



DRINKING WATER SAFETY

in Newfoundland and Labrador

2017
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 in the table below. This report describes the initiatives, activities and accomplishments pertaining to the MBSAP for drinking water safety of public drinking water systems for the 2016–17 fiscal year. This is the 16th annual report prepared by the Department of Municipal Affairs and Environment, Government of Newfoundland and Labrador.

Highlights of MBSAP component indicators for the 2016–17 fiscal year include:

Level I Source Protection and Distribution	<ul style="list-style-type: none">• 318 protected public water supply areas in the province• 235 land use referrals reviewed for proposed activities concerning protected public water supply areas• 76 permits issued for development activity in a protected public water supply area• 5 watershed management committees• 489 disinfection systems, 126 drinking water treatment systems, 20 water treatment plants (WTPs), and 30 potable water dispensing units (PWDUs)• 119 permits issued to construct water and sewer infrastructure• \$36,165,439 approved for water infrastructure projects
Level II Monitoring and Enforcement	<ul style="list-style-type: none">• 193 active boil water advisories (BWAs) as of March 31, 2017• 18,569 bacteriological samples and 2,686 chemical and physical water quality samples were collected• Bacteriological and chemical drinking water quality exceedances recorded (Table 11)• 1,071 seasonal community updates were available through the portal• 34 regulatory inspections/investigations performed• 26 education and 126 on-site training seminars conducted• 428 certified water or wastewater system operators• 292 participants at the 2017 Annual Drinking Water Safety Workshop• Corrective measures undertaken (Table 16)
Level III Public Policy	<ul style="list-style-type: none">• Update of the BWA system assessment tool• Development of fact sheets and presentations as part of the Boil Water Advisory Reduction Strategy• A video on procedures for tap water quality sampling• A video on the benefits of chlorination• A video on procedures for chlorine residual testing• Drinking water system Full Cost Accounting Assessment Tool developed

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Hon. Andrew Parsons, QC
Minister of Municipal Affairs
and Environment

MESSAGE FROM THE MINISTER

As the Minister of Municipal Affairs and Environment, I am pleased to present the 2017 Annual Report on Drinking Water Safety in Newfoundland and Labrador.

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 (lead entity), Health and Community Services, Service NL and the Regional Health Authorities.

The Provincial Government is committed to supporting the provision of clean drinking water for Newfoundlanders and Labradorians. The department works with communities to reduce long-term boil water advisories and protect the integrity of their water systems. We offer training and assist communities and operators in maintaining good quality water systems using the best technical and governance practices.

Throughout the year, the department focused on networking and outreach with stakeholders, including over 500 communities. Through the Boil Water Advisory Reduction Initiative, officials worked with 11 pilot communities to address 15 boil water advisories. The department developed a Full Cost Accounting Assessment Tool for public drinking water system owners and operators to assist in financial planning and the sustainable operations, and also produced new training videos to assist in training drinking water system operators.

Through the Provincial Government's commitments under The Way Forward, as well as the Minister's mandate letter, the department is continuing work to develop a water quality action plan to address infrastructure, expertise, and technology to ensure our provincial water systems are safe and sustainable. I would like to commend the staff and officials of the department for their shared commitment and hard work to provide clean, safe and reliable drinking water to the people of Newfoundland and Labrador.

Sincerely,

A handwritten signature in black ink, appearing to be the initials 'AP' followed by a stylized flourish.

Hon. Andrew Parsons, QC
Minister of Municipal Affairs and Environment

Drinking
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Newfoundland
and Labrador

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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 2016–17 fiscal year (April 1, 2016, to March 31, 2017). The report describes the three levels of the MBSAP and their various components (Figure 1). It illustrates how government is implementing the MBSAP.

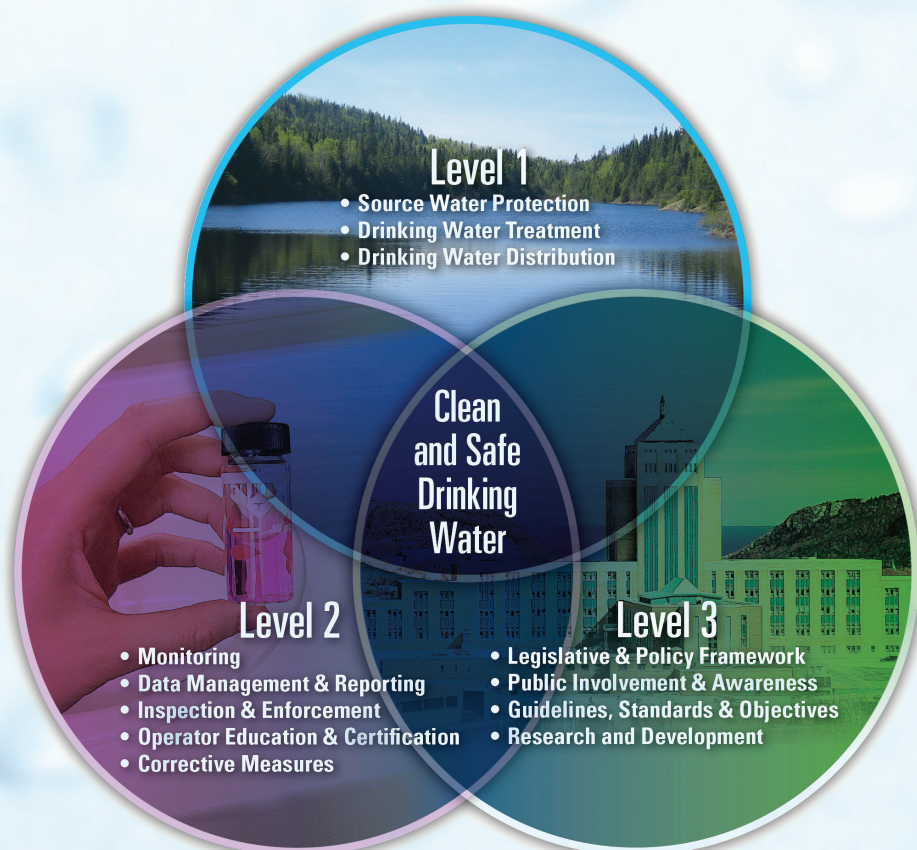
The MBSAP is considered to be the most effective method of managing drinking water systems and has been implemented by other jurisdictions throughout Canada.

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 in special information boxes.

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.

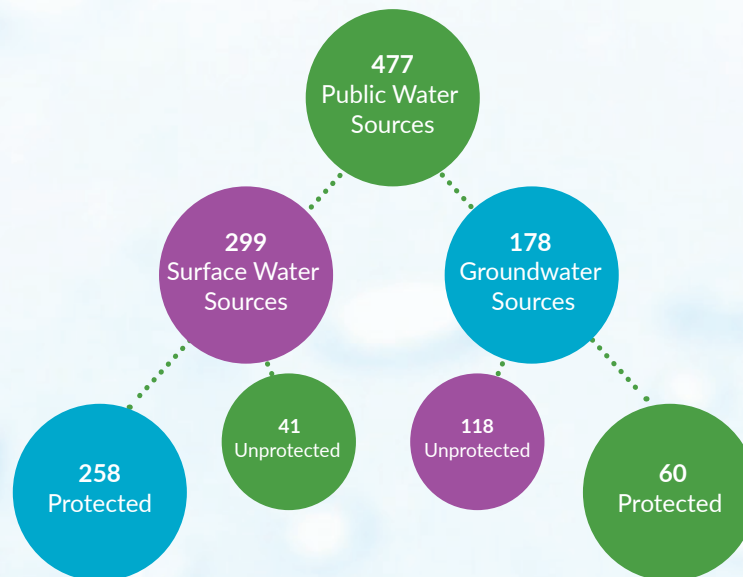
The three components of Level I of the MBSAP are:

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 411,261, representing 93 percent of the population serviced by public drinking water systems. Figure 2 shows the status of public water sources for fiscal year 2016-17.

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))
- permits for development activity
- watershed management plans
- watershed management committees
- community monitoring and inspections
- regulatory inspections

Referrals

In the 2016–17 fiscal year, the WRMD processed 235 referrals from various departments for proposed activities concerning PPWSAs as outlined in Table 1.

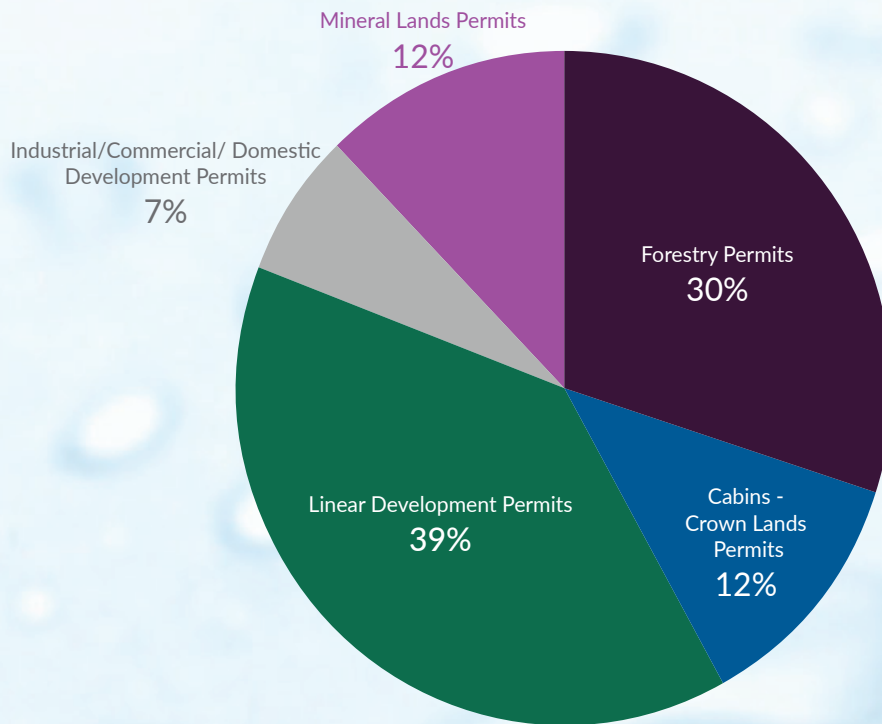
Table 1: Number of Referrals Processed

Type of Referral					Total
Fisheries and Land Resources (Crown Lands)	Natural Resources	ILUC	Municipal Affairs and Environment (Environmental Assessment)	Other	
99	71	51	12	2	235

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 2016–17 fiscal year, 76 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 2012.

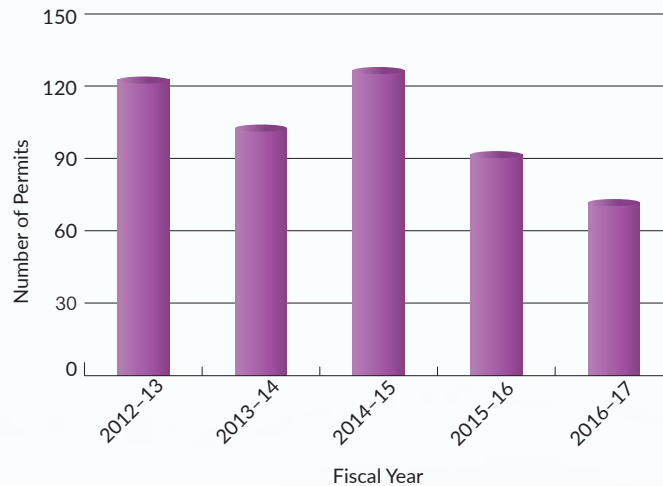
Figure 3: Type of Development Permits



The top two developmental activities for which permits were issued include:

1. linear developments
2. forestry activities

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 2016-17 are 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

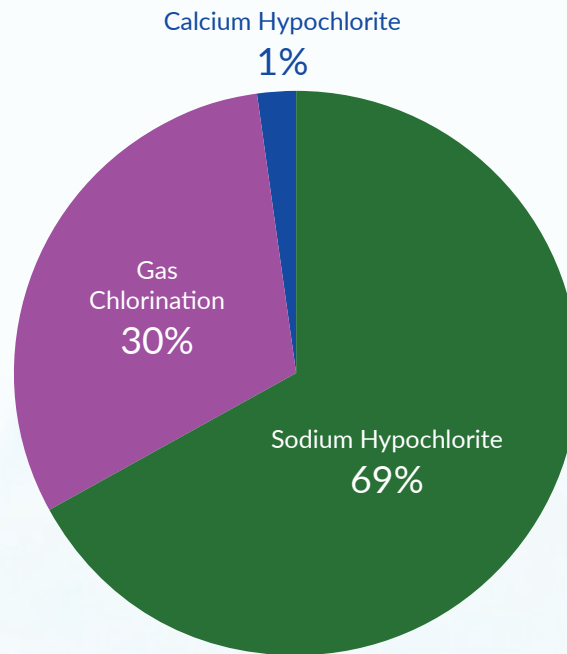
The most critical aspect of water treatment is disinfection as it ensures the pathogenic safety of drinking water. While there are several forms of disinfection used in the treatment of drinking water, chlorination is the most commonly used disinfection method in the province. The different disinfection 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
443	33	8	4	1

There are a number of different chlorination system types in the province. Figure 5 illustrates the distribution of these systems in 2016–17.

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 2016–17 fiscal year.

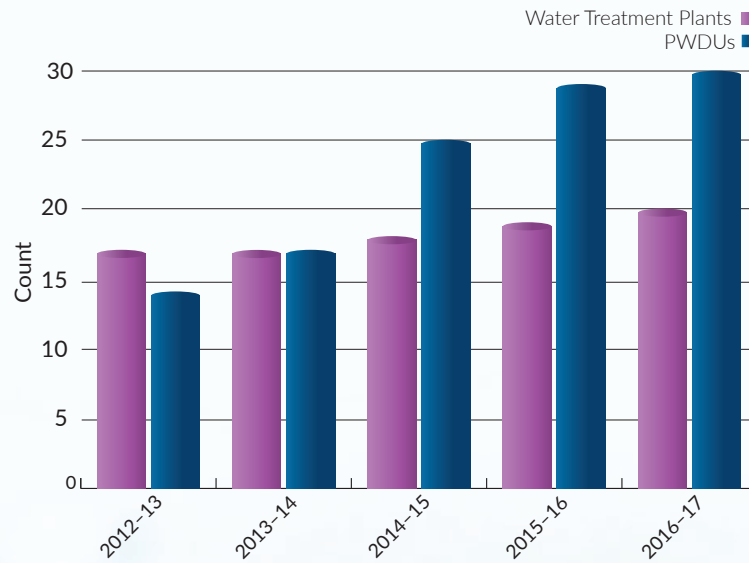
Table 3: Number of Water Treatment Systems in Newfoundland and Labrador

Type of Drinking Water Treatment System						
PH adjustment	Micron/pressure filters	Infiltration galleries	Arsenic removal	Iron/Manganese removal	Lead removal	Strontium removal
53	34	22	10	5	1	1

Water Treatment Plants

As of March 31, 2017, 50 water treatment plants are in place in Newfoundland and Labrador (this number includes 30 potable water dispensing units). Figure 6 illustrates the total number of water treatment plants in Newfoundland and Labrador for each fiscal year since 2012–13.

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 2016-17, there were 508 public water distribution systems in the province. Table 4 shows the breakdown of the number of water distribution systems for 2016-17. Seventy-six percent of public water distribution systems fall into the “≤ 500” classification.

Table 4: Public Water Distribution System Classes for 2016-17

Size (population serviced)	> 50,000	15,001 - 50,000	1,501 - 15,000	501 - 1,500	≤ 500	Total
Count	1	5	36	80	386	508

*Total number of distribution systems is different from previous years due to an update in population serviced.

During the 2016-17 fiscal year, the Department of Municipal Affairs and Environment approved \$36,165,439 for water related projects. Table 5 provides a breakdown of initiatives from April 1, 2016 to March 31, 2017.

In 2016-17, the Department issued 14 permits to operate for drinking water systems and 119 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 2016-17 fiscal year was 322. Figure 7 shows the number of permits to construct issued for each fiscal year since 2012-13.

Table 5: Funding Approved for 2016-17

Category	Funding (\$)*
New Water Supply Infrastructure	\$2,831,950.22
Upgrades to Water Supply Infrastructure	\$6,287,585.98
New Water Distribution	\$2,281,370.34
Upgrades to Water Distribution	\$8,002,972.06
New Drinking Water Treatment	\$1,972,992.46
Upgrades to Drinking Water Treatment	\$1,123,361.98
Joint upgrades/extensions to water distribution/ sewage collection systems	\$13,375,985.14
DWSI/PWDU**	\$138,745.72
Studies	\$150,475.58
Total	\$36,165,439.48

*Provincial share less GST amounts shown.

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

Figure 7: Number of Permits to Construct per Fiscal Year





Example of an ATV

HIGHLIGHT

Guidelines for the Construction and Maintenance of ATV Trails Inside Protected Public Water Supply Areas

The use of All Terrain Vehicles (ATVs) for recreational activities is very popular in Newfoundland and Labrador. With over 7500 kilometres of authorized trails in the province, it is important to ensure that Protected Public Water Supply Areas (PPWSAs) that are used as drinking water sources are appropriately considered during trail development. These areas are more vulnerable to erosion and sedimentation when ATV trails are improperly designed and maintained as this can lead to the degradation of drinking water quality.

The Water Resources Management Division developed a new document in 2017: Guidelines for the Construction and Maintenance of ATV Trails inside Protected Public Water Supply Areas. The guide was developed to act as an aid for the development and planning of new ATV trails that are located inside PPWSAs. The guide is intended for use as a reference for community groups, non-profit groups, proponents and all other persons and/or organizations involved in ATV trail planning and development inside PPWSAs. The guide covers items related to trail construction and management in the areas of:

- erosion and sedimentation
- trail design
- drainage concepts and features
- wet soil crossing
- management, monitoring and maintenance

All ATV trails within PPWSAs will be required to follow this guide when designing and constructing new ATV trails or upgrading existing ATV trails. The sustainable design of trails will ensure the integrity of the trail system and the safety of drinking water quality for residents.

The document has been developed with the protection of water supply areas in mind but can be used as a general reference by all trail developers. Trails that are planned using the practices outlined in the guide will help protect and preserve our natural environment as well as contribute to the sustainability of trail networks for future generations. The guide is available online at:

mae.gov.nl.ca/waterres/quality/drinkingwater/pdf/ATV_trail_construction_guide_pws.pdf

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

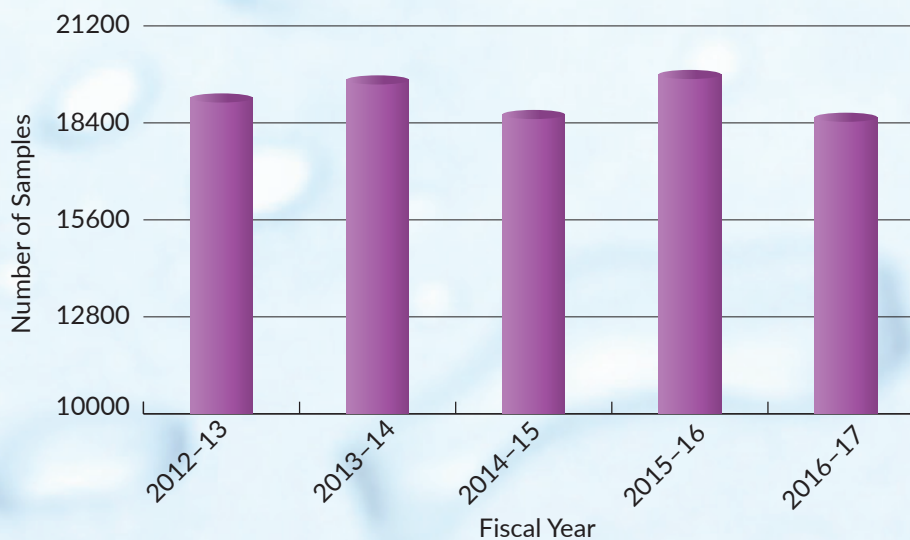
Drinking water quality monitoring consists of regular sampling and testing of drinking water from both the source and the tap. The extensive monitoring program for drinking water quality in the province is a joint responsibility shared by the Departments of Municipal Affairs and Environment, Health and 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 2016–17, 18,569 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 2012–13.

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 2016–17

Region					Total
St. John's	Eastern	Central	Western	Northern	
7,610	973	3,963	4,330	1,693	18,569

Bacteriological Parameters: Results

Based on the analysis of bacteriological parameters for public drinking water samples taken during the 2016–17 fiscal year, 611 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 number of samples found to be unsatisfactory for total coliforms at each regional drinking water testing facility for the fiscal year 2016–17.

Table 7: Number of Unsatisfactory Samples for Total Coliforms for 2016–17

Region					Total
St. John's	Eastern	Central	Western	Northern	
198	42	151	203	17	611
2.6%	4.3%	3.8%	4.7%	1.0%	3.3%

There were 117 bacteriological samples tested that were found to be unsatisfactory in terms of E. coli. Table 8 shows the number of samples found to be unsatisfactory for E. coli, at each regional drinking water testing facility, for the fiscal year 2016–17.

Table 8: Number of Unsatisfactory Samples for E. coli for 2016–17

Region					Total
St. John's	Eastern	Central	Western	Northern	
13	7	39	53	5	117
0.17%	0.72%	0.98%	1.2%	0.29%	0.63%

The number of unsatisfactory samples for total coliforms and E. coli for each fiscal year since 2012–13 is shown in Figure 9.

Figure 9: Unsatisfactory Bacteriological Samples per Fiscal Year

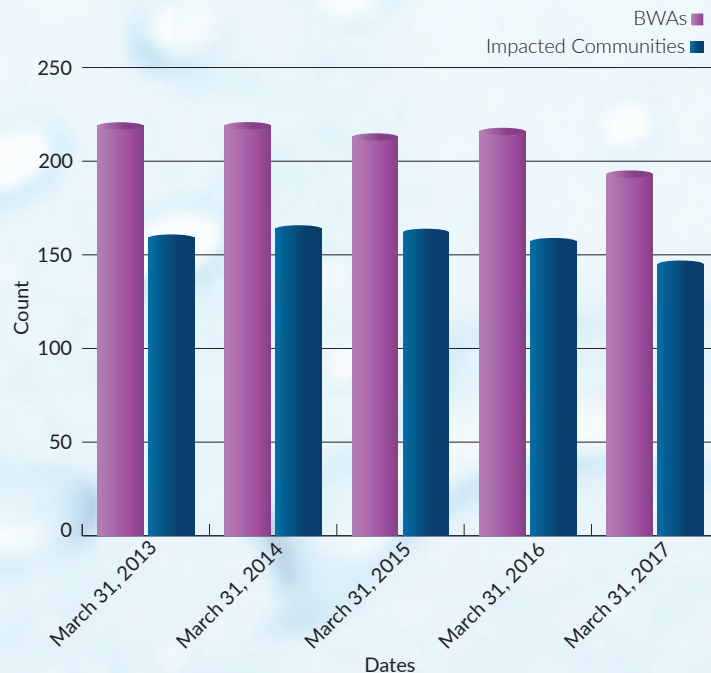


*Escherichia coli (E. coli) is considered a good indicator of recent fecal contamination of drinking water and the possible presence of disease causing microorganisms.

Boil Water Advisories

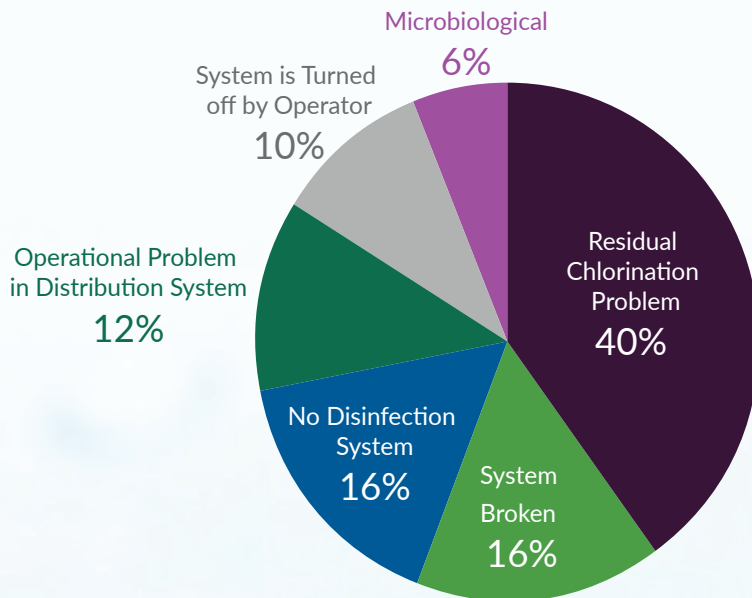
Boil water advisories are preventative measures for protecting public health from waterborne microbiological contamination that may, or are known to be, present in drinking water. A BWA is also issued when water quality is questionable due to operational deficiencies (such as inadequate chlorine residual), 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, 2013.

Figure 10: Number of BWAs and Number of Communities Affected



On March 31, 2017, 193 BWAs were in effect (this includes long-term BWAs), affecting 145 communities in the province, with an impacted population of 31,036 (6.1% of total population). Figure 11 illustrates the distribution of existing BWAs by reason used to issue the advisory for the 2016–17 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, 2017. A total of 135 BWAs have been in effect for a period of five years or greater.

Chemical and Physical Water Quality

The number of chemical and physical water quality samples taken by region for 2016–17 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 2016–17

Region	Source	Tap	THM	HAA	Total
Eastern	22	454	421	388	1,285
Western	24	300	266	273	863
Central	20	87	83	55	245
Labrador	10	74	100	105	289
Other (Special)	4	0	0	0	4
Total	80	915	870	821	2,686

HIGHLIGHT

Boil Water Advisory Reduction Initiative

Under the 2015 Community Sustainability Partnership a Boil Water Advisory (BWA) Reduction Initiative was launched to build capacity. This initiative involves the development of solutions by external consultants with the goal of reducing the number of BWAs. The first project under this initiative was launched in July 2015 and included the development of 18 standard operating procedures (SOPs) for the removal of BWAs. These SOPs are available on the department's website (mae.gov.nl.ca/waterres/quality/drinkingwater/sopbwa.html).

During the 2016-17 fiscal year, three projects were completed under the BWA Reduction Initiative. The first project involved the implementation of the SOPs in eleven pilot communities addressing 15 BWAs. The main objective of this study was to reduce the overall number of BWAs and to test the applicability of the developed SOPs. CBCL Limited was contracted to undertake this study and to work with the pilot communities to implement corrective measures identified in the SOPs.

The second study involved the development of a Full Cost Accounting Assessment Tool and was conducted by CBCL Limited. The overall goal of this project was to develop an economic assessment tool for communities with public drinking water systems to assist in decision-making. The assessment tool is primarily intended for use by public drinking water system owners and operators to assist in their financial planning and the sustainable operation of their drinking water systems. The full cost accounting assessment tool and a user's manual are available on the department's website (mae.gov.nl.ca/waterres/quality/drinkingwater/sopbwa.html).

The final project conducted during 2016-17 under the BWA Reduction Initiative was the production of three drinking water system operational training videos. The training videos were produced by PB Productions and provide information on the benefits of chlorination, provide direction on how to conduct chlorine residual testing and how to properly collect drinking water quality samples. The intent of these training videos is to reduce the number of BWAs by ensuring proper operational practices. The videos are available on the Water Resources Management Division's YouTube page (youtube.com/user/NLWaterResources).

The BWA Reduction Initiative will continue in 2017-18 and will involve additional piloting of the SOPs and Full Cost Accounting Assessment Tool, as well as the production of additional training videos.

In 2016–17, the department collected 2,686 samples. Eighty percent of the samples that were scheduled for this fiscal year were collected. Table 10 shows the number of samples scheduled and the number actually taken for 2016–17.

Table 10: Number of Samples Scheduled and Collected by the Department for 2016–17

Type of Sample	Scheduled	Collected	Per cent
Tap	1,102	915	83
Trihalomethanes	1,128	870	77
Haloacetic acids	1,016	821	81
Source	94	80	85
Total	3,340	2,686	80

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)
- interruption in chemical water testing in the central region

Every year, the department schedules special parameter monitoring. In 2016–17, special parameter monitoring programs were conducted for radiological (gross alpha/beta and lead-210 radium -226) and bromate.

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 2012–13, 2013–14, 2014–15, 2015–16 and 2016–17. The number of Disinfection By-Product exceedances may be underreported for the 2016–17 fiscal year as locational running averages for Disinfection By-Products could not be calculated so that they can be compared to the GCDWQ. 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: mae.gov.nl.ca/waterres/quality/drinkingwater/manual.html

Table 11: Exceedances per Fiscal Year

Department	Exceedances						
	Parameters	2012-13	2013-14	2014-15	2015-16	2016-17*	
Service NL	Bacteriological	Escherichia coli	133	132	211	92	117
		Total coliforms	930	962	932	970	611
Municipal Affairs and Environment	Chemical and Physical	Turbidity	103	78	170	83	70
		Arsenic	4	13	6	8	6
		Barium	1	2	1	0	0
		Fluoride	1	0	0	0	1
		Lead	4	2	4	6	8
	Disinfection By-Products	Trihalomethanes (THMs)	132	117	93	108	62
		Haloacetic Acids (HAAs)	147	153	117	134	62
	Aesthetic	Colour	433	466	307	424	312
		pH	335	368	196	225	254
		Total Dissolved Solids	17	19	11	17	11
		Chloride	6	5	2	7	6
		Sodium	4	3	2	7	6
		Sulphate	2	2	1	0	1
		Copper	1	5	9	7	6
		Iron	113	127	86	102	97
Manganese	106	102	81	68	63		

*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 timeframe: (releases.gov.nl.ca/releases/2017/ma/0405n05.aspx)

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.

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 2016–17 fiscal year, departmental staff carried out a total of 34 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 2016–17.

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 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 2016–17 fiscal year, 26 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 2016–17, the province's three operator trainers conducted 126 on-site training sessions throughout the province. These sessions were attended by a total of 194 participants.

Table 12: Types of Public Reports Produced by the Department

Type	Description
Seasonal Community Drinking Water Quality Updates	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 provided 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 2016–17 fiscal year, 1,071 seasonal community updates were available through the portal.
Exceedance Reports	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 2016–17 fiscal year, 19 exceedance reports (eight arsenic, nine lead, one bromate, one fluoride) were sent to communities.
Annual Drinking Water Safety in Newfoundland and Labrador Report	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.
Web Documents on Drinking Water Quality	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 online at: mae.gov.nl.ca/waterres/whatsnew/index.html

Table 13: Inspections by the Department for 2016–17

Protected Surface Water Supplies	Permits to Operate	Permits to Construct	Protected Groundwater Supplies	Total
5	12	11	6	34

HIGHLIGHT

2017 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, 22 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 any monetary compensation. The 2017 Award was presented to Mr. Calvin Warford from the Local Service District (LSD) of Pleasantview. Calvin has been a volunteer with the LSD for over 35 years and is dedicated to the operation of the drinking water system. In addition to operating the drinking water system, Mr. Warford has also volunteered as the LSD Chairperson for the past three years.

The 2017 Operator of the Year Award was presented to Mr. Brian Marsden and Mr. John Skinner. The co-winners work for the Town of Ramea. Brian is a Class 1 Water Treatment Plant Operator and John is a Class 1 Water Distribution System Operator. In December 2016, severe storm conditions on the island of Ramea caused approximately 180 metres of beach front to be washed away and 10 million gallons of sea water flowed into the drinking water supply. The single source of drinking water on the island was compromised and a state of emergency was declared. The response of the operators to this disaster was far above any expectations. They are always available when a problem arises and are eager to learn and take on new challenges.



Award recipients from left to right (Brian Marsden, John Skinner, Calvin Warford) receive awards from the Minister of Municipal Affairs and Environment

Operator Certification

Certification is an essential component for the operation of a safe drinking water system. There are 428 certified water or wastewater operators in Newfoundland and Labrador. Seventy-four operators achieved their first level of certification in 2016–17. Table 14 contains the total number of operator certificates issued by classification.

Table 14: Total Number of Operator Certificates Issued for 2016–17

Water Distribution	Water Treatment	Very Small Water Systems	Wastewater Collection	Wastewater Treatment	Total Certificates
45	20	2	21	17	105

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	Wastewater Collection	Wastewater Treatment
120	23	5	52	22

*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 2017 Clean and Safe Drinking Water Workshop took place on March 28 - 30, 2017, in Gander. The workshop attracted 292 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.

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 2016–17

Corrective Measure	Description
Policy	<ul style="list-style-type: none"> • Year 16 of the Multi-Barrier Strategic Action Plan for Safe Drinking Water in Newfoundland and Labrador • The Interdepartmental Safe Drinking Water Technical Working Group met four times • Drinking Water Treatment Standards for Newfoundland and Labrador under review
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"> • Water main upgrades and replacement (also includes new watermains)- 72 • New or upgraded pumps or pumphouse- 7 • New or upgraded valves- 8 • New or upgraded flow meter- 3 • Intake upgrades- 3 • 1 community assessment undertaken in response to drinking water quality issues (Ramea) • 10 Permit to Operate Drinking Water Inspection Reports and Inspection Risk Ratings (Irishtown-Summerside, Humber Arm South, St. George's, Stephenville, Stephenville Crossing, Torbay, Kippens, Labrador City, Wabush, Baie Verte)
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- 3 • Chlorination system upgrades- 3 • New filtration systems- 2 • New PWDUs- 5 • Water treatment plant upgrades- 2
Source Alternatives	<ul style="list-style-type: none"> • Permits to Construct issued relating to water sources: <ul style="list-style-type: none"> • New or upgraded intake or screen house- 3

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.

Regional Operator Program

The Water and Wastewater Operator pilot program is a three-year initiative that started in 2015–16 funded through the Community Sustainability Partnerships (CSP). 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). 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.

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.

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 2016–17, the working group focused on improving communication with the Regional Water Quality Committees, reducing the number of active BWAs in the province, and improvements to the BWA database system.

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.

New videos for the following drinking water related topics can be found on the NL Water Resources channel at youtube.com/user/NLWaterResources:

- A video on procedures for tap water quality sampling
- A video on the benefits of chlorination
- A video on procedures for chlorine residual testing

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, <http://env.gov.nl.ca/env/waterres/regulations/index.html>, 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 2016–17, the following studies were implemented:

- Implementation of Standard Operating Procedures for the Reduction of Boil Water Advisories in Newfoundland and Labrador
- Drinking water system Full Cost Accounting Assessment Tool developed

Weblinks:

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

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
mae.gov.nl.ca/waterres/reports/index.html

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

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

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
mae.gov.nl.ca/waterres/regulations/policies/standards_microbiological.html

Standards for Chemical and Physical Monitoring of
Drinking Water
mae.gov.nl.ca/waterres/regulations/policies/physical_monitoring.html

Policy for Drinking Water Quality Monitoring and
Reporting for Public Water Supplies
mae.gov.nl.ca/waterres/regulations/policies/water_quality.html

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

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

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

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

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

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This document is available electronically at:

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

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