

Water Distribution	Water Treatment	Potable Water Dispensing Units	Very Small Water Systems	Wastewater Collection	Wastewater Treatment
122	25	2	7	59	24

*The above numbers do not include industrial facilities that employ certified operators - only municipalities.

Annual Clean and Safe Drinking Water Workshop

The Annual Clean and Safe Drinking Water Workshop is open to all community operators and administrators. It brings together drinking water quality stakeholders and provides them with opportunities to learn about drinking water safety, to exchange information, and to share experiences. The presentations delivered throughout this event are carefully chosen to address specific challenges faced by small communities in providing clean and safe drinking water.

The 2019 Clean and Safe Drinking Water Workshop took place on March 28 - 30, 2019, in Gander. The workshop attracted 249 participants from across the province and country. A travel subsidy is provided to attendees by the Department of Municipal Affairs and Environment to attend the workshop. Communities from the island portion of the province that were approved for the subsidy were reimbursed up to \$400, and communities from Labrador that were approved for the subsidy were reimbursed up to \$700.

HIGHLIGHT

2019 Operator of the Year Awards

The Department of Municipal Affairs and Environment created the Operator of the Year Awards to recognize the outstanding dedication of municipal operators in providing clean and safe drinking water. Community representatives across the province were invited to nominate an operator they felt had made an outstanding contribution. In total, 20 nominations were submitted to the selection committee for consideration in two categories: Volunteer Operator of the Year and Operator of the Year.

The Volunteer Operator of the Year Award was created to honour an individual that operates a municipal drinking water system without monetary compensation. The 2019 Award was presented to Mr. Danny Keats from the Local Service District of Smith Sound. Mr. Keats has been a volunteer water system operator in Smith Sound for four years. He has donated countless hours to the operation of the drinking water system and to the people of his community without asking for a helping hand or having any complaints. Mr. Keats has successfully developed a good relationship with the LSD Committee and the water system users.

The 2019 Operator of the Year Award was presented to Mr. Jerry Spurrell, Town of Trinity Bay North. Mr. Spurrell has worked with the Town of Trinity Bay North for over 10 years and has achieved his Class 2 Water Distribution and Class 1 Wastewater Collection certifications. Jerry is responsible for a water system that services approximately 1,820 residents in four communities along 15 km of coastline. He exhibits a commitment to quality assurance and quality control in concert with concerns for the well-being of the environment and is dedicated to ensuring safe and clean drinking water for the residents of Trinity Bay North.



Award recipients Jerry Spurrell (center) and Danny Keats (right) receive awards from the Minister of Municipal Affairs and Environment (left)

Corrective Measures

The Level II components of the MBSAP provide an ongoing picture of drinking water supply, quality, and infrastructure. The issues identified require the implementation of corrective actions to deal with these challenges. Corrective measures can include structural, non-structural, operational techniques and other best management practices.

There are five classes of corrective measures: policy, design, water system management, water treatment alternatives, and source alternatives. Table 16 shows the progress made in each category of corrective measures.

Table 16: Corrective Measures Undertaken for 2018-19

Corrective Measure	Description
Policy	<ul style="list-style-type: none"> • Year 18 of the Multi-Barrier Strategic Action Plan for Safe Drinking Water in Newfoundland and Labrador • The Interdepartmental Safe Drinking Water Technical Working Group met three times
Design	<ul style="list-style-type: none"> • Updating the Newfoundland and Labrador Guidelines for the Design, Construction and Operation of Water and Sewerage Systems to the Newfoundland and Labrador Guidelines for the Design of Drinking Water Systems underway
Water System Management	<ul style="list-style-type: none"> • Ongoing operator education, training and certification • Permits to Construct issued relating to water system management: <ul style="list-style-type: none"> • New or replaced watermains – 85 • New or upgraded pumps or pumphouses – 8 • New or upgraded valves – 7 • New or upgraded flow meters – 2 • New or upgraded hydrants/flush hydrants – 2 • New or upgraded intakes – 6 • New or upgraded storage tanks – 2 • 7 Permits to Operate issued for drinking water systems (Lourdes, Channel-Port aux Basques, St. John's (Petty Harbour-Long Pond), Happy Valley-Goose Bay, Harbour Breton, Gander, Lark Harbour).
Water Treatment Alternatives	<ul style="list-style-type: none"> • Permits to Construct issued relating to water treatment: <ul style="list-style-type: none"> • New chlorination systems – 6 • New Fe/Mn Removal systems – 1 • New filtration systems – 1 • Potable Water Dispensing Units – 1 • Water treatment plant upgrades – 1

LEVEL III

The management of drinking water depends on the contribution of several levels of government as well as the public. The four components in Level III of the MBSAP are:

1. legislative and policy frameworks
2. public involvement and awareness
3. guidelines, standards and objectives
4. research and development

Legislative and Policy Frameworks

The legislation that governs public drinking water systems in the province includes the Water Resources Act, the Municipal Affairs Act, and the Municipalities Act. All of the legislation, policy directives, standards, and regulations are posted on the province's website. These three Acts contain broadly stated initiatives:

- the Water Resources Act regulates the administration of water rights, the protection of public water supply areas, and a range of construction, operation, and development permits pertaining to drinking water infrastructure and development that may impact public water supplies
- the Municipal Affairs Act administers the management of waterworks
- the Municipalities Act grants powers to municipalities for the construction, operation, and maintenance of water systems and for the allocation of funds for this work

Government also introduces regulations, guidelines and policy directives to provide more explicit direction for legislation.

Interdepartmental Cooperation

The Provincial Government's efforts to provide clean and safe drinking water are the result of the combined contributions of the departments of Municipal Affairs and Environment, Health and Community Services, and Service NL. Each department is responsible for various aspects of the MBSAP. Their efforts are coordinated by an interdepartmental committee of ministers, which is chaired by the Minister of Municipal Affairs and Environment. The committee's work is supported by the committee of deputy ministers and the Interdepartmental Safe Drinking Water Technical Working Group, which was formed in June 2000. Medical Officers of Health and representatives from the Public Health Laboratory are also members of the working group. The working group leads work on the development of policy and guidelines relating to drinking water safety.

In 2018–19, the working group focused on reducing the number of active BWAs in the province, developing a path forward for the introduction of new GCDWQ for manganese, lead and copper and improvements to the Public Health Laboratory.

Regional Operator Program

The Water and Wastewater Operator pilot program was a three-year initiative that started in 2015–16 funded through the Community Sustainability Partnerships (CSP) and has since been extended to March 31st, 2021. The main goal of the pilot program was to enhance effective operation and maintenance of municipal water and wastewater systems, in the pilot communities, in accordance with regulatory requirements and in a more efficient and cost effective manner. The program was initiated through the Department of Municipal Affairs and

Environment and Regional Service Boards in the Eastern, Central and Western Regions. Originally, the program started with 37 communities (13 in Eastern, 12 in Central, 12 in Western) and has since grown to 51 communities (20 in Eastern, 20 in Central, 11 Western). The pilot project approval letter for municipalities selected to be involved in the program indicated that municipalities selected for the water/wastewater operator pilot initiative must be actively participating in that pilot project to be eligible for receipt of the payments of Municipal Operating Grants and the share of the Provincial Gas Tax Revenues commencing April 2016.

In 2018–19, the program was expanded to include 15 more communities. These communities included Portugal Cove South, Trepassey, St. Shott's, St. Mary's, Gaskiers-Point La Haye, Leading Tickles, Phillips Head, Cottrell's Cove, Summerford, Twillingate, Upper Ferry, Tompkins, Benoit's Siding, St. Andrew's and Great Codroy. In 2019-20, the program was further expanded to include 9 additional communities. These communities included Admiral's Beach, O'Donnell's, Riverhead, St. Joseph's, Gander Bay South, Benton, Cape Freels, Dead Man's Bay and Benton. The communities were selected based on geographic proximity, assessed need, and likelihood of the community to actively participate in the program. Out of the original 37 communities and the 24 newly added ones, it was found that the following 10 local service districts have either declined to participate or are non-compliant with the conditions of the pilot program by not disinfecting their public water system: Avondale, Biscay Bay, Brigus South, Stoneville, Port Albert, Benoit's Siding, Sheaves Cove, Great Codroy, Upper Ferry and Tompkins. It has been noticed that participating communities have been able to manage their existing infrastructure better and at the same time lower costs by shifting from a reactive to a proactive approach to maintenance and repairs, engage in more effective planning exercises, and provide a higher quality level of service to residents.

The program has been useful to small rural communities. The current pilot program ends on March 31, 2021.

Public Involvement and Awareness

The department continues to provide accessible and timely drinking water quality information to the public. The department's website is a major tool for increasing public awareness and encouraging public involvement. Watershed management committees are another way the public can participate in efforts to ensure clean and safe drinking water supplies. They are excellent forums in which stakeholders can voice opinions and concerns about land management and water quality issues in their watershed areas.

The establishment of watershed management committees furthers the goals of increasing public involvement and awareness of drinking water safety issues. Sessions from the BWA Reduction Initiative community workshops can be found on the NL Water Resources channel at [youtube.com/user/NLWaterResources](https://www.youtube.com/user/NLWaterResources). The videos have been developed as part of the BWA Reduction Initiative strategy for communities, water system operators, and the general public.

Guidelines, Standards and Objectives

To ensure clean and safe drinking water, the department sets drinking water safety guidelines, standards, and objectives, and regularly reviews and updates them to address current issues and challenges. Guidelines, standards and objectives currently available on the website, gov.nl.ca/mae/waterres/regulations/policies/, include:

- Bacteriological Quality of Drinking Water
- Standards for Chemical and Physical Monitoring
- Guidelines for the Design, Construction and Operation of Water and Sewerage Systems
- Chlorination Equipment Selection Guidelines
- Best Management Practices for the Control of Disinfection by-Products in Drinking Water Systems in Newfoundland and Labrador

- Guidelines for Disinfecting Dug and Drilled Wells
- Guidelines for Sealing Groundwater Wells
- Selection Criteria and Guidelines for the Design, Construction and Operation of Potable Water Dispensing Units

Research and Development

In order to stay on top of current and emerging issues that affect drinking water safety, the department undertakes several research and development activities each year. During 2018–19, the following studies were implemented:

- Development and Delivery of Community Workshop and Mentoring Program for the Reduction of Boil Water Advisories in Newfoundland and Labrador
- Event Based Sampling of Surface Water Drinking Water Supplies in Newfoundland and Labrador
- Evaluation of New Drinking Water Filtration Systems in Newfoundland and Labrador

Weblinks:

Department of Municipal Affairs and Environment
gov.nl.ca/mae

Newfoundland and Labrador Water Resources Act
 SNL 2002 cW-4.01
assembly.nl.ca/Legislation/sr/statutes/w04-01.htm

Water Resources Management Division Reports and Publications
gov.nl.ca/mae/waterres/reports/

Newfoundland and Labrador Water Resources Portal
gov.nl.ca/mae/waterres/portal/

Protected Water Supply Area List and GIS Layers
gov.nl.ca/mae/waterres/gis/

Guidelines for Canadian Drinking Water Quality: Summary Table
canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html

Standards for Bacteriological Quality of Drinking Water
gov.nl.ca/mae/waterres/regulations/policies/standards-microbiological/

Standards for Chemical and Physical Monitoring of Drinking Water
gov.nl.ca/mae/waterres/regulations/policies/physical-monitoring/

Policy for Drinking Water Quality Monitoring and Reporting for Public Water Supplies
gov.nl.ca/mae/waterres/regulations/policies/water-quality/

Department of Municipal Affairs and Environment Drinking Water Quality Data
gov.nl.ca/mae/waterres/quality/drinkingwater/chemical/

Acts, Regulations, Policy Directives, and Water Quality Standards
gov.nl.ca/mae/waterres/regulations/policies/

Education, Training, and Certification
gov.nl.ca/mae/waterres/training/

Guidelines for the Design, Construction, and Operation of Water and Sewerage Systems
gov.nl.ca/mae/waterres/waste/groundwater/report/

Best Management Practices for the Control of Disinfection By-products in Drinking Water Systems in Newfoundland and Labrador
gov.nl.ca/mae/waterres/reports/cwws/

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gov.nl.ca/mae/waterres/reports/#1

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