Chapter 1 An Overview

Contents

Chapter 1 An Overview

1.1 Introduction

In the aftermath of the water-borne outbreak in Walkerton, the Government of Ontario established this public Inquiry.[1] The first part of the Inquiry's mandate directed me to report on the events in Walkerton and the causes of the tragedy. The report for Part 1 was released in January 2002. The second part of the mandate directed me to make recommendations to ensure the safety of drinking water across the province. This volume is the Part 2 report.

This report results from a very thorough public process that involved the active participation of a wide array of individuals and groups with interest and expertise in the many issues relating to the safety of drinking water. In the process, the Inquiry reviewed the most current literature in the area, the best practices in water management and regulation employed in jurisdictions around the world, and the latest in science and technology. I am satisfied that I have had the benefit of the best available experience, expertise, and advice to assist in developing a set of reasonable and practical recommendations.

In this report, I make recommendations for improvements to each of the main components of Ontario's water delivery system.[2] However, readers should not conclude that Ontario's existing system needs radical reform. It does not. We can be proud of the high level of expertise and competence that our leading water providers exhibit. The challenge is to ensure that the best practices are implemented across the province. A review of outbreaks in jurisdictions around the world shows that many of the failures that played a role in the Walkerton tragedy have also been contributing factors on other occasions.[3] We must take seriously the lessons learned from these experiences so as to avoid similar failures in the future.

For the convenience of readers, I first set out a brief executive summary of my recommendations. That is followed by a discussion of some of the principles and themes that underlie the approach I have adopted throughout the report

[1] Throughout this report, the terms "the Inquiry" and "the Commission" are used interchangeably.
[2] These recommendations should be read together with the recommendations made in the Part 1 report of this Inquiry.
[3] S. Hrudey et. al., 2002, "A fatal waterborne disease outbreak in Walkerton, Ontario: Comparison with other waterborne outbreaks in the developed world," proceedings at the International Water Association World Water Congress Health-Related Water Microbiology Symposium, Melbourne, Australia, April 7–12.

and then by a more complete overview of the recommendations that are contained in the body of the Part 2 report. The chapter concludes with a complete listing of the Part 2 recommendations. The remaining chapters contain the full text of my report.

1.2 Executive Summary

The recommendations in this report are divided into five areas.

1.2.1 Source Protection

The first barrier to the contamination of drinking water involves protecting the sources of drinking water. I recommend that the Province adopt a watershed-based planning process, led by the Ministry of the Environment (MOE) and by the conservation authorities[4] (where appropriate), and involving local actors. The purpose is to develop a source protection plan for each watershed in the province. The plans would be approved by the MOE and would be binding on provincial and municipal government decisions that directly affect drinking water safety. Large farms, and small farms in sensitive areas, would be required to develop water protection plans that are consistent with the watershed-based source protection plans.

1.2.2 Standards and Technology

The next set of barriers to the contamination of drinking water relies on having in place effective standards and technology for treating water and for monitoring its quality as it makes its way to the consumer. I recommend that Ontario's standards and technology be continually updated according to the most recent knowledge and experience. The processes for doing so should be open and transparent.

---

[4] Conservation authorities were established in Ontario in 1946. There are currently 36 conservation authorities in the province. Their functions include controlling potential flood damage, and in many cases they also perform watershed management, including planning, education, prevention, and monitoring. In managing particular watersheds, they also protect lands and wetlands for recreation and wildlife and have the power to acquire lands and build structures such as reservoirs and dams.

1.2.3 Municipal Water Providers

Over 80% of Ontarians get their drinking water from municipal sources. I therefore recommend that all municipal water providers be required to adopt a quality management approach for their water systems. As a condition of provincial approval, municipalities would be required to have an accredited operating agency (either internal or external) and to have an approved operational plan for their water system. There would be mandatory training for all water system operators, and grandparented operators would be required to pass certification examinations within two years.

1.2.4 Provincial Oversight

The provincial government is responsible for regulating and overseeing the safety of Ontario's drinking water. I recommend that the government strengthen the way in which it fulfills this responsibility. In particular, I recommend that the Province adopt a government-wide drinking water policy and a *Safe Drinking Water Act* for Ontario, and that it establish two specialized branches within the MOE. These branches would be responsible, respectively, for watershed planning and for overseeing water systems. It is essential for the Province to strictly enforce drinking water regulations and to commit sufficient resources, financial and otherwise, to enable the MOE to play this role effectively.

1.2.5 Special Cases

Special approaches are needed in two areas: small water systems and First Nations water supplies. For those small systems that are currently captured by regulatory standards, I recommend that the Province allow variances from regulatory standards only where the owner demonstrates that safety will not be compromised, and never for cost reasons alone. For those small systems that serve the public but that do not currently fall under regulatory standards – such as those at rural restaurants and campgrounds – I recommend that they be given the option either to comply with regulatory standards or to post a notice at every tap that the water is not potable. For First Nations water supplies, I recommend that the Province make available on request the services of the Ontario Clean Water Agency (OCWA), along with other technical assistance, as well as training.

Readers involved with the water industry will find most of the recommendations familiar. The recommendations are based on the best practices found in other jurisdictions and on the most current thinking of those with experience and expertise in the industry. For example, watershed-based management planning has been adopted in Europe and Australia and is already being used in a few Ontario watersheds. Also, the concept of quality management for water providers is becoming broadly accepted by the water industry throughout North America, Europe, and Australia. Quality management systems, which have been used in other industries for years, are currently used by some Ontario water providers. Given the importance of water industry practices to public health, the time has come to make quality management mandatory for municipal water providers. Finally, few informed observers, if any, would argue against the need for the Province to ensure that drinking water systems are overseen in a consistently strong and effective manner.

1.3 General Principles

This section outlines a number of general principles and themes that underlie the approach I have adopted throughout the report.

While it is not possible to utterly remove all risk from a water system, the recommendations' overall goal is to ensure that Ontario's drinking water systems deliver water with a level of risk so negligible that a reasonable and informed person would feel safe drinking the water.[5]

The risks of unsafe drinking water can be reduced to a negligible level by simultaneously introducing a number of measures: by placing multiple barriers aimed at preventing contaminants from reaching consumers, by adopting a cautious approach to making decisions that affect drinking water safety, by ensuring that water providers apply sound quality management and operating systems, and by providing for effective provincial government regulation and oversight.

I discussed the multiple-barrier concept in section 4.2 of the Part 1 report, and it is a recurring theme throughout this Part 2 report. The multiple-barrier approach is well-entrenched in the water industry, for good reasons. Putting in place a series of measures, each independently acting as a barrier to passing

[5] I address standards setting with regard to vulnerable subpopulations in Chapter 5 of this report.

water-borne contaminants through the system to consumers, achieves a greater overall level of protection than does relying exclusively on a single barrier (e.g., treatment alone or source protection alone). A failure in any given barrier will not cause a failure of the entire system. The challenge is to ensure that each of the barriers is functioning properly, so that together they constitute the highest level of protection that is reasonably and practically available.

My recommendations are intended to improve both transparency and accountability in the water supply system. Public confidence will be fostered by ensuring that members of the public have access to current information about the different components of the system, about the quality of the water, and about decisions that affect water safety. Public confidence will also be raised by ensuring that those who make decisions about drinking water safety are accountable for the consequences of those decisions.

Taken together, the recommendations constitute an overall approach to reducing to negligible levels the risks that can affect drinking water. It is important to invest resources so as to achieve the greatest combined reduction of risk for a reasonable cost. In my view, the risk reduction that could result from implementing the recommendations in both of my reports makes the costs of their implementation well worth bearing. I asked Strategic Alternatives, a respected consulting firm, to estimate the costs of implementing all the recommendations, as well as the cost increases that have resulted from the steps that the provincial government has already introduced since the Walkerton tragedy.[6]

In summary, Strategic Alternatives estimates the following:

- One-time cost of implementing this Inquiry's recommendations: $99 million to $280 million.

- Ongoing annual cost of implementing the Inquiry's recommendations: $17 million to $49 million per year.

[6] Strategic Alternatives et al., 2002, "The costs of clean water: Estimates of costs arising from the recommendations of the Walkerton Inquiry," Walkerton Inquiry Commissioned Paper 25. I want to emphasize that the Strategic Alternatives report contains estimates based on the assumptions set out in that report. Strategic Alternatives made those assumptions based on its expertise and on available information. While I have no reason to disagree with those assumptions, they should not be considered to constitute the details of the recommendations made in this report. In implementing the recommendations, the Province and municipal governments may find it necessary to adopt different assumptions in some cases.

- One-time cost of steps taken by the provincial government since the Walkerton tragedy: $100 million to $520 million.[7]

- Ongoing annual cost of steps taken by the provincial government since the Walkerton tragedy: $41 million to $200 million per year.

These costs may be allocated among the provincial government, municipalities, and individuals in a variety of ways. No matter how they are allocated, given that this province has over 11 million people (and assuming that the Strategic Alternatives estimates are reasonably accurate), the overall cost of safe water for Ontario would still compare favourably with that in other jurisdictions, as well as with expenditures typically made by Ontario households for other services. According to Strategic Alternatives, the one-time costs of my recommendations, amortized over 10 years at 7% interest, would amount to an average of between $7 and $19 per household per year.[8] Comparing the average water rates with those for less essential services such as cable television, telephones, or Internet access makes this point powerfully.

The cost of the Walkerton tragedy itself also makes for a compelling comparison. A study commissioned by the Inquiry estimates the economic impact of the Walkerton events to be more than $64.5 million.[9] Of course, this figure does not include the tragedy's great impact in terms of human suffering and loss of life. Still, it does show that from an economic standpoint alone, the costs of a system failure can be enormous.

I have approached the recommendations with a view toward using existing structures and institutions wherever those structures are able to carry out my recommendations. For example, I recommend that the provincial government's responsibility for protecting water sources be implemented on a watershed basis through the already existing conservation authorities, rather than by establishing new local bodies to fulfill this role. If a conservation authority is unable to carry out the new responsibility, the MOE itself should do so. I expect that the use of existing institutions will facilitate the adoption of these recommendations and reduce the costs of implementing them.

---

[7] These estimated costs relate only to implementing Ontario Regulation 459/00 and Ontario Regulation 505/01.

[8] The actual costs for a given household may vary considerably.

[9] J. Livernois, 2002, "The economic costs of the Walkerton water crisis," Walkerton Inquiry Commissioned Paper 14.

Since Dr. John Snow's 1854 discovery in London, England, that drinking water could kill people by transmitting disease, the developed world has come a long way toward eliminating the transmission of water-borne disease. The Walkerton experience warns us that we may have become victims of our own success, taking for granted our drinking water's safety. The keynote in the future should be vigilance. We should never be complacent about drinking water safety. Circumstances change. Ontario's population will likely continue increasing, as will the intensity and the types of human activities that can threaten drinking water sources. New pathogens and chemical contaminants will continue to emerge. We will be able to minimize risk to a negligible level in the future only if we constantly monitor the design and management of our water delivery systems to ensure that we are always employing the safest practices available. The recommendations in this report are aimed at achieving this important objective.

1.4 Specific Recommendations

Here I discuss more fully the recommendations summarized in section 1.2.

1.4.1 Source Protection (Chapter 4)

In a multiple-barrier system for providing safe drinking water, the first barrier involves selecting and protecting reliable, high-quality drinking water sources.

A strong source protection program offers a wide variety of benefits. It lowers risk cost-effectively: keeping contaminants out of drinking water sources is an efficient way of keeping them out of drinking water. This is particularly so because standard treatments cannot effectively remove certain contaminants. And protecting drinking water sources can in some instances be less expensive than treating contaminated water so that it meets required safety standards.

The public strongly favours source protection as a key component of our water system. No other aspect of the task of ensuring drinking water safety received as much attention during the town hall meetings that this Inquiry held across

Ontario. Source protection was also one of the main issues identified by the parties with standing in the Inquiry.[10]

I recommend a source protection system that includes a strong planning component on an ecologically meaningful scale – that is, at the watershed level.

Drinking water source protection, as one aspect of watershed management, makes the most sense in the context of an overall watershed management plan. In this report, I restrict my recommendations to those aspects of watershed management that I think are necessary to protect drinking water sources, but I want to emphasize that a comprehensive approach for managing all aspects of watersheds is needed and should be adopted by the province. Source protection plans should be a subset of the broader watershed management plans.

The following are some of the main elements of the source protection system I envision:

Leadership from the Ministry of the Environment (MOE): I recommend that the MOE be the lead provincial agency with regard to all aspects of providing safe drinking water, including source protection. The MOE would establish the framework for developing the watershed-based source water protection plans, would help to fund and participate in their development, and would approve the completed plans.

A local planning process: To ensure that local considerations are fully taken into account, and to develop goodwill within and acceptance by local communities, source protection planning should be done as much as possible at a local (watershed) level, by those who will be most directly affected (municipalities and other affected local groups). Where possible, conservation authorities should coordinate the plans' local development. Otherwise, the MOE itself should undertake the coordination role. I envision the process as being completely open to public scrutiny.

---

[10] I granted standing on being satisfied that a party had an interest in the Inquiry's subject matter and could bring a useful perspective to the issues being considered. In the Part 2 process, I granted standing to 36 parties. The parties who were granted standing are listed in Chapter 16 of this report.

Approval by the MOE: Once draft plans are developed at the watershed level, I envision that they would then be subject to MOE approval. Requiring approval will provide consistency of approach across watersheds and should help prevent undue influence by local interests.

Effective plans: If source protection plans are to be meaningful, they must be respected by the various actors in a watershed. Once the MOE has approved a plan, therefore, provincial Permits to Take Water and Certificates of Approval for sewage treatment plants and any other activities that pose a threat to water quality will have to be consistent with the approved plan. In cases involving a significant direct threat to drinking water sources, municipal official plans and zoning decisions will also need to be consistent with the local source protection plans. In all other situations, municipal official plans and zoning decisions should at least take the relevant source protection plans into account.

The chapter on source protection also includes a number of recommendations relating to specific potential sources of contamination, including sewage treatment plants, septage and biosolids, septic tanks, agriculture, and industrial activity. The thrust of all of these recommendations is that no discharges into drinking water sources should be permitted unless they are consistent with watershed-based source protection plans. In particular, I envision requiring large farms in all locations and smaller farms in sensitive areas to develop water protection plans for MOE approval. In addition, I recommend that there be minimum regulatory requirements for agricultural activities that create impacts on drinking water sources. The objective of these recommendations is to ensure that the cumulative effect of discharges from farms in a given watershed remains within acceptable limits. For smaller farms in areas that are not considered sensitive, I recommend continuing and improving the current voluntary programs for environmental protection.

1.4.2 Standards and Technology (Chapters 5 to 9)

I make a number of recommendations directed at improving the process by which standards are set. I propose making the federal–provincial process for establishing water quality guidelines more transparent and more accessible to public participation. I also propose that Ontario establish an Advisory Council

on Standards to provide a broader range of expertise in the provincial standard-setting process. Both suggestions are aimed at obtaining more assistance, at little cost, in this critical area.

In addition, I make specific recommendations for improving a number of current practices in setting standards. These recommendations relate to such matters as turbidity levels, disinfection by-products, heavy metals and priority organics, selecting appropriate treatment processes, continuous monitoring of operational measurements, and collecting and testing samples.

These recommendations should not be viewed as a criticism of Ontario's current water quality standards. Indeed, I have no doubt that the current standards were established with great concern for the safety of the province's drinking water. Rather, the specific proposals are intended to bring Ontario's regulatory standards and practices into line with the most current developments in technology and the best practices adopted elsewhere. These proposals may be viewed as part of the continuing process of ensuring that our standards are consistent with the most up-to-date information and practices.

1.4.3 Municipal Water Providers (Chapters 10 to 12)

Over 80% of Ontarians are served by municipally owned water systems. Although municipalities are permitted to sell their systems, there was no suggestion during the Inquiry that any municipalities are even considering doing so. Moreover, nothing I heard during the Inquiry led me to conclude that I should make recommendations about the ownership of municipal systems in order to address water safety issues. The recommendations in this area are therefore premised on continued municipal ownership.

There are, however, a number of different ways in which a municipality may choose to manage and operate the water system it owns. Possible approaches include a variety of internal management structures, regionalization or consolidation with other municipalities, and contracting with external operating agencies such as the Ontario Clean Water Agency, various private operators, or other municipalities. There are advantages – and, in some cases, drawbacks – to each choice. What is best for a particular municipality will depend on its circumstances. The first consideration, however, in choosing any management or operational structure should always be safety. It will be through the process

of mandatory accreditation and operational planning that we will gain assurance about the competence of operating agencies, whether public or private.

I recommend that each municipality review the available options, with provincial guidance where required, to determine the management structure that will best promote the safety of its drinking water. This review should be done in the light of a number of my recommendations, including those involving mandatory accreditation and operational planning. But whatever management structure is chosen, the arrangement must be such that the municipality, as the system's owner, remains accountable for the provision of safe drinking water.

To promote accountability, I recommend that the persons designated by a municipality to oversee the management and operation of its water system be held to a statutory standard of care for the safety of the water, similar to the duty of a director of a corporation.

Perhaps the most significant recommendations in this report address the need for quality management through mandatory accreditation and operational planning. Sound management and operating systems help prevent, not simply react to, the contamination of drinking water. In this vein, I recommend requiring all operating agencies to become accredited in accordance with a quality management standard – a standard that will be developed by the industry and others knowledgeable in the area and mandated by the MOE. Accreditation is designed to ensure that operating agencies have systems in place at the organizational level that will enable them to deliver safe water. Also, as part of the quality management approach, I recommend that each municipality be required to have an operational plan for its water system. I anticipate that the accreditation standard and the requirement for operational plans can be tailored to accommodate systems of different sizes and complexity.

In addition, I recommend that mandatory certification for individual operators continue and that those operators who have received their certification by way of grandparenting be required to meet current standards regarding experience and knowledge, demonstrated by passing an examination at the appropriate level, within two years. I also propose that the MOE develop a curriculum for operator training and that mandatory training requirements specifically emphasize water quality and safety issues.

Finally, I recommend that municipalities be formally required to raise adequate resources to pay for their water systems. Water safety is promoted by sound

fiscal management. I propose requiring each municipality to have a financial plan that provides for full cost recovery and for proper asset management in accordance with provincially established standards. Provincial subsidies should be available only in exceptional cases – specifically, when safety is at risk and when no other alternatives, either technological or managerial, are available.

Before leaving this topic, I want to comment on the additional burden these recommendations will place on municipalities. For many, the added burden will not be great. The well-run water systems, while not currently accredited, already practise quality management and already have financial plans that should be easily adaptable to the newly mandated standards. However, for some systems, particularly smaller ones, these proposals will involve a significant amount of work. But that is not an adequate reason for not implementing them. The Walkerton tragedy and other outbreaks have taught us the vital importance of sound management. Any adjustments made for small communities should be based on their water systems' relative lack of complexity and lower risk, and should never compromise safety. Some of my recommendations, especially those involving mandatory accreditation and operational planning, may lead certain municipalities to conclude that they should no longer manage their water system internally, and to move to an alternative model, either by joining their system with that of a neighbouring municipality or by engaging the services of an external operating agency.

1.4.4 Provincial Oversight (Chapter 13)

The intent of the recommendations in this area is to strengthen provincial oversight of water delivery systems. In the Part 1 report, I found several failures in the way the provincial government exercised its oversight role in relation to the Walkerton tragedy, and I made specific recommendations aimed at addressing those failures. Taken together, the recommendations in the two reports will, in my view, improve the quality of provincial policy and provide for effective oversight across the province.

With regard to policy, I recommend that the Province develop a comprehensive, source-to-tap, government-wide drinking water policy and enact a *Safe Drinking Water Act* embodying the important elements of that policy. I also propose that the Ministry of the Environment (MOE) take the lead in developing and implementing the policy.

I recommend that two new branches be created within the MOE. The Watershed Management Branch would be responsible for overseeing the watershed-based planning process described in section 1.4.1. It is important that the provincial government's responsibilities for watershed management be coordinated in one place – a place where there is sufficient expertise to manage the process. This new branch would be responsible for developing the framework for watershed planning, participating in the locally based process of developing the plans, and approving the draft plans. In the event that draft plans are not developed as required at the local level, this branch of the MOE would step in and take charge of the process. Having a centralized MOE branch dedicated to watershed management should promote consistency in planning across the province and provide the expertise and support necessary for ensuring that good plans are developed.

I also propose establishing a specialized Drinking Water Branch within the MOE. This branch would be responsible for overseeing drinking water treatment and distribution systems. The skills and knowledge needed for the tasks of regulating and overseeing drinking water providers and systems differ significantly from those required for performing most of the ministry's other responsibilities. Within this branch, I recommend creating a new position: the Chief Inspector – Drinking Water Systems. This person would be responsible for the inspections program. I suggest that individual inspectors should have the same qualifications as, or higher qualifications than, the operators of the systems they inspect. The Drinking Water Branch would oversee and be responsible for the quality management accreditation program proposed in section 1.4.3. The Drinking Water Branch would also be responsible for granting most of the approvals necessary for operating a drinking water system. I recommend a new form of approval – the owner's licence – that will collect in one set of documents all the approvals and conditions necessary for operating a waterworks.

To date, the MOE's Investigations and Enforcement Branch (IEB) has investigated – and, where appropriate, prosecuted – those suspected of non-compliance with regulatory requirements. I am satisfied that the IEB should remain, as currently constituted, a separate branch within the ministry. For the most part, this arrangement has worked well. In my view, the necessary independence from inspections and abatement can be maintained without establishing a new agency outside the ministry. However, I do recommend that the new provincial policy on drinking water provide for strict enforcement

of drinking water regulations and that it apply equally to all operating agencies, including the municipalities and OCWA.

Finally, I urge the government to proceed with the proposed Integrated Divisional System and to either include in that system, in one database, or otherwise provide central access to, information related to source protection, information about each drinking water system in Ontario, and all other data that might reasonably be required by the Drinking Water Branch and by the local boards of health.

Chapter 11 of the Part 1 report discusses in some detail the budget reductions within the MOE. Implementing a number of the recommendations I make in this Part 2 report will involve expenditures aimed at ensuring that the MOE is able to carry out its oversight role fully and effectively. It will be essential for the Province to provide the MOE with sufficient resources, financial and otherwise, to enable it to act on these recommendations.

1.4.5 Special Cases (Chapters 14 and 15)

In Chapters 14 and 15 of this report, I discuss two kinds of systems that warrant special consideration: small water systems and First Nations reserves, respectively.

1.4.5.1 *Small Water Systems*

There are two categories of small water systems. The first category comprises systems covered by Ontario Regulation 459/00, which sets out water quality, treatment, monitoring, and other requirements for systems that serve more than five households or that have more than a specified capacity. During the Inquiry, I heard at length that Ontario Regulation 459/00's current requirements are financially onerous for many small communal systems.

For some municipal systems, following the recommendations in this report regarding accreditation, operational plans, and financial plans may indeed increase expenses, at least temporarily. To address concerns about the costs of regulatory requirements, I recommend allowing water systems, whether municipally or privately owned, to apply for a variance from provincially imposed standards, including those currently found in Ontario Regulation 459/00. Any such variance should be granted solely on the basis of a satisfactory

risk assessment. In some cases, the nature of the water source or the use of specialized technology may ensure water safety without the need of meeting the full regulatory requirements.

I also recommend that in future, the Province refuse to approve water systems that will not be economically viable under the regulatory regime necessary for ensuring water safety in that system. Problems regarding the costs of regulatory compliance should be addressed before approval is granted.

Existing systems that are not economically viable under the current regulatory regime should be required to explore all available management and technological options in order to find the most cost-effective way of providing safe water. If, in the end, no alternatives can be found and currently authorized systems are not affordable beyond a predetermined point, I recommend provincial assistance. I expect that few such cases will occur, and they should be phased out, if possible, over time.

The second category of small systems that present a troubling concern comprises privately owned systems that do not come within Ontario Regulation 459/00 but that serve drinking water to the public: that is, establishments with their own wells, such as rural restaurants, gas stations, summer camps, resorts, schools, hospitals, and businesses. In December 2001, the provincial government passed Ontario Regulation 505/01, which sets out certain requirements for some of these types of water providers. But that regulation applies only to water providers whose systems serve designated facilities, such as schools, nursing homes, and hospitals. I agree with this initiative. I recommend, however, that Ontario Regulation 505/01 be extended to *all* those who own a water system that is not covered by Ontario Regulation 459/00 but that serves the public. For those whose systems are not covered by Ontario Regulation 505/01 as now written, I propose giving them a choice: either comply with the regulation or post a sign at every tap saying that the water is not potable.

Finally, I address privately owned wells that serve fewer than six residences and that do not serve the public. I propose that the owner of any such system remain responsible for the safety of his or her own water. I recommend that the province improve education programs aimed at informing the owners of private wells about the potential dangers to drinking water and about the technology available for treating water within private systems. The province should encourage regular testing by private well owners and should continue to make free microbiological tests available through local health units.

1.4.5.2 *First Nations Water Systems*

Constitutionally, First Nations reserves fall within the jurisdiction of the First Nations themselves and of the federal government. Because this is a provincial inquiry, my recommendations in this regard must be circumscribed.

The water provided on many First Nations reserves is some of the poorest-quality water in the province. Residents of Ontario's First Nations reserves are also Ontario residents. I therefore suggest to the First Nations and to the federal government that the water quality standards for reserves should be no lower than those that apply elsewhere in the province and that those standards should be made legally enforceable. To assist with this objective, I recommend that when asked, Ontario make its resources and expertise available, on a cost-recovery basis, to help improve the water quality on reserves. In particular, I suggest that the Ontario Clean Water Agency be available to operate water systems on reserves and that the MOE make its inspections, abatement, and training programs available to reserves as well. I also suggest that the First Nations, where appropriate, be involved in the watershed-based source protection planning process I recommend (see section 1.4.1).

1.5 The Balance of This Report

In addition to the recommendations described above, this report includes an overview of the current regulatory scheme (Chapter 2) and a discussion of the multiple-barrier approach (Chapter 3). Chapter 16 describes the process followed during Part 2 of this Inquiry. When read together, Chapter 14 in the Part 1 report and Chapter 16 in this Part 2 report provide a complete description of this Inquiry's process.

In the course of its work, the Inquiry accumulated a substantial library of materials. Papers were commissioned from distinguished experts in the areas most relevant to the work of Part 2 of the Inquiry, and the parties with standing contributed another large set. All of these papers, as well as a selection of the many submissions received from the general public, will be available on the Inquiry's Web site, www.walkertoninquiry.com, until December 31, 2002, and all are included on the compact disc that is in a pocket at the back of the Part 2 report. The Inquiry's general records – including the originals of these materials, as well as transcripts of hearings and documents introduced in evidence – are deposited in the Provincial Archives.

1.6 Summary

The people of Ontario are entitled to safe, high-quality drinking water. For the most part, they have enjoyed just that. But improvement is clearly necessary in a number of areas. This report examines the statutory, regulatory, technological, management, and operational systems and processes currently in place for supplying Ontario's drinking water. My aim throughout is to identify any weaknesses in those areas and to propose ways to correct those weaknesses. My recommendations touch on all dimensions of Ontario's water system and on all the actors within it. If the recommendations in this Part 2 report and those contained in the Part 1 report are implemented, I am confident that Ontarians will enjoy safe drinking water well into the future.

1.7 List of Part 2 Recommendations

The following is a list of all recommendations in Part 2.[11]

Source Protection (Chapter 4)

Recommendation 1
Drinking water sources should be protected by developing watershed-based source protection plans. Source protection plans should be required for all watersheds in Ontario.

Recommendation 2
The Ministry of the Environment should ensure that draft source protection plans are prepared through an inclusive process of local consultation. Where appropriate, this process should be managed by conservation authorities.

Recommendation 3
Draft source protection plans should be reviewed by the Ministry of the Environment and subject to ministry approval.

Recommendation 4
Provincial government decisions that affect the quality of drinking water sources must be consistent with approved source protection plans.

[11] As a result of the broader perspective afforded to me by Part 2, some of my Part 2 recommendations do not exactly reflect those in Part 1. Where this occurs, my Part 2 recommendations should take precedence.

Recommendation 5
Where the potential exists for a significant direct threat to drinking water sources, municipal official plans and decisions must be consistent with the applicable source protection plan. Otherwise, municipal official plans and decisions should have regard to the source protection plan. The plans should designate areas where consistency is required.

Recommendation 6
The provincial government should provide for limited rights of appeal to challenge source protection plans, and provincial and municipal decisions that are inconsistent with the plans.

Recommendation 7
The provincial government should ensure that sufficient funds are available to complete the planning and adoption of source protection plans.

Recommendation 8
Conservation authorities (or, in their absence, the Ministry of the Environment) should be responsible for implementing local initiatives to educate landowners, industry, and the public about the requirements and importance of drinking water source protection.

Recommendation 9
Septic systems should be inspected as a condition for the transfer of a deed.

Recommendation 10
The Ministry of the Environment should not issue Certificates of Approval for the spreading of waste materials unless they are compatible with the applicable source protection plan.

Recommendation 11
The Ministry of the Environment should take the lead role in regulating the potential impacts of farm activities on drinking water sources. The Ministry of Agriculture, Food and Rural Affairs should provide technical support to the Ministry of the Environment and should continue to advise farmers about the protection of drinking water sources.

Recommendation 12
Where necessary, the Ministry of the Environment should establish minimum regulatory requirements for agricultural activities that generate impacts on drinking water sources.

Recommendation 13
All large or intensive farms, and all farms in areas designated as sensitive or high-risk by the applicable source protection plan, should be required to develop binding individual water protection plans consistent with the source protection plan.

Recommendation 14
Once a farm has in place an individual water protection plan that is consistent with the applicable source protection plan, municipalities should not have the authority to require that farm to meet a higher standard of protection of drinking water sources than that which is laid out in the farm's water protection plan.

Recommendation 15
The Ministry of the Environment should work with the Ministry of Agriculture, Food and Rural Affairs, agricultural groups, conservation authorities, municipalities, and other interested groups to create a provincial framework for developing individual farm water protection plans.

Recommendation 16
The provincial government, through the Ministry of Agriculture, Food and Rural Affairs in collaboration with the Ministry of the Environment, should establish a system of cost-share incentives for water protection projects on farms.

Recommendation 17
The regulation of other industries by the provincial government and by municipalities must be consistent with provincially approved source protection plans.

Standards (Chapter 5)

Recommendation 18
In setting drinking water quality standards, the objective should be such that, if the standards are met, a reasonable and informed person would feel safe drinking the water.

Recommendation 19
Standards setting should be based on a precautionary approach, particularly with respect to contaminants whose effects on human health are unknown.

Recommendation 20
Regarding drinking water quality research, I encourage Health Canada and other agencies to adopt as a priority the development of sufficiently detailed definitions of the susceptibility of vulnerable population groups to drinking water contaminant exposures to allow appropriate adjustments in drinking water quality guidelines.

Recommendation 21
I suggest that the federal–provincial process for proposing drinking water quality guidelines be refined to provide for greater transparency and public participation.

Recommendation 22
I suggest that the Federal–Provincial Subcommittee on Drinking Water focus on drinking water quality guidelines. I encourage Health Canada to commit the required scientific support to the federal-provincial process for proposing drinking water quality guidelines.

Recommendation 23
I encourage the federal government to adopt standards that are as stringent as, or more stringent than, Ontario Regulation 459/00 for all federal facilities, Indian reserves, national parks, military installations, and other lands under federal jurisdiction in Ontario.

Recommendation 24
The provincial government should continue to be the government responsible for setting legally binding drinking water quality standards.

Recommendation 25
In setting drinking water quality standards for Ontario, the Minister of the Environment should be advised by an Advisory Council on Standards.

Recommendation 26
The Advisory Council on Standards should have the authority to recommend that the provincial government adopt standards for contaminants that are not on the current federal–provincial agenda.

Recommendation 27
The Advisory Council on Standards should consider whether to replace the total coliform test with an *E. coli* test.

Recommendation 28
No formal maximum contaminant level for protozoa should be established until real-time tests are available. The objective, as with bacterial and viral pathogens, should be zero, and the regulations should so state; but the standard should be a treatment standard, specified in terms of log removal dependent on source water quality.

Recommendation 29
The provincial government should seek the advice of the Advisory Council on Standards regarding the desirability of a turbidity limit that is lower than the limit specified in the federal–provincial *Guidelines*.

Treatment (Chapter 6)

Recommendation 30
All raw water intended for drinking water should be subject to a characterization of each parameter that could indicate a public health risk. The results, regardless of the type of source, should be taken into account in designing and approving any treatment system.

Recommendation 31
The Advisory Council on Standards should review Ontario's standards for disinfection by-products to take account of the risks that may be posed by the by-products of all chemical and radiation-based disinfectants.

Recommendation 32
The provincial government should support major wastewater plant operators in collaborative studies aimed at identifying practical methods of reducing or removing heavy metals and priority organics (such as endocrine disruptors) that are not removed by conventional treatment.

Recommendation 33
The Ministry of the Environment should be adequately resourced to support a water sciences and standards function in relation to drinking water.

Distribution (Chapter 7)

Recommendation 34
The provincial government should encourage the federal government, working with the Standards Council of Canada and with advice from municipalities, the water industry, and other stakeholders, to develop standards for materials, including piping, valves, storage tanks, and bulk chemicals, that come into contact with drinking water.

Recommendation 35
As part of an asset management program, lead service lines should be located and replaced over time with safer materials.

Monitoring (Chapter 8)

Recommendation 36
All municipal water providers in Ontario should have, as a minimum, continuous inline monitoring of turbidity, disinfectant residual, and pressure at the treatment plant, together with alarms that signal immediately when any regulatory parameters are exceeded. The disinfectant residual should be continuously or frequently measured in the distribution system. Where needed, alarms should be accompanied by automatic shut-off mechanisms.

Recommendation 37
Every municipal water provider should be responsible for developing an adequate sampling and continuous measurement plan as part of its operational plan, as recommended in Chapter 11 of this report.

Recommendation 38
Sampling plans should provide for sampling under the conditions most challenging to the system, such as after heavy rainfalls or spring floods.

Recommendation 39
Ontario Regulation 459/00 should be modified to require standard protocols for the collection, transport, custody, labelling, testing, and reporting of drinking water samples, and for testing all scheduled contaminants, that meet or better the protocols in *Standard Methods.*

Recommendation 40
Where remoteness dictates that samples for bacteriological analysis cannot be delivered to a lab either within regulated times or under guaranteed conditions, the Ministry of the Environment should determine the feasibility of alternative means of providing microbiological testing that meet the requirements of *Standard Methods*.

Laboratories (Chapter 9)

Recommendation 41
The provincial government should phase in the mandatory accreditation of laboratories for all testing parameters, and all drinking water testing should be performed only by accredited facilities.

Recommendation 42
The Ministry of the Environment should licence and periodically inspect, as required, environmental laboratories that offer drinking water testing; as with water treatment operations, continuing accreditation should be a condition of licence.

Recommendation 43
The results of laboratory accreditation audits should be provided to the Ministry of the Environment and should be publicly available.

The Role of Municipal Government (Chapter 10)

Recommendation 44
Municipalities should review the management and operating structure for their water system to ensure that it is capable of providing safe drinking water on a reliable basis.

Recommendation 45
Given that the safety of drinking water is essential for public health, those who discharge the oversight responsibilities of the municipality should be held to a statutory standard of care.

Recommendation 46
The provincial government should provide guidance and technical advice to support municipal reviews of water systems.

Recommendation 47
The provincial government should require municipalities to submit a financial plan for their water system, in accordance with provincial standards, as a condition of licence for their water systems.

Recommendation 48
As a general principle, municipalities should plan to raise adequate resources for their water systems from local revenue sources, barring exceptional circumstances.

Recommendation 49
Municipal contracts with external operating agencies should be made public.

Recommendation 50
The role of the Ontario Clean Water Agency in offering operational services to municipalities should be maintained. The provincial government should clarify the Ontario Clean Water Agency's status and mandate. In particular, OCWA should be:

- an arm's-length agency with an independent, qualified board responsible for choosing the chief executive; and

- available to provide standby emergency capabilities.

Quality Management (Chapter 11)

Recommendation 51
The provincial government should require all owners of municipal water systems, as condition of their licence (see Recommendation 71), to have an accredited operating agency, whether internal or external to the municipality.

Recommendation 52
Accreditation should be based on an independent audit and a periodic review by a certified accrediting body.

Recommendation 53
The Ministry of the Environment should initiate the development of a drinking water quality management standard for Ontario. Municipalities, the water industry, and other relevant stakeholders should be actively recruited to take part in the development of the standard. The water industry is recognized as an essential participant in this initiative.

Recommendation 54
The Ministry of the Environment's Drinking Water Branch (see Recommendation 69) should have the responsibility for recognizing the drinking water quality management standard that will apply in Ontario and for ensuring that accreditation is properly implemented.

Recommendation 55
The drinking water quality management standard should come into force by a date to be fixed by the provincial government. All municipalities should be required under the *Safe Drinking Water Act* (see Recommendation 67) to have an operating agency for their water system accredited within a specified time.

Recommendation 56
The provincial government should require municipalities to have operational plans for their water systems by a date to be fixed by the provincial government.

Recommendation 57
Operational plans should be approved and reviewed as part of the Ministry of the Environment approvals and inspections programs.

Recommendation 58
The Ministry of the Environment should work with Emergency Measures Ontario and water industry associations to develop a generic emergency response plan for municipal water providers. A viable and current emergency response plan, and procedures for training and periodic testing of the plan, should be an essential element of mandatory accreditation and operational planning.

Training of Individual Operators (Chapter 12)

Recommendation 59
The Ministry of the Environment should continue to require the mandatory certification of persons who perform operational work in water treatment and distribution facilities. Education, examination, and experience are essential components of ensuring competence.

Recommendation 60
The Ministry of the Environment should require water system operators who currently hold certificates obtained through the grandparenting process to become certified through examination within two years, and it should require operators to be recertified periodically.

Recommendation 61
The Ministry of the Environment should require all applicants for an operator's licence at the entry level to complete a training course that has a specific curriculum to ensure a basic minimum knowledge of principles in relevant subject areas.

Recommendation 62
The Ministry of the Environment should develop a comprehensive training curriculum for operators and should consolidate the current annual training requirement in Ontario Regulation 435/93 and the proposed requirement of ministry-approved training into a single, integrated program approved by the Ministry of the Environment.

Recommendation 63
The Ministry of the Environment should take measures to ensure that training courses are accessible to operators in small and remote communities and that the courses are tailored to meet the needs of the operators of these water systems.

Recommendation 64
The Ministry of the Environment should meet with stakeholders to evaluate existing training courses and to determine the long-term training requirements of the waterworks industry. The ministry should play an active role in ensuring the availability of an array of courses on the subjects required to train operators.

Provincial Government (Chapter 13)

Recommendation 65
The provincial government should develop a comprehensive "source to tap" drinking water policy covering all elements of the provision of drinking water, from source protection to standards development, treatment, distribution, and emergency response.

Recommendation 66
The Ministry of the Environment should be the lead ministry responsible for developing and implementing the "source to tap" Drinking Water Policy.

Recommendation 67
The provincial government should enact a *Safe Drinking Water Act* to deal with matters related to the treatment and distribution of drinking water.

Recommendation 68
The provincial government should amend the *Environmental Protection Act* to implement the recommendations regarding source protection.

Recommendation 69
The provincial government should create a Drinking Water Branch within the Ministry of the Environment to be responsible for overseeing the drinking water treatment and distribution system.

Recommendation 70
The provincial government should create a Watershed Management Branch within the Ministry of the Environment to be responsible for oversight of watershed-based source protection plans and, if implemented, watershed management plans.

Recommendation 71
The Ministry of the Environment should require the owners of municipal water systems to obtain an owner's licence for the operation of their waterworks. In order to obtain a licence, an owner should have:

- a Certificate of Approval for the facility;
- a Permit to Take Water;
- approved operational plans;
- an approved financial plan; and
- an accredited operating agency.

Recommendation 72
The provincial government should create an office of Chief Inspector – Drinking Water Systems.

Recommendation 73
Inspectors should be required to have the same or higher qualifications as the operators of the systems they inspect and should receive special training in inspections.

Recommendation 74
The Ministry of the Environment should increase its commitment to the use of mandatory abatement.

Recommendation 75
The Ministry of the Environment should increase its commitment to strict enforcement of all regulations and provisions related to the safety of drinking water.

Recommendation 76
The Ministry of the Environment should initiate a process whereby the public can require the Investigations and Enforcement Branch to investigate alleged violations of drinking water provisions.

Recommendation 77
A steering group should be established within each public health unit area in the province, comprised of representatives of affected local hospitals, municipalities, local Ministry of the Environment offices and local boards of health, for the purpose of developing in a coordinated fashion emergency response plans for the control of, or the response to, infectious diseases and public health hazard outbreaks.

Recommendation 78
The provincial government should ensure that programs relating to the safety of drinking water are adequately funded.

Recommendation 79
The Ministry of the Environment should create an Integrated Divisional System which provides central electronic access to information:

- relevant to source protection;
- relevant to each drinking water system in Ontario (including a description of the system, trend analyses, water quality, and systems data);
- required by the Drinking Water Branch (including for approvals and inspections); and
- required by local Boards of Health.

Recommendation 80
The Drinking Water Branch should prepare an annual "State of Ontario's Drinking Water Report," which should be tabled in the Legislature.

Small Systems (Chapter 14)

Recommendation 81
Ontario Regulation 459/00 should apply to any system that provides drinking water to more than a prescribed number of private residences.

Recommendation 82
The Ministry of the Environment should establish a procedure under which owners of communal water systems may apply for a variance from provincial regulations only if a risk analysis and management plan demonstrate that safe drinking water can be provided by means other than those laid down in regulations.

Recommendation 83
The provincial government should not approve water systems that would not be economically viable under the regulatory regime existing at the time of the application.

Recommendation 84
Approved systems that are not economically viable under the improved regulatory scheme should be required to explore all managerial, operational, and technological options to find the most economical way of providing safe drinking water. If the system is still too expensive, the provincial government should make assistance available to lower the cost per household to a predetermined level.

Recommendation 85
The application of Ontario Regulation 505/01 should be broadened to include all owners of water systems that serve the public for a commercial or institutional purpose and that do not come within the requirements of Ontario Regulation 459/00.

Recommendation 86
With regard to private drinking water systems that are not covered by either Ontario Regulation 459/00 or Ontario Regulation 505/01, the provincial government should provide the public with information about how to supply water safely and should ensure that this information is well distributed. It should also maintain the system of licensing well drillers and ensure the easy availability of microbiological testing, including testing for *E. coli*.

Recommendation 87
The provincial government should review the current practices for the delivery of drinking water in bulk and the need for a regulatory framework in this area.

First Nations (Chapter 15)

Recommendation 88
Ontario First Nations should be invited to join in the watershed planning process outlined in Chapter 4 of this report.

Recommendation 89
I encourage First Nations and the federal government to formally adopt drinking water standards, applicable to reserves, that are as stringent as, or more stringent than, the standards adopted by the provincial government.

Recommendation 90
I encourage First Nations and the federal government to consider moving to a quality management standard over time, even if the consequence is that several communities, perhaps both reserve and non-reserve, might collaborate on a regional basis, or that First Nation communities might choose to contract with others to manage their water supply systems.

Recommendation 91
The provincial government should require the Ontario Clean Water Agency (OCWA) to offer its services to First Nations band councils for operating on-reserve water systems on a normal commercial basis.

Recommendation 92
The provincial government should actively offer, on a cost-recovery basis, its training facilities and curriculum to First Nations water system operators.

Recommendation 93
As a matter of principle, the provincial government should make technical assistance, drinking water testing, inspection, and enforcement available to First Nations communities on a cost-recovery basis, if requested.