2.15 Water Quality Management

Introduction

In May 2001, Government released a report entitled *Source to Tap - Water Supplies in Newfoundland and Labrador* (*Source to Tap* report). The report was prepared in response to drinking water contamination tragedies in Canada which prompted many Newfoundlanders and Labradorians to question the safety of their public water supplies.

The report contained information on the status of public water supplies, presented Government's action plan to enhance the protection of public water supplies, and outlined initiatives to ensure drinking water safety.

A public water supply is a water supply operated by a community. The May 2001 *Source to Tap* report identified that approximately 83% of the Province's population received water from 607 public water supplies with the remaining 17% receiving their water from water supplies operated by private individuals or groups of individuals. Of the 83% receiving water from public water supplies, approximately 88% obtained their water from 314 surface water sources (lakes, ponds, reservoirs, rivers and streams) while the remaining 12% obtained their water from 293 groundwater supplies (dug and drilled wells).

The number of public water supplies identified by the Department of Environment and Conservation has decreased from 607 as outlined in the May 2001 *Source to Tap* report to 532 in October 2003. The number of public water supplies outlined in the *Source to Tap* report was a preliminary number based on surveys conducted by the Department of Environment and Conservation. The decrease in October 2003 is a reflection of the Department gathering more detailed information on existing water supplies as well as the result of changes over time as communities abandon or commission water supplies.

The Province indicated in the *Source to Tap* report that it had adopted a *"multi-barrier approach"* to ensure that its public water supplies provide clean and safe water. The multi-barrier approach to drinking water quality refers only to public water supplies. The main components of this approach are: source protection; water treatment; water system operation and maintenance; water quality monitoring; water quality reporting; regulatory inspection and mitigation planning; and operator education and training.

While the operation and maintenance of water supply systems and delivery of water to consumers is the responsibility of municipal governments, the Province also has responsibilities for public water supplies, with these responsibilities being shared between the following four departments: Environment and Conservation; Government Services; Health and Community Services; and Municipal and Provincial Affairs, with the Department of Environment and Conservation being the lead department for communications on water quality issues.

Details of the responsibilities in relation to the components of the multi-barrier approach are outlined in Figure 1.

Figure 1

Responsibilities by Component of the Multi-Barrier Approach

Component	Responsibility	Role
Source Protection	Environment and Conservation	Designates protected water supply areas and regulates activities in such areas
Water Treatment	Municipal governments	Build and operate public water supply systems
	Environment and Conservation	Provides regulatory approval of water systems
	Municipal and Provincial Affairs	Provides funding for public water system infrastructure
Water System Operation and Maintenance	Municipal governments	Build and operate public water supply systems
Water Quality Monitoring	Environment and Conservation	Monitors chemical and physical attributes of drinking water both at tap and at source
	Government Services	Monitors microbiological quality of drinking water at tap
Water Quality Reporting	Environment and Conservation	Reports to municipalities on its monitoring activities and to the House of Assembly on drinking water safety
	Government Services	Reports to municipalities on its monitoring activities and to the House of Assembly through the Department's annual report
Regulatory Inspection and Mitigation Planning	Environment and Conservation	Inspects public water systems and identifies emerging issues and mitigation strategies
Operator Education and Training	Environment and Conservation	Provides seminars and on-site training to assist with operation and maintenance of water systems
-	Health and Community Services	Assesses health impacts of contamination in water supplies and provides advice to avoid adverse health impacts

Source: Department of Environment and Conservation

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Scope and Objectives

We completed our review of Water Quality Management in November 2003. The objective of the review was to determine whether Government's commitments outlined in the May 2001 report *Source to Tap - Water Supplies in Newfoundland and Labrador*, have been met. Our review covered the period from May 2001 to November 2003.

The review did not address areas for which municipalities have primary responsibilities - water treatment and water system operation and maintenance.

Conclusions

In May 2001, Government released a report entitled *Source to Tap - Water Supplies in Newfoundland and Labrador* (*Source to Tap* report). The report was prepared in response to drinking water contamination tragedies in Canada and contained information on the status of public water supplies, presented Government's action plan to enhance the protection of public water supplies, and outlined initiatives to ensure drinking water safety. The report identified that approximately 83% of the Province's population received water from 607 public water supplies with the remaining 17% receiving their water from water supplies operated by private individuals or groups of individuals.

The 607 public water supplies identified by the Department of Environment and Conservation in the May 2001 *Source to Tap* report was a preliminary number based on surveys conducted by the Department. As of October 2003, this number had decreased to 532. The decrease is a reflection of the Department gathering more detailed information on existing water supplies as well as the result of changes over time as communities abandon or commission water supplies.

The Province indicated in the *Source to Tap* report that it had adopted a *"multi-barrier approach"* to ensure that public water supplies provide clean and safe water. The main responsibilities for Government under this approach are: source protection; water quality monitoring; water quality reporting; regulatory inspection and mitigation planning; and operator education and training. While the Department of Environment and Conservation is the lead department on water quality issues, other departments have involvement as well.

Our review indicated that while Government is making progress toward its commitments outlined in its *Source to Tap* report, it has not met all these commitments and is not always complying with Provincial standards for monitoring drinking water. Specifically:

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Source protection - While Government committed in the *Source to Tap* report to continue its efforts to protect the remaining public water supplies, as of October 2003, 256 of the 532 (48%) public water supplies were still not protected. Under the *Water Resources Act*, the Department of Environment and Conservation may designate areas around a public water source as protected, thereby prohibiting or limiting activities within the protected area that have the potential to impair the quality of the water or diminish the amount of water available.

Water quality monitoring - The Department of Environment and Conservation is not conducting Trihalomethanes (THM) and other *chemical* water quality testing in accordance with the commitment contained in the *Source to Tap* report or in accordance with Provincial standards. The number of communities and public water supplies in the Province known to have THM levels above the maximum acceptable concentration (and the number of people exposed) is increasing. THMs are compounds formed in chlorinated drinking water supplies. Their possible adverse health effects have received extensive media attention in recent years.

Of the 25 water supplies we reviewed for *chemical* water quality testing, 4 were not tested with the required frequency. Furthermore, of these 25 water supplies reviewed, 23 were chlorinated and required testing for THMs. Of these 23, 7 were not tested with the required frequency.

As well, the Department of Government Services is not conducting *microbiological* water quality testing in accordance with the *Source to Tap* report commitment or in accordance with Provincial standards. Such testing determines the total coliforms and escherichia coli (E.coli) in water supplies. Of the 10 water supplies we reviewed for *microbiological* water quality testing, 7 were not tested with the required frequency.

Water quality reporting - Government has met the commitments made in the *Source to Tap* report regarding reporting of water quality data. These commitments include reporting annually to the House of Assembly, providing drinking water quality data to the public, and reporting annually to the operator of each public water supply system in the Province.

Regulatory inspection and mitigation planning - The Department of Environment and Conservation is not inspecting water systems under the *Water Resources Act* in accordance with the commitment contained in the *Source to Tap* report. While the commitment was to conduct these inspections at least once each year, Department officials indicated that inspections are conducted only when operational problems are encountered, relating to a proposed upgrade, or in response to infrastructure funding need assessment.

Operator education and training - Progress is being made on the commitments Government made in the *Source to Tap* report regarding education and training of water system operators; however, certification of water system operators is currently on a voluntary basis with mandatory certification being an area which requires further attention.

Findings and Recommendations

The main components of the Province's multi-barrier approach for ensuring that public water supplies provide clean and safe water are: source protection; water treatment; water system operation and maintenance; water quality monitoring; water quality reporting; regulatory inspection and mitigation planning; and operator education and training.

Municipalities have primary responsibility for water treatment and water system operation and maintenance, with Government having responsibility for: source protection; water quality monitoring; water quality reporting; regulatory inspection and mitigation planning; and operator education and training.

The following is an assessment of whether Government has met its commitments as outlined in the May 2001 *Source to Tap*. Findings are presented for each component of the multi-barrier approach for which Government has primary responsibility.

Source Protection

Under section 39(1) of the *Water Resources Act*, the Department of Environment and Conservation may designate areas around a public water source as protected. In order for a water supply to become protected, the municipality must apply to the Department.

When areas have been designated under the *Act* as protected, activities within the protected area that have the potential to impair the quality of the water or diminish the amount of water available are prohibited or limited. Source water protection is considered one of the first and best lines of defence in a multi-barrier approach to providing safe and clean drinking water to consumers.

The May 2001 *Source to Tap* report indicated that a total of 244 of the total 607 public water supplies (40%) were protected under the *Water Resources Act.* While no specific details were provided, Government did commit in the report to continue to work with municipalities to protect the remaining public water supplies.

Figure 2 shows the breakdown of source protection by water supply type.

Figure 2

Protected Water Sources

	Surface Water Sources		Ground Water Sources		Combined Sources	
	May 2001	Oct 2003	May 2001	Oct 2003	May 2001	Oct 2003
# of protected sources	236	255	8	21	244	276
Total # of sources	314	317	293	215	607	532
% of sources protected	75%	80%	3%	10%	40%	52%

Source: Department of Environment and Conservation

As shown in Figure 2, as of October 2003, a total of 276 of 532 public water supplies (52%) were protected, representing an overall increase of 32 (276 less 244) protected water supplies from May 2001. However, 256 of the 532 (48%) public water supplies were still not protected. These 256 water supplies provide water to approximately 26% of the population serviced by public water supplies. As well, while the overall number of protected water supplies has increased by 32, there are far less ground water sources protected than surface water sources.

Water Quality Monitoring

There are two main types of water quality monitoring - chemical monitoring and microbiological monitoring. Monitoring is based on an analysis of water samples.

Chemical monitoring determines the level of various chemicals present in the Province's water supplies. The main chemicals of concern are arsenic, lead, turbidity and trihalomethanes. Microbiological monitoring determines the presence of microbes, such as bacteria, viruses or protozoan parasites, which can cause illness in humans. These determinations are then compared against acceptable limits to assess the quality of the water source.

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The departments of Environment and Conservation and Government Services share the responsibility of monitoring drinking water quality in the Province. The Department of Environment and Conservation is responsible for monitoring chemical contaminants and the Department of Government Services is responsible for monitoring microbiological contaminants.

While there is no Provincial legislation which requires testing of drinking water quality or outlines the testing frequency, the acceptable chemical and microbiological limits and testing frequency of the Province's drinking water quality monitoring program are based on *Guidelines for Canadian Drinking Water Quality* published by Health Canada. The Department of Environment and Conservation has compiled Provincial standards for the monitoring of drinking water based on these national guidelines.

1. Chemical Monitoring - Department of Environment and Conservation

(a) Water Quality

Source Water Testing Frequency - The May 2001 *Source to Tap* report did not provide a commitment relating to source water testing frequency. As well, at the time of our review there was no Provincial standard or Health Canada Guideline for the frequency of testing for source water quality. Source water sampling is taken from where the water enters the distribution system, generally a pond, lake or well, and can be a good indicator of the expected quality of water that leaves the distribution system, i.e. tap water.

Tap Water Testing Frequency - Government stated in its May 2001 *Source to Tap* report that each of the 607 public water supplies in the Province would be tested at tap at least twice each year for all health related chemicals for which maximum acceptable concentrations have been established. This is in accordance with the Provincial standards (Health Canada Guidelines) which state that all public drinking water supplies should be tested semi-annually for tap water quality.

To determine whether Government is following its commitment for tap water testing frequency stated in the *Source to Tap* report and in existing Provincial standards (Health Canada Guidelines), we reviewed the drinking water quality database maintained by the Department of Environment and Conservation. The database shows that while each of the 532 public water supplies had been tested at least once during the year ended 31 March 2003, 38 (7%)

of these water supplies had not been tested semi-annually as required.

We also selected a sample of 25 of the 532 public water supplies in the Province and reviewed all chemical testing for the year ended 31 March 2003. Figure 3 shows tap water testing for the 25 public water supplies included in the sample.

Figure 3

Summary of Results - Chemical Testing
For the Year Ended 31 March 2003

	Eastern	Western	Central	Labrador	Total
Number of samples	10	6	6	3	25
Less than semi-annual tap water testing	0	1 (Francois)	0	3 (Port Hope Simpson, Rigolet, St. Lewis)	4
Possible adverse health effects discovered in samples	1 (Marysvale)	2 (St. George's, Trout River)	0	1 (Rigolet)	4
Description and quantity of contaminant	Turbidity, 4.7	Lead, 0.024 Lead, 0.011		Turbidity, 2.1	
Maximum acceptable concentration of contaminant	Turbidity, 1.0	Lead, 0.010		Turbidity, 1.0	

Source: Department of Environment and Conservation

While each of the 25 sampled water supplies had been tested at least once during the year, as Figure 3 shows, 4 of the 25 samples (16%) had not been tested semi-annually as required. Of the 4 water supplies which had not been tested semi-annually, 1 was found to contain a chemical with a possible adverse health effect. This water supply was in Rigolet, Labrador. At the time of our review in November 2003, no follow-up visit had been made by the Department since the original test was conducted in July 2002.

In summary, our review of the Department of Environment and Conservation's database and our review of a sample of public water supplies tested by the Department both indicated that the Department is not conducting chemical water quality testing in accordance with the commitment contained in the *Source to Tap* report or in accordance with Provincial standards.

While the May 2001 *Source to Tap* report did not provide a commitment relating to source water testing frequency and there was no Provincial standard or Health Canada Guideline for the frequency of testing for source water quality, we also reviewed the 25 samples to determine frequency of source water testing. Our review indicated that although there is no requirement relating to source water testing, 6 of the 25 samples chosen had source water tested semi-annually.

(b) Trihalomethanes

Trihalomethanes **(**THMs) are compounds formed in chlorinated drinking water supplies. Their possible adverse health effects have received extensive media attention in recent years.

Government stated in its May 2001 *Source to Tap* report each chlorinated surface public water supply in the Province would be tested at least four times each year for THMs to determine whether maximum acceptable concentrations have been exceeded. This is in accordance with the Provincial standards (Health Canada Guidelines) which state that all chlorinated public drinking water supplies should be tested four times each year for THMs.

Figure 4 shows the number of public water supplies in the Province known to have THM levels above the maximum acceptable concentration.

Figure 4

THM Levels

	Total number of public water supplies	Number of chlorinated public water supplies	Number of supplies with THMs above acceptable concentration	Percentage of chlorinated water supplies	Approximate number of people exposed
May 2001	607	Not Available	59	Not Available	79,600
October 2003	532	429	97	23 %	93,000

Source: Department of Environment and Conservation

As Figure 4 shows, the number of public water supplies in the Province known to have THM levels above the maximum acceptable concentration (and the number of people exposed) is increasing.

To determine whether Government is following its commitment for THM testing frequency stated in the *Source to Tap* report and in existing Provincial standards (Health Canada Guidelines), we reviewed the drinking water quality database maintained by the Department of Environment and Conservation. The database shows that there were approximately 400 chlorinated public water supplies operating during the fiscal year ended 31 March 2003. We could not determine from the database the number of water supplies which were never tested during the year; however, we were able to determine that 111 (33%) of the 336 water supplies tested were not tested at least four times as required. Of these 111 supplies, 38 were tested only once, 54 twice and 19 three times. It was noted that some of the 111 water supplies may not have operated throughout the entire year, due to existing water supplies being abandoned or new supplies being commissioned.

We reviewed the same 25 public water supplies that we tested for chemical contaminants to determine the frequency of THM testing for the year ended 31 March 2003. Figure 5 shows testing for the 25 public water supplies included in the sample.

Figure 5

Summary of Results - THM Testing
For the Year Ended 31 March 2003

Region	Sources in Sample	Number of sources requiring seasonal testing	Sources with higher than acceptable THM levels	Sources not tested four times during year	Sources not tested four times and having high THM levels
Eastern	10	9	1 (Clarenville)	2 (Holyrood - not tested during year, Marysvale - not tested during year)	Not determinable as supplies not tested during year
Western	6	5	1 (St. George's)	1 (Pacquet - tested 3 times)	0
Central	6	6	2 (Lewisporte, New-Wes Valley)	1 (Campbellton - not tested during year)	Not determinable as supplies not tested during year
Labrador	3	3	2 (Rigolet, St. Lewis)	3 (Port Hope Simpson - tested once, Rigolet - tested once, St. Lewis - tested once)	2 (Rigolet, St. Lewis)
Total	25	23	6	7	2

Source: Department of Environment and Conservation

As Figure 5 shows, the Department of Environment and Conservation is not conducting THM water quality testing as required. Specifically, for the 23 public water supplies in our sample requiring THM testing (two supplies were not chlorinated), 7 (30%) were not tested 4 times per year as required. Of these 7, 3 were not tested at all during the year. Furthermore, 2 of the 7 samples which were not tested four times during the year were found to contain higher than acceptable THM levels.

In summary, our review of the Department of Environment and Conservation's database and our review of a sample of public water supplies both indicated that the Department is not conducting THM water quality testing in accordance with the commitment contained in the *Source to Tap* report or in accordance with Provincial standards.

2. Microbiological Monitoring - Department of Government Services

Government stated in its 2001 *Source to Tap* report that the number of samples taken for microbiological water quality testing would be expanded to meet the requirements of the Health Canada Guidelines. These Guidelines provide guidance on frequency of testing and the acceptable levels of naturally occurring elements in drinking water. The Department of Environment and Conservation has compiled Provincial standards for the monitoring of drinking water based on these national guidelines.

The Provincial standards (Health Canada Guidelines) recommend the frequency for microbiological testing based on population serviced by the water supply. While all public water supplies are to be tested monthly, the recommended number of samples to be taken each month varies, as outlined in Figure 6.

Figure 6

Method of Determining Sample Size for Microbiological Testing

Population Serviced	Number of Samples per Month	Number of water supplies - October 2003 (total 532)
Less than 100	1 sample	224
Between 101 and 5,000	4 samples	298
Between 5,001 and 90,000	1 additional sample per every 1,000 people between 5,000 and 90,000 people.	10
Greater than 90,000	1 additional sample item per every additional 10,000 people above 90,000 people	-

Source: Standards for Bacteriological Quality of Drinking Water

Samples of drinking water are taken by the inspectors and tested at regional testing sites for evidence of total coliforms and escherichia coli (E.coli). In the *Source to Tap* report, drinking water is considered safe if no more than 10 total coliforms are found in a 100-ml sample and if there is no evidence of E.coli. The results of these tests are reported to the municipality affected and are available on the Department's municipal information management system database. Action is recommended to the municipality based on the level of contamination identified in the test. Such action could include checking and adjusting chlorine levels or flushing water mains. If these actions do not remedy the contamination or if E.coli is present, the municipality must put a boil water advisory into effect.

Officials at the Department of Environment and Conservation indicated that no public database information was available which would show the frequency of testing for individual water supplies. We were, however, able to determine the number of tests conducted during the year ended 31 March 2003 and the results of the testing. A total of 15,352 water samples were tested, with 1,182 (8%) resulting in detection of coliforms, and 150 (1%) resulting in detection of E.coli.

To determine whether Government is following its commitment stated in the *Source to Tap* report and is following Provincial standards (Health Canada Guidelines), we selected a sample of 10 of the 532 public water supplies in the Province and reviewed all microbiological testing for the year ended 31 March 2003.

Figure 7 shows microbiological water testing during the year ended 31 March 2003 for the 10 public water supplies included in our sample.

Figure 7

Summary of Results - Microbiological Testing
For the Year Ended 31 March 2003

Region	Number of water supplies	Did not meet Guidelines for 11 out of 12 months	Did not meet Guidelines between 6 and 11 months	Did not meet Guidelines between 1 and 5 months	Met Guidelines
St. John's	2		1 (Conception Harbour)	1 (Clarke's Beach)	
Eastern	2			1 (Burin)	1 (Parker's Cove)
Gander	2			2 (King's Point, Millertown)	
Western	3	2 (Pasadena, St. Anthony)			1 (Upper Ferry)
Labrador	1				1 (Happy Valley-Goose Bay)
Total	10	2	1	4	3

Source: Municipal Information Management System database

As Figure 7 shows, the Department of Government Services is not conducting microbiological water testing in accordance with the commitment contained in the *Source to Tap* report and in accordance with Provincial standards (Health Canada Guidelines). Specifically, for the 10 public water supplies in our sample requiring microbiological testing, 7 (70%) were not tested as required.

2.15 Water Quality Management

Water Quality Reporting

A goal of the multi-barrier approach to drinking water quality is to provide free access to drinking water quality data to the public. Government made three main commitments in the *Source to Tap* report regarding reporting of water quality data. These commitments include:

- reporting annually to the House of Assembly on the state of water quality in the Province;

- providing drinking water quality data to the public on the Department of Environment and Conservation's website on a regular basis; and

- reporting annually to the operator of each public water supply system in the Province, through a consumer confidence report in January of the following year.

Our review of whether Government met each of these commitments indicated the following:

- *Reporting annually to the House of Assembly* - The first annual report was tabled in the House of Assembly in November 2002 for the fiscal year ending 31 March 2002. Department officials indicated that the annual report for the fiscal year ending 31 March 2003 is expected to be tabled in the House of Assembly in the very near future.

- *Providing drinking water quality data to the public* - The Department has revised its data management system in order to update its website quarterly with results from each sampling season. The website was updated with data from the summer 2003 sampling season in November 2003. As well, the Department maintains a listing of current boil water advisories in effect in the Province and regularly updates the website.

- *Reporting annually to the operator of each public water supply system* - Consumer confidence reports are to be mailed to municipalities in January of each year, covering the sampling data for the past calendar year. The first annual report of this kind was issued in March 2002. In addition, the Department has adopted a policy of issuing quarterly reports to the municipalities with data from each sampling season. Data for the fall sampling season is combined with the annual report and is to be issued in January each year. These new quarterly reports have been issued since

25 March 2002 for the winter 2002 sampling season and have been issued consistently within 60 days of the sampling end date for each season.

Regulatory Inspection and Mitigation Planning

Inspections of water supply systems are provided for under the *Water Resources Act* to ensure that systems are being properly operated and maintained, thereby contributing to the overall integrity of public water supply systems and the safety of drinking water.

Government committed in the *Source to Tap* report that as part of routine regulatory inspections, Department of Environment and Conservation staff would visit all public water systems in the Province at least once each year, or more than once in the case of any reported operational problems.

To determine the Department's progress in meeting these commitments, we reviewed the frequency of inspection for water treatment plants, chlorination facilities, water distribution systems and public groundwater wells.

Our review indicated that the Department is not meeting its commitments in this area as follows:

- ***Water treatment plants will be inspected at least twice a year***.

  As of November 2003, there were 13 water treatment plants in the Province. Department officials indicated that water treatment plants are only formally inspected when there are operational problems encountered, where there has been a proposed upgrade, or in response to infrastructure funding need assessment. They also indicated that trainers may note problem areas when they provide training to operators; however, this would not represent a formal inspection.

- ***Chlorination facilities will be inspected at least three times a year.***

  As of November 2003, there were 422 chlorination facilities in the Province. As in the case of water treatment plants, Department officials indicated that chlorination facilities are only formally inspected when operational problems are encountered, relating to a proposed upgrade, or in response to infrastructure funding need assessment.

- ***Water distribution systems will be inspected at least once a year to ensure water system flushing, cross-connection control, and leakage control***.

  As of November 2003, there were 403 water distribution systems in the Province. As in the case of water treatment plants and chlorination facilities, Department officials indicated that water distribution systems are only formally inspected when operational problems are encountered, relating to a proposed upgrade, or in response to infrastructure funding need assessment.

- ***Public groundwater wells and other selected wells will be inspected on a regular basis in order to ensure that these wells are constructed as per requirements of the Well Drilling Act and Regulations.***

  As of November 2003, there were 215 groundwater sources consisting of 213 wells and two springs. There are 285 public groundwater wells which make up the 213 well sources. A Department official indicated that public groundwater wells are inspected twice annually; however, we were unable to confirm whether inspections were conducted as indicated since reports on inspections conducted to 31 March 2003 were verbal and no inspection report was created. Subsequent to 31 March 2003, 164 inspections of public groundwater well sources were conducted to November 2003.

Operator Education and Training

The availability of trained and qualified operators is critical to the safe and sustainable operation of water systems. Government indicated in the May 2001 *Source to Tap* report that a long-term strategic plan would be completed for the education and training of water system operators. The plan was to consist of the following two phases:

- Phase I - classroom education and training of water system operators; and

- Phase II - on-site, hands-on training as a follow-up to education and training.

The objectives of the plan were to offer educational seminars and on-site training to operators regarding proper operation and maintenance of water supply systems, ensuring public water supply systems are operated and maintained as per regulatory requirements, providing for the delivery of safe, clean drinking water, and restoring public confidence in drinking water quality.

The benefits to be derived from the plan were to include prolonging the life of water infrastructure and maximizing the return on capital investment, providing more efficient and safe operations of systems by educated, trained, and knowledgeable operators, minimizing the number of boil water advisories, and addressing related water quality problems.

Our review indicated that Government has met its main commitment to operator education and training. Details on the Department's activities regarding operator education and training are as follows:

Education and training seminars - While the Department intended to conduct 54 seminars in 2001-02 and 72 in 2002-03, the actual number of seminars conducted was 51 in 2001-02 and 66 in 2002-03.

On-site training of water system operators - Three operator trainers were hired in November 2002 and three mobile training units were made available to the program in February 2003. Since February 2003, on-site training was provided to 333 of 403 operators in 297 communities.

While Government has met its main commitment to educate and train operators, operator certification is one area which requires further attention.

The Province of Newfoundland and Labrador does not have a legislative requirement for mandatory certification of water system operators; however, officials of the Department of Environment and Conservation indicated that consideration is currently being given to providing such a requirement.

Certification in the Province is currently on a voluntary basis utilizing the operator certification program offered through the Atlantic Canada Water and Wastewater Voluntary Certification Board. There were 61 operators certified under the Program when the May 2001 *Source to Tap* report was released. According to Department officials, there were 162 certified operators in the Province as of November 2003.

Currently 7 of the 13 provinces and territories in Canada have legislation which requires mandatory certification of water system operators. According to Department officials, of the 6 provinces and territories that do not have mandatory operator certification legislation, 2 provinces are expected to have such legislation in place in the very near future. Figure 8 presents information for provinces and territories in relation to legislation requiring mandatory certification of water system operators.

Figure 8

Operator Certification in Canada

Provinces with legislation requiring mandatory certification of water system operators	Provinces and territories with no legislation requiring mandatory certification of water system operators
British Columbia	Yukon Territory
Alberta	Northwest Territories
Saskatchewan	Nunavut
Manitoba	New Brunswick
Ontario	Prince Edward Island
Quebec	Newfoundland and Labrador
Nova Scotia	

Source: Department of Environment and Conservation

As of October 2003, there were 567 water supply systems in Newfoundland and Labrador. Water supply systems are classified according to the population they service, with some of the 532 public water supplies in the Province having more than one water supply system. Of the 567 water supply systems, 520 are classified as small systems, serving less than 1,500 people. According to the Department, the majority of these small systems are owned by Local Service Districts and small Community Councils and represent the greatest risk in terms of water quality and health issues due to the lack of financial and/or technical capacity to properly operate the systems. Mandatory certification would reduce the risk of water quality and health issues. While certification is not required in Newfoundland and Labrador, there are over 400 classified water systems for which trained water system operators would be required under mandatory certification.

The Department has commenced a process of documenting the education and training of operators of each classified water system, however, it is in the initial stages only. As a result, it is not possible to compare the education and training obtained to the amount required to operate the classified water system. Operator certification would provide a mechanism to track qualified operators of water systems by class.

Recommendations

Government should continue its work in meeting the commitments outlined in the Source to Tap *report. Specifically:*

- *efforts should continue to protect the remaining pubic water supplies in the Province through designating areas around public water sources as protected under the* Water Resources Act*;*
- *Trihalomethanes (THM) and other chemical water quality testing should be conducted in accordance with the commitment contained in the* Source to Tap *report and in accordance with Provincial standards;*
- *microbiological water quality testing should be conducted in accordance with the commitment contained in the* Source to Tap *report and in accordance with Provincial standards; and*
- *inspections of water systems under the* Water Resources Act *should be conducted in accordance with the commitment contained in the* Source to Tap *report.*

Government should further consider the issue of mandatory certification of water system operators.

Department's Response

By way of general comments, the title of this report does not reflect the fact that the review pertained only to drinking water, i.e. drinking water quality of public water supplies and not to water quality management overall. The latter is a multi-faceted program which includes ambient water quality monitoring, hydrologic modelling, protection of bodies of water, permitting of alterations and other activities, many of which integrate with drinking water program elements.

On the other hand, one of the most important determinants of drinking water quality is the municipality, which has the primary responsibility for operation and maintenance of water supply systems. The role of municipal governments is mentioned in the introduction of the review but their crucial significance was not addressed. Considerable effort is being made to engage municipalities to be more proactive in managing drinking water and to ensure that it is safe, clean and reliable. We suggest the role of municipalities be more strongly reflected in the report.

My last general comment is that the main basis for the comparative analysis of the review was the document "Source to Tap, Water Supplies in Newfoundland and Labrador, May 2001". *This document laid out a proactive plan which introduced the concept of a multi-barrier approach to clean and safe drinking water. It announced several new or enhanced initiatives including a comprehensive plan for chemical and microbiological drinking water quality monitoring, operator training, new legislation, integration of cross-departmental activities, source protection, water quality reporting and a review of the permitting aspects of water systems and their operation. While some goals may not have been achieved the significant point is that there is a solid plan and government is actively working in achieving all of its objectives.*

The following are my comments regarding the recommendations of your review. This department, and I'm sure this applies to the other departments with their role in safe and clean drinking water, will strive to not only meet the commitments in "Source to Tap", but to adapt the multi-barrier strategic action plan to existing and emerging issues in the area of drinking water safety in a manner that is rational and uses existing resources efficiently and cost effectively.

Protection of Water Supplies *- As pointed out to the auditors, it is the responsibility of owners of water supply systems (municipal governments) to apply for watershed and wellhead protection. Government cannot impose watershed designation of a municipal authority and some towns have elected to not have their watershed designated as a protected watershed area. Wellhead protection is a new initiative permitted under the Water Resources Act which was passed in May 2002, and the department has written to 100 communities where risk analysis showed that protection would be a priority. A follow up letter was written later. So far only 27 communities responded of which eight declined. For those communities that did respond, their applications were or are being processed.*

Currently out of 308 surface water supplies, 255 are protected. Communities in this category that do not have their water supply protected have been written to on several occasions but they have chosen not to take up the designation process. We will continue to remind them of the benefits of watershed protection.

Trihalomethanes (THMs) and other Chemical Testing *- We agree that the water quality testing should be carried out in accordance with our provincial standards. These standards are derived from Health Canada's* "Guidelines for Canadian Drinking Water Quality" *and they specify how often a sample should be collected. These guidelines are not prescriptive, rather they allow for adaptation to local circumstances. Rather than give a blanket commitment for water quality sampling, a detailed workplan has been prepared for this task. It is published on the department's website at:*

www.gov.nl.ca/env/ENV/waterres/Surfacewater/Schedule/Drinking Water-SamplingSchedule.asp

To allow for resource and extenuating circumstances, we have added the following qualifer:

Please note that while every reasonable effort will be made to collect all of the drinking water quality samples listed in the schedule, circumstances such as inaccessibility to the site, lack of necessary chlorination, sample spoilage, staff travel restrictions or other factors will result in a certain percentage of missed samples. Data gaps will be filled on a priority basis but there will be limits placed on filling these gaps due to cost efficiently considerations.

THMs sampling frequency was reduced in special cases where groundwater is the water supply source. THMs formation requires both chlorine and organic compounds. Groundwater generally does not have organic compounds, thus once it is shown that the source is not under the influence of surface water, there is little need to sample for THMs, especially on a seasonal basis. Several water supplies (Campbellton, Marysvale, Holyrood) which were reported in the review fell into this category. "Source to Tap" *did not elaborate on this but pages 4-6 of the report did not include groundwater supplies in the THMs sampling plans, only surface water supplies were included.*

Mictobiological Water Quality Testing *- As discussed in the previous section, every effort is being made to collect and analyse water samples from every public water supply in the province as per the frequency stated in the provincial standard for drinking water quality. But as is the case for THMs and chemical sampling, circumstances may prevent the collection of samples from time to time. In addition, a water supply is not tested if it is*

currently under a boil water advisory. There is no point in doing so since the safety of the water is already shown to be compromised. Regular microbiological testing of water resumes once the reason for the boil water advisory is corrected.

Inspections of Water Systems *- We agree that there should be frequent inspections of water supply systems. At issue is a discrepancy between what was planned as per* "Source to Tap" *and what constitutes a formal inspection in the opinion of the auditors. There are many opportunities for a site visit. These include when source water inspections take place, when the various samples are taken and when on-site training is provided. All staff are instructed to note any changes to the system and to report them to our Community Water and Wastewater Specialists along with reporting of any potential problems with the facilities.*

Operator Certification *- The Department of Environment and Conservation is considering mandatory certification of water system operators. This is something that will have to be phased in since there are many operators who would not be able to meet the qualification requirements or pass the necessary tests without training and upgrading. Training operators so that they can achieve certification is a long term training objective. In* "Source to Tap" *we reported that there were 61 certified operators in the province. Currently we have increased that number almost threefold to 173 certified operators.*

In closing, I would like to say that "Source to Tap" was a huge initiative which followed upon the crises in the drinking water sector following the Walkerton incident. The multi-barrier approach has been successfully implemented on many fronts as shown in the two annual reports on drinking water safety in Newfoundland and Labrador published since May 2001.