

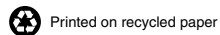
**Watershed Based Source Protection:
Implementation Committee Report to
the Minister of the Environment**

November, 2004

Watershed Based Source Protection: Implementation Committee Report to the Minister of the Environment

November, 2004

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November 30, 2004

The Honorable Leona Dombrowsky,
Minister of the Environment

Dear Minister Dombrowsky:

On behalf of the Implementation Committee, I am pleased to present you with our final report entitled “Watershed-based Source Protection: Implementation Committee Report to the Minister of the Environment”.

The mandate of the Committee was to provide advice to the province focused on two key areas: the development and enhancement of tools and authorities that could be employed to protect Ontario’s sources of drinking water, and an examination of innovative funding mechanisms and approaches. Throughout its work, the members strived to ensure their recommendations would reflect a balanced and objective perspective.

In the area of tools and authorities, the Committee believes that its recommendations provide a comprehensive set of tools with which to manage risks to sources of drinking water – whether a risk is to the quality of the source or to the quantity of the source. In the area of funding of source protection, the Committee strongly advises that the province should fund the development of source protection plans up to the point of provincial approval. This approach will ensure source protection planning proceeds quickly, will facilitate the building of working relationships within each watershed and will provide time to undertake the necessary policy development to establish a long-term sustainable funding strategy. In its advice the Committee has provided a practical set of recommendations on how source protection could be funded over the long-term.

It is our advice that the province undertakes broader consultation on this report so that both the report itself and the views of others can be considered when developing source protection legislation.

It has been a privilege to participate along with the other members of the Implementation Committee in developing this report. On behalf of the Committee, I would like to thank you in advance for your consideration of its recommendations.

Sincerely,



Nigel Bellchamber, Co-Chair



Joan Andrew, Co-Chair

ACKNOWLEDGEMENTS

The Committee members would like to thank the chairs of the Implementation Committee, Nigel Bellchamber and Joan Andrew, for their dedication and commitment in leading the Committee through its work. The Implementation Committee would also like to thank Nicola Crawhall, Policy Advisor to the Minister of Environment, for her guidance and support throughout the process.

The Implementation Committee was assisted in its work by the Implementation Committee Working Group. The Committee would like to thank Theresa McClenaghan for her significant contribution in chairing the working group. The working group was a core assemblage of several members of the Implementation Committee and ministry staff from provincial ministries, including the ministries of Environment, Municipal Affairs and Housing, Natural Resources, Agriculture and Food, Northern Development and Mines, Finance, and Public Infrastructure and Renewal.

In addition, representatives from the federal government and Conservation Ontario, as well as individual Conservation Authorities, also provided tremendous ongoing assistance. The Implementation Committee would like to extend its appreciation to all those involved in the working group. Their combined efforts contributed greatly to the operations of the Committee as it prepared this report.

ORGANIZATION OF THE REPORT

The Implementation Committee's report is organized into 8 sections:

- **SECTION 1: INTRODUCTION AND PURPOSE** - provides context for the Implementation Committee report, the government's actions on source water protection, and principles to guide source protection planning and implementation.
- **SECTION 2: SOURCE PROTECTION PLANNING PROCESS** - provides an overview of the draft Drinking Water Source Protection Act and recommendations for training, information sharing, roles and responsibilities, federal lands and First Nations.
- **SECTION 3: IMPLEMENTATION FRAMEWORK** - provides information on the content of source protection plans and issues affecting plan implementation.
- **SECTION 4: IMPLEMENTATION TOOLS** – provides recommendations on provincial, municipal, and other tools available for implementing source protection.
- **SECTION 5: ISSUE-SPECIFIC IMPLEMENTATION TOOLS** – provides recommendations for tools required for source protection implementation for specific issues.
- **SECTION 6: FUNDING OF SOURCE WATER PROTECTION** - outlines potential costs of plan development and implementation and recommendations on various funding mechanisms and incentives.
- **SECTION 7: CONCLUSION** - presents the Implementation Committee's conclusion on the implementation aspects of source water protection.
- **SECTION 8: APPENDICES**
 - List of Implementation Committee Members**
 - List of Implementation Committee Recommendations**
 - Glossary**
 - Initiatives Related to Source Protection**
 - Roles and Responsibilities Matrix**
 - Source Protection Planning Governance Structure**

EXECUTIVE SUMMARY

Safe drinking water is essential to human health. To protect sources of drinking water, the provincial government is developing legislation that would require source protection plans to be prepared for all of Ontario's watersheds. The goal of source protection is to safeguard human health by ensuring that current and future sources of drinking water in Ontario's lakes, rivers and groundwater are protected from potential contamination and depletion. Since water knows no jurisdiction, and upstream activities affect downstream communities, source protection plans must be prepared jointly on a watershed basis by the stakeholders in that watershed. Source protection plans would identify risks of contamination or depletion to sources of drinking water and establish measures to reduce those risks.

In 2003, the government formed two committees to advise the province on source protection planning and implementation. A Technical Experts Committee was established to provide advice on a process for assessing threats to sources of drinking water. An Implementation Committee was established to recommend strategies to implement and fund source protection. This report contains the 133 recommendations of the Implementation Committee. The Technical Experts Committee submitted its recommendations to the government in a separate report.

The mandates of the two committees follow from *Part Two Report of the Walkerton Inquiry*, the second of a two volume report produced by Justice Dennis O'Connor in 2002. O'Connor undertook a Public Inquiry after the tragedy that occurred in Walkerton, Ontario in 2000, when seven people died and 2,300 others became ill from contaminated drinking water. In that report, O'Connor made 22 recommendations related to source protection and stated that protecting and enhancing natural systems is one of the most effective means of protecting the safety of Ontario's drinking water. He called source protection "the first line of defence" in a multi-barrier approach to ensuring safe drinking water. The multiple barrier approach covers all elements of the provision of drinking water, including source protection, treatment, distribution, monitoring, and responses to adverse conditions.

Each major section of the Implementation Committee's report is briefly discussed below. The full text of the recommendations can be found in Appendix 8.2.

Section 1: Introduction and Purpose

This section contains key background information and provides context for the Implementation Committee report. This section also describes the government's actions to date on source water protection and provides a summary of the Committee's Terms of Reference. Lastly, the section highlights the overarching principles upon which source protection planning and implementation should be based.

Draft Drinking Water Source Protection Act

Draft drinking water source protection legislation, released to the public by the Ministry of the Environment in June 2004, proposes legislative provisions necessary for the development of source protection plans. The Ministry of the Environment has indicated that it will develop comprehensive legislation dealing with both the planning and implementation aspects of source protection after considering advice of the Implementation Committee and the Technical Experts Committee.

Terms of Reference

Under its Terms of Reference, the Implementation Committee was directed to provide the Ontario government with advice on the tools and approaches to implement watershed-based source protection. To this end, the Committee reviewed and made recommendations on roles and responsibilities for the provincial government, municipalities, conservation authorities, the federal government, First Nations and private land owners. The Committee also made recommendations on regulatory and non-regulatory tools that could be used to implement source protection measures and recommendations on innovative funding approaches.

Section 2: Source Protection Planning Process

This section of the report describes the proposed source protection planning process according to the draft drinking water source protection legislation. The description of the planning process also incorporates information from the report of the Technical Experts Committee which is important to the work of the Implementation Committee. The description is followed by the Committee's advice on roles and responsibilities for source protection planning and implementation. This section also provides additional advice in a number of areas which the Committee believes are important to a successful source protection planning process. These include: federal lands, First Nations, transboundary issues, integration with other programs, Great Lakes, accessing/sharing information and training needs.

Proposed Source Protection Planning Process

Under the proposed legislation, source protection plans will be prepared collaboratively by stakeholders within each watershed. A Source Protection Board (SPB), which would be the Conservation Authority Board (in watersheds where one exists), will coordinate the planning process. The source protection boards will establish a multi-stakeholder Source protection committee (SPC). The SPCs will be responsible for developing a source protection plan for the watershed.

The development of each watershed's source protection plan will be based on a technical assessment of the sources of drinking water. In the assessment reports, SPCs will report on their evaluation of the vulnerability of drinking water sources and potential risks (both present and future) to these sources. The assessments will examine both the quality and quantity issues. For each threat identified, the risk of contamination or depletion will be assessed to determine the appropriate risk category (significant risk, moderate risk, low risk and negligible risk). The SPB will approve the assessment report and ensure that it is made available to the public. The SPC

will develop a source protection plan that includes measures to reduce the risks identified in the assessment report. Each measure will specify responsibilities, the timing and method for completion and monitoring, and evaluation activities. The public will be consulted throughout the process, and each source protection plan will be subject to approval by the Minister of the Environment.

Roles and Responsibilities

As part of its mandate, the Implementation Committee developed advice on the roles and responsibilities of the primary participants in source protection planning and implementation. These participants include the provincial government, municipalities, conservation authorities, the federal government, First Nations, private landowners and other stakeholders. The Implementation Committee agreed that these participants must see source protection as a collaborative process. The management of the water source will have limited success if the planning and implementation activities begin and end at jurisdictional lines. The SPCs, with the help of SPBs, will be the primary bodies responsible for facilitating this collaboration.

Assessment Phase

One of the first responsibilities of the SPCs will be to prepare a description of the watershed. The watershed description will set the foundation for developing a Terms of Reference (ToR) for the assessment report. The ToR will set out work assignments for the various parties. The Implementation Committee decided on two scales of work – local and regional/watershed – as a useful way to describe the roles and responsibilities for the assessment phase of source protection planning.

Local- The Implementation Committee agreed that municipalities should lead the assessment work, as well as the identification of management strategies in wellhead protection areas (WHPA) and intake protection zones (IPZ). These are the ‘vulnerable’ areas most directly connected to a drinking water system. Small municipalities may require assistance for this work from the Source protection committee.

Regional/Watershed- The Implementation Committee used the term regional/watershed to recognize issues that have broader impacts across the watershed or within a portion of the watershed, such as extensive aquifers and recharge areas, intake protection zones, and vulnerable areas that extend across municipal boundaries. The Source protection committee should negotiate a strategy for assigning and facilitating assessment work across municipal boundaries within a watershed. The distribution of work should recognize the distribution of expertise, capacity, previous work, investments and knowledge amongst participants.

The Implementation Committee advised that Source protection committees should be responsible for work that involves the entire watershed, including the watershed description and the development of water budgets. The SPCs will need assistance from the municipalities and the provincial government to provide assistance, particularly in fulfilling information needs.

Funding of the Assessment Phase

The Implementation Committee recommended that the provincial government take responsibility for funding the development of source protection plans up to the point of provincial approval. By assuming this responsibility, the government will ensure timely preparation of the technical assessment reports and source protection plans and will also facilitate the building of local working relationships.

Implementation Phase

The management of risks within a specific plan area is expected to result in a mixture of local measures and wider ranging measures that operate on a regional or watershed scale. In general, the landowners who are responsible for an activity that represents a risk to drinking water will be responsible for managing their activities in conformity with the source protection plan.

The Implementation Committee agreed that those already involved in a program area should be responsible for developing and overseeing the implementation of the applicable measure in the source protection plan. For activities in wellhead protection areas and intake protection zones and other vulnerable areas within municipal boundaries, municipalities will be responsible for establishing a program measure (if it isn't addressed through a specific provincial instrument). In conjunction with the work of all stakeholders, the province should accept responsibility for identifying and developing programs for any issues that, as a result of their prevalence or risk, are found to be of broad provincial interest. The assessment report will facilitate collaboration on the development of measures to address issues that cross municipal or watershed boundaries.

Funding of Implementation

The Implementation Committee agreed that the provincial government should ensure that source protection legislation clearly delineates the responsibilities and powers of municipalities, conservation authorities and other relevant agencies. The government should ensure that sufficient financial ability and authority exists for these jurisdictions to implement their responsibilities. The Implementation Committee recognized that financial assistance may be necessary to ensure the implementation of certain source protection measures. In such cases, financial incentives are often a useful tool to assist in implementation.

Federal Government

The federal government should participate in source water protection and implementation to ensure that all sources of drinking water in Ontario are protected. According to the Treasury Board Secretariat's Directory of Federal Real Property, there are 40 federal departments, agencies, corporations etc. with approximately 460,000 hectares of federal lands and waterways in Ontario, not including Reserve lands as defined under the *Indian Act*.

First Nations

The full participation of First Nations in the source protection process will be crucial to ensuring all sources of drinking water in the province are protected, including on First Nations land. First

Nations have a long history of environmental stewardship. Water plays a central and integral part of their heritage and way of life. As source protection legislation nears introduction, the provincial government must strive to ensure the adequate participation of First Nations in the source protection process, both at the planning and implementation stages.

Transboundary Issues

In some cases, sub-surface aquifers, groundwater systems and surface water systems extend beyond watershed boundaries. An ongoing, open dialogue must be established and maintained between both Source protection committees and municipalities who have adjoining watershed boundaries.

Integration with other programs

To ensure efficient use of available resources, and to avoid duplication of efforts, source protection plan development and implementation must be coordinated and integrated with water protection programs administered by all levels of government.

Great Lakes

The Great Lakes are the source of drinking water for approximately 75% of Ontario's population. The importance of the Great Lakes will increase significantly over the near term as greater demands arise for multiple uses, including drinking water. Protecting the Great Lakes involves a number of jurisdictions and the Implementation Committee agreed that source water protection principles, strategies, and policies should be incorporated into existing Great Lakes programs and resulting agreements so that they are protected and improved as sources of drinking water.

Accessing/Sharing Information

Accessing and sharing information requires a coordinated and cooperative approach among stakeholders and all levels of government. Currently, the provincial and federal governments, First Nations, municipalities and conservation authorities all collect data relevant to source protection. In order to ensure an efficient flow of reliable data, issues such as the need for province-wide coordination of information management, the development of data standards, and the need for a centralized repository and conduit for data, must be addressed.

Training Needs

Education and training will be required for chairs and members of source protection boards and committees, as well as senior management staff. An orientation on source protection and related legislation, policies and processes in Ontario should be delivered to these individuals. This training should also cover facilitation, communications, and effective decision-making, and should be tailored to meet local needs.

In addition, some form of dispute resolution mechanism will be needed, as situations may arise where agencies participating in the source protection planning process (SPCs, SPBs, municipal councils, conservation authorities) disagree on a particular issue or action needed. The establishment of an Alternative Dispute Resolution (ADR) process may aid in the resolution of differing positions and help to facilitate local support for the source protection planning process. It may also reduce the likelihood of appeals of Ministry of Environment approved plans and may increase public confidence in the planning process.

Section 3: Implementation Framework

This section of the report provides the Committee's recommendations related to the legislative status of source protection plans. It describes how measures contained in the plans should be implemented, amended and updated, and how source protection should interact with existing legislative and regulatory instruments and with other water-related programs.

Risk Management Measures Identified in the Source Protection Plan

The Source protection committees will identify the risks (significant, moderate, and low) of contamination or depletion to their drinking water sources, and identify actions to reduce those risks. For risks identified as "significant," the committees will identify, evaluate and specify where it is mandatory that measures be taken to reduce the risk. For risks identified as "moderate" or "low," committees will develop measures proportional to the level of risk. The final plan will specify who will be responsible for each measure, the timing and method for completion, and the means for monitoring and evaluating its effectiveness.

Interim Measures

Prior to the completion of the source protection plan, risks may be identified (e.g. in the assessment report) which require more immediate attention. Those threats considered "significant" should be addressed immediately, rather than waiting for final approval of the plan or its implementation.

Notification of Source Protection Plans

Once a source protection plan is approved by the province, the public and individual landowners and business operators who may be affected by the new requirements or land use restrictions should be notified.

Plan Implementation, Monitoring and Amendment

Source protection is a continuous process; source protection plans must be "living documents". Plans must continue to be reviewed and updated to fill in gaps and take advantage of new information and available technologies. A transparent, consultative approach is as important in the updating of source protection plans as it is in their initial formulation. The coordination and implementation of approved source protection plans must include effective monitoring,

evaluation and reporting on the status and performance of a plan, as well as ongoing identification of any gaps that may exist and the steps that should be taken to address those gaps.

Status of Source Protection Plans

It is important that all provincial and municipal decisions affecting drinking water be consistent with approved source protection plans. In addition, source protection plans must prevail if conflicts with other instruments occur. A primacy clause would help ensure effective implementation of source protection plans by providing the legal basis for decision-making in the event of such conflicts.

Section 4: Implementation Tools

The Implementation Committee identified tools that are applicable to a range of source protection risks. In this section, the Committee makes recommendations related to the general authority of the provincial government and municipal governments to regulate the affairs of others to curtail activities that may pose a risk to a source of drinking water. The Committee also makes general recommendations on a range of broader tools which can be applied to a wide range of situations and settings (e.g. Land Securement, Education and Outreach, Best Management Practices, etc).

The Committee focused on making use of, or enhancing, existing implementation tools before developing new approaches. The Committee also emphasized that the most suitable approach for managing risks for a given issue will be best determined within each individual watershed as the potential risks to drinking water are locally assessed and evaluated.

A Continuum of Tools

The Committee recognized that different management approaches are capable of achieving similar outcomes depending on local circumstances. The range of approaches that could be employed to manage risks to sources of drinking water can be categorized as a continuum that moves from binding/formal approaches to non-binding/informal approaches.

The Committee recommended that a complete “tool-kit” for the implementing agencies would provide a range of “soft tools,” such as education and outreach, as well as more “formal” tools, such as legislated powers to pass regulations and inspect private businesses.

Provincial Source Protection Guidance Manual

The Implementation Committee agreed that a provincial guidance manual should be developed to assist all parties involved in source protection with the selection of appropriate management tools. The manual should be developed by the Ministry of the Environment with the assistance of other levels of government, conservation authorities, First Nations and other stakeholders. The manual should include a description of the range of existing and new legal authorities that

can be employed, as well as the full range of non-legal tools available, including education and incentive programs.

Provincial Authority

In this report, the Implementation Committee made recommendations dealing with the province's own lands and activities, new and expanding operations, and existing activities which operate under provincial approvals. The objective of these recommendations was to ensure consistency between local source protection plan approvals and permits that the province issues for a wide range of activities.

The Committee emphasized that a process should exist for ensuring consistency between local source protection plans and all provincially approved activities that affect drinking water sources in a watershed, regardless of the date of the original approval of that activity.

Municipal Authority

Municipalities have a major role to play in the implementation of source protection plans.

Legislative and jurisdictional reviews conducted by the Regions of Waterloo and Halton, as well as Oxford County, indicate that gaps exist in current municipal authority to address threats to vulnerable drinking water sources in existing built-up areas and from existing activities.

The existing municipal land use planning system is well structured to implement source water protection plans for future uses. However, some municipalities have noted the need for by-law making authority to better manage existing developments that could include regulating, licensing, permitting, prohibiting, approving, and conditional actions similar to the "spheres of jurisdiction" currently used for other functions in the *Municipal Act*. The Committee recommended that the province establish a source water protection "sphere of jurisdiction" under the *Municipal Act* or new source protection legislation to provide municipalities with this authority for source protection purposes.

The Committee also examined the relationship between source protection plans and municipal official plans and zoning by-laws and recommends that municipal land-use planning decisions be required to "be consistent with" source protection plans from the time a source protection plan is approved by the province. Municipal official plans should be updated to include source protection plan data and policies, and the province should work with municipalities to ensure a timely update of municipal official plans.

Land Securement

Land securement for land conservation purposes refers to the acquisition of full title to land or partial title to land to protect natural heritage features and ecosystem functions (e.g. a legally binding interest such as a conservation easement). Land securement can protect source water by

providing protective buffers around reservoirs, priority stream segments, wetlands, groundwater recharge areas, wellhead areas, and other critical zones within source water protection areas.

The Implementation Committee agreed that the government should develop a Land Securement Program to meet source protection goals across watersheds. This program would be supported by a review of all ongoing acquisition and disposition programs, and a review of possible provincial and federal tax incentives. Such a program should be integrated and coordinated with other programs that achieve similar benefits.

The Committee agreed that the expropriation of land should only be considered as a last resort (subject to the *Expropriations Act*, the *Government Services Act*, and the *Provincial Parks Act*) in order to protect vulnerable areas where human health or safety is at risk.

Best Management Practices

Certain public facilities, as well as commercial and industrial businesses, can pose a potential risk to sources of drinking water. The provincial government should support the development and implementation of sector-specific best management practices (BMPs). This approach is an effective means to reduce the threat posed by many of these operations, and to reduce the overall water-use of certain sectors.

The province should prioritize its work on developing BMPs by focusing on sectors and/or activities (such as urban and rural storm water management) that pose the most risk to sources of drinking water. By collaborating with the Source protection committee, municipalities, industry sectors and other interested stakeholders, the province can effectively identify priorities for development of BMPs.

Research and Technology

Research and technology can play a critical role by determining the best combination of actions and measures to prevent the degradation of drinking water supplies. The Implementation Committee supported the ongoing research and development of technologies related to source protection. These technologies will foster sound decision-making, and will help provide tools that will consider social, economic, and health factors, as well as environmental concerns, in the protection of Ontario's drinking water sources.

Education and Outreach

Education and outreach should be recognized as an essential component of development and implementation of source protection plans. Effective education and outreach initiatives can result in more efficient use of resources, increased partnerships and cooperation, and more innovative ways to protect sources of drinking water. For example, education and outreach could support stakeholders in the management of specific issues related to source protection, such as: owners/users of abandoned and private wells, septic systems, storage tanks; the agricultural sector; businesses that engage in specific activities (e.g. storage and application of pesticides, storage of other chemicals); and the local community.

Section 5: Issue-Specific Implementation Tools

This section of the report provides recommendations on risk management tools for a variety of specific issues that, depending on location and other factors, could represent a threat to sources of drinking water. The Source protection committees should, in their threats assessment, attempt to characterize all potential threats to drinking water sources in the watershed. The Implementation Committee wanted to ensure that specific tools and approaches were available to address a wide range of threats (i.e. activities, land uses and circumstances) within the watershed. For the most part, the Committee made no assumptions about the prevalence of these threats. Rather, it focused on ensuring that appropriate management strategies exist in the event that such threats to drinking water sources were identified.

Section 6: Funding of Source Water Protection

In public consultations, funding emerged as the most significant obstacle to source protection implementation. In the *Part Two Report of the Walkerton Inquiry*, Justice O'Connor recommended a combination of funding mechanisms, and emphasized three key sources: user fees, provincial and/or municipal general revenues, and pollution charges. In formulating its advice, the Implementation Committee considered Justice O'Connor's recommendations and also reviewed funding tools used in other jurisdictions.

The development of funding recommendations began with developing key principles that, when applied consistently, will help inform a strategy to fund source water protection across Ontario. These principles include: Cost effective, Fair and Equitable; Ability-to-pay; Users Pay; Polluters Pay; Payment for Benefits; Full-Cost Accounting; Financial Oversight, Accountability and Transparency; Adequacy; Sustainable, Permanent and Ongoing; and Shared Responsibility.

The Implementation Committee examined, in a preliminary fashion, the potential costs of plan development and implementation. The cost of plan development was assessed based on the previous watershed experiences of several conservation authorities. The resulting plan development costs were estimated to be \$1,000 to \$1,500 per square kilometer of watershed area or \$6.5 to \$10 million for an average watershed region. As for plan implementation, the Committee was able to make use of the Niagara Water Quality Protection Strategy (2003), which included a detailed cost implementation plan. The resulting cost estimate for the implementation of source protection was \$12.4 million per year. This estimate only provides a first approximation for one region of the province. As the development of source protection plans proceeds through its various phases, more detailed studies will be required.

The Committee identified existing funding mechanisms and new funding sources to implement source protection plans. The Committee made numerous recommendations suggesting that long-term sustainable funding be provided for source protection planning and implementation, including ongoing source protection plan updating, monitoring and review. The Committee agreed that parties responsible for an activity which represents a risk to a source of drinking

water should be responsible for funding its management. Beyond this obligation, provincial general revenue should be the primary source of funding for the implementation of source protection plans.

Over and above provincial general revenue, specific recommendations were made on three funding approaches considered the most viable to support source protection implementation in Ontario: water and sewage rates, water taking charges, and pollution charges.

Water and Sewage Rates

The Committee recommended that water and sewage rates be used to pay for at least some portion of the municipal share of funding source water protection. The *Sustainable Water and Sewage Systems Act (2002)*, once proclaimed, will make it mandatory for municipalities to assess and report on the full cost of providing their water and sewer services. It will also become mandatory to prepare long-term cost-recovery plans. These plans will consider, among other things, the costs associated with source protection measures.

Currently, water consumers on municipal systems in Ontario pay the costs of accessing, treating and distributing water. However, those who take water directly from the source do not pay for the water itself. On average, households in Ontario pay \$45 a month for water and wastewater services. Compared to other OECD countries, and other provinces in Canada, this is a relatively low rate for water services and does not reflect the true cost of providing water and waste water services.

Water Taking Charges

In December 2003, the government announced its intent to apply charges to water takings from the watershed for commercial purposes. The Implementation Committee recommended that the provincial government proceed with the introduction of volume-based water taking charges to fund a portion of source protection implementation, with only limited exemptions permitted.

Pollution Charges

The Implementation Committee agreed that a pollution charge in Ontario would be a valuable tool to fund source protection. Pollution charges achieve several goals: they provide incentives for modifying behaviour (e.g., emission reductions); they ensure polluters internalize the costs associated with their impact on the environment; and they offset some of the costs associated with environmental management activities. The Implementation Committee supported the provincial government's work on pollution charges, and recommended that the province move forward in developing a pollution charge policy framework, including undertaking consultations with experts in the field as well as broad public consultations.

Financial Incentives and Assistance

Incentive programs and financial assistance should be created to enhance source protection, encourage voluntary implementation of source protection measures, promote compliance, and

provide for the long term sustainability of water use. Incentive programs and financial assistance may be particularly useful where a lack of “ability-to-pay” prevents certain source protection activities. Incentives may be defined in a variety of ways and include: partnerships, cost-sharing, grants and loans, technical assistance, tax credits, information and education, and recognition programs. All incentive programs should include an educational and technical component.

Financial Incentives for Agriculture and Farm Water Protection Plans (FWPPs)

Provincial, federal, and local funding sources should be used to provide additional financial assistance for Farm Water Protection Planning (FWPP) and projects undertaken by farmers in vulnerable areas and for large livestock farms. The provincial government should establish a system of cost-share incentives for FWPPs and other projects early enough to allow improvements to be made in an orderly and cost-effective manner.

Participation of Private System Owners

Private property owners may stand to benefit from source protection activities. They could also pose a contamination risk to source water. Incentive programs should be developed to encourage and assist private property owners with covering the costs of specific activities on their property that are beneficial to source protection. Furthermore, municipalities should be given the authority to levy source protection charges on properties not connected to municipal systems.

Section 7: Conclusion

The Implementation Committee’s work focused in two key areas: the identification of tools and authorities that would be necessary to implement measures to prevent or manage risks to sources of drinking water and, how best to fund source protection.

In the area of tools and authorities, the Committee recommended a comprehensive set of tools with which to manage risks to sources of drinking water – whether a risk is to the quality of the source or to quantity of the source. Recognizing that different approaches are capable of achieving similar outcomes, depending on local circumstances, the Committee has provided advice on a wide range of tools that could be used to manage risks to drinking water - from binding/formal approaches to non-binding/informal approaches.

The Committee acknowledged that existing activities, already established in source protection areas or already causing a broader issue in the watershed, represented the greatest challenge to managing risks to sources of drinking water. The Committee has provided advice on the need for provincial ministries to use their authorities to implement source protection plans. The Committee has also made recommendations on the importance of enhancing municipal authority to develop and implement formal local source protection measures through a new municipal “sphere of jurisdiction”. The Committee emphasizes that whether a measure is regulatory or voluntary in nature, educational mechanisms for all parties must be used in tandem. The Committee also emphasizes that financial assistance

and incentives will play an important role in ensuring that parties have the financial capacity to fulfill their obligations to source protection.

In the area of funding of source protection, the Committee strongly advises that the province should fund the development of source protection plans up to the point of provincial approval. This approach will ensure source protection planning proceeds quickly, will facilitate the building of working relationships within each watershed and will provide time to undertake the necessary policy development to establish a long-term sustainable funding strategy. In its advice the Committee has provided a practical set of recommendations on how source protection could be funded over the long-term.

SECTION 1: INTRODUCTION AND PURPOSE

1.1 Purpose

Clean and safe drinking water is essential to human health. In Ontario, the provincial government has stated its commitment to implementing the recommendations made by Justice Dennis O'Connor in the *Report of the Walkerton Inquiry* (Parts One and Two). The report sets out a framework for a comprehensive drinking water strategy for Ontario. O'Connor recommends that watershed-based source protection plans be developed and implemented in watersheds across Ontario. Source protection is the first of five barriers in a "multi-barrier" approach to achieving a healthy public water supply.

In December, 2003, the government established two expert committees to provide advice in a number of areas that required research before the province could move forward with source protection legislation:

- A Technical Experts Committee to provide advice on a process for assessing threats to sources of drinking water; and,
- An Implementation Committee to provide advice on how best to implement strategies to protect watersheds, and to examine innovative funding mechanisms and approaches.

The purpose of this Report is to convey the advice of the Implementation Committee to the Minister of the Environment for consideration in the development of source protection legislation and the overall source protection program for Ontario.

The Technical Experts Committee (TEC) submitted a report to the Minister of the Environment containing its recommendations relating to key topic areas, such as:

- threats inventory and issues identification;
- vulnerability analysis;
- identification of sensitive water resources; and
- risk analysis/management.

1.2 Key Information

Walkerton Inquiry

In the spring of 2000, seven people died and 2,300 more became ill from contaminated water in Walkerton, Ontario. In response, the Ontario government launched a Public Inquiry led by the Honourable Dennis O'Connor. Justice O'Connor's findings were released in two volumes:

- *Part One: The Events of May 2000 and Related Issues* (January 2002) reported on the events in Walkerton and the causes of the tragedy. It contained 28 recommendations.
- *Part Two: A Strategy for Safe Drinking Water* (May 2002). It contained 93 recommendations on approaches to ensure safe drinking water.

The recommendations in *Part Two* suggest that safe drinking water is best ensured through a multiple barrier approach that prevents contaminants from entering the water supply. The multiple barrier approach covers all elements of the provision of drinking water, including source protection, treatment, distribution, monitoring, and responses to adverse conditions. O'Connor's first recommendation states: "Drinking water sources should be protected by developing watershed-based source protection plans for all watersheds in Ontario."

Justice O'Connor makes 22 recommendations related to source protection planning. His report also addresses certain specific threats: human waste and septic systems, biosolids and septage, agriculture, and other industries.

Since O'Connor's report was published, the provincial government has undertaken consultations with other levels of government and various stakeholders in its effort to develop the policy basis for source protection legislation. The consultations resulted in the following documents:

- The report of the Advisory Committee on Watershed-based Source Protection Planning;
- A White Paper on Watershed-based Source Protection Planning; and
- A Draft Drinking Water Source Protection Act.

Advisory Committee on Watershed-based Source Protection Planning

In November, 2002, the Ministry of the Environment established the Advisory Committee on Watershed-based Source Protection Planning. The government asked the Committee to provide advice on a framework for watershed-based source protection planning that would be consistent with Justice O'Connor's recommendations.

The Committee's report, *Protecting Ontario's Drinking Water: Toward a Watershed-based Source Protection Planning Framework*, was published in April 2003. The report provided 55 recommendations addressing a range of topic areas concerning source protection, including: fundamental issues (accountability, principles, legislation, gaps, new powers and responsibilities), the planning process, risk management, and information management. It also recommended the establishment of the Technical Experts Committee and the Implementation Committee.

White Paper on Watershed-based Source Protection Planning

In February, 2004 the Ontario government published the *White Paper on Watershed-based Source Protection Planning*. The White Paper proposes an approach for the development of

a watershed-based source protection program and a legislative framework for the development and approval of source protection plans.

The Ministry posted the paper on the Environmental Registry and also held a series of eight consultation sessions across the province in March. Two information sessions were held with First Nations (Toronto and Sioux Lookout).

Draft Drinking Water Source Protection Act

On June 23, 2004, the government posted draft Drinking Water Source Protection legislation on the Environmental Registry for public comment. The draft source protection planning legislation drew on the comments received to the White Paper. Key components of the draft legislation include:

- the establishment of watershed boundaries for the purpose of developing source protection plans;
- the delineation of source protection boards and Source protection committees to undertake the planning exercise;
- requirements related to the development of the terms of reference, assessment report and source protection plans; and
- an approvals and appeals process.

The draft legislation addresses the planning aspects of source protection only. The Technical Experts Committee and the Implementation Committee were established to provide advice on the implementation aspects of source protection.

1.3 Implementation Committee Terms of Reference

The Implementation Committee was established by the Minister of the Environment on December 18, 2003. Under its terms of reference, the Committee was directed to provide the Ontario government with advice on the tools and approaches to implement watershed-based source protection. To this end, the Committee reviewed existing, new and expanding roles and responsibilities for all participants in a comprehensive source water protection system, including the provincial government, municipalities, conservation authorities and First Nations, and private entities. In addition, the Committee undertook a review of innovative funding mechanisms.

The Implementation Committee consisted of representatives from key stakeholder groups, including municipalities, conservation authorities, First Nations, environmental non-government organizations, agriculture, industry, the health sector and academia. The Committee was co-chaired by Nigel Bellchamber, general manager of the Ontario Municipal Administrators' Association, and Joan Andrew, Assistant Deputy Minister, Ministry of the Environment. The government was represented by the ministries of Environment, Natural Resources, Agriculture and Food, Municipal Affairs and Housing, Health and Long-Term Care, and Public Infrastructure Renewal. The assistant deputy ministers of these ministries sat on the committee ex-officio.

A working group was established to support the Implementation Committee. The working group was comprised of representatives from provincial government ministries, Conservation Ontario, and Environment Canada, as well as several members from the Implementation Committee. Additional representatives included members from the agricultural sector, First Nations, industry and private entities.

The Implementation Committee met over 11 months to build consensus on a framework for the implementation of source protection plans across Ontario.

1.4 Implementation Principles

The Implementation Committee examined various guiding principles to establish a consistent approach to source protection planning and implementation. The guiding principles were based, in part, on those adopted by the Advisory Committee on Watershed-based Source Protection Planning (pages 7 and 8 of the Advisory Committee Report). The Committee agreed that source protection planning and implementation should be based on the following principles:

Sustainability and Continuous Improvement

- Water is essential for our health and ecosystem viability and must be valued as finite.
- The costs and impacts on individuals, land owners, businesses, industries and governments must be economically sustainable.
- Source protection planning is built on a commitment to continuous improvement, including peer review that requires ongoing support of all stakeholders to ensure successful implementation based on assessment, monitoring, evaluation and reporting, followed by the appropriate modifications to the plan.
- Source protection plans must be based on sound technical assessments and be subject to continuous enhancement as knowledge increases.

Comprehensive

- Source protection plans must be developed on a watershed basis, and should be defensible and have the flexibility to accommodate Ontario's diverse watersheds.
- Source protection plans should consider historical, existing, new and future land uses when considering how to ensure clean sources of drinking water now and in the future.

Precautionary Approach

- The absence of scientific certainty about a risk should not bar the taking of precautionary measures in the face of possible irreversible harm. The weight of evidence should be considered in the application of this approach.

Shared Responsibility and Stewardship

- While the Ministry of the Environment has ultimate accountability for ensuring source water protection, responsibility for specific outcomes is shared among all levels of government and water managers, users and land owners.

Public Participation and Transparency

- There must be open discussion and communication of the source protection planning process and its results, from inception to implementation. Stakeholders and the public must have opportunities for meaningful input.
- The source protection process must provide for certain limited rights of appeal to challenge the approval of source protection plans.

Cost Effectiveness and Fairness

- The costs and impacts on individuals, land owners, businesses, industries and governments must be clear, fair and sustainable.
- The landowner's right to privacy must be balanced with the need to have right of access to private property under certain circumstances.
- Source protection planning and implementation should be based on due process and fairness.

Clear Accountability

- Source protection roles and responsibilities need to be clearly defined to ensure clear accountability for desired outcomes.

Coordinated, Integrated, Inclusive

- Source protection should be coordinated, integrated and inclusive of other water management initiatives and processes across departments and jurisdictions.

Pragmatic

- Expectations need to be balanced with the capacity to deliver results (e.g., funding).
- Source protection initiatives should build on existing capacities and roles.
- In planning and implementing source protection initiatives, consideration needs to be given to the availability of effective tools (i.e. technological tools may take longer to develop than policy/management tools).
- A range of tools should be available to permit a flexible implementation approach at the watershed level.
- Source protection planning must access all information that is practical and reasonable and use effective technologies and risk management practices to maximize the protection of human health.

Effective Decision-Making

- Implementation should be carried out at a scale where elements of good decision-making can be considered (i.e. decision-making must be delegated to the appropriate jurisdictional level).
- Wherever practical, planning and implementation should be locally driven to provide for local flexibility on how risks to drinking water are reduced.
- There must be clear delineation of local, provincial and federal responsibilities. Issues that cross jurisdictions should be resolved collaboratively through a shared decision-making process.

- Where there are competing interests, all options should be examined, which may in some cases include finding an alternative drinking water source.

Phased-in, Prioritized, Results-based

- A risk management approach should be used that sets priorities for action.
- Implementation should firstly focus on priority components to mitigate immediate threats to drinking water.
- There should be a schedule for completion of initial plans that reflects a phased approach and considers the existing level of risk.
- Source protection planning and implementation should take a results-based approach.
- Source protection plans must be updated and re-assessed on a regular basis.

SECTION 2: SOURCE PROTECTION PLANNING PROCESS

2.1 Introduction

This section provides a description of the proposed source protection planning process. It describes three major phases that, under the process, would be carried out in individual watersheds:

- establishing an organizational structure;
- technical assessment of sources of drinking water; and
- source protection plan development.

This section also provides context for the Committee's advice on the basic roles and responsibilities of the primary participants in source protection planning. Appendix 8.5 provides a detailed documentation of roles and responsibilities envisioned by the Committee. Proposed responsibilities related to funding are described in Section 6.

Participants in source protection planning and implementation will include the provincial government, municipalities, conservation authorities, the federal government, First Nations, industry, the agriculture sector and the public. Further work is required to clarify the roles of the federal government and First Nations in source water protection. Their involvement is essential to applying a true watershed approach, and to achieving the goal of safe and reliable drinking water throughout Ontario. The provincial government should move forward quickly to ensure that specific roles and responsibilities for these key participants are identified and coordinated.

Later in this section, the Committee provides additional advice in a number of areas the Committee believes are essential to a successful source protection planning process, including the involvement of the federal government, First Nations, transboundary issues, integration with other programs, Great Lakes, accessing/sharing information, and training needs.

2.2 The Proposed Source Protection Planning Process

The Ministry of the Environment released draft drinking water source protection legislation in June, 2004. It proposes legislative provisions necessary for the development of source protection plans. The Implementation Committee considered the process outlined in the draft legislation (refer to Appendix 8.6 for a diagram of the province's proposed governance structure) to provide context for this section of its report. The Committee also drew on a draft report of the Technical Experts Committee for an explanation of the potential technical details of source protection planning and implementation.

2.2.1 Organizational Structure

Source Protection Boards and Committees

Source protection planning and implementation must be a collaborative process. The management of the water source will have limited success if the planning and implementation activities begin and end at jurisdictional lines. A Source Protection Board (SPB) established for each watershed would be responsible for the coordinating source protection activities. The draft drinking water source protection legislation prepared by the Ministry of the Environment proposes that, in southern Ontario, the boards of conservation authorities serve as SPB for source protection purposes.

To facilitate efficient use of resources, and coordination of source protection planning across watershed boundaries, individual watersheds would be grouped into a number of watershed regions and these regions would then share resources.

One source protection board (SPB), designated as “lead” within each watershed region, would be responsible for working with other SPB’s in the region to establish a multi-stakeholder Source protection committee (SPC). The SPC would be responsible for the preparation of a technical assessment for each watershed in the region and would develop a source protection plan for each watershed using the assessment information. Each watershed’s SPB (working with the lead SPB for the region) would assist the SPC by ensuring that the necessary technical expertise is available. Working groups comprised of staff from conservation authorities, the province, the federal government, First Nations and other stakeholders would be established in each watershed to undertake the necessary technical work to develop a source protection plan.

Governance in Northern Ontario

For those areas currently without conservation authorities and areas in Northern Ontario where existing conservation authorities only cover some of the area, the draft legislation provides the Minister with a broad authority to establish source protection boards. Details of an approach for areas in central and Northern Ontario have yet to be proposed by the Ministry of the Environment.

In Northern Ontario, a different governance structure may be more appropriate recognizing that the jurisdiction over lands in Northern Ontario involves a large percentage of Crown lands and First Nations lands and that source protection planning bodies will need to address a different set of issues than in southern Ontario.

The Implementation Committee was not mandated to provide advice on a governance structure for Northern Ontario. However, the implementation tools identified in this report are applicable across the province. To ensure source protection planning in the north is not delayed, the Committee advised that the province undertake consultations with appropriate stakeholders to establish planning boards/committees in Northern Ontario and to develop applicable roles and responsibilities.

2.2.2 Technical Assessment

The purpose of the Technical Assessment Phase of source protection planning would be to evaluate the vulnerability of drinking water sources and the potential risks to these sources. For each threat identified, the risk of the water becoming contaminated or depleted would be assessed to determine what level of risk a threat may pose. When the SPC has completed the assessment report, the SPB would approve the assessment report and ensure that it is available to the public.

The report of the Technical Experts Committee (TEC) describes two major parts of the technical assessment phase: risk identification and risk assessment (refer to Section 2.2.3 for an illustration of the Threats Assessment Framework recommended by TEC).

1) Risk Identification

Risk Identification involves a number of key areas of work, including:

- a) a watershed description;
- b) a water budget;
- c) delineation of protection areas; and,
- d) threats inventory and issues identification.

a) Watershed Description

The watershed description compiles available background information (e.g. physical characteristics, population distribution, land uses) to provide context for source protection planning. All drinking water sources, including private, communal and municipal, would be highlighted so that stakeholders would know where drinking water supplies are located in relation to various threats.

The watershed description would set the foundation for preparing a Terms of Reference (ToR) for the development of the detailed watershed assessment report. The ToR would set out work assignments for the various participants. The SPC would coordinate the development of the ToR to suit the local watershed conditions, and where necessary ensure work is coordinated across both municipal boundaries and watersheds. Areas requiring detailed risk identification work include: water budgets, delineation of source protection areas, and identification of threats and issues within the watershed.

b) Water Budgets

The preparation of water budgets is essential to managing water quantity. Water budgets compare all current and forecasted water uses and withdrawals to the amount of water in the watershed. Water budgets also characterize the flow of water and identify key hydrologic processes, including where and how groundwater resources are recharged from the surface, how groundwater sustains surface water, and the role of physical features such as wetlands and riparian zones along rivers and streams.

c) Delineation of Source Protection Areas

The delineation of drinking water source protection areas serves to map areas of land where sources of drinking water are most vulnerable to contamination. These are the areas where risk assessment work and risk management measures should be focused.

The Technical Experts Committee identified four source protection areas:

Wellhead (groundwater) Protection Areas (WHPA): Wellhead protection areas are the area surrounding a well within which the well's groundwater sources are vulnerable to surface threats. These areas include the surface and subsurface area surrounding a water well or well field that supplies a public water system. Contaminants are reasonably likely to move through the surface and subsurface area, eventually reaching the water well or well field.

Intake Protection Zones (IPZ): Intake protection zones are the areas of land and water immediately upstream of a municipal drinking water intake. The main need for a protection zone is to respond to "spill" situations where accidental events or storm events deliver spikes in contaminant concentrations to the intake. Intake protection zones would be defined by a specific response time to an event upstream. The Implementation Committee noted that although the delineation of intake protection areas will serve to guide source protection measures for risks that are more immediate in nature, the implementation of measures to protect drinking water intakes should not detract from broader initiatives to protect surface water as part of the provinces overall water management programs.

Other Vulnerable Areas: Other vulnerable areas are land areas where an aquifer is vulnerable to contamination due to ineffectiveness of the soil overburden in preventing surface contaminants from reaching the groundwater. The protection of other vulnerable areas will safeguard private wells on the aquifer and protect the aquifer as a long-term supply of drinking water.

Significant Recharge Areas: Recharge areas are areas which account for the bulk flow of water from the surface to the aquifer. A decline in the recharge rate within these areas might have significant impacts to surface water sources that are dependent on local groundwater discharge. In addition, cumulative loadings that occur in significant recharge areas can have consequences for water quality in underlying aquifers.

d) Threats Inventory and Issues Identification

The threats inventory and issues identification stage of the technical assessment involves an examination of historical, current and future planned land use practices to identify those that could negatively impact drinking water.

Water quality and quantity threats that may pose risks to drinking water supplies, now or in the future, are identified through consultation, review of land practices (threats analysis), and

information about the water resource (monitoring analysis). This process leads to the creation of a summary list of potential threats that affect drinking water. This summary would form the foundation for a more formal “risk assessment” analysis, and also serves as the basis for public consultations. At this stage, the SPC would identify which potential risks will be addressed through the subsequent risk assessment. Threats that affect water but are not risks to drinking water supplies may be referred to other parties for action.

Risk Assessment

The risk assessment stage involves using the information gathered in the Risk Identification stage to evaluate levels of risk to the sources of drinking water. For each risk, the SPC would analyze the quantity, severity, irreversibility, and magnitude of the potential risk and rank each issue. Three categories of risk are recommended by the Technical Experts Committee: significant risks (for mandatory risk reduction); moderate risks for mandatory management; and low risk for mandatory surveillance. A fourth category exists for threats that pose a negligible risk and require no action.

2.2.3 Risk Management - Source Protection Plan Development

The purpose of the final stage of the source protection planning process is to use the risk assessment as a basis for evaluating options available for reducing risks to an acceptable level. The source protection plan would outline measures to reduce risks of contamination or depletion and enhance the protection of drinking water sources. Each measure would specify who would be responsible, the timing and method for completion and monitoring, and evaluation activities. The public would be consulted throughout the process. Measures would be developed to prevent future risks from occurring in source protection areas and to manage existing risks. In the case of significant risks, the goal would be to reduce the risk to a level such that a significant risk no longer exists.

General Risk Management Concepts

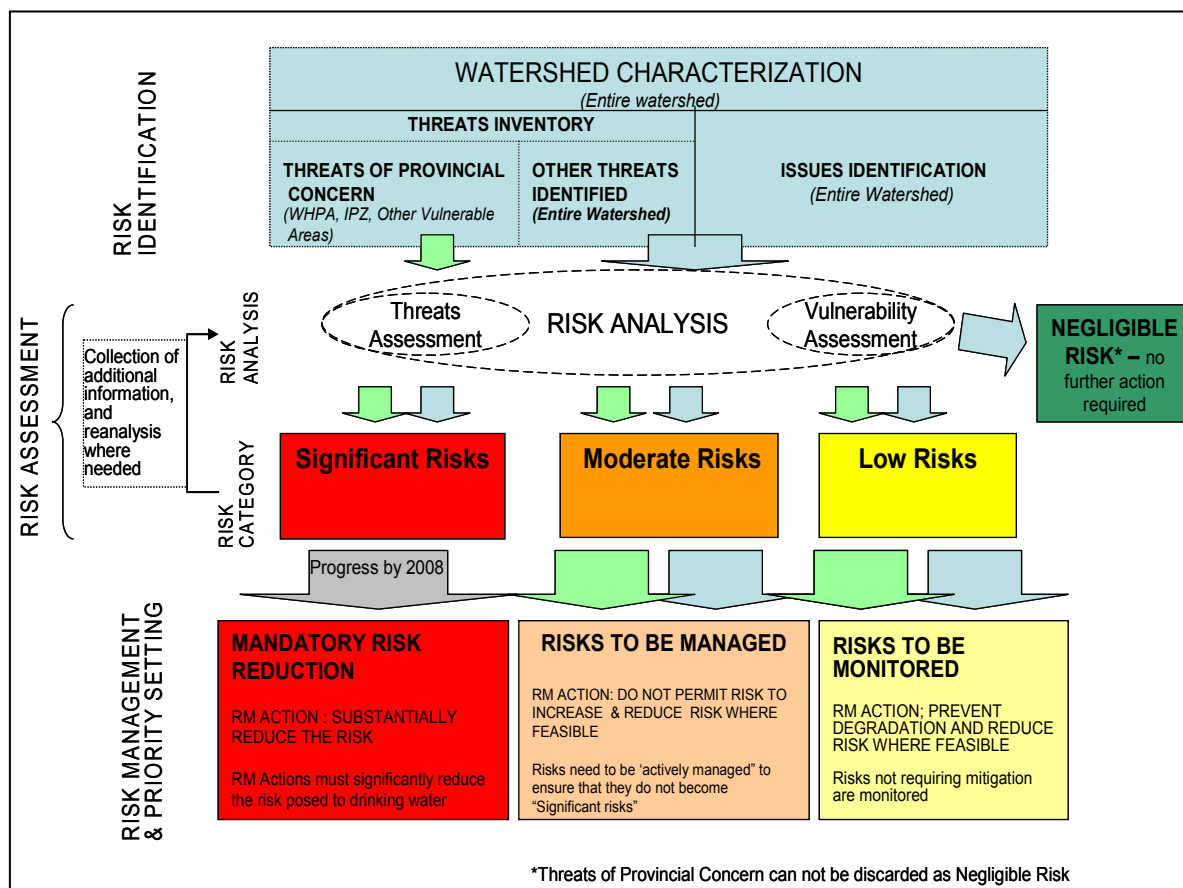
Risk Category	Risk Management Concept
Significant Risk	Mandatory Risk Reduction: immediately take action to substantially reduce the risk.
Moderate Risk	Mandatory Risk Management: do not permit risk to increase and initiate plan to reduce risk as opportunities arise.
Low Risk	Mandatory Risk Surveillance: monitor risk and make plans to prevent an increase in risk.
Negligible Risk	No further action required.

When the SPC has completed a draft plan for a watershed, the SPB would work with the SPC to seek endorsement from the municipal councils in the watershed. After ensuring the plan is in accordance with the regulations, the SPB would submit the plan to the Ministry of the Environment. The Ministry would post the plan on the Environmental Bill of Rights Registry. After receiving feedback, the Minister would determine whether the source protection plan should be approved.

The SPB would be required to prepare and publish annual reports on its progress. These reports would describe the measures taken to implement the source protection plan. The Minister would be required to publish a summary of the reports.

The overall threats assessment framework envisioned by the Technical Experts Committee is illustrated below. The diagram depicts the risk identification and risk assessment steps that form the technical assessment report, as well as the risk management step which is the key element of the overall source protection plan.

Figure 2.1 Threats Assessment Framework



This graphic is taken from the report of the Technical Experts Committee (TEC). It illustrates a process for assessing threats and issues and assigning them a level of risk. Threats of provincial concern are threats that the TEC recommends be assessed in all watersheds in Ontario.

2.3 Roles and Responsibilities

The above description of the source protection planning and implementation processes provide context for the Implementation Committee’s advice on roles and responsibilities. An overview of the major roles and responsibilities is provided here. Detailed documentation of the Committee’s advice on roles and responsibilities is contained in Appendix 8.5.

Recommendation 1: The provincial government should ensure that source protection legislation clearly delineates the responsibilities and powers of municipalities, conservation authorities and other relevant agencies, relative to source protection, and ensure that there is sufficient jurisdiction, authority and financial ability to implement those responsibilities.

2.3.1 Technical Assessment / Plan Development Roles and Responsibilities

The Implementation Committee decided on two scales of work – local and regional/watershed – as a useful way to describe the roles and responsibilities for the assessment and plan development phases of source protection planning. The Committee emphasized that collaboration amongst stakeholders will become increasingly important as the work moves from the local scale to the regional/watershed scale.

Local

Municipalities should carry the lead responsibility within wellhead protection areas and intake protection zones for both the assessment work and the development of measures to manage risks in these areas (except where a provincial instrument exists). Small municipalities may require assistance from the SPC to undertake the necessary assessment work.

Wellhead protection areas (WHPA) and intake protection zones (IPZ) are the vulnerable areas most directly connected to a drinking water system. Risks due to the presence of activities in these areas and zones are more immediate, and the benefit derived from protecting these areas accrue predominantly to the users of the system (i.e. the local municipality). Where these areas cross municipal boundaries, the SPCs will facilitate the coordination of the assessment. Municipalities should be responsible for inputting their assessment information into the assessment report for the watershed.

Regional/ Watershed

The Committee used the term regional/watershed to recognize hydrologic features and issues that may have broad impacts across the watershed or a large portion of the watershed, such as extensive aquifers and recharge areas, intake protection zones, and vulnerable areas that extend across municipal boundaries.

The SPC should base regional and watershed work and study requirements on the watershed description. The SPC should negotiate and assign assessment work across municipal boundaries within a watershed. The distribution of work should recognize the distribution of expertise, capacity, previous work, investments and knowledge amongst participants. Often, large municipalities will have in-house expertise and knowledge of local water resources, and can therefore play a strong role in the assessment work within their boundaries. Small municipalities are likely to require assistance from the SPC.

The SPC should be responsible for the entire watershed, including the watershed description and the development of water budgets. The SPC will need the municipalities and the provincial government to provide assistance, particularly in fulfilling information needs.

Funding of the Assessment Phase

In Section 6, the Implementation Committee recommends that the provincial government take responsibility for funding the development of source protection plans up to the point of provincial approval. By assuming this responsibility, the government will ensure that source protection assessment work and plan development proceeds expediently. This funding will also facilitate the building of local working relationships in each watershed. The information gained in the assessment process should enable the province, in consultation with other levels of government and stakeholders, to identify implementation funding needs and develop an appropriate long-term funding strategy.

2.3.2 Implementation Roles and Responsibilities

The management of risks within a specific plan area is expected to result in a mixture of localized measures and wider ranging measures that operate on a regional or watershed scale.

The Implementation Committee agreed that parties already active in a program area should be responsible for developing risk management measures for input to the source protection plan and overseeing implementation of the applicable measure. In many cases, responsibilities for establishing risk management measures will be clear. For example, certain measures could be specified by the province. For activities in wellhead protection areas, intake protection zones, and other vulnerable areas within municipal boundaries, municipalities should be responsible for establishing a risk management measure (if it isn't addressed through a specific provincial instrument). The province should also accept responsibility for identifying and developing programs for threats that represent a high risk and are prevalent across Ontario. The technical assessment will facilitate identification of proposed measures to address issues that cross municipal or watershed boundaries. In some cases, a measure may be needed to address threats that are of common interest to a number of participants. Typically, this situation would occur for threats that are at a regional or watershed scale. The Source protection committee, working with affected parties, should be responsible for facilitating the establishment of measures to address such threats.

Funding of Implementation

Although responsibility for implementation should rest with the person(s) upon which a measure is imposed or agreed to in the source protection plan, there may be financial implications which should be assessed as part of an implementation strategy for each measure. The Committee recognized that financial assistance and incentives may be necessary to assist in implementation. For example, farmers are responsible for implementing measures related to their practices; however, the provincial and federal governments have historically provided financial assistance for the implementation of such measures. Addressing some risks might achieve multiple benefits, such as the

achievement of aesthetic, recreational or wildlife habitat objectives, tourism, heritage or other values. In such cases cost sharing with other parties may be appropriate.

2.4 Federal Government

The participation of the federal government will be critical to source water protection planning and implementation in Ontario. In *Part Two* of his report, Justice O'Connor stated, "I also encourage the federal government to participate where appropriate; particularly relevant will be representatives of Fisheries and Oceans Canada, Environment Canada, Indian and Northern Affairs Canada, and Agriculture and Agri-Food Canada. The participation of federal agencies will help ensure intergovernmental coordination in an area where constitutional jurisdiction is not always clear." According to the Treasury Board Secretariat's Directory of Federal Real Property, there are 40 federal departments, agencies, corporations etc. with approximately 460,000 hectares of federal lands and waterways in Ontario, not including Reserve lands as defined under the *Indian Act*.

Recommendation 2: The provincial government should expedite its work with the federal government to identify and ensure coordinated participation of federal land holders in source protection planning and implementation on federal lands and waters.

2.5 First Nations

The participation of First Nations in the source protection process will be crucial to ensuring all sources of drinking water in the province are protected, including on First Nations land.

Justice O'Connor stated:

"Members of First Nations are also residents of Ontario. There can be no justification for acquiescing in the application of a lesser public health standard on certain residents of Ontario than that enjoyed by others in the province. This is especially true when there is ample evidence that the water provided in First Nations communities falls well short of the standards of safety and adequacy that are considered acceptable in other parts of the province."

The Implementation Committee recognizes that the province has established a working relationship with First Nations. The province is working to ensure that First Nations communities are involved in all aspects of source protection planning. First Nations representatives were members of both the Technical Experts Committee and the Implementation Committee.

First Nations have a long history of environmental stewardship, and water plays a central and integral part of their heritage and way of life. According to Ojibway Teachings, *"water, like the blood of humans is the blood of Mother Earth and is the basis and the lifeline to all life". The Mohawks speak of water in their Thanksgiving Address stating "water is indeed one of the most powerful medicines we have, for it has the ability to give and to sustain life."*

This heritage encompasses a vast body of ecological/indigenous knowledge that stems from the historic presence of Aboriginal peoples in North America. Such knowledge resides with all long standing residents of a watershed, including First Nations communities, and should be considered in the development of source protection plans.

As source protection legislation approaches introduction, the provincial government must strive to ensure the adequate participation of First Nations in the source protection process, both at the planning and implementation phase.

Recommendations 3: In order to ensure involvement of First Nations in source protection, the provincial government should:

- Expedite its discussions with the federal government and First Nations on how best to involve First Nations leaders and community members in a governance structure for source protection planning and implementation; and
- Ensure local ecological/indigenous knowledge is incorporated in the development of source protection plans.

2.6 Transboundary Issues

In some cases, sub-surface aquifers, groundwater systems and surface water systems extend beyond existing watershed boundaries. An ongoing, open dialogue must be established and maintained among both SPCs and municipalities who have adjoining watershed boundaries. This dialogue will help these parties derive co-ordinated and complementary source protection implementation measures in their respective watersheds.

Recommendation 4: Source protection committees should establish ongoing communication mechanisms with neighbouring committees. Cross boundary assessment work and implementation of surface water and groundwater measures should be documented in the assessment report and in source protection plans.

2.7 Integration With Other Programs

To ensure efficient use of available resources and avoid duplication of efforts, source protection plan development and implementation must be coordinated and integrated with water protection programs administered by all levels of government (e.g. Great Lakes programs, flood and drought management plans, fisheries protection programs, species at risk habitat protection and species recovery programs, and historic canal protection programs).

Recommendation 5: The provincial government and Source protection committees should work with relevant parties to ensure that the development and implementation of source protection plans are integrated with water management and protection programs administered by all levels of government.

2.8 Great Lakes

The Great Lakes are an immense freshwater resource that account for one-fifth of the world's fresh surface water. The Great Lakes Basin is home to 45% of Canada's industries, accounts for 50% of Canada's manufacturing activities, accounts for 40% of GDP, and is the source of drinking water for approximately 75% of Ontario's population. However, only 1% of the water of the Great Lakes is renewable. The importance of the Great Lakes will increase significantly over the near term as greater demands are placed on them for multiple uses, including drinking water.

The Implementation Committee recognizes that there are a multitude of jurisdictional challenges that are part of protecting the Great Lakes. In Ontario, both federal and provincial governments have forged partnerships with other levels of government, First Nations, conservation authorities, industry, NGOs, and other stakeholders to cooperate and coordinate efforts to restore, protect, and conserve the Great Lakes ecosystem. Numerous agreements and programs are in place to achieve these goals.

Recommendation 6: The provincial government should ensure, when participating in inter-jurisdictional negotiations regarding the Great Lakes, that source water protection principles, strategies, and policies are incorporated into existing Great Lakes programs and resulting agreements so that they are protected and improved as sources of drinking water.

2.9 Accessing/Sharing Information

Source protection planning is a complex undertaking that involves many parties with diverse expertise and interests. Information access and sharing amongst these parties is a formidable task, requiring coordination and cooperation among all levels of government and stakeholders.

At present, data relevant to source protection is collected by a variety of entities, including the province, the federal government, municipalities, conservation authorities, stewardship organizations and First Nations. In order to ensure an efficient flow of reliable data, issues such as the need for province-wide coordination of information management, the development of data standards, and the need for a centralized repository and conduit for data must be addressed. All parties involved in source protection should be consulted to maximize resources and efficiencies in the creation of an improved information system. As well, making information accessible to the public is essential to ensure transparency in the process of developing, implementing and monitoring source protection plans.

Other information management, sharing and accessibility issues to be considered include: developing agreements on the use and protection of shared information, obtaining adequate funding, and developing and maintaining the appropriate skills among stakeholders to access and manage information for source protection purposes.

Recommendation 7: The provincial government should vest in source protection committees (SPCs) the authority to access and obtain relevant information necessary for the completion of a source protection plan, with appropriate privacy and proprietary protection considerations, and that information sharing should be coordinated among the province, the federal government, First Nations, municipalities, conservation authorities and other organizations. This information should be made accessible to the public.

2.10 Training Needs

Given the many participants that will be involved in source protection planning and implementation, it is essential that there be a transparent and effective decision-making process. Chairs, members and senior management staff working with planning bodies will require education and training in source protection and skill-specific areas (e.g., communications, facilitation) to build the capacities required by their respective roles. An orientation on source protection and related legislation, policies and processes in Ontario should be delivered to these individuals. Training should be tailored to meet local needs.

Support should be provided to individuals working with planning boards and committees, so that they can effectively fulfill their roles in the source protection process. This support should include a base level of mandatory education and training in facilitation, communications and effective decision-making. The chairs of Source protection committees and source protection boards should also be provided with the training they need to carry out their roles.

In addition, it is anticipated that some form of dispute resolution mechanism will need to be in place to manage issues and gain stakeholder buy-in at the local level. Situations may arise where agencies participating in the source protection planning process (Source protection committees; source protection boards, municipal councils, conservation authorities) will have difficulty agreeing on a particular issue or action. The establishment of an alternative dispute resolution (ADR) process may aid in the resolution of differing positions and help to facilitate local buy-in to the source protection planning process. It may also reduce the likelihood of appeals to MOE-approved plans and may increase public confidence in the planning process.

The province should establish strategies for preventing disputes and a set of procedures to be followed in the event of a dispute. This includes providing ADR training to chairs of source protection boards and committees and putting in place a mechanism to facilitate the sharing of dispute resolution practices among chairs.

Recommendation 8:

- The provincial government should ensure the appropriate tools, guidance and support services are available to Chairs, members and senior management staff working with Source protection committees (SPCs) and Source Protection Boards (SPBs).

- Chairs and members of SPCs and SPBs should have access to professional alternative dispute resolution services to manage issues that may arise during the planning and implementation process.
- A mechanism should be put in place to facilitate the sharing of best practices among Chairs and members of source protection boards and committees.

SECTION 3: IMPLEMENTATION FRAMEWORK

3.1 Introduction

This section of the report provides the Implementation Committee's advice in a number of areas critical to the overall implementation of source protection plans including:

- implementing measures defined in the source protection plan;
- establishing interim measures;
- notifying landowners, businesses and the public of source protection requirements;
- facilitation and oversight of the plan implementation process, including tracking the status of implementation, assessing plan effectiveness, addressing any gaps and making adjustments to respond to new information and changing conditions; and
- ensuring the status of source protection plans in relation to other decisions and legislation.

Further recommendations on specific implementation tools and funding are also contained throughout this report.

3.2 Risk Management Measures Identified in the Source Protection Plan

Based on the technical assessment report, SPCs will identify existing and potential future risks of contamination or depletion to their drinking water sources, and plan measures to reduce those risks. In general, the Implementation Committee supports an "outcome-based" approach to risk management, where risk management options would be developed locally to meet outcomes established by the province. An outcome-based approach would provide for local flexibility in deciding the best approach to reducing risks.

Priority should be placed on managing threats that pose the greatest risk to drinking water. SPCs will identify significant, moderate, and low risks. For risks identified as "significant," the committees will identify, evaluate and specify where it is mandatory that measures be taken to reduce the risk. Measures can be any steps the committee proposes as appropriate to achieve the required outcome (i.e., regulatory, voluntary or incentive-based). For threats identified as "moderate" or "low" risks, committees will develop and evaluate options to mitigate the risks, and the province should require these measures to be implemented.

The Implementation Plan is an action plan. It should identify risk management measures and set out who, how, and when each measure would be accomplished. A projected cost should also be included. Milestones and performance tracking protocols should be identified for all risk management measures. The plan should include a strategy for resolving any outstanding issues.

Recommendation 9: Where a source protection plan identifies a “significant risk,” the plan shall:

- Describe the required outcome;
- Give a brief description of the measure(s) to be adopted and set out a rationale for how the proposed measure(s) will mitigate the water risk;
- Specify any entity or person who has legal responsibility for implementing the measure(s) and ensure the responsible entity has acknowledged the measure(s) to be undertaken;
- Where relevant, estimate the cost of implementing the measure(s) and who should fund the measure(s);
- Specify the time frame for implementing the measure(s);
- Specify how and over what time frame the measure(s) will be monitored and evaluated to determine whether the measure(s), as designed and implemented, is effective in mitigating the water risk.

In addition, the plan should follow the above steps to identify appropriate responses proportionate to the level of risk (i.e. “moderate” or “low”)

3.3 Interim Measures

Prior to the completion of source protection plans, threats may be identified which pose a significant risk to source waters and require more immediate attention. Such threats are likely to be identified in a draft assessment report, or could develop at any stage in the planning phase. Those threats posing “significant” risk to drinking water should be addressed immediately and not delayed while waiting for final approval of the plan or its implementation.

Recommendation 10: Where there is a threat identified in the assessment report, as determined by Source protection committee and supported by the source protection board, that poses a significant risk to source waters and that would require interim action prior to source protection plan approval, the risk should be brought to the attention of all parties that have responsibilities related to the risk. Those parties should undertake an investigation of the risk and determine appropriate action.

3.4 Notification of Source Protection Plans

Inclusiveness, transparency and public involvement are key principles underlying source water protection planning. The process should include public meetings and consultations on various elements of plan development. Once a source protection plan is approved by the province, the general public and individual landowners/ business operators who may be affected by new requirements and new land-use restrictions should be notified.

Recommendation 11: The source protection legislation and regulations should include provisions for public consultation, similar to those articulated in the *Planning Act* and its regulations, at the appropriate stages during plan development and for notification of the public and affected land-owners/ business operators following plan approval.

3.5 Plan Implementation, Monitoring and Amendment

Source protection is a continuous process; source protection plans must be “living documents” that are updated as needed (e.g. when new science or information arises), and the planning process must allow for plans to be amended when appropriate.

Plans must continue to be reviewed and updated to take advantage of improvements in information and available technologies. A transparent, consultative approach is as important in the updating of source protection plans as it is in their initial formulation.

The coordination and implementation of approved source protection plans must ensure effective monitoring, evaluation and reporting on the status and performance of a plan, as well as ongoing identification of any gaps that may exist as well as actions to address those gaps.

The Implementation Committee recognizes that the role of the SPC will likely change over the initial 5-10 years, as plan development and implementation proceed. Once baseline source protection plans are in place, however, the intensity of the work of the SPC is expected to lessen (although this will vary by watershed). The government should continue to review and assess the role of a formal SPC as the overall process continues.

Recommendation 12: Source protection plans must be considered “living documents” that are reviewed and updated as needed to reflect current watershed characteristics, scientific research, and technological innovation.

Recommendation 13: Once source protection plans have been developed and approved, the lead source protection board/conservation authority/other designated lead body in a watershed region should work with individual SPBs or other designated boards to facilitate implementation of the plans. This work should be in partnership with municipalities, the province, the federal government, First Nations and other stakeholders. This includes:

- monitoring, evaluating and reporting on the status of implementation of an approved plan, including assessing plan effectiveness, expenditures to date, and addressing any identified gaps in the plan;
- reviewing and updating information pertinent to source protection plans; and
- considering amendments to the plan as appropriate.

The lead CA, in conjunction with all watershed partners, should identify responsibility for these activities where relevant and appropriate.

Recommendation 14: The provincial government should review and assess, based on the advice of the Source Protection Board, the ongoing role of a formal Source protection committee as the overall source protection process continues.

3.6 Status of Source Protection Plans

To ensure effective source protection implementation, it is important that the source protection legislation and local source protection plans provide direction for any decisions affecting sources of drinking water.

Source protection plans must prevail should conflicts with other instruments occur. A primacy clause would help ensure effective implementation of source protection plans by providing the legal basis for making decisions if a conflict occurs.

Consistency in Decision Making

Recommendation 15: Source protection legislation should ensure that:

- a) provincial government regulation and decisions that affect drinking water are consistent with provincially approved source protection plans.
- b) municipalities implement source water protection plans through their land-use planning systems where applicable and that municipal regulation of activities shall complement and implement, where applicable, provincially approved source protection plans.

Conflicts with Existing Legislation

Recommendation 16: Source protection legislation should ensure that if there is a conflict between an approved source protection plan as it pertains to a significant risk to drinking water and 1) a provincial law or instrument or 2) a municipal official plan or by-law, the approved source protection plan should prevail.

SECTION 4: IMPLEMENTATION TOOLS

4.1 Introduction

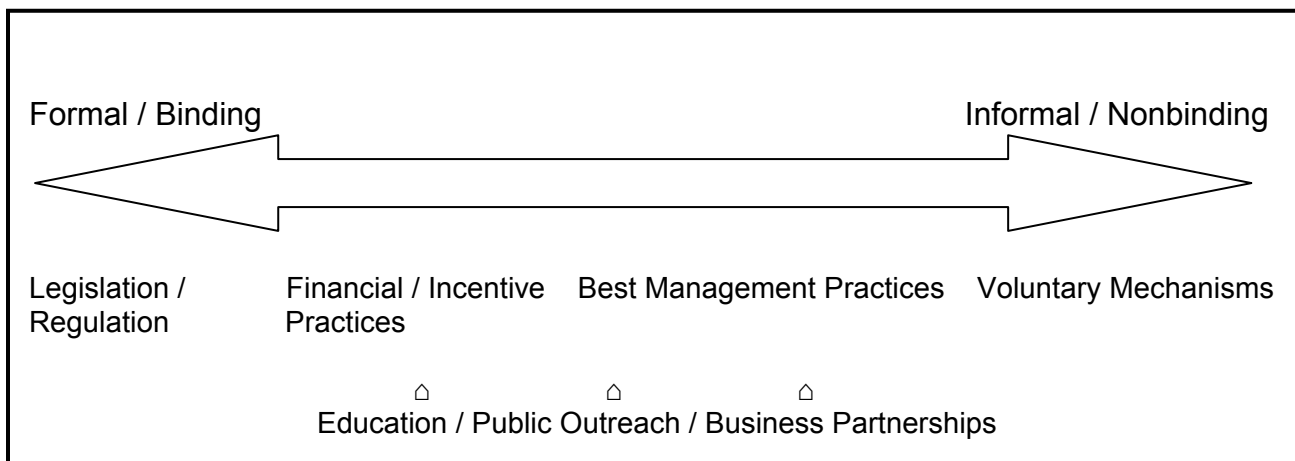
This section of the Committee’s Report examines source protection tools that are applicable to a wide range of source protection risks. Section 5 provides recommendations on risk management tools for a list of specific issues that, depending on location and other factors, could represent a threat to a source of drinking water. In its approach to providing advice on source protection tools, the Committee focused on making use of, or enhancing, existing implementation tools before developing new approaches.

4.2 A Continuum of Tools

The Committee acknowledged that existing activities, already established in source protection areas or already causing a broader issue in the watershed (e.g., cumulative loadings of a contaminant), represented the greatest challenge to managing risks to sources of drinking water. The most suitable approach for managing risks for a given issue should be determined within each individual watershed, since the potential risks to drinking water are locally assessed and evaluated.

A host of tools are available to manage risks to sources of drinking water. The range of approaches available can be categorized as a continuum, as illustrated in Figure 4.1. The continuum moves from binding/formal approaches to non-binding/informal approaches. Often these tools are complementary. For example, education should always be employed whether it is in conjunction with regulation and enforcement or voluntary best management practices. Incentives and financial assistance are also often employed as a complementary tool.

Figure 4.1: Continuum of Tools



Using a wide mix of management tools would provide the flexibility desired by municipalities to develop locally tailored implementation plans. This mix of tools demonstrates that different approaches are capable of achieving similar outcomes depending on local circumstances. A complete “tool-kit” for the implementing agencies would combine a range of “soft tools” such as education, outreach and Best Management Practices, with more “formal” tools, such as legislated powers to pass regulations and inspect private businesses and properties.

Provincial Source Protection Guidance Manual

A Provincial source protection guidance manual should be developed by the Ministry of the Environment with the assistance of other key ministries, municipalities, conservation authorities, the federal government, First Nations and other stakeholders. The manual should include a description of the range of existing and new legal authorities that can be employed and the full range of non-legal tools, including education and incentive programs.

Recommendation 17: A provincial source protection guidance manual should be prepared to assist all parties involved with the selection and use of appropriate management tools.

4.3 Provincial Authority

In *Part Two* of his report, Justice O’Connor noted that effective source protection plans must be respected by those carrying on business and regulating activities within individual watersheds, including the province on matters of provincial approvals. Examples include Permits to Take Water (PTTW) and Certificates of Approval for activities that pose a threat to water quality.

In order to ensure consistency between provincial approvals and local watershed source protection plans, the Implementation Committee drafted recommendations dealing with: the province’s own lands and activities; new and expanding operations; and, existing activities which operate under provincial approvals.

For new operations or expanding operations requiring a provincial approval, the province should mandate that no approval be issued unless the proponent demonstrates that the operations will be consistent with the relevant source protection plan(s).

For existing operations where there is an identified water risk in an approved source protection plan, the province should require (in relevant legislation or regulations) the operator to demonstrate that the operation will be consistent with the approved source protection plan, or seek amendments to the relevant approvals as necessary.

A process should be established to ensure consistency between local source protection plans and all provincially approved activities that affect drinking water sources in a watershed, regardless of the date of the original approval of that activity. Provincial approvals apply to a wide range of activities and uses such as air emissions and sewer system discharges.

Recommendation 18: Approved source protection plans should be binding on the Crown.

Recommendation 19: There must be consistency between source protection plans and decisions that the province makes related to a wide range of activities, including those related to:

- the province's own lands and activities;
- new and expanding operations; and
- existing activities which operate under provincial approvals (permits, licenses, etc).

Recommendation 20: The province must ensure there is sufficient authority to bring existing operations into consistency with approved source protection plans using appropriate regulatory and legislative mechanisms.

4.4 Municipal Authority

Municipalities will have a major role to play in the implementation of source protection plans. Municipalities will implement source-water protection measures within their jurisdictions in a number of ways (though they will all be contingent upon fiscal capacity):

- Water and sewer service delivery responsibilities under the *Municipal Act*, *Sustainable Sewer and Water Systems Act*, and investment in infrastructure;
- By-law making authority under the *Municipal Act*;
- Membership on and working with conservation authorities under the *Conservation Authorities Act*;
- Land-use planning activities under the *Planning Act*, including brownfield redevelopment and other revitalization program activities;
- Data collection and analysis to support effective decision-making; and
- Water conservation and public education activities, incentives and programs.

In several municipalities and conservation authorities, concern about vulnerable drinking water supplies has prompted the development of a variety of source-water protection programs, incentives, and threat analysis methodologies which can act as early models. Several municipalities have rural water quality funding programs, including: the Region of Waterloo, the counties of Brant, Wellington and Middlesex and the cities of Guelph and Brantford.

Halton Region has adopted a comprehensive aquifer management plan based on a watershed perspective. The Region is exploring land purchases and the use of conservation easements to permanently protect wellheads. Waterloo has documented the results of incentives to businesses and farmers of voluntary water protection activities. It has one of the most sophisticated water modeling capabilities in the province. Oxford County's experience shows how source water data and policies might be incorporated in municipal official plans and zoning documents. A large

number of municipalities have water conservation programs based on significant public education programs.

Legislative and jurisdictional reviews conducted by the Regions of Waterloo and Halton, as well as Oxford County, indicate gaps exist in municipal authority to address threats to vulnerable drinking water sources in existing built-up areas and from existing activities. For example, the transport, storage, handling and disposal of chemicals by businesses and industries located over a vulnerable aquifer cannot be regulated by municipalities. Some municipalities have noted the need for a by-law making authority that could include regulating, licensing, permitting, prohibiting, approving, and conditional actions similar to the “spheres of jurisdiction” currently used for other functions in the *Municipal Act*. Municipalities currently can require grading, drainage and other physical infrastructure to protect water sources through site plan control agreements for new development being considered under the *Planning Act*. A source water protection “sphere of jurisdiction” under the *Municipal Act* should provide some similar ability for existing development and activities.

Currently, the planning system is well structured to work with source protection plans to manage future land uses. The Committee emphasized the prevention of future risks (as opposed to managing risks once they are established) as the preferred approach when making decisions on the location and operational practices of future development. The delineation of source protection areas will provide the basis for making future planning decisions so that new higher risk development can be directed to locations that will represent less risk to sources of drinking water. In addition, for future uses, municipalities could be given the flexibility to require source water protection measures as a condition of zoning approval for certain land uses in vulnerable areas. Under this scheme, unless the conditions were met, the zoning approval would not take effect.

Recommendation 21: To address the gap in municipal authority and support municipal implementation of source water protection plans, the Implementation Committee recommends that:

- Municipal land-use planning decisions be required to “be consistent with” source-water protection plans from the time the plans are approved by the province;
- At the time of regular comprehensive plan reviews, municipal official plans should be updated to include source-water protection plan data and policies and that the province work with municipalities to ensure a timely update of municipal official plans;
- Municipalities be given a source-water protection “sphere of jurisdiction” that includes by-law making powers to assist in the protection of drinking water sources, with authority to be provided through either the *Municipal Act* or proposed source water protection legislation; and
- The province consider the potential for conditional zoning to address source-water protection objectives.

4.5 Land Securement

Land securement for land conservation purposes refers to the acquisition of full title to land or partial title to land (e.g. a legally binding interest such as a conservation easement) to protect natural heritage features and ecosystem functions. Land securement can protect source water by directly conserving important hydrological features, such as wetlands, lakes, ponds, groundwater recharge areas, wellhead areas, headwaters and watercourses. It can also conserve, mitigate or prevent incompatible land uses on lands adjacent to source water.

The term ‘securement,’ as used by entities such as land trusts, covers both the purchase and donation of lands. The term ‘acquisition’ is more often used by such groups to describe the purchase of title.

Securement of full title to land, or partial title, provides a strong level of protection as it vests the care and ownership of the land with a conservation body whose mandate is to protect the land. Securement is usually accomplished through a permanent legally binding measure that is not subject to zoning changes, land use planning, or other kinds of policies. However, it is usually also the most costly conservation tool in terms of initial acquisition and/or subsequent stewardship of the lands. Moreover, the effectiveness of securement must be measured against the mandate and capacity of the conservation body holding title. In the case of conservation easements, it must be measured against the quality of the conservation easement agreement and the body’s capacity for stewardship, monitoring and enforcement. Securement can, if the objectives are carefully balanced, accommodate source water protection objectives along with other objectives, such as habitat protection and protection of landscapes and cultural heritage features.

Several organizations exist that can hold conservation easements or title to land for the conservation of natural heritage, natural resources, or habitat. They include: conservation authorities, the Ministry of Natural Resources, Ontario Parks, Parks Canada, the Ontario Heritage Foundation, Environment Canada, and a growing community of land trusts. Other entities, such as municipalities and universities, can and do hold lands for conservation purposes.

Securement options include the purchase, donation or partial donation of:

- full title (fee simple interest) to land, or,
- partial title such as conservation easement agreements and common law easements and covenants. Common law restrictions are less common and less effective. Generally, conservation easements are most commonly created under one of two provincial statutes, the *Conservation Lands Act* or the *Ontario Heritage Act*.

There are several variations on the above, some of which include:

- Life tenancy (acquisition of residual interest) where the landowner, and/or designate(s), retains the ability to live on or use the land for a time-limited period, and the conservation body holds remainder of title,
- Bequests,

- Lease to own,
- Land exchange where the conservation body trades lands with the landowner,
- Acquisition of an option to purchase, and,
- Acquisition of a right of first refusal to acquire the land.

The transfer of development rights, where a landowner sells or donates his or her development rights, have been used effectively in the United States. In Canada, the concepts of transferable development credits and ‘density bonusing’ are being considered.

No program currently exists in Ontario that directly acquires or specifically provides funding for acquisition of lands for source water protection purposes. However, there are programs that provide funding, assistance or incentives for the securement of natural heritage or habitat. Many lands that provide source water protection often have natural heritage or habitat features, such as wetlands, core lands within the Oak Ridges Moraine, and habitat corridors, that would qualify for assistance or incentives under these programs. Many lands important for source water protection have already been secured through such programs.

Land securement programs include the Ontario Ministry of Natural Resources’ Ecological Land Acquisition Program, the Oak Ridges Moraine Foundation funding program, the National Capital Commission’s Greenlands Program, and partnership programs coordinated by large conservation NGO’s such as the Nature Conservancy of Canada and Ducks Unlimited Canada. Programs such as the Ontario Land Trust Alliance’s *Ontario Land Trust Assistance Program* (OLTAP) provide limited funds to assist with the costs associated with land securement. The federal Habitat Stewardship Program provides stewardship funds and some limited funds to acquire or assist with the securement of habitat for species at risk. Private foundations are also becoming increasingly involved in acquisition.

Incentive programs include Environment Canada’s Ecological Gifts Program, which provides enhanced federal and corresponding provincial income tax deductions for donations of full and partial title to ecologically sensitive lands. Provincial planning policies lack a comprehensive definition of significant hydrological resources. This shortcoming inhibits donors of lands under the Ecological Gifts Program’s criterion of ‘significant hydrological resource’ from receiving full income tax benefits. Likewise, the Ecological Gifts Program will certify as eco-gifts lands qualifying under the provincial Conservation Lands Tax Incentive Program (CLTIP). But CLTIP currently does not have a source water or hydrological features category.

The provincial government should develop a Land Securement Program to meet source water protection goals across watersheds. Such a program should be integrated and coordinated with other programs that achieve similar benefits.

To assist the work of a Land Securement Program, the province should review all of its ongoing acquisition and disposition programs to determine:

- whether explicit source protection criteria can or should be included in the programs; and

- if the financial resources of the programs are adequate when including source protection objectives (will need to consider impact on municipal tax base when reviewing these options), and
- if resources and mechanisms are available or needed for long-term stewardship of secured lands and conservation easements.

As required, these programs should be revised.

The province should look at opportunities to combine/integrate programs for priority land acquisition, where source protection areas of concern are identified. Coordination between existing agencies, charities, and organizations should be encouraged so that the protection available through various programs and resources is maximized.

Adding lands associated with source water protection to the definition of conservation lands under the provincial Conservation Land Tax Incentive Program will enhance source protection under current incentive programs. Similarly, the federal government should incorporate source water protection as an explicit criterion under the Federal Ecological Gifts Program.

Incentives could also be created through the elimination of all tax action – both provincial and federal (i.e. land transfer tax, probate fees), where land is transferred to a land stewardship organization to be used for source protection purposes in accordance with an approved source protection plan.

In order that these various programs are utilized and well supported, provincial agency staff and landowners should be advised of the range of tools available for land securement.

The expropriation of land should only be considered as a last resort (subject to the *Expropriations Act*, the *Government Services Act*, and the *Provincial Parks Act*) in order to protect vulnerable areas where human health or safety is at risk.

Recommendation 22: A land securement program should be developed to meet source protection goals across watersheds. Such a program would be supported by:

- a review of all of the on-going acquisition and disposition programs; and
- a review of provincial and federal tax and land use incentives.

Recommendation 23: Where appropriate, and as a last resort, the provincial government should consider the use of expropriation in vulnerable areas where human health is at risk.

4.6 Best Management Practices

Certain public facilities, as well as commercial and industrial businesses, can pose a potential risk to sources of drinking water. These facilities may not be aware of the risk, or the environmental regulations that apply to their operations.

Best Management Practices (BMPs) would be an effective means through which to reduce the risk posed by many of these operations, and to reduce the overall water-use of certain sectors. Examples of BMPs in Ontario include those addressing water management in the agriculture sector and stormwater management, such as buffers for water retention purposes. The province should prioritize its work on developing BMPs by focusing on sectors and/or activities (such as urban and rural storm water management) that pose a risk to sources of drinking water. By collaborating with interested stakeholders, the province can effectively identify priorities and develop BMPs, which in turn provide incentives to implement measures that will achieve source protection goals.

BMPs can help protect sources of drinking water, by providing guidelines for businesses to follow that could prevent contaminants from reaching source waters. Often, these guidelines have added benefits to the polluter, by reducing costs, by reducing liability, by improving worker health and safety, and by enhancing public image.

Recommendation 24: The provincial government should support the development and implementation of sector-specific best management practices (BMPs), including:

- Refining existing technical guidance or pollution prevention strategies to reflect source protection;
- As appropriate, developing new sector-specific technical guidance; and
- Supporting the development of an education and outreach strategy to support BMPs

4.7 Research and Technology

The development of research and technologies related to source protection supports sound decision-making and processes that will achieve an equitable and efficient allocation of water resources among stakeholders. Such advancements will provide appropriate tools that consider social, economic, and health factors, as well as environmental concerns, in the protection of Ontario's drinking water sources.

Planning and implementation of measures to protect drinking water sources should be based on comprehensive and reliable data, including data on water quantity and quality. Research and technology can play a critical role by determining the best combination of actions and measures to prevent the degradation of drinking water supplies.

Research and technology initiatives would generate scientifically-based information and techniques to: deal with potential threats to drinking water, effectively manage competing water

uses, enhance public understanding, and foster cooperation with other organizations and individuals who have a shared interest in source protection.

Recommendation 25: The province should support continued scientific research and the development of technological advances, innovations and techniques (e.g. improved septic system technology, improved techniques for manure spreading, etc.) that will advance watershed-based source protection.

4.8 Education and Outreach

Effective education and outreach initiatives can help enhance the support of stakeholders for source protection. These initiatives can also result in more efficient use of resources, increased partnerships and cooperation, and more innovative ways to protect sources of drinking water. For example, education and outreach could support stakeholders in the management of specific issues related to source protection, such as: owners/users of abandoned and private wells, septic systems, storage tanks; the agricultural sector; businesses that engage in specific activities (e.g. storage and application of pesticides, storage of other chemicals); and the local community.

An education and outreach program could include:

- written materials (e.g., brochures, fact sheets, internet sites, documentation of Best Management Practices);
- community outreach (e.g., presentations before local communities, school programs);
- special activities (e.g., workshops, demonstrations and tours, videos, slide presentations); and
- media liaison (e.g., press releases).

Local circumstances will guide specific education and outreach requirements.

Recommendation 26: Education and outreach should be recognized as an essential component in the development and implementation of source protection plans.

SECTION 5: ISSUE SPECIFIC IMPLEMENTATION TOOLS

5.1 Introduction

The Implementation Committee made a series of recommendations related to specific potential issues and/or threats to drinking water sources. The list of issues examined by the Committee was based largely on the experience and expertise of staff from various municipalities, conservation authorities, and the Ministry of the Environment. The Committee also reviewed information from groundwater reports and studies.

For the most part, the Committee made no assumptions about the prevalence of these threats. Instead, it chose to focus on ensuring that appropriate management strategies exist in the event that such threats were identified in a watershed and determined to represent a risk to a source of drinking water.

The issues examined by the Committee could represent a risk to a source of drinking water in a number of ways. For example, an activity may produce pollutants that could contaminate a source of drinking water, create a pathway for contamination to reach a source of drinking water, or have an adverse effect on water quantity.

SPECIFIC ISSUES	
5.2 Abandoned Water Wells	5.14 Land Application of Biosolids and Septage
5.3 Oil and Gas Wells	5.15 Manure and Fertilizer Application /Storage
5.4 Other Wells	5.16 Farm Water Protection Planning Framework
5.5 Aggregate Extraction	5.17 Septic Systems
5.6 Mines and Mine Tailings	5.18 Salts/De-icing Compounds
5.7 Storage Tanks	5.19 Cemeteries
5.8 Chemical Use	5.20 Storm Water
5.9 Small and Medium Enterprises	5.21 Waste Water
5.10 Pesticides	5.22 Non-Point Sources/Cumulative Loading
5.11 Contaminated sites	5.23 Land Drainage
5.12 Waste Disposal Facilities	5.24 Water Quantity/Water Conservation
5.13 Hazardous and Liquid Industrial Waste	5.25 Private Water Wells

The Committee studied these issues and made recommendations on appropriate risk management tools for each one. The list reviewed by the Committee is not intended to limit the local assessment of activities. Source protection committees should, in their risk analysis, attempt to characterize all potential threats to drinking water sources in the watershed.

5.2 Abandoned Drinking Water Wells

The term “abandoned well” generally refers to a water supply or monitoring well that is no longer being used. A “properly decommissioned well” is one that has been plugged and sealed, or excavated according to the abandonment provisions (often referred to as decommissioning) set out in provincial regulations. Improperly decommissioned wells pose a potential risk to groundwater sources by bypassing the natural purification system and creating a direct pathway to the aquifer.

In Ontario, the construction and decommissioning of water wells is governed by Regulation 903 under the *Ontario Water Resources Act* (OWRA). The regulation sets out construction, decommissioning, and material standards used by the water well and geo-technical industries. The regulation defines how wells are to be constructed and decommissioned with the intent of protecting groundwater resources from contaminants originating at the surface (or in some cases, from other aquifers at depth).

Well owners are legally obligated to properly decommission wells on their property. Yet improperly decommissioned wells can be found across the province. The exact number and location of such wells is unknown, but best estimates place the number in the tens of thousands. Furthermore, the specific risk associated with these wells is difficult to quantify since the age and depth of the wells may also be unknown.

Currently, no province-wide incentive program exists to assist landowners with well identification and decommissioning. This lack of detailed information also makes it difficult to estimate the total cost associated with an abandonment program. Well discovery programs should initially focus on improperly decommissioned wells in high risk areas (e.g., wellhead protection zones).

In order to secure a high-degree of participation, incentive programs need to be established. Substantial incentives provided to landowners will encourage the proper decommissioning of wells. In-kind contributions should be considered in calculating the landowner’s portion of the total cost of the decommissioning to provide project management incentives.

In certain circumstances, the delivery of such programs by entities other than the government should be considered to avoid the perception of a potential regulatory risk to the participant. Existing and new federal, provincial, municipal and conservation authority programs should be coordinated to enhance coverage of assistance with well identification and decommissioning. Such coordination should also strive for consistency of program eligibility in various parts of the province.

In Ontario, regulations define a highly technical, multi-step process that must be followed when decommissioning a well, thereby placing a heavy reliance on contractors licensed to do this type of work. Evidence from existing and former programs have indicated a shortage of licensed well contractors willing to perform the process of proper water well decommissioning; many contractors would rather focus on new well drilling contracts.

Recommendation 27: Well abandonment programs should be available to all private landowners.

Recommendation 28: The provincial government should:

- require permits to construct new wells, and those permits should be made conditional on the proper decommissioning of any abandoned wells or wells to be abandoned on the property. Permitting could be linked with permitting and inspection of septic systems, and/or when a property is connected to municipal water infrastructure.
- develop decommissioning programs to identify, locate, inventory, prioritize and ensure proper abandonment of existing wells, including former ministry observation wells.
- explore mechanisms for enabling municipalities to require proponents to demonstrate they have located and decommissioned improperly abandoned wells as a condition in the development approval process.
- look for ways to provide for better enforcement with regard to existing well requirements.

Recommendation 29: The provincial government should:

- Expand training for well decommissioning activities; and
- Expand the eligibility of licensing for well decommissioning activities to those who have the necessary training in proper well decommissioning.

Recommendation 30: The provincial government should review existing requirements under Regulation 903 to ensure consistency with source protection objectives.

Recommendation 31: The provincial government should develop and distribute:

- Education materials to owners to describe proper well operation and decommissioning practices; and
- Guidance materials to licensed contractors to describe proper well operation and decommissioning practices.

5.3 Oil and Gas Wells

It is estimated that tens of thousands of wells were drilled and abandoned in southwestern Ontario prior to the establishment of provincial standards for their construction, operation, maintenance and decommissioning. An additional 3,700 wells have been drilled since the introduction of a regulatory scheme. An average of 100 new wells are drilled every year. The provincial government does not inspect these wells, and they are rarely inspected or monitored by their owners. The government does not know the location or the construction details of many of these abandoned wells.

Approximately 600 wells are suspended annually. The government has no information about whether these suspended “live” wells are adequately maintained or inspected. Current regulations do not require that wells be tested in order for their owners to obtain ongoing licensing.

The production of oil and gas involves drilling wells through stratified rock formations, allowing oil, gas, brine and other subsurface fluids to flow to the surface. If left unplugged, fluids such as sulphur or salt water, natural gas and oil can flow upwards, contaminating groundwater and surface waters. Similarly, contaminants originating at the surface such as pesticides, herbicides, fertilizers, manure or spills of other substances can flow down wells and contaminate groundwater. Old abandoned oil and gas production works, such as tanks, often contain oil and formation water that contaminates fresh water resources as they leak into the environment.

The governance of oil and gas well industries is fragmented and under-resourced. The Ministry of Natural Resources, the Ministry of the Environment and the Ontario Energy Board regulate different aspects of industry activities.

Issues identified are:

1. Inadequate mechanisms (programs, legislative authority and incentives) for municipalities and farmers to identify and properly decommission abandoned wells;
2. Insufficient capacity to inspect licensed wells and works and lack of enforcement compliance with required construction, operation, maintenance and decommissioning standards;
3. Fragmentation of oil and gas well legislation between the *Environmental Protection Act*, the *Assessment Act*, the *Mining Act* and the *Oil, Gas and Salt Resources Act*; and
4. Inadequate financial and liability assurance requirements to compel operators to properly decommission wells and sites.

Activities under the Oil, Gas and Salt Resources Act and Part IV of the Mining Act

Recommendation 32: The provincial government should consider consolidating the approach to governance of subsurface, well-related industries between the *Environmental Protection Act*, the *Assessment Act*, the *Oil, Gas and Salt Resources Act* and the *Mining Act* to allow for a coordinated approach to source water protection.

Recommendation 33: In order to ensure consistency with source protection, the petroleum resources program should provide for field inspection and enforcement for current industry activities to ensure compliance with construction and maintenance standards for wells and facilities, as well as regulatory requirements for decommissioning. Resources should be made available for the petroleum resource program where required.

Recommendation 34: There should be amendments to the *Oil, Gas and Salt Resources Act* to mitigate the risk of abandonment of authorized activities without proper decommissioning. This could be accomplished by increasing financial assurance requirements for authorized activities and increasing penalties for suspending wells and works.

Recommendation 35: Regulation 341 exemptions, under the *Environmental Protection Act*, of oil field fluids from regulation as designated waste should be limited to their injection into underground formations regulated under the *Oil, Gas and Salt Resources Act*.

Petroleum Wells and Works

Recommendation 36: A comprehensive abandoned oil and gas well program should be created. It should include adequate provincial funding, staffing and legislative support, as well as financial incentives for private landowners to report, maintain and decommission abandoned wells.

Recommendation 37: The provincial government should explore mechanisms for enabling municipalities to require proponents to demonstrate they have located and decommissioned abandoned wells, and/or undertaken other necessary remedies, as a condition of the development approval process.

Recommendation 38: There should be amendments to, or the creation of, legislation under the *Oil, Gas and Salt Resources Act* to address abandoned wells/works on private lands.

Recommendation 39: Source protection plans should provide a prioritization for plugging abandoned oil and gas wells that includes local information such as drinking water intakes, high quality aquifers, etc. Source protection criteria should be included in developing criteria for the program priorities.

5.4 Other Wells

In addition to the categories of wells covered in this report, there may be other types of abandoned wells that exist on the landscape, including water quality and quantity monitoring wells and wells that were previously used for the disposal of liquid waste (i.e. “deep well disposal” sites). While not specifically addressed in this report, the Implementation Committee strongly urges the province to investigate the importance of these wells, and to consider the need for identifying and ensuring that such wells have been properly decommissioned.

5.5 Aggregate Extraction

The Ministry of Natural Resources (MNR) is responsible for the management of aggregate resources in Ontario, and the administration of the *Aggregate Resources Act* (ARA). The purposes of the ARA are:

- to provide for the management of the aggregate resources of Ontario;
- to control and regulate aggregate operations on Crown land and portions of private lands, designated by regulation;
- to require the rehabilitation of land from which aggregate has been excavated; and
- to minimize adverse impacts on the environment resulting from aggregate operations.

The potential source water concerns that would be assessed in the source protection planning process include:

- Removal of surface material, which reduces the amount of filtering material above a groundwater source;
- Exposing the water table, allowing for easier introduction/migration of surface pollutants;
- Potential loss of water quantity as a result of existing aggregate operations, including the possible impact of pumping groundwater as part of the operations (i.e. Permit to Take Water);
- Risk of importation of contaminated or deleterious fill to rehabilitate closed sites; and
- Activities within an existing extraction site which may introduce potential risks to source water (i.e. asphalt recycling, on-site storage of fuel).

The ARA requires that an application for a new licence, wayside permit or aggregate permit comply with the requirements of the “*Aggregate Resources of Ontario Provincial Standards (AROPS)*.” There are 15 categories designed to reflect the various types of applications. Each category includes Site Plan Standards, Report Standards (e.g. Hydrogeological reports), Prescribed Conditions, and Notification and Consultation Standards. In addition, there are Operational and Compliance Reporting Standards common to the type of instrument (i.e. licence, wayside permit and aggregate permit).

Current application requirements (i.e. Hydrogeological report) may not adequately recognize and protect drinking water sources. Currently, the AROPS only requires a Hydrogeological report for certain categories of applications, and the requirements do not specifically require that potential effects of the proposal on water storage capacity from the removal of the aggregate material be addressed. In addition, aggregate operations on private land within non-designated areas of the province are not subject to the provisions of the ARA.

There are approximately 6,900 abandoned aggregate sites on private land (i.e. within designated areas). Of these, 2,700 sites are considered candidate sites for restoration, with 70 high priority sites.

Historically, sites that have insufficient material for rehabilitation are permitted to bring appropriate materials onto the site for rehabilitation, subject to limitations imposed by the site plan or licence. The management of inert fill is governed by regulation 347 under the *Environmental Protection Act*. Both the Ministry of the Environment and the Ministry of Natural Resources play a role in ensuring that the material being brought into licenced and permitted sites for rehabilitation purposes complies with established guidelines and standards.

In 1997, the Ontario Aggregate Resources Corporation (TOARC), through an agreement with the Ministry of Natural Resources, assumed responsibility for the administration of the Management of Abandoned Aggregate Properties (MAAP) program. The MAAP program annually rehabilitates 15 - 20 sites. Currently, source protection is not one of the criteria used in selecting sites for rehabilitation.

An additional issue is that abandoned pit and quarry sites on private land within non-designated areas of Ontario are not eligible for funding under this program.

Generally, municipalities plan for all land use activities, including the post-extraction rehabilitation of pits and quarries, based on a site-specific basis. In most cases, there is little or no consideration of the broader watershed implications.

Recommendation 40: The provincial government should take action to ensure that activities related to aggregate extraction minimize risks to source water, including:

- designation under the ARA of significant aggregate resource areas on private land in Ontario that are currently not designated;
- development of standards/processes on the use of inert fill for rehabilitation purposes;
- review of the application requirements (i.e. Hydrogeological report) for all new applications and site plan amendments to ensure all categories have the necessary information;
- require that the Hydrogeological report include a statement regarding the effects, if any, the proposal may have on water storage from the removal of the aggregate material;
- investigate and where appropriate, use existing approval mechanisms (such as site plan amendment) to mitigate any identified significant impacts to source water resulting from extraction operations;
- request that TOARC include source protection as one of their selection criteria for the rehabilitation of abandoned pit and quarry sites; and
- ensuring that source water impacts identified within an existing aggregate operation not regulated under the ARA be investigated by the Ministry of the Environment.

Recommendation 41: Municipalities should ensure that all land use activities related to the post extraction rehabilitation of pits and quarries be consistent with the relevant approved source protection plan(s).

5.6 Mines and Mine Tailings

Historically, the focus of mining activities and requirements has been on removing mineral commodities, and not necessarily the rehabilitation of the mine features once the activities had ceased. The most common environmental risks from mining are acid drainage and the contamination of ground and surface water by heavy metals.

Mine tailings are the waste products of mineral processing from mining operations. The negative effects of mine tailings include the loss of land-surface values, soil erosion, and air and water pollution. The environmental impact of mine tailings is a nation-wide problem in Canada. Tailings from copper, zinc, nickel, gold, and uranium mines contain sulphide minerals. When tailings come in contact with oxygen and water, these sulphide minerals will oxidize and generate acid. Acid-mine drainage (AMD) will dissolve the residue metals in the tailings thus causing groundwater and surface water contamination.

Today's mining requirements (i.e. regulations) stipulate that comprehensive environmental studies be undertaken prior to expansion or development. The *Mining Act* now requires closure and rehabilitation plans, along with a requirement for financial assurance to pay for closure and rehabilitation.

The Implementation Committee supports the provincial government's measures to inventory abandoned mines. The government is evaluating these mines to determine the likelihood of sudden failures of tailings containment structures and the potential consequences for public safety and to the environment.

According to Ontario's Abandoned Mine Registry, Ontario has approximately 5,600 abandoned mine sites. This registry, as administered by the Ministry of Northern Development and Mines (MNDM), provides useful information on which to plan, schedule and undertake remedial work.

In addition to the Registry, MNDM administers the Abandoned Mines Fund, which currently has a funding allocation of \$21.5 million (2004-07). The purpose of this fund is to address serious or immediate risks on a privately-owned site. For example, when a company is in receivership and an emergency situation occurs that may place public health or safety at risk, this situation constitutes an immediate risk.

In 2002, the Ministry of Natural Resources (MNR) reviewed the Abandoned Mine Registry and identified 88 sites on Crown Land that had unconfined and confined mine tailings. MNR investigated these 88 sites and identified a variety of threats.

Recommendation 42: The provincial government should consider establishing a program to identify and assess the hazards from abandoned mines for source protection purposes.

Recommendation 43: For new, expanding and existing operations, the *Mining Act*, the *Environmental Protection Act*, the *Environmental Assessment Act*, and other legislative mechanisms should be reviewed and enhanced as necessary to address risks associated with mining operations identified by approved source protection plans.

Recommendation 44: If a significant risk to source water is identified within an existing mining operation, the Ministry of the Environment should, in consultation with the Ministry of Northern Development and Mines, investigate and where appropriate use its regulatory mechanisms to mitigate the impact.

5.7 Storage Tanks (Above and Below Ground)

Above ground storage tanks (ASTs) and underground storage tanks (USTs) are used for storing petroleum hydrocarbon products, including crude oil, gasoline, diesel and heating fuels and a variety of other liquid fuels. They are also used to store liquid wastes (e.g., waste oil, hazardous waste), chemicals (e.g., chlorinated solvents, pesticides, treated waste) and food products.

Leaks or accidental discharges from storage tanks can contaminate source water. Some of the causes of storage tank leaks and discharges include holes from corrosion, failure of piping systems, improper installation, spills, and overfilling. The remediation of contaminated groundwater, if it is even possible to do so, is an expensive and uncertain process.

Source protection committees will need to determine the location of all ASTs and USTs in their watersheds. Information on the location, age and state of storage tanks holding liquid heating fuels for commercial purposes is available from the Technical Standards and Safety Authority (TSSA). The TSSA is mandated by the Ministry of Consumer and Business Services to regulate and inspect liquid fuel storage for commercial purposes. Owners of tanks storing liquid fuels for commercial purposes are required to regularly update tanks and tank equipment. Tanks holding non-heating fuels for private purposes, such as golf-courses, farms, lumber-yards, and fleet-services, are covered by the general regulations for safe fuel handling (under *The Technical Standards and Safety Act, 2001*, including Ontario Regulation 213/01 Fuel Oil, and Ontario Regulation 217/01 Liquid Fuels), but are not regularly inspected or met with updating requirements. There are no updating or inspection programs or requirements for tanks storing other chemicals such as chlorinated solvents and pesticides. These tanks are inspected only as part of general Ministry of the Environment SWAT inspections (the Ministry of the Environment's risk-based inspection and enforcement team).

Currently, there are only limited programs or guidelines encouraging and assisting owners to inspect, monitor or update tanks and associated equipment.

Storage tanks on federal and First Nations lands have not previously been regulated. Environment Canada has recently drafted amendments to CEPA that would address petroleum piping and storage tanks on federal and First Nations lands. This initiative provides an opportunity for the province to cover areas that might otherwise be difficult to access.

Recommendation 45: The application of TSSA management approaches (e.g., inspection and updating requirements) should be extended to apply to all fuel tanks. Information collected by TSSA should be made available for source protection purposes.

Recommendation 46: For non-fuel chemicals, storage tanks should be regulated according to the level of risk to WHPA, IPZ, and VA.

Recommendation 47: The provincial government should review and consider establishing standards for the transportation and storage of petroleum fuels, solvents (petroleum, chlorinated), and inorganic fertilizers in WHPA, IPZ and VA.

Recommendation 48: The provincial government should support recent federal initiatives to establish regulations covering federal lands regarding the storage and use of petroleum products and other chemicals.

5.8 Chemical Use, Handling and Storage

Businesses use a wide range of chemicals and solvents as part of their daily activities. The potential chemical contamination to source water, and subsequent harm to human health, depends on the type and quantity of the chemical and also on the characteristics of the area upon which the chemicals are being used and stored.

It is critical to properly identify, assess, and manage hazardous chemicals, such as fuels/hydrocarbons, dense non-aqueous phase liquids, organic solvents and pesticides. The province may want to evaluate the merits of regulating practices when such chemicals are within designated vulnerable areas.

The province should develop and disseminate Best Management Practices (BMPs) to further control and decrease the potential negative effect chemicals can have on the environment. BMPs include both managerial procedures and structural facilities that prevent or reduce contamination to drinking water. Managerial procedures involve schedules of required and prohibited activities, maintenance procedures, and other operational actions. Structural activities include the physical layout and construction of the work site plus the selection of products and materials used. Specific examples of BMPs for chemical use, handling and storage include: use of impermeable/secondary containment systems, correct and clear labeling, supervised deliveries, appropriate training and education of all employees, accurate

drainage plans, proper contingency planning, and regular maintenance of containment measures.

Recommendation 49: The provincial government should work with stakeholders to determine what requirements must be adopted when using, handling and storing chemicals in vulnerable areas, to ensure consistency with source protection. Approaches could include: voluntary best management practices; financial incentives; formal agreements; and/or mandatory measures such as regulations and municipal by-laws.

5.9 Small and Medium Enterprises (SME)

There are thousands of industrial and commercial facilities in Ontario. Many conduct activities that have the potential to release contaminants that may adversely impact drinking water sources.

Different industrial and commercial facilities pose different types and levels of threats to drinking water sources. Several factors influence the degree of threat and thus the required level of response. These include:

- The type of activity carried out (extent to which chemicals of concern are used);
- The nature of the contaminants (degree of toxicity or risk to harm human health, persistence in the environment, degradability etc.);
- Location of the facility (proximity to and vulnerability of water source);
- Size of facility (scale of potential problems);
- Quantity of potential contaminants used, stored and disposed of;
- Potential for release of contaminants (including protection/prevention measures in place);
- Amount of wastes shipped off-site;
- Numbers of facilities within an area of concern;
- Whether releases are continuous and authorized, or one-time unforeseen incidents; and
- Historical practices within the facility or sector.

Examples of sectors and generic types of activity that use chemicals that pose a potential threat to drinking water, if released, include (but are not limited to): auto wrecker/recyclers, small private campgrounds, vehicle maintenance/body shop facilities, metal manufacturers, furniture strippers, engine rebuilders, electroplating, medical clinics, photo labs, printers, dry cleaners, lawn and garden services, and painters.

These small and medium enterprises (SMEs) have the potential to release pollutants such as: petroleum products, mercury, paint thinners, methyl chloride, perchloroethylene, sodium hydroxide, photography solutions, pesticides, methyl ethyl ketone, mineral spirits, etc. Some of the specific challenges involved in regulating SMEs are:

- The large numbers of SMEs create enforcement difficulties;

- Much of the regulatory framework is general (e.g., *Ontario Water Resources Act*, *Environmental Protection Act*) and not specific to facilities, sectors or activities; and
- SMEs may have a poor understanding of prudent/safe operating practices.

Recommendation 50: The provincial government should work with municipalities, and commercial and industrial partners to:

- identify SMEs that are most likely to pose a threat or significant risk to a source of drinking water and are most pervasive across the province; and
- develop appropriate management tools and measures to reduce the risk from these sectors including Best Management Practices, incentives, compliance assistance programs and appropriate education and outreach.

Auto Wreckers and Recyclers

As an example of an SME that could potentially pose a threat to sources of drinking water, the Committee undertook a more detailed analysis of the auto wrecking and recycling industry.

Auto wreckers and recyclers are responsible for processing approximately 400,000 to 500,000 irreparable or end-of-life vehicles per year. They dismantle the vehicles, remove hazardous fluids and other materials (such as mercury switches), salvage parts for resale, and recycle the steel shell. Because of the many hazardous fluids the industry deals with, and the poor record of awareness on environmental requirements, these facilities potentially represent a risk to sources of drinking water.

The implementation Committee advises that the province examine the auto wrecking/recycling industry, as an example of an SME that should be considered.

In addition, the province should examine the benefits of designating used automobiles under the *Waste Diversion Act*, for the purposes of watershed-base source protection.

5.10 Pesticides

Pesticides are useful tools in agricultural and industrial processes. Used correctly, they contribute to higher productivity and higher quality characteristics in crops. However, when pesticides are improperly handled, applied, and stored, they pose a potential threat to drinking water sources. Pesticides, and their breakdown compounds, vary in their potential environmental impacts and ability to migrate. Pesticides currently detected in source waters are generally well below the Ontario Drinking-Water Quality Standards (O. Reg 169/03, under the *Safe Drinking Water Act*).

Pesticides are regulated by both the federal and provincial governments. At the federal level, the Pest Management Regulatory Agency (PMRA) evaluates pesticides for registration and use in Canada, using health and environmental risk assessments. All pesticides imported, sold, or used

in Canada are regulated by the federal *Pest Control Products Act*, administered by Health Canada.

The Ministry of the Environment, through the *Pesticides Act* (and Regulation 914), regulates and enforces the sale, use, transportation, storage and disposal of pesticides. The province also issues associated licenses (applicator, operator and vendor). The province provides information related to the responsible use of pesticides and promotes reduced reliance (education/training programs and the promotion of alternative pest management practices). In addition, some voluntary private sector best management practices have been established (e.g., agriculture, golf courses).

Some municipalities have established pesticide control by-laws. On May 22, 2003, Toronto City Council successfully passed a pesticide by-law explicitly prohibiting chemical pesticide use to control nuisance weeds on lawns, gardens and greenspace. This prohibition came into effect in April 2004. The by-law parallels pesticide by-laws implemented in Hudson and other Quebec municipalities as well as Halifax, Nova Scotia, and recently in Cobalt and Perth, Ontario.

Even though there has been a 53% reduction in the agricultural use of pesticides over the past few decades, as well as improved requirements and programs (e.g., training, labeling), the potential risk posed by pesticides to source water suggests a need to ensure that existing mechanisms are appropriately strengthened in the context of source protection objectives.

Recommendation 51: The provincial pesticide program (e.g., training courses and public educational material) should be reviewed and where necessary strengthened in the context of source protection objectives. Areas of focus should include:

- Continued development and verification of best management practices to minimize risks associated with the storage, handling and application of pesticides in wellhead protection areas, intake protection zones and other Vulnerable areas; and
- Development of programs to encourage reduced reliance on pesticides.

Recommendation 52: The provincial government should review existing monitoring programs to ensure the systems are robust and include high-risk and new pesticides (and their breakdown products).

Recommendation 53: The provincial government should prioritize inspections and enforcement of the *Ontario Pesticides Act* and Regulation 914 in high risk areas as identified by approved source protection plans.

Recommendation 54: The provincial government should review the *Ontario Pesticides Act* and Regulation 914 to determine if appropriate pesticide storage requirements exist in the context of source protection objectives.

Recommendation 55: The Ontario Pesticides Advisory Committee should be directed to review standards for storage of certain pesticide schedules in wellhead protection areas, intake protection zones and vulnerable areas.

Recommendation 56: The provincial government should encourage the use of standard and scientifically defensible requirements for municipal pesticides by-laws, including an exemption for agricultural use and forestry use. The province should seek input from the Ontario Pesticide Advisory Committee, medical officers of health, municipalities, and other key stakeholders.

Recommendation 57: The provincial government should establish additional requirements related to the sale of pesticides for home use, and consider introducing training for vendors of certain home-use products.

Recommendation 58: The provincial government should work with the federal government to expedite the:

- re-evaluation of existing pesticides to ensure products are removed from the market or that labels indicate the precautions for use if surface and groundwater contamination is identified as a concern;
- evaluation of new products for registration, including those that are more protective of source waters than the products they are replacing; and
- approval of minor use pesticides that pose no concern to source waters.

5.11 Contaminated Sites

The contamination of soil, sediment and groundwater is often attributed to a wide variety of land use activities, such as old landfills, manufacturing activities, commercial activities such as dry cleaning or photo-finishing shops, coal tar sites, fuel handling facilities, refineries and gas stations, and mine sites.

The number and location of all contaminated sites in Ontario is unknown, though several mechanisms exist through which contamination is identified. The Ministry of the Environment may locate contaminated sites by responding to complaints or through other investigations. Many municipalities are developing “historical land-use inventories” to identify properties that should be assessed for contamination as part of a land use change. Additionally, there are some requirements in the EPA related to the reporting of spills and known discharges. As individual SPCs carry out their planning, additional known or potentially contaminated sites may be identified.

Currently, where a contaminated site is causing or is “likely” to cause an “adverse effect,” the EPA authorizes the Ministry of the Environment to order responsible parties to undertake assessments, remediation, or risk-management activities on and off-site. For

source protection purposes, existing provisions may not provide sufficient mechanisms to follow up on the advice of Source protection committees and protect designated wellhead protection areas, intake protection zones, and vulnerable areas from potential contamination.

In cases where no responsible party can be identified, (e.g., because a business went bankrupt), the provincial government may be obligated to undertake an environmental assessment to identify potential adverse effects and remediate such sites at the government's expense. The Environmental Clean-Up Fund (currently constituted as an emergency fund) will not likely be able to support an increase in requests for funding. Municipalities may also choose to take on the responsibility for addressing problems at abandoned sites, and to see them brought back to a new beneficial use. Municipalities may in some cases be challenged in finding financial resources for this purpose, which may pose a barrier to brownfields redevelopment.

The Province recently implemented the *Brownfields Statute Law Amendment Act, 2001* and Regulations 298/02, 299/02, 153/04 and 274/04 to encourage voluntary assessment and remediation of contaminated sites. This legislation provides assessment and clean up standards, regulatory liability limitations, and financial tools. The regulations are meant to encourage site clean up and redevelopment. The standards for contaminated site clean-up used in the redevelopment of brownfields does not necessarily require that the clean-up achieve a potable groundwater level, depending on the proposed use of the property. However, for source protection purposes, certain contaminated sites may be required by source protection plans to meet the potable groundwater standards, such as in wellhead protection areas, intake protection zones, and other vulnerable areas.

Contamination that moves beyond an individual property is of utmost concern to source protection. Current programs do not provide a clear, consistent process for addressing contamination that spans multiple properties (community-contaminated sites), including the level of involvement of communities in restoration decisions.

Recommendation 59: The provincial government should ensure the necessary authorities are available to Source protection committees to identify known and potentially contaminated sites that could pose a threat to drinking water sources.

Recommendation 60: The provincial government should review the "order powers" provisions of the *Environmental Protection Act* to ensure they are available in the context of potential threats to drinking water sources as identified by the Source protection committees.

Recommendation 61: Where a source protection plan identifies a contaminated property that poses a significant risk to source water, the property should be redeveloped or remediated to reduce or eliminate the risk. The responsibility for that remediation or redevelopment is the responsibility of the property owner, or other party(ies) as proposed in the source protection plan.

Recommendation 62: Civil liability provisions pertaining to the brownfields program should be reviewed to ensure that there are no barriers to redevelopment or remediation for source protection purposes.

Recommendation 63: The Record of Site Condition Regulation (Reg. 153/04) should be amended to ensure that its provisions are consistent with source water protection plans regarding the protection of potable water in wellhead protection areas, intake protection zones, and vulnerable areas.

Recommendation 64: The provincial government should review its contaminated sites program to address community involvement in the clean up of contaminated sites and to address community-wide contamination.

5.12 Waste Disposal Facilities

Landfilling is the disposal of waste by depositing and covering the waste in pits. Two types of landfills are common in Ontario. Natural attenuation landfill sites (old and small facilities) are typically sited, designed and operated to rely on the natural hydrogeologic setting to control the release of contaminants. New, large, and expanding landfills typically include an engineered liner and a collection system to control leachate migration. Larger landfills also often have systems to control and harness landfill gas emissions.

In Ontario, landfilling sites and other waste management activities, including waste transfer stations, are subject to Part V of the *Environmental Protection Act* (EPA). The basic legislative framework for waste management is defined in Part V and the regulatory requirements for the design and operation of waste disposal sites are included in Ontario Regulation 347. For new or expanding landfilling sites, these regulatory requirements are superseded by Ontario Regulation 232/98.

The statutory requirement for a Certificate of Approval (C of A) for a waste disposal facility is contained in Section 27 of the EPA. Section 27 requires that approval be obtained from the MOE Director before using, operating, establishing, altering, enlarging or extending a waste management system or a waste disposal site. To obtain approval for a landfill site, a detailed assessment of the site must be carried out to identify any potential effects on the environment and to show how these potential effects can be satisfactorily addressed. In addition, a contingency plan is required for the implementation of additional groundwater protection measures.

The C of A process takes the landfill standards and refines them as necessary to reflect the particular setting and conditions at each landfill. The resulting C of A will define the size and design of the site, the types of waste to be accepted, and the requirements for site operation, monitoring, closure and post-closure care. Monitoring of the leachate, groundwater and surface water impacts to ensure the site is operating in accordance with its groundwater and surface water protection requirements is a particularly important component of the C of A.

Recommendation 65: Approvals for new and expanding landfill and waste disposal facilities should be consistent with approved source protection plans.

Recommendation 66: The provincial government should ensure that the necessary authorities exist so that existing landfill and waste disposal facilities are required to be operated in a manner consistent with approved source protection plans.

Recommendation 67: In the case of non-approved, closed landfill sites, the provincial government should review existing powers (e.g., order powers investigation, monitoring, remediation) to ensure they can be used to address risks as identified in approved source protection plans.

5.13 Hazardous and Liquid Industrial Waste

The shipping, storage, and handling of hazardous waste is of primary concern with respect to the protection of source water. It is important, particularly in wellhead protection areas, intake protection zones, and vulnerable areas, that these operations are carried out in accordance with relevant legislation, regulations, and guidelines.

The EPA (and related regulations), provide the Ministry of the Environment the authority to govern the management of hazardous and liquid industrial wastes (applies to generators, carriers and receivers). A C of A is required to carry and receive these wastes, and forms the basis for the Ministry's hazardous waste tracking system.

The Ministry is preparing to implement a Land Disposal Restriction (LDR) Program under the authority of the *Environmental Protection Act*. The LDR program will ensure that hazardous waste meets certain standards (mobility and toxicity) before it is disposed of on land. The emerging program will provide enhanced environmental protection in addition to that which is provided in disposal facilities. The LDR program will also provide an incentive to reduce the production of hazardous waste.

Recommendation 68: The province should ensure that educational materials are provided to generators, carriers and handlers of hazardous and liquid industrial waste that emphasize the importance of proper handling and storage, particularly in high risk areas identified by approved source protection plans.

5.14 Land Application of Biosolids and Septage

Biosolids is the general term which refers to the semi-solid, nutrient-rich organic matter generated by sewage treatment plants, pulp and paper mills and other wastes such as those from food processing operations. Biosolids are nutrients under the *Nutrient Management Act, 2000* (NMA). Biosolids can beneficially be land applied, provided they meet the Ministry of the Environment's standards.

Septage is the generic name for waste from portable toilets, septic systems and holding tanks. The regulatory name for septage is "hauled sewage." Hauled sewage comes from residential, commercial and industrial sources.

The land application of biosolids and treated septage is considered beneficial to crop production and, provided appropriate standards and practices are followed, is safe to both human health and the environment. However, the Technical Experts Committee has identified biosolids and untreated septage as potential provincial concerns.

In 2001, the Water Environment Association of Ontario completed a study that assessed the fate and significance of selected contaminants in biosolids, including trace organics such as PCBs and pathogens. The report recommended further work in the areas of pathogens, unregulated metals, pharmaceuticals and estrogenic hormones.

The Ministry of the Environment regulates the management of biosolids under the *Environmental Protection Act* (EPA) and the General Waste Management Regulation (EPA O. Reg. 347), and under the *Nutrient Management Act, 2002* (NMA). Standards for the land application of biosolids are detailed in the *1996 Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land*. The Ministry is in the process of updating the Guidelines to harmonize them with the NMA. These land application standards are imposed through the conditions of the Certificates of Approval that are issued by the Ministry of the Environment. Many surface water and groundwater issues are already addressed by the Guidelines.

The land application of untreated septage is also regulated through the certificate of approval process. The public has expressed concern about the potential for source water contamination from land application of untreated septage. The Ministry of the Environment is currently developing a strategy to ban this practice.

Recommendation 69: The provincial government should, where necessary, revise existing or provide additional biosolids management standards to align them with source protection objectives and to address issues related to vulnerable areas of the watershed. In particular, the province should:

- Review standards for storage and land application of biosolids as they apply to wellhead protection areas, intake protection zones and other vulnerable areas, and make any necessary modifications;
- Ensure that the standards include provincially uniform outcomes in order to ensure consistency across the province; and
- Coordinate and integrate nutrient management planning and source protection planning as much as possible.

Recommendation 70: Any future authorization or approval system for land application of biosolids and/or treated septage should include linkages to the *Nutrient Management Act, 2002*, and/or Farm Water Protection Plans, and should be consistent with the relevant approved source protection plan(s).

Recommendation 71: The provincial government should proceed expeditiously with the proposal to ban the land application of untreated septage, and with the development of standards for the land application of treated septage.

Recommendation 72: The provincial government should provide incentives and financial assistance for septage treatment costs, including addressing upgrade costs of municipal sewage treatment improvements to deal with septage and to establish appropriate financial contribution by those with responsibilities for septage (e.g. private landowners).

5.15 Manure/Fertilizer Application and Storage

Due to the pathogens present in manure, manure storage and application pose a risk to drinking water sources. Impacts from nitrogen can also pose a risk to groundwater. Impacts from phosphorus primarily affect surface water. Other related issues focus on the lack of detailed knowledge of potential contaminants in manure. Studies are being conducted to obtain a better understanding of the contaminant characteristics of manure.

Manure may pose a risk to sources of drinking water, particularly when stored in wellhead protection areas, intake protection zones and other vulnerable areas. Current approaches to manure management can be adapted to address source protection issues. Many surface water and groundwater issues are already addressed. The *Nutrient Management Act* specifies setbacks, land application standards, construction standards, and other requirements.

The province plans to develop additional standards on many topics related to source protection issues for inclusion in the nutrient management regulation. Standards regarding pathogens to assist in reducing risks associated with pathogens are also being considered.

Recommendation 73: The requirements under the source protection legislation and the *Nutrient Management Act, 2002*, should be harmonized to ensure consistency and appropriate and co-coordinated phase-in with applicable Nutrient Management Regulations.

Recommendation 74: The provincial government should, where necessary, revise existing or provide additional nutrient management standards to address source protection and issues related to vulnerable areas of the watershed, including wellhead protection areas, intake protection zones and other vulnerable areas. In particular, the province should:

- Review standards for manure application and storage as they apply to vulnerable areas and make any necessary modifications;
- Assess the need for standards for commercial fertilizer application and storage in vulnerable areas;
- Ensure that the standards include provincially uniform outcomes in order to ensure consistency across the province;
- Ensure that Nutrient Management Plans are consistent with source protection objectives.

The review of these standards should include drinking water source protection and human health objectives.

Recommendation 75: Manure storage and land application activities in vulnerable areas should abide by applicable provincial standards and approved source protection plans.

5.16 Farm Water Protection Planning Framework

The Ontario Ministry of Agriculture and Food (OMAF) and the Ministry of the Environment (MOE) should continue to develop and consult with key stakeholders on a framework for Farm Water Protection Plans (FWPP) for large farms and farms in vulnerable areas.

Farm Water Protection Plans should be scoped to address the risks associated with large farms and farms in vulnerable areas. For example, where relevant to source protection, these plans should generally focus on groundwater in wellhead protection areas and on surface water in intake protection zones and other vulnerable areas. The source protection plans will identify the risks for each area.

The farm water protection planning process should be undertaken in accordance with the approved source protection plan(s). Based on, and consistent with, the risks and vulnerable areas identified in the source protection plan, the FWPP would include:

- A threats inventory;
- A risk assessment;
- An identification of mitigation measures;
- An Implementation and Contingency Plan; and
- Management standards and updating as required in accordance with the Source Protection Plan.

The farm water protection planning process should be administered provincially, and the plans approved provincially. The framework should allow for various approaches to addressing FWPP requirements.

In addition, the Environmental Farm Plan Workbook and supporting materials will eventually need to be revised after specific legislative and regulatory requirements for source protection are finalized.

Recommendation 76: OMAF and MOE should continue to develop and consult with key stakeholders on a planning framework for Farm Water Protection Plans (FWPP) for large farms and farms in vulnerable areas.

Recommendation 77: The provincial government should examine the implications and impacts of the number of farms and commodity groups potentially affected by Farm Water Protection Plan requirements. This would allow for informed decision-making with regard to the scope of regulatory requirements, cost sharing and associated programs that may be required. The province should also investigate policy issues and costs related to interim measures that farms may have to address in terms of immediate health risks identified in source protection assessment reports.

Recommendation 78: There should be coordination and integration of nutrient management and source protection planning/assessment and farm water protection programs, to ensure that there is no unnecessary duplication. This integration should result in the streamlining of any planning processes and approvals requirements.

Recommendation 79: An education and outreach strategy should be developed to communicate Farm Water Protection Plan program objectives and the results of implementing the program.

Recommendation 80: Progress on implementation of Farm Water Protection Plans should be monitored and communicated to the source protection boards.

5.17 Septic Systems

There are approximately 1.2 million on-site septic systems in Ontario, chiefly in rural and remote areas. Improperly functioning septic systems may lead to groundwater and surface water contamination and pose a potential risk to drinking water sources. Even properly functioning septic systems may represent a risk to a source of drinking water, because of their location near a well, or because of the cumulative discharge from many systems in an area. Key pollutants of concern include bacteria, viruses, other pathogens and nitrates.

In Ontario, small on-site septic systems (10,000 litres or less per day) are regulated by the *Building Code Act* and associated regulations, administered by the Ministry of Municipal Affairs and Housing. Larger septic systems are regulated by the *Ontario Water Resources Act*, which is administered by the Ministry of the Environment.

The *Building Code Act* regulates the construction, operation and maintenance of septic systems. The Building Code specifies technical requirements that must be met when constructing a new septic system, or extending, repairing or altering an existing system. The Code also mandates that owners of septic systems operate and maintain their systems in accordance with requirements of the Code.

To support source protection objectives, a number of changes are needed to provide the necessary tools and authorities for the management of small, on-site septic systems. A major concern with septic systems is that once they are installed, they are generally assumed to be functioning effectively unless a problem is noticed.

Under the *Building Code Act*, septic system enforcement is a local responsibility delegated to municipal building departments, health units or conservation authorities. Currently, the Act does not provide clear authority for the routine re-inspection of existing septic systems. The power of enforcement authorities is limited to addressing “unsafe” conditions, but this is usually a complaint driven process.

In *Part Two Report of the Walkerton Inquiry*, Justice O’Connor recommended that septic systems be inspected as a condition for the transfer of a deed. The recommendation recognizes the significant role that septic re-inspections can play in source protection. However, to be truly effective for source protection purposes, a septic re-inspection program must have the flexibility to focus its re-inspection efforts to manage the risks identified in the local source protection assessment. Re-inspecting septic systems only as part of the transfer of a deed may prove ineffective for source protection purposes.

An effective septic re-inspection program for the province that would help meet source protection objectives would include the following:

- Re-inspections undertaken in areas designated in source protection plans, and in other areas as determined by the local enforcement body;
- Provincial technical standards for the performance and ongoing use of septic systems;
- Clear qualifications for inspectors;
- Designated local responsibility for septic system re-inspections and enforcement;
- Cost-recovery mechanisms for re-inspections; and
- Provincial protocols for local septic inspections.

Local enforcement bodies that are assigned the responsibility to re-inspect small on-site sewage systems should be enabled to determine:

- The frequency and types of re-inspections;
- Whether responsibility for conducting re-inspections should be delegated to qualified private agents;
- A mechanism to track the location and condition of septic systems; and
- Appropriate mitigation measures (subject to provincial requirements) for systems that cannot be upgraded to comply with re-inspection standards due to technical limitations (e.g., lot size or soil conditions).

Recommendation 81: Provincial legislation should authorize septic re-inspections of small on-site septic systems.

Recommendation 82: For larger septic systems, the Ministry of the Environment should revise its re-inspection protocols to target vulnerable areas.

Recommendation 83: Provincial legislation should provide clear authority to the septic approval authority to restrict the construction or modification of new or additional septic systems in specified vulnerable areas.

5.18 Salts/De-icing Compounds

Road salt and other de-icing compounds are used on highways and roadways to enhance traffic safety. While no direct link has been made between road salts and adverse human health, road salt can adversely affect potability. Therefore, road salt protection measures may be required in a source protection plan.

Road salt may cause adverse effects on soils, roadside vegetation, wildlife, groundwater, aquatic habitat and surface water. The severity of these impacts depends on the characteristics and vulnerability of the receptors and the amount and frequency of application.

Road salt contamination will increase as urban areas expand. It is becoming an increasingly common concern for residents who live near major roadways and rely on private wells for

their potable supply. For many of these residents, levels of sodium and chloride in the water have become so high that the water has become undrinkable.

In Ontario, a number of regional municipalities, such as Waterloo and York, have identified road salt contamination as a concern and are undertaking management practices to reduce road salt loadings, including minimizing application and storing snow away from areas where snow-melt will infiltrate aquifers or run off directly to surface waters.

No federal regulations exist in Canada which directly govern levels of salt use or salt concentrations in various environmental media. However, under the *Canadian Environmental Protection Act, 1999*, the Government of Canada published a Code of Practice for the Environmental Management of Road Salts on April 3, 2004. The Code is designed to help municipalities and other road authorities better manage their use of road salts, with a view to reducing environmental impact while maintaining road safety.

In addition to road salt and de-icing compounds, water conditioning products (i.e. water softener salts) have the potential to contribute to adverse cumulative impacts on drinking water sources. The province should examine the impacts of the use of such products, and measures to address those impacts.

Recommendation 84: Salt management plans should be required by Ministry of Transportation, the relevant municipality, and private contractors that are consistent with the approved source protection plan for the watershed.

Recommendation 85: Municipal contracts for salt application should include provisions such as adherence to the federal code of practice or other applicable codes or requirements.

Recommendation 86: Salt management considerations in the source protection plan should include provisions regarding areas in the watershed that are precluded from placement of cleared snow.

Recommendation 87: Approvals and decisions regarding new road siting and construction should include consideration of chlorides and other road-carried contaminants with respect to source protection issues.

5.19 Cemeteries

Little published information is available about the potential source water contamination potential of cemeteries. Cemeteries are often located on hilltops, up gradient from the local groundwater flow. Through the action of infiltrating rainfall, the potential exists for the release of various contaminants into the local groundwater supply, including bacteria, breakdown products from decay, and chemicals used for embalming. Increasing

concentrations of these contaminants may reach a level sufficient to render groundwaters unusable or unpotable.

Under the *Planning Act*, a new cemetery must be authorized by the municipality zoning by-law. The impact of a proposed use on water quality is a consideration when making a land use planning decision. The *Cemeteries Act* requires that an application for consent be submitted to the Registrar appointed under the Act; the application must be accompanied by a certificate of a medical officer of health stating that the land is suitable for use as a cemetery. Within municipal boundaries, the Registrar will not approve an application unless the municipality has first approved the application.

The recommendations below build on the existing regulatory framework governing these sites. Updating current guidelines regarding cemetery siting, as well as ensuring appropriate risk assessment and ongoing monitoring by the owners of these sites, should ensure that potential risks are minimized.

Recommendation 88: For new or expanding cemeteries, the *Cemeteries Act* should be amended to include a provision requiring an evaluation of the likelihood of contaminants from the cemetery flowing into surface water or groundwater.

Recommendation 89: The Guidelines for Reviewing Proposed Cemetery Sites Relative to Impact on Ground Water should be reviewed and kept current to account for protection of source water, with reference to currently available materials.

Recommendation 90: Monitoring should be undertaken by the owners of existing cemeteries located in wellhead protection areas, intake protection zones and other vulnerable areas. The monitoring should cover parameters specified by the province and the province should assist in this monitoring.

Recommendation 91: The provincial government should ensure that appropriate order powers are available in case of an issue involving protection of source water from contaminants emanating from a cemetery.

5.20 Storm Water

Urban storm water runoff is a significant source of several pollutants: organic matter, nitrogen, phosphorus, chloride, heavy metals, suspended solids/silt, oil, grease, and pathogens.

The current provincial policy framework related to municipal storm water management consists of both mandatory requirements and guidance measures (e.g., manuals, best

management practices). Under the *Ontario Water Resources Act* (OWRA), storm water collected in sewage works which contribute to direct discharges to lakes and rivers requires a Certificate of Approval from the Ontario Ministry of Environment.

The *Stormwater Management Planning and Design Manual, 2003*, produced by the Ministry of Environment, provides guidance in the planning and design of storm water management facilities and practices. For instance, the Manual recommends that storm water management plans be developed within a watershed or sub-watershed context with hierarchy on source and non-structural controls, followed by pipes and end-of pipe controls.

Best management practices (BMPs) for storm water management consist of non-structural (buffer strips, catch basin cleaning, street sweeping, stoop and scoop by-law, etc.) and structural techniques (wet ponds, wetlands, extended detention ponds, infiltration techniques, vegetative filters) aimed at improving the quality of storm water runoff and enhancing the potential for groundwater recharge.

In addition, industrial facilities regulated through the Municipal and Industrial Strategy for Abatement (MISA) Clean Water regulations (covers 196 facilities in nine industrial sectors) are required to prepare storm water management plans and submit them to the Ministry of the Environment. To support that work, the Ministry has developed a Storm Water Control Study Protocol that provides guidance in the preparation of the plans.

Provincial approvals for municipal drainage as defined under the *Drainage Act* are not required. Drainage systems serving highways and agricultural lands are exempt from the Ministry of the Environment's approval processes.

There are several gaps within the current framework that, if addressed, would strengthen the contribution of storm water management to source protection. An example would be adding criteria specific to pathogens to the design considerations for storm water management facilities located in areas where there is potential to impact sources of drinking water (e.g., upstream of water intakes). Also, there are very few facilities in Ontario for which this type of design criteria is a mandatory requirement. Similarly, other contaminants in storm water discharges that could impact drinking water sources (such as phosphorous) should be assessed, particularly on a watershed basis.

Currently, the province relies on individual municipalities to manage storm water within their respective jurisdictions. Due to the diversity of these jurisdictions, some municipalities may not have the expertise, tools, or resources to fully address source protection through storm water management.

Recommendation 92: Municipalities should address source protection objectives in the design and implementation of storm water management processes and facilities.

Recommendation 93: The provincial government should undertake studies to better assess possible migration of pathogens and soluble contaminants through storm water management facilities, practices to improve design of the facilities, and practices to minimize their impact on sources of drinking water.

Recommendation 94: Provincial approval of infiltration systems should consider potential risks in groundwater wellhead protection areas, recharge areas or vulnerable areas. Provincial approval of storm water system discharges should consider separation distances from surface water intake zones.

Recommendation 95: The provincial government should provide for various mechanisms to deal with storm water (e.g. green roofs, roof top collection), provided that tools are available for the relevant local agencies to ensure long-term operation and maintenance of such systems.

Recommendation 96: Where relevant for source protection purposes, municipalities should be provided with the authority to:

- inspect and enforce requirements for private storm water measures post-development;
- require retrofits, upgrades or the addition of storm water management measures to existing, expanding or intensifying development, including development on private lands;
- manage external changes or improvements to property that are related to storm water management (e.g. on lot controls).

Recommendation 97: The provincial government should promote the use of shared storm water collection systems that serve multiple properties. Capital costs and on-going operation and maintenance costs for retrofits could be supported by a user pay system.

Recommendation 98: The standards and requirements for the approval of storm water management systems should be continuously improved and enhanced as new information, research and techniques become available, to ensure that source protection objectives are met.

5.21 Waste Water

Direct discharges to water from municipal sewage treatment plants and industries, and overflows from municipal sewers are potential threats to Ontario's water quality. Possible impacts of waste water discharges include increased costs to treat drinking water, impairment of near shore habitat, and acute and chronic risks to fish and aquatic biota.

Human health is potentially affected through two pathways: increased toxic substance levels in water, sediments and biota, and contamination of drinking water supplies.

The *Environmental Protection Act* (EPA) and *Ontario Water Resources Act* (OWRA) provide legislative authority addressing discharges of contaminants, particularly through issuing Certificates of Approval.

Municipal Discharges

Municipal discharges of waste water are currently managed through policies, Certificates of Approval and legislation. Certificates of Approval detail many aspects of sewage works processes, management, and effluent quality requirements. OWRA also provides authority concerning inspections and tests. Current policy documents used to set effluent quality requirements are:

- Guideline and Procedures: Levels of Treatment for Municipal and Private Sewage Treatment Works Discharging to Surface Waters (Policy F-5, which is currently being updated to reflect an updated management framework for Sewage Treatment Plants);
- Policies, Guidelines Provincial Water Quality Objectives (Blue Book); and
- Deriving Receiving Water-based Effluent Requirements (Green Book).

Notwithstanding the requirements set out by the current policy and legislative frameworks, several gaps exist in ensuring that direct waste water discharges do not pose a threat to drinking water sources. A regulation requiring minimum treatments standards sufficient to protect drinking water sources is needed. Guidelines and procedures for setting effluent requirements for Ontario's sewage treatment plans also need to be updated to reflect advances in technologies and to be congruent with national and international standards. In addition, updating the current Guidelines and Procedures (F-5) to provide clarity with regard to effluent requirements, particularly the acute lethality requirement, and the management of harmful pollutants, will ensure further source water protection.

Industrial Discharges

Under the Municipal/Industrial Strategy for Abatement Program (MISA), nine major industrial sectors in Ontario are regulated with respect to waste water discharges (Petroleum, Pulp and Paper, Iron and Steel, Organic Chemical Manufacturing, Inorganic Chemical, Metal Casting, Industrial Minerals, Metal Mining, Electric Power Generation). MISA's ultimate goal is the virtual elimination of persistent toxic contaminants from all discharges into Ontario's waterways. Effluent requirements for sectors not regulated by the MISA regulations are set on a case-by-case basis.

Combined Sewer Outflows (CSOs)

The province currently works with municipalities to develop best management practices that guide municipal decision-making with regard to sewer use, including guidance documents to help identify and reduce sources of harmful pollutants and other

contaminants discharged to sewers. Primary treatment is currently the minimum level of treatment during wet weather and is insufficient for source protection.

Through the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA), the province has committed to developing a management framework for Ontario's municipal sewage treatment plants (MSTP) and enhancing MSTP effluent requirements. Strict end-of-pipe requirements for sewage treatment plants would encourage municipalities to put sewer use by-laws in place as a cost-effective tool to manage harmful pollutants associated with non-domestic discharges to sanitary sewers (i.e., industrial, septage and landfill leachate).

Recommendation 99: The Implementation Committee recommends that:

- the Province develop a regulation for municipal sewage treatment plant discharges to ensure clarity, consistency and enforceability;
- the Province provide adequate funding for upgrading the remaining primary level Sewage Treatment Plants;
- the Province require an enhanced minimum level of treatment for Combined Sewer Overflows, particularly those in intake protection zones;
- existing powers to enact Sewer Use by-laws be used by municipalities for source protection purposes and that the province develop a model source protection sewer use by-law; and
- analysis and repair of underground sewage and stormwater pipes should focus on vulnerable areas.

5.22 Non-Point Sources/Cumulative Loading

Non-point source pollutants are substances of widespread origin which run off, wash off, or seep through the ground, and may contaminate surface and/or groundwater. Non-point source pollution often results from small, and potentially mobile sources, rather than from larger fixed locations. Although the effect of one activity (e.g. a single manufacturer, homeowner or farm) on water quality may seem insignificant, the cumulative impacts from numerous operations across a given region may continue to impair water quality despite, in some cases, existing site-specific controls. Some of the more significant cumulative elements that may impact drinking water sources include: nitrates and phosphorus (from farms and septic systems), pathogen loadings, chlorides, and suspended sediments and particles.

It is important that non-point source pollution problems and cumulative threats in the watershed be identified and addressed. The most effective basis for sound decision-making includes a careful analysis of the specific and diverse sources of cumulative water quality risks, the relative contributions of various activities, and alternatives to address those risks. In particular, source protection plans should include measures to track long term trends with respect to cumulative loading, and develop measures to mitigate such risks.

The province should provide assistance to municipalities and conservation authorities by supporting the continued research and development of strategies and programs to address cumulative risks to source water, which could include incentive-based approaches. The continuing developments of practices and technologies that are effective in reducing cumulative risks to source water should also be supported.

Recommendation 100: Source protection plan assessments should include consideration of the links between cumulative threats and associated land and water uses. The plans should also provide for relevant measures to address those threats on a watershed scale.

Recommendation 101: Cumulative loading that jeopardizes source water protection objectives should be addressed through regulatory and approval mechanisms for sectors that emit contaminants to source waters, air or land.

Recommendation 102: The provincial government should:

- ensure that source protection plans include measures to track long term trends with respect to cumulative loading issues;
- support research into, and the development of strategies, programs, practices and technologies to address cumulative loading issues;
- continue to explore various incentive-based methods as a way to address cumulative loading in specific circumstances.

5.23 Land Drainage

Drainage is a fundamental component of food production systems. To aid crop planting, growth and harvest, drainage systems remove from farmland the excess water for crop needs in spring, and after high rainfall events in summer and fall.

There are two types of land drainage:

- private systems (open ditch or subsurface tile drainage systems owned privately and located on private land); and
- Municipal drainage systems (owned and managed by the local municipality on behalf of a community of landowners).

The *Drainage Act* governs the financing and construction of public municipal drainage systems. The *Tile Drainage Act* and the *Agricultural Tile Drainage Installation Act* govern the financing and construction of private agricultural drainage systems. In Ontario, approximately half the arable land is subsurface drained.

The impacts of agricultural drainage on water quantity and quality regimes are highly varied and can depend on many factors, including:

- The presence of subsurface drainage systems with surface drainage systems;
- The condition of drainage systems;

- Crop production and nutrient management practices; and
- Watershed characteristics and weather patterns.

The relationship between water quantity and water quality is complex. The development of water budgets, a requirement of source protection planning, could be influenced by drainage systems and the nature of the influence (positive and negative) can be highly varied. Private, non-agricultural drainage systems have similar implications for source protection. These systems include golf courses and other residential, commercial, industrial, and road drainage, as well as drainage systems that were once agricultural and are now urban and drainage systems that simultaneously serve agricultural and urban developments. These drainage systems are not treated consistently within the existing provincial water policy framework.

The present process for approval and construction of drainage projects does not assess projects within the context of source protection planning areas. The cumulative impacts of water quantity regimes on a source protection planning area scale cannot be assessed within the drainage approvals process. Yet source protection plan water budgets must consider agricultural and other drainage programs in their development.

The impacts and benefits of drainage works can range dramatically from situation to situation. It is important that the source protection planning process have a comprehensive understanding of the nature and character of drainage impacts and benefits within a wide range of varied contexts so that relevant science can be applied to the source protection planning areas.

The Ontario Ministry of Agriculture and Food (OMAF) commissioned a review of scientific literature on the environmental impacts of agriculture-related drainage. The review identified some best management practices and a range of issues requiring further research in support of the broader use of these practices under different conditions. The science on the relationship of drainage to water quality and quantity under different conditions within an Ontario context has significant gaps. A thorough review and synthesis of the science and a research agenda to deal with these gaps would help establish specific connections that could be addressed through more extensive best management practices. A framework for what aspects of drainage should be considered in source protection could then be developed by the province.

The science and practices associated with municipal and private agricultural and non-agricultural land drainage should be reviewed and assessed for relevance to source protection planning in Ontario. Considerations that could be included as part of this review are:

- a review of public policy (including relevant legislation and related processes);
- the development of improved private agricultural and non-agricultural land drainage practices, including the development of appropriate BMP's; and
- the development of a provincial framework on the impacts of drainage for source protection that should be addressed in source protection plans.

Peat Extraction

In the context of its discussion on drainage, the Committee also examined the related issue of 'peat extraction.' Wetlands such as peat bogs can cover large areas of land, can be quite deep, and serve as a storage area for large quantities of water, while also filtering pollutants as water moves through them. In many cases, drainage of these areas and subsequent peat extraction activities result in a decrease in the storage capacity of the land, thereby increasing the amount of runoff emanating from the catchment as both baseflow and stormflow. The quality of this runoff also changes as a result of drainage and extraction. Currently, a municipality may choose to prohibit or regulate activities that involve the removal of topsoil, including peat extraction, by passing a site alteration by-law pursuant to section 142 of the *Municipal Act, 2001*.

A by-law regulating these activities was recently passed by the United Counties of Prescott-Russell. In addition to prohibiting peat extraction in certain areas, the by-law also regulates tree removal. Furthermore, conservation authorities have authority under the *Conservation Authorities Act* to regulate excavations (not including aggregates) to protect areas that are significant for source protection purposes. Both of these mechanisms should be further examined to determine the best approach to implementing protective measures where peat bogs are identified as important to a source of drinking water.

Recommendation 103: The legislation, policy and protocols associated with land drainage activities in agricultural and urban and urbanizing areas should be reviewed and, if necessary, amended to ensure that drainage activities are consistent with approved source protection plans.

5.24 Water Quantity/Water Conservation

5.24.1 Permits to Take Water

As the provincial government moves forward on source protection legislation, it is undertaking other initiatives related to protecting drinking water sources, such as improvements to the Permit to Take Water Program (PTTW). The PTTW is a building block of the overall source protection strategy. Since the Ministry of the Environment is currently reviewing the decision-making processes under the Permit to Take Water Program, the Implementation Committee was mandated to provide advice on certain issues related to this review.

Water takings in Ontario are governed by the *Ontario Water Resources Act* and Ontario Regulation 285/99, the Water Taking and Transfer Regulation. Section 34 of the *Ontario Water Resources Act* requires anyone taking more than a total of 50,000 litres of water in a day, with some exceptions, to obtain a Permit from a Director appointed by the Minister for the purposes of Section 34. At present there are over 6,000 Permits To Take Water issued by the provincial government.

Permitted water uses include: municipal, commercial, industrial, and private communal water supplies, agricultural irrigation, recreational uses and other uses such as construction de-watering. Certain uses are exempt from the permitting requirements, namely individual household use, direct watering of livestock and poultry, and water for firefighting.

The Ministry reviews each Permit to Take Water application on a case-by-case basis. Permits are issued with site-specific terms and conditions to prevent interference with other water users and to minimize environmental impacts. Ministry directors have the authority to impose conditions requiring permit holders to monitor and report the amounts of water that they take. However, at present there is no comprehensive database on the actual amounts of water taken under permit. Information concerning actual water taking is needed to assess the cumulative impacts in watersheds and aquifers as well as to support the issuance of new permits.

On December 18, 2003, the provincial government announced a one-year moratorium on issuing new and expanding permits to take water for uses that remove water from the watershed. The one-year moratorium is intended to allow the Ministry of the Environment time to develop and implement interim methods meant to ensure that decisions on permit to take water applications take into consideration the cumulative impacts of water takings on the availability of water within watersheds.

On June 18, 2004, a proposed new regulation governing the Permit to Take Water program was posted to the Environmental Bill of Rights Registry for 60 days of public comment. The proposed changes to the Permit to Take Water program and draft regulatory amendments to the Water Taking and Transfer Regulation that were posted will:

- 1) Strengthen the factors that ministry directors must consider in making water-taking decisions;
- 2) Explicitly include water conservation as a factor ministry directors must consider in making water-taking decisions;
- 3) Set conditions for ministry directors to refuse permits for uses that remove water from the watershed, where there are concerns about the sustainability of the watershed;
- 4) Require mandatory reporting of water takings by permit holders; and
- 5) Require enhanced notification to municipalities and conservation authorities of water-taking permit applications.

To ensure that drinking water supplies will be available in the future, decisions about water allocations should integrate considerations such as ongoing water needs, competing uses, and source protection measures within a particular watershed. A decision-making mechanism for future water allocations would necessarily take into account health, environmental, social and economic impacts in order to achieve sustainable outcomes for Ontario's drinking water sources. The Implementation Committee recognized that source waters in northern areas may not be under the same pressures as in southern parts of the province. The detail of the water budgets should be tailored to the intensity of water use in the watershed.

Recommendation 104: As part of the source protection planning process, the provincial government should require that water budgets be developed to govern long-term sustainable use of water for all watersheds in the province.

Recommendation 105: Accurate information on water use will be a critical component in developing useful water budgets and in managing water quantity; therefore the provincial government should phase in mandatory water use monitoring and reporting (e.g. as a permit condition) on an annual basis to meet the needs for accurate water budgets. The requirements for more detailed monitoring may vary depending on local watershed conditions.

Recommendation 106: In the preparation of water budgets, the provincial government should establish a mechanism to obtain information on return flow tracking (quantity and quality), and this information should be closely linked to water taking data.

Recommendation 107: The provincial government should examine how best to promote and prioritize water use and conservation for both permitted takings, as well as for takings where a permit is not required.

Recommendation 108: The provincial government should issue water taking permits consistent with the approved source protection plan. The onus for demonstrating consistency with the approved plan should rest with the proponent who is seeking the permit.

Recommendation 109: The provincial government should make available water quantity data for the purposes of transparency and openness, while recognizing the reasonable rights of water users to proprietary protection. The province should undertake measures to produce this data in a useable form to all Source protection committees.

Recommendation 110: The Ministry should consider improvements to the Permit to Take Water program, which include:

- developing clear service standards for Permit to Take Water applications;
- using previously submitted information in the consideration of permit renewals to avoid duplication and redundancy;
- examining opportunities to harmonize processes for PTTW with other environmental and water-related approvals while maintaining environmental standards;

- considering delegating the authority for certain types of permit renewals, particularly when the content of the permit is unchanged, or when any changes are relatively minor.

Recommendation 111: The provincial government should ensure that a mechanism exists to facilitate water use allocation decisions. Special consideration should be given to future water needs, together with appropriate conservation measures and within the context of a sustainable watershed plan.

5.24.2 Water Conservation

The Organisation for Economic Co-operation and Development (OECD) ranks Canada 28 out of 29 OECD countries in terms of per capita water consumption. Only the United States uses more water than Canada.

Water conservation can be defined as practices, techniques, and technologies that improve the efficiency of water use. For instance, provincial support for continued research into new techniques for efficient water use practices will be integral to successful implementation of the source protection framework.

The provincial government should assist various sectors (municipalities, agriculture, industry) in the development of water conservation toolkits. Measures in the toolkits could include:

- water conservation best management practices;
- education and outreach;
- water restoration measures (e.g. buffering, wetlands, water retention on the landscape, cleanup programs);
- incentive programs (e.g. retro-fitting rebates, rebates on or distribution of water efficient plumbing fixtures);
- promoting conservation through water rates in municipal systems;
- universal metering in municipal systems;
- water accounting and loss control;
- costing and pricing;
- full cost recovery;
- water use audits and repairs;
- water use regulation;
- leak detection and repair;
- appropriate water reuse and recycling measures; and
- encouragement of the use of efficient irrigation systems and landscape materials.

The benefits of water conservation may include deferring capital costs to develop new water-related infrastructure, ensuring maximum use of existing infrastructure, planning for growth without having to find new sources of water, and reducing the use of chemicals to purify and treat water. There may also be significant ecosystem benefits associated with water conservation.

Recommendation 112: The provincial government should assist various sectors (e.g. municipalities, agriculture, industry) in the development of water conservation toolkits, to aid in the protection of water quantity, and promote water conservation and water quantity restoration strategies.

Recommendation 113: The provincial government should examine opportunities and potential benefits to establishing further water-use efficiency standards by way of amendments to the *Ontario Building Code* where appropriate.

5.24.3 Ontario Low Water Response (OLWR)

Ontario Low Water Response (OLWR) is a policy that incorporates local knowledge and understanding into a province-wide program. The OLWR uses local Water Response Teams (led by conservation authorities and Ministry of Natural Resources Districts where no CAs exist) to address decreasing water supply during times of low water and drought conditions.

The Water Response Teams characterize their watersheds, including identifying data sources of water supply use and demand. Using this information, they work with stakeholder representatives to decrease demand first through voluntary reduction in demand (Level I), and then through regulated reductions of demand (Level II), and finally in drought situations through water use restrictions (Level III). Level II regulation is achieved through such tools as municipal by-laws and requests of PTTW permit holders to reduce demand. Level III restrictions are implemented through such tools as changes to Permits under the Permit To Take Water program. The intent of the program is to mitigate and potentially prevent the effects of both low water conditions and drought conditions. It is not intended to address the situation where water supply chronically fails to meet demand.

The Norfolk Water Supply Project is an excellent example of how a small watershed with significant, chronic drought conditions can be managed. This study should be used as a guide in the development of sectoral water conservation plans.

Water availability is best assessed through detailed water budgets which provide clear, quantifiable information on water resources. In most watersheds, watershed-scale water budgets are not currently available. Justice O'Connor recommended that water budgets be prepared as part of watershed-based source water protection planning.

Watershed water budgets account for the movement of water through the various components of the water cycle, including precipitation, evapotranspiration, groundwater inflow and outflow, surface water outflow, change in storage, water withdrawals, and water returns. Water budgets should improve the ability of the OLWR to anticipate and respond to low water supply situations in ways that would retain water on the land during low water or drought periods.

Recommendation 114: The development of cooperative, sectoral water conservation plans should be based on Ontario Low Water Response plans.

5.25 Private Water Wells

Justice O'Connor noted that protecting sources of drinking water is the only type of protection available to some consumers. Currently, many rural residents drink untreated groundwater from wells. The protection of those groundwater sources is the only barrier in their drinking water systems.

Over 2 million Ontario residents get their drinking water from private wells. Private wells are predominantly used in non-urban areas (i.e., small communities and rural areas). If private water wells are improperly sited, designed, constructed, repaired, maintained, or decommissioned, there is a risk to those who rely on these resources. The construction, maintenance, alteration, and abandonment of wells in Ontario are governed by Regulation 903 (under the *Ontario Water Resources Act*). The regulation also sets standards for who can construct or work on a well, and reporting requirements.

The provincial wells program should be enhanced through education and outreach for private well owners and users. Specifically, greater efforts should be made to provide the public with clear and comprehensive guidance materials in order to: highlight the potential risks relating to water wells; support and clarify existing requirements (e.g., siting, construction, maintenance, abandonment and decommissioning) for wells; and support the ongoing use and establishment of best practices.

Source protection committees should identify opportunities within the watershed where private wells could benefit from source protection measures. Such measures could include farm water protection plans in defined vulnerable areas, management and improvement of existing wells, septic system improvements, and watershed scale programs to address cumulative impacts.

Recommendation 115: An integrated approach to managing potential threats associated with private water wells should be developed. This should include: enhanced education and outreach, comprehensive guidelines (including considerations for the siting of new wells) and identifying opportunities within the watershed for efficient and effective source protection measures to be applied to private wells.

SECTION 6: FUNDING OF SOURCE WATER PROTECTION

6.1 Introduction

During public consultations on source protection, funding emerged as the most significant perceived obstacle to implementing source protection. Many suggested that, at a minimum, the provincial government should fund the initial development of source protection plans. It was also suggested that the long-term implementation and sustainability of these plans would depend on new sources of funding.

In the *Part Two Report of the Walkerton Inquiry*, Justice Dennis O'Connor recommended a combination of funding mechanisms to pay for source protection planning. He emphasized three key sources of funding:

- user fees (municipal water rates, Permits to Take Water);
- provincial and/or municipal general revenues; and
- charges on those who discharge pollutants.

Similarly, the Advisory Committee on Watershed-based Source Protection, which provided initial advice on a framework for source protection, recommended developing a cost sharing formula, whereby the province and affected municipalities would fund source protection activities. The funding formula would:

- consist of contributions from users, polluters and other beneficiaries through user fees, permit fees or other means;
- recognize both direct and indirect costs of source protection;
- be linked to the body responsible for the activity the funds will support;
- reflect differences across the province in ability to pay.

The Implementation Committee considered this advice in assessing and recommending funding mechanisms for Ontario. The Committee also reviewed funding tools in other jurisdictions to determine what tools could potentially be used to support source protection implementation in Ontario. The Committee concluded that it is imperative that the provincial government establish and implement funding strategies and tools for all components of source protection planning.

The Committee examined various funding mechanisms to support the jurisdictions and stakeholders involved in source protection planning and implementation, including the provincial government, municipalities, conservation authorities, agriculture, and First Nations. Support will also be needed for cooperative initiatives between Ontario and the federal government regarding federal lands and waters and the Great Lakes.

A strong need exists for sources of funding from all three levels of the government. However, it is necessary that some of the costs be borne by responsible parties, or those who impact sources of drinking water.

For those responsible parties, there is great value in looking at incentive programs as a useful tool to assist in implementation. For example, farms are responsible for implementing measures related to their practices. However, the province and federal government have historically provided financial assistance for the implementation of such measures.

For the purposes of providing advice on funding for source water protection, the Implementation Committee identified funding principles to guide a funding strategy, examined the potential costs of plan development and implementation, made recommendations on a sustainable funding approach, and recommended specific funding mechanisms, including incentive programs.

6.2 Funding Mechanisms used to support source protection in other jurisdictions

The Implementation Committee reviewed some of the key funding tools used in Canadian provinces, select U.S. states and international jurisdictions that could potentially be used to support source protection implementation in Ontario. Various approaches were taken from different jurisdictions, including user fees, taxes, special purpose funds, grants and incentive programs. The Committee assessed the relevance of these funding mechanisms in an Ontario context.

Canada

Across Canada, provincial governments have taken a variety of approaches to fund source protection programs. Provinces are utilizing a range of funding mechanisms - from user fees to taxes - to offset program costs.

Federal, provincial and municipal governments often share the responsibility for funding components of source protection programs. In New Brunswick, the Wellfield Protection Program (2000) is cost-shared between the province and municipalities. In Manitoba, operating budgets of Conservation Districts, the jurisdictions responsible for a range of watershed management activities, are cost-shared between the province, municipalities and other sources.

One potential source of funding, a fee on water withdrawals, is used by almost every province. These fees include application and administrative fees, license and permit fees, and water rental fees. Ontario and Prince Edward Island are the only provinces not currently charging an administrative fee on water takings.

Some provinces have developed innovative funding mechanisms, including dedicated taxes and environmental fees that support program costs. In Manitoba, an Environmental Protection Tax is levied on glass liquor bottles and disposable diapers, generating approximately \$3 million in revenue annually for the Manitoba Sustainable Development Innovations Fund. The Fund provides grants for ecosystem conservation and water projects. New Brunswick has

established an Environmental Trust Fund to provide assistance to community groups, municipalities, non-profit organizations, and institutions working to protect, preserve and enhance the environment. The Fund is financed through an environmental fee generated by a beverage container stewardship program.

The United States

In the U.S., most states rely heavily on federal funding to implement source water assessment and programs. These funds are made available through the U.S. Environmental Protection Agency (EPA). For example, through the Clean Water State Revolving Fund, federal capitalization grants are available to states for wastewater treatment, non-point source pollution control and watershed and estuary management projects. States are required to match 20% of the federal capitalization grant. States use the federal capitalization grants to establish State Revolving Funds, providing low interest loans to communities of all sizes, non-profit organizations and commercial enterprises. Funding is also available for state and tribal agencies to implement approved non-point source management programs. A portion of the fund is allocated to the development and implementation of watershed-based plans. State agencies must provide 40% of the total project/program costs.

A number of states, including New York, Minnesota, Michigan, Illinois, Kansas, Indiana and Ohio, charge water user fees to offset costs associated with meeting legislative requirements of the U.S. *Safe Drinking Water Act*. While water user fees are common across states, many other fees are also utilized, including wastewater, hazardous waste and pesticide fees. State and local governments have established a number of grant and incentive programs to facilitate source protection initiatives. Many states have also put in place programs that recognize differences between communities in ability to pay and financial hardship cases.

International Jurisdictions

Many countries employ user fees – including water fees and charges and pollution charges – to help support source protection activities. In Europe, New Zealand, and Australia, funding responsibilities for source protection varies from fully public to fully private funding. All of these jurisdictions impose water user charges based on the principle of full cost recovery.

In Australia, water resource management is cost-shared between the national and state governments. State governments fund water resource management programs through national government appropriations and water user charges imposed at the state level.

In Germany, New Zealand, and France, regional/state governments are required to provide nearly all funding of source protection. Each of these countries imposes pollution charges, Germany and New Zealand by charging polluters directly and France by incorporating a pollution tax into consumer water bills.

The United Kingdom requires water companies to finance source protection. The companies are able to fully recover costs related to source protection by passing them on to water consumers through the water rate system.

6.3 Funding Principles

One of the Implementation Committee's first tasks was to develop guiding principles to inform and direct a proposed strategy to fund source water protection. The principles are fundamental concepts agreed to by the Committee to guide the development of the funding recommendations outlined in this report.

- **Cost Effective, Fair and Equitable:** Costs and impacts on individuals, land owners, businesses, industries and government must be clear, fair and economically sustainable.
- **Polluters Pay:** Those who benefit from the use of water should contribute in proportion to the impact of the use.
- **Users Pay:** Users who benefit from the use of water should contribute in proportion to the amount taken.
- **Ability-to-pay:** Must recognize financial hardship, and that ability-to-pay may vary across sectors.
- **Payment for Benefits:** Incentive programs and payments for environmental benefits should be used to encourage implementation of source protection.
- **Full Cost Accounting:** A full-cost accounting approach should be taken to cover source protection plan development, implementation, maintenance and plan update.
- **Financial Oversight, Accountability & Transparency:** There must be proper and on-going management, accountability, and transparency in the use of all sources of funding.
- **Adequacy:** Funding mechanisms must address financial requirements of plan development, implementation, maintenance and ongoing plan update to ensure successful source water protection.
- **Sustainable, Permanent and Ongoing:** Long-term funding must be in place to ensure sustainable source protection plan development, implementation, maintenance and on-going plan update.
- **Shared Responsibility:** Costs will be distributed between users and society through a combination of mechanisms (such as general revenue, pollution charges, water rates).

When taken together, the 10 principles define a framework for promoting a long term, sustainable funding strategy. The framework should be flexible enough to be used province-wide under a variety of settings and circumstances.

Recommendation 116: The ten guiding principles should be used in developing a strategy to fund source protection activities.

6.4 Assessment of Funding Needs / Potential costs of source protection planning and implementation: Case Study Examples

The Implementation Committee undertook a preliminary examination of the potential costs of plan development and implementation to provide general guidance to the funding discussions. The cost of source protection can be categorized as plan development (short-term) costs and plan implementation (long-term annual) costs.

The cost of plan development was assessed based on the previous watershed planning experiences of several conservation authorities. Using this experience, a high level assessment was undertaken of the potential plan development costs for two of the proposed watershed regions in southern Ontario.

The cost estimated in the case studies included a technical analysis and risk assessments consistent with the Technical Experts Committee's recommendations. It also included direct staffing and consulting costs, as well as Source protection committee support costs and public consultation costs. The cost estimates excluded provincial agency expenses, third-party participation costs, and ongoing monitoring and plan maintenance costs. The province will need to undertake a significant amount of analysis to estimate these costs.

Generalized watershed region estimates were extrapolated from these case studies by prorating based on watershed area. The resulting total plan development costs were estimated to be \$1,000 to \$1,500 per square kilometre of watershed area or \$6.5 million to \$10 million for an average watershed region. Determining costs for specific watershed regions will require a much more extensive analysis.

The case studies were limited to southern Ontario. The resulting estimates are not considered applicable to central or Northern Ontario due to significant differences in geology, population and high density land use. The estimates are also not likely applicable in high population watersheds in the GTA, where the costs would be expected to be higher.

The potential costs of plan implementation were more difficult to examine, since there are few Ontario experiences to draw from. With limited time and information, the Committee was only able to undertake a cursory assessment of potential costs of plan implementation. Fortunately the Committee was able to utilize the recently completed Niagara Water Quality Protection Strategy (2003), a broad water management strategy that included a detailed cost and implementation plan. It consisted of 460 activities in 11 program areas.

The Niagara Strategy was reviewed to extract implementation costs related to source protection only from the broader water resources management activities. The resulting cost estimate was \$12.4 million per year or \$30 per capita per year. Since the Niagara Strategy was examining more than source protection, there were a number of uncertainties with this extrapolation. This is the first approximation for one region of the province, and is included as an example only; this estimate is not considered to be transferable to other watershed regions in the province.

This assessment provides some initial guidance on the likely costs of source protection, while additional analyses would be required to develop reliable estimates for budgeting purposes. As the development of source protection proceeds through its various phases, more detailed studies of costs will need to be undertaken.

Recommendation 117: The provincial government should coordinate and publish an annual report on source water protection expenditures and projected costs, incorporating the activities of the province, conservation authorities, municipalities, and other bodies such as the federal government and First Nations.

Recommendation 118: Funding requirements for source protection should be assessed on a continuous basis. The provincial government should consider the ongoing costs related to plan development, implementation, monitoring and review and updating as source protection proceeds through its various stages.

6.5 Sustainable Funding for Source Protection

The Implementation Committee identified funding mechanisms and sources to implement source water protection. Since legislation will make source protection mandatory, the Implementation Committee expressed concern about the availability of sustainable source protection funding. The Committee made several recommendations designed to ensure the long-term sustainability of revenue for source protection planning and implementation, including ongoing source protection plan updating, monitoring and review.

The provincial government should make funding available for source protection planning in 2004 and onwards. This commitment will allow technical work to proceed while legislation is being finalized. In addition, it is the role of the province to make sure that funding responsibilities are delineated to ensure long-term funding is available, and funding shortfalls are addressed, should they arise. Moreover, as costs become more certain, the provincial government should consider whether additional tools are required at the provincial and/or municipal levels.

The Implementation Committee identified four key funding sources as fundamental components of source protection planning and implementation. These sources include all three levels of government (provincial, municipal, and federal) and water users (those benefiting from and/or impacting on water).

Contributions from provincial government: In addition to provincial general revenue, the province should consider new mechanisms to cover their portion of source protection costs, including pollution charges and water-taking charges. In addition, the province could examine other accounting mechanism such as dedicated funds and special purpose accounts.

Contributions from municipalities: Municipalities have a range of revenue sources that may be useful in addressing the costs associated with local source water protection. Such sources could include, but may not be limited to:

- Water and Sewer Rates (user fees);
- Development charges (for new growth capital only); and
- Property taxes.

Contributions from the federal government: The province must encourage federal government participation and funding in source water protection.

Contributions from private entities or persons: Any funding program should require all those impacting on and benefiting from water to share in the responsibility and contribute to the funding of ongoing source protection planning and implementation after the initial plan development.

Parties responsible for an activity which represents a risk to a source of drinking water should be responsible for funding its management. The Implementation Committee further emphasizes the need for incentive programs and financial assistance where necessary. Beyond the obligation of responsible parties to pay for the management of their own activities, provincial general revenue should be the primary source of funding for the implementation of source protection plans.

Recommendation 119: The provincial government should fund the development of all initial watershed-based source protection plans sufficient for Ministerial approval, with funding to begin in the 2004/05 fiscal year.

Recommendation 120: The provincial government, in cooperation with other levels of government and water users, should establish a sustainable, secure and long-term funding program to adequately support both capital and operating expenditures over a multi-year period related to ongoing source protection plan implementation, monitoring, review and updating.

Recommendation 121: Any funding program established needs to give consideration to:

- Differences in ability-to-pay, including financial hardship cases; and
- Assistance in areas with limited revenue generation capacity or in areas where additional work or effort is needed to implement source protection.

Recommendation 122: In examining how to match sources of funding with activities funded, the Committee recommended some general concepts that could be considered for adoption:

- where funding is required for local, municipal level source protection activities (e.g. wellhead protection) it could be provided through municipal revenue sources;
- where funding is required for source protection implementation activities aimed at implementation activities of broader, provincial interest, it could be provided through provincial general revenue;

- where source protection activities have general benefits to users on a watershed scale (e.g. provincial agricultural programs), contributions could be made by all three levels of government- federal, provincial and municipal.

Recommendation 123: The province should help bring about the establishment of source protection trusts that could accommodate contributions from all levels of government, the private sector and non-governmental organizations to support source water protection. As well, the province should encourage non-governmental organizations to define how they will participate in supporting source protection planning and implementation.

Recommendation 124: The province should work with the federal government and First Nations to ensure adequate funding is made available to enable the full participation of First Nations in source protection planning and implementation.

6.6 An Ontario Funding Model: Specific Recommendations for Funding Source Protection

The Implementation Committee considered a number of specific funding mechanisms to support ongoing planning and implementation costs. These mechanisms included municipal water and sewage rates, water taking charges, pollution charges, dedicated taxes, lotteries, development charges, property taxes and permit fees.

The Committee also considered the advice of Justice O'Connor, who recommended that the provincial government ensure that programs relating to the safety of drinking water are adequately funded.

The Committee made recommendations on three funding approaches it considered the most viable to support source protection implementation in Ontario, over and above provincial general revenue: water and sewage rates, water taking charges, and pollution charges. The Committee agreed that these funding sources have the most potential to generate sources of ongoing revenue for source water protection. Determining the appropriate or relative weight of each mechanism was not feasible, since the full costs related to planning and implementation will not be completely known until the process is underway across the province.

This section also makes recommendations related to general funding incentives and financial assistance used to provide rewards and funding aid for source protection activities. The Committee also examined incentives for specific issues such as Farm Water Protection Plans and private property owners not on municipal systems.

6.6.1 Water and Sewage Rates

Justice O'Connor recommended user fees as one of the mechanisms to fund source protection. Currently, water consumers on municipal systems in Ontario pay the costs of accessing, treating and distributing water. However, those who take water directly from the source do not pay for the water itself. On average, households in Ontario pay \$45 a month for water and wastewater services. Compared to other OECD countries, and other provinces in Canada, this is a relatively low rate for water services. In Canada, Ontario has the fifth lowest rate (Québec has the lowest, and the Northwest Territories the highest).

These low rates do not reflect the full cost of providing water and wastewater services, and often result in excessive water use. This excess puts added strain on water resources by removing a larger quantity of water than is truly necessary, and also affects water quality by increasing non-point sources of pollution.

Water and sewage rates should be used to pay for some component of the municipal share of source water protection, especially where funding is required for municipal level source protection activities (e.g. wellhead protection).

The *Sustainable Water and Sewage Systems Act (2002)* received Royal Assent on December 13, 2002. The Act will make it mandatory for municipalities to assess and report on the full cost of providing their water and sewer services and to prepare long-term cost-recovery plans. These plans will consider, among other things, the costs associated with source protection measures.

The provincial government has established an expert panel to develop a long-term investment and financing strategy for water and wastewater infrastructure in Ontario. The expert panel, in the development of this strategy, should consider the cost implications of source protection, as it constitutes a critical component of the drinking water delivery system.

Recommendation 125: Municipal councils should consider whether at least some portion of the municipal share of funding for source water protection should be recovered from municipal water and sewage rates.

6.6.2 Water Taking Charges

On December 18, 2003 the provincial government announced its intention to apply charges to water takings that remove water from the watershed for commercial purposes. This fee would represent the first time that charges for water takings were applied in Ontario.

The *White Paper on Watershed-based Source Protection Planning* sets out key principles to guide the development of a provincial framework for water-taking charges. The proposed framework would:

- promote water resource protection through efficient use and conservation;
- ensure fairness, equity, and transparency for permitted water users and other stakeholders;

- apply user charges to permitted water takers that can contribute to the costs of managing a sustainable and healthy supply of water in Ontario.

Several other jurisdictions charge for water taking (e.g., British Columbia, Saskatchewan, Manitoba, Nova Scotia, Minnesota, United Kingdom). In many jurisdictions, uses such as drinking water, fire protection, agriculture, and wildlife habitat and wetland conservation are exempt from water taking charges.

In Ontario, water taking charges should include administrative fees for volume-based water taking charges and for Permit to Take Water (PTTW) applications. The volume-based water taking charge should be implemented through a regulatory charge, not a royalty. It should be based on the actual volume of water taken, not the maximum permitted amount.

Charges for water takings should be phased-in over time and rates should vary according to:

- Characteristics of the water taking
- Impact on water quality
- Use
- Quality of water (e.g., rates should be lower for lower quality water)
- Whether use/sector is determined to have a wider public benefit (e.g., wetland restoration)
- Economic considerations on a sectoral basis
- Geographic considerations (e.g. disparity may exist between northern and southern Ontario and rural and urban Ontario in relation to ability to pay).

Exemptions from the charge for certain sectors should only be permitted on a limited basis, since these exemptions could have a significant impact on revenue generated for source protection purposes. Exemptions may be permitted for the following purposes:

1. Water taken for fire protection purposes.
2. Water taken for environmental conservation purposes (e.g. fish ladders; wetlands).
3. Use of recycled water.
4. Based on the size of taking: the level at which a permit to take water is required (currently below 50,000 litres per day).
5. The government may add exemptions as required, if they are in the public interest.

Recommendation 126: The provincial government should proceed with the introduction of volume based water taking charges, with only limited exemptions permitted. Water taking charges should fund a portion of the costs of source protection implementation.

6.6.3 Pollution Charges

Governments are increasingly looking to employ economic tools, such as pollution charges, in their environmental protection frameworks. These tools achieve several goals. They provide incentives for modifying behaviour (e.g., emission reductions), ensure polluters internalize the costs associated with their impact on the environment, and offset some of the costs associated with environmental management activities. A pollution charge in Ontario would be a valuable tool to fund source protection. A volume based charge may also encourage a reduction in the quantity of effluent discharged into source water.

The government should consider examples of broad based pollution charges used in other jurisdictions. The charge could cover a wide range of pollutants, across multiple sectors and across effluent or discharge streams that could affect water quality. In determining potential pollutants where a pollution charge may be imposed, consideration should be given to the impact of the pollutant on drinking water sources. In developing pollution charges, the province should reward good practices and penalize bad ones.

The Implementation Committee supports the provincial government's work on pollution charges. The Committee believes the province should move forward in developing a pollution charge policy framework, including undertaking consultations with experts in the field as well as broad public consultations.

Recommendation 127: Pollution charges should be used to fund a portion of the costs of source protection.

6.7 Financial Incentives and Assistance

A number of jurisdictions make use of incentive and assistance programs to create benefits to the environment. In Ontario, such programs could be created to encourage voluntary implementation of source protection measures, promote compliance, and provide for long term sustainability of water use.

Incentive and assistance programs will likely be a key factor to the success of source protection programs and activities and may be particularly useful when “ability-to-pay” becomes an issue. One example is that of abandoned wells. The few thousand dollars it might cost to properly decommission a well is often a significant deterrent for a private well owner to take action. Other examples could include: incentives for Farm Water Protection Plans, septic system improvements, clean-up of contaminated sites, mines, and historic deep well disposal sites.

Incentive-based approaches may also be used to provide rewards for source protection activities. The rewards may or may not be financial. An example would be the establishment of recognition programs by the Province for source protection achievements such as an Award for Water Stewardship, accompanied by public recognition and cash awards. Incentives may be defined in a variety of ways and include:

- partnerships;

- cost-sharing;
- grants and loans;
- technical assistance;
- tax credits;
- information and education; and
- recognition programs.

Payments to landowners (often referred to as incentives) for an activity (i.e. planting of riparian areas to permanent cover), based on the value of the activity for source protection reasons, should also be considered. Such payments would be for a multi-year period and would allow landowners to develop a multi-year business plan based on these payments.

Incentive programs have been successful in a number of other jurisdictions. New York has established long-term incentive programs for agricultural operations around its sources of drinking water that have resulted in significant benefits (environmental and financial) to the operation of the city's drinking water supply. In Dayton, Ohio, financial incentives are provided to property owners who reduce their amount of chemical inventory by at least 97 percent. The amount of funds granted to the business owner depends on the availability of funding, the percent of reduction, and the appraised value of the property. Where businesses cannot achieve the full 97% reduction, a 0% interest loan is available for projects that will reduce the risk to the groundwater (i.e. underground storage tank removals and upgrades, moving hazardous waste to secured indoor storage).

Recommendation 128: Federal and provincial governments, municipalities, conservation authorities and other relevant groups should work together to ensure their incentive programs enhance and promote source protection and are coordinated, consistent, complementary, and accessible.

6.7.1 Financial Incentives for Agriculture/Farm Water Protection Plans

Justice O'Connor recommended that once watershed-based source protection plans were in place, farms whose activities posed a risk to drinking water because of: a) their size (large), b) their intensity (intensive), or c) location (high risk) would be required to develop individual Farm Water Protection Plans (FWPPs) that are consistent with corresponding source protection plan.

Justice O'Connor also examined the need for financial assistance programs for on-farm water protection initiatives. He recommended the provincial government provide financial support for water protection projects on farms.

Provincial, federal, and local funding sources should be used to provide additional financial assistance for Farm Water Protection Planning. The funding incentives should be provided at a level that is sufficient to ensure implementation and avoid hardship to the agricultural community. When developing criteria for providing the incentives, consideration should be given to the public benefits, the ability to pay, and the risks being addressed.

Federal and provincial governments, municipalities, conservation authorities and other relevant groups should work together to ensure their incentive programs are coordinated, consistent, complementary, accessible and address farm water protection planning. Furthermore, farm water protection planning priorities should be considered as part of the objectives of local rural water quality incentive programs, where such programs exist. Where such programs do not currently exist, the creation of local rural water quality incentive programs should be considered to help address farm water protection planning priorities.

On the issue of federal funding, the provincial and federal governments should cooperate to ensure that federal agri-environmental incentive programs (available through 2008) prioritize Farm Water Protection Planning and projects. The Committee hopes that future federal agri-environmental programs (post-2008) consider Farm Water Protection Planning and projects as one of the priorities for cost-sharing programs.

Recommendation 129: The provincial government should establish a system of cost-share incentives for Farm Water Protection Plans and projects. The program should be put in place early enough to allow sufficient lead time to ensure improvements can be made in an orderly and cost-effective manner.

Recommendation 130: The provincial government should work with the federal government to ensure the availability of federal funding to support Farm Water Protection Planning.

6.7.2 Participation of Private System Owners

Private property owners may stand to benefit from source protection activities (e.g., additional protection for private wells). Conversely, the activities of private land owners could pose a contamination risk to source water (e.g., septic systems).

To provide for a more equitable method of funding source protection, municipalities should have the authority to levy charges on properties not connected to municipal sewer and water systems. The money raised could then be used to fund a portion of ongoing source protection planning and implementation costs in a manner the council considers equitable.

As noted previously, ability to pay is often a disincentive for private property owners to take actions needed to protect source water. Incentive programs should be encouraged and funded at both the provincial level and local level to assist private property owners with covering the costs of specific activities beneficial to source protection (e.g., well decommissioning, rural water quality programs, and nutrient management practices).

In some instances, the restriction of specific existing activities may be recommended in a source protection plan. These restrictions could potentially cause significant economic losses to an individual or group of individuals (or landowners). Consideration should be given to compensation options for property owners for revenue lost as a result of the land-use

restrictions specified in source protection plans. An appropriate appeal mechanism may be required where significant economic loss has been recorded.

Recommendation 131: Municipalities should be given the authority to levy source protection charges on properties not connected to municipal sewer and water systems.

Recommendation 132: Incentive programs should be developed to assist private property owners and should include an education component.

Recommendation 133: The province should conduct a review of compensation options (how and where) for landowners where there are land use restrictions on their properties as a result of an approved source protection plan, to ensure a consistent approach can be taken across the province.

SECTION 7: CONCLUSION

Safe drinking water is central to the health of Ontarians. Protecting drinking water sources was a key focus of *Part Two Report of the Walkerton Inquiry*. In Part Two, Justice O'Connor described source protection as a primary measure in a multi-barrier approach to ensuring safe drinking water.

The provincial government appointed the Implementation Committee to provide advice in a number of areas critical to the implementation of source protection plans. The Implementation Committee's work focused in two key areas: the identification of tools and authorities that would be necessary to implement measures to prevent or manage risks to sources of drinking water, and how best to fund source protection. During the preparation of its advice the Implementation Committee was informed by the work of the Technical Experts Committee, which was proceeding in parallel.

First and foremost, the Committee stresses that all levels of government, business sectors and the public have a stake, and a responsibility, to protect sources of drinking water in Ontario – both to themselves and to their neighbours. Collaboration amongst all parties within a watershed will be crucial for source protection to be truly successful.

Recognizing that different approaches are capable of achieving similar outcomes (depending on local circumstances), the Committee has provided advice on a wide range of tools that could be used to manage risks to drinking water - from binding/formal approaches to non-binding/informal approaches.

The Committee emphasized the prevention of future risks (as opposed to managing risks once they are established) as the preferred approach when making decisions on the location and operational practices of future development. The delineation of source protection areas will provide the basis for making future planning decisions so that new higher risk development can be directed to locations that will represent less risk to sources of drinking water. The Committee recommended that municipal land-use planning decisions be required to “be consistent with” source-water protection plans from the time the plans are approved by the province and that at the time of regular comprehensive reviews of municipal official plans they should be updated to include source-water protection plan data and policies.

The Committee acknowledged that existing activities, already established in source protection areas or already causing a broader issue in the watershed, represented the greatest challenge to managing risks to sources of drinking water. The Committee has provided advice on the need for provincial ministries to use their authorities to implement source protection plans. The Committee has also made recommendations on the importance of enhancing municipal authority to develop and implement formal local source protection measures through a new municipal “sphere of jurisdiction”. The Committee emphasizes that whether a measure is regulatory or voluntary in nature, educational mechanisms for all

parties must be used in tandem. The Committee also emphasizes that financial assistance and incentives will play an important role in ensuring that parties have the financial capacity to fulfill their obligations to source protection.

The Committee recommends that source protection legislation ensure that if there is a conflict between an approved source protection plan as it pertains to a significant risk to drinking water and 1) a provincial law or instrument or 2) a municipal official plan or by-law, the approved source protection plan should prevail.

How source protection will be funded is a question paramount on the minds of most parties that will be involved in source protection. Source protection will be an ongoing process. The Committee has recommended that the province accept responsibility for funding the development of source protection plans up to the point of provincial approval. This will ensure that proper assessment work is undertaken in all watersheds and the timely development of assessment reports and source protection plans. To ensure the longer-term funding of source protection implementation, the Committee has provided a comprehensive set of mechanisms that, taken together, could ensure adequate sources of funding over the long-term. The Committee provides some initial guidance on the likely costs of source protection, while additional analyses would be required to develop reliable estimates for budgeting purposes. As the development of source protection proceeds through its various phases, more detailed studies of costs will need to be undertaken. The final make-up of the Ontario funding model, including the extent to which the various funding mechanisms are employed, should be based on these estimates.

The Implementation Committee urges the government to consider its advice and recommendations in the drafting of drinking water source protection legislation.

SECTION 8: APPENDICES

8.1 List of Implementation Committee Members

CO-CHAIRS	Representative / Alternate
Ontario Municipal Administrators' Association Ministry of the Environment	Nigel Bellchamber Joan Andrew
MUNICIPALITIES/AMO	Representative / Alternate
Association of Municipalities of Ontario (AMO)	Milena Avramovic
The Regional Municipality of York	Michael Garrett / Lloyd Lemon
The Corporation of the County of Hastings	Jim Pine
CONSERVATION AUTHORITIES	Representative / Alternate
Grand River Conservation Authority (CA)	Peter Krause / Jim Kelleher, Paul Emerson
Conservation Ontario (CO)	Dick Hunter / Charley Worte
ENVIRONMENTAL NGOS	Representative / Alternate
Ducks Unlimited Canada	Jim Anderson / Ron Maher
Canadian Environmental Law Association (CELA)	Theresa McClenaghan / Rick Lindgren
SECTOR ORGANIZATIONS	Representative / Alternate
Ontario Farm Animal Council (OFAC)	John Maaskant / Greg Hannan
Ontario Federation of Agriculture (OFA)	Allen Gardiner
Aggregate Producers' Association of Ontario	Peter White
Ontario Farm Environmental Coalition (OFEC)	David Armitage
Urban Development Institute (UDI)	Neil Rodgers
Chiefs of Ontario	Sara Neuert / Sue Chiblow, Derrick Kamanga
Ontario Ground Water Association (OGWA)	Earl Morwood
Ontario Water Works Association	Tim Lotimer
Ontario Mining Association	Patrick Reid / Barbara Mossop
Willms & Shier Environmental Lawyers	Juli Abouchar
ACADEMIC	Representative
Ontario Agri-Food Technologies	Dr. Gordon Surgeoner
HEALTH	Representative / Alternate
Ontario Medical Association (OMA)	Dr. Ted Boadway / John Wellner
GOVERNMENT REPRESENTATIVES (EX-OFFICIO)	
FEDERAL GOVERNMENT	Representative / Alternate
Environment Canada	Simon Llewellyn / John Merriman

8.2 List of Implementation Committee Recommendations

Recommendation 1: The provincial government should ensure that source protection legislation clearly delineates the responsibilities and powers of municipalities, conservation authorities and other relevant agencies, relative to source protection, and ensure that there is sufficient jurisdiction, authority and financial ability to implement those responsibilities.

Recommendation 2: The provincial government should expedite its work with the federal government to identify and ensure coordinated participation of federal land holders in source protection planning and implementation on federal lands and waters.

Recommendations 3: In order to ensure involvement of First Nations in source protection, the provincial government should:

- Expedite its discussions with the federal government and First Nations on how best to involve First Nations leaders and community members in a governance structure for source protection planning and implementation; and
- Ensure local ecological/indigenous knowledge is incorporated in the development of source protection plans.

Recommendation 4: Source protection committees should establish ongoing communication mechanisms with neighbouring committees. Cross boundary assessment work and implementation of surface water and groundwater measures should be documented in the assessment report and in source protection plans.

Recommendation 5: The provincial government and local Source protection committees should work with relevant parties to ensure that the development and implementation of source protection plans are integrated with water management and protection programs administered by all levels of government.

Recommendation 6: The provincial government should ensure, when participating in inter-jurisdictional negotiations regarding the Great Lakes, that source water protection principles, strategies, and policies are incorporated into existing Great Lakes programs and resulting agreements so that they are protected and improved as sources of drinking water.

Recommendation 7: The provincial government should vest in Source protection committees the authority to access and obtain relevant information necessary for the completion of a source protection plan, with appropriate privacy and proprietary protection considerations, and that information sharing should be coordinated among the province, the federal government, First Nations, municipalities, conservation authorities and other organizations. This information should be made accessible to the public.

Recommendation 8:

- The provincial government should ensure the appropriate tools, guidance and support services are available to Chairs, members and senior management staff working with Source Protection Planning Committees (SPCs) and Source Protection Boards (SPBs).
- Chairs and members of SPCs and SPBs should have access to professional alternative dispute resolution services to manage issues that may arise during the planning and implementation process.
- A mechanism should be put in place to facilitate the sharing of best practices among Chairs and members of source protection planning boards and committees.

Recommendation 9: Where a source protection plan identifies a “significant” risk, the plan shall:

- Describe the required outcome;
- Give a brief description of the measure(s) to be adopted and set out a rationale for how the proposed measure(s) will mitigate the water risk;
- Specify any entity or person who has legal responsibility for implementing the measure(s) and ensure the responsible entity has acknowledged the measure(s) to be undertaken;
- Where relevant, estimate the cost of implementing the measure(s) and who should fund the measure(s);
- Specify the time frame for implementing the measure(s);
- Specify how and over what time frame the measure(s) will be monitored and evaluated to determine whether the measure(s), as designed and implemented, is effective in mitigating the water risk.

In addition, the plan should follow the above steps to identify appropriate responses proportionate to the level of risk (i.e. “moderate” or “low”)

Recommendation 10: Where there is a threat identified in the assessment report, as determined by Source protection committee and supported by the source protection board, that poses a significant risk to source waters and that would require interim action prior to formal source protection plan approval, the risk should be brought to the attention of all parties that have responsibilities related to the risk. Those parties should undertake an investigation of the risk and determine appropriate action.

Recommendation 11: The source protection legislation and regulations should include provisions for public consultation, similar to those articulated in the Planning Act and its regulations, at the appropriate stages during plan development and for notification of the public and affected land-owners/ business operators following plan approval.

Recommendation 12: Source protection plans must be considered “living documents” that are reviewed and updated as needed to reflect current watershed characteristics, scientific research, and technological innovation.

Recommendation 13: Once source protection plans have been developed and approved, the lead source protection board/conservation authority/other designated lead body in a watershed region should work with individual SPBs or other designated boards to facilitate implementation of the plans, in partnership with municipalities, the province, the federal government, First Nations and other stakeholders. This includes:

- monitoring, evaluating and reporting on the status of implementation of an approved plan, including assessing plan effectiveness, expenditures to date, and addressing any identified gaps in the plan;
- reviewing and updating information pertinent to source protection plans; and
- considering amendments to the plan as appropriate.

The lead CA, in conjunction with all watershed partners, should identify responsibility for these activities where relevant and appropriate.

Recommendation 14: The provincial government should review and assess, based on the advice of the Source Protection Board, the ongoing role of a formal Source protection committee as the overall source protection process continues.

Recommendation 15: Source protection legislation should ensure that:

- a) provincial government regulations and decisions that affect drinking water are consistent with provincially approved source protection plans;
- b) municipalities implement source water protection plans through their land-use planning systems where applicable and that municipal regulation of activities shall complement and implement, where applicable, provincially approved source protection plans.

Recommendation 16: Source protection legislation should ensure that if there is a conflict between an approved source protection plan as it pertains to a significant risk to drinking water and 1) a provincial law or instrument or 2) a municipal official plan or by-law, the approved source protection plan should prevail.

Recommendation 17: A provincial source protection guidance manual should be prepared to assist all parties involved with the selection and use of appropriate management tools.

Recommendation 18: Approved source protection plans should be binding on the Crown.

Recommendation 19: There must be consistency between source protection plans and decisions that the province makes related to a wide range of activities including those related to:

- the province's own lands and activities;
- new and expanding operations; and
- existing activities which operate under provincial approvals (permits, licenses, etc).

Recommendation 20: The province must ensure there is sufficient authority to bring existing operations into consistency with approved source protection plans using appropriate regulatory and legislative mechanisms.

Recommendation 21: To address the gap in municipal authority and support municipal implementation of source water protection plans, the Implementation Committee recommends that:

- Municipal land-use planning decisions be required to "be consistent with" source-water protection plans from the time the plans are approved by the province;
- At the time of regular comprehensive plan reviews, municipal official plans should be updated to include source-water protection plan data and policies and that the province work with municipalities to ensure a timely update of municipal official plans;
- Municipalities be given a source-water protection "sphere of jurisdiction" that includes by-law making powers to assist in the protection of drinking water sources, with authority to be provided through either the *Municipal Act* or proposed source water protection legislation; and
- The province consider the potential for conditional zoning to address source-water protection objectives.

Recommendation 22: A land securement program should be developed to meet source protection goals across watersheds. Such a program would be supported by:

- a review of all of the on-going acquisition and disposition programs; and
- a review of provincial and federal tax and land use incentives.

Recommendation 23: Where appropriate, and as a last resort, the provincial government should consider the use of expropriation in vulnerable areas where human health is at risk.

Recommendation 24: The provincial government should support the development and implementation of sector-specific best management practices (BMPs), including:

- Refining existing technical guidance or pollution prevention strategies to reflect source protection;
- As appropriate, developing new sector-specific technical guidance; and
- Supporting the development of an education and outreach strategy to support BMPs

Recommendation 25: The province should support continued scientific research and the development of technological advances, innovations and techniques (e.g. improved septic system technology, improved techniques for manure spreading, etc.) that will advance watershed source protection.

Recommendation 26: Education and outreach should be recognized as an essential component in the development and implementation of source protection plans.

Recommendation 27: Well abandonment programs should be available to all private landowners.

Recommendation 28: The provincial government should:

- require permits to construct new wells, and those permits should be made conditional on the proper decommissioning of any abandoned wells or wells to be abandoned on the property. Permitting could be linked with permitting and inspection of septic systems, and/or when a property is connected to municipal water infrastructure.
- develop decommissioning programs to identify, locate, inventory, prioritize and ensure proper abandonment of existing wells, including former ministry observation wells.
- explore mechanisms for enabling municipalities to require proponents to demonstrate they have located and decommissioned improperly abandoned wells as a condition in the development approval process.
- look for ways to enhance existing practices (e.g., legislative/regulatory mechanisms) that could provide for better enforcement with regard to existing well requirements.

Recommendation 29: The provincial government should:

- expand training for well decommissioning activities; and
- expand the eligibility of licensing for well decommissioning activities to those who have the necessary training in proper well decommissioning.

Recommendation 30: The provincial government should review existing requirements under Regulation 903 to ensure consistency with source protection objectives.

Recommendation 31: The provincial government should develop and distribute: Education materials to owners to describe proper well operation and decommissioning practices; and Guidance materials to licensed contractors to describe proper well operation and decommissioning practices.

Recommendation 32: The provincial government should consider consolidating the approach to governance of subsurface, well-related industries between the *Environmental Protection Act*, the *Assessment Act*, the *Oil, Gas and Salt Resources Act* and the *Mining Act* to allow for a coordinated approach to source water protection.

Recommendation 33: In order to ensure consistency with source protection, the petroleum resources program should provide for field inspection and enforcement for current industry activities to ensure compliance with construction and maintenance standards for wells and facilities, as well as regulatory requirements for decommissioning. Resources should be made available for the petroleum resource program where required.

Recommendation 34: There should be amendments to the *Oil, Gas and Salt Resources Act* to mitigate the risk of abandonment of authorized activities without proper decommissioning. This could be accomplished by increasing financial assurance requirements for authorized activities and increasing penalties for suspending wells and works.

Recommendation 35: Regulation 341 exemptions, under the *Environmental Protection Act*, of oil field fluids from regulation as designated waste should be limited to their injection into underground formations regulated under the *Oil, Gas and Salt Resources Act*.

Recommendation 36: A comprehensive abandoned oil and gas well program should be created. It should include adequate provincial funding, staffing and legislative support, as well as financial incentives for private landowners to report, maintain and decommission abandoned wells.

Recommendation 37: The provincial government should explore mechanisms for enabling municipalities to require proponents to demonstrate they have located and decommissioned abandoned wells, and/or undertaken other necessary remedies, as a condition of the development approval process.

Recommendation 38: There should be amendments to, or the creation of, legislation under the *Oil, Gas and Salt Resources Act* to address abandoned wells/works on private lands.

Recommendation 39: Source protection plans should provide a prioritization for plugging abandoned oil and gas wells that includes local information such as drinking water intakes, high quality aquifers, etc. Source protection criteria should be included in developing criteria for the program priorities.

Recommendation 40: The provincial government should take action to ensure that activities related to aggregate extraction minimize risks to source water, including:

- designation under the ARA of significant aggregate resource areas on private land in Ontario that are currently not designated;
- development of standards/processes on the use of inert fill for rehabilitation purposes;
- review of the application requirements (i.e. Hydrogeological report) for all new applications and site plan amendments to ensure all categories have the necessary information;
- require that the Hydrogeological report include a statement regarding the effects, if any, the proposal may have on water storage from the removal of the aggregate material;
- investigate and where appropriate, use existing approval mechanisms (such as site plan amendment) to mitigate any identified significant impacts to source water resulting from extraction operations;
- request that TOARC include source protection as one of their selection criteria for the rehabilitation of abandoned pit and quarry sites; and
- ensuring that source water impacts identified within an existing aggregate operation not regulated under the ARA be investigated by the Ministry of the Environment.

Recommendation 41: Municipalities should ensure that all land use activities related to the post extraction rehabilitation of pits and quarries be consistent with the relevant approved source protection plan(s).

Recommendation 42: The provincial government should consider establishing a program to identify and assess the hazards from abandoned mines for source protection purposes.

Recommendation 43: For new, expanding and existing operations, the *Mining Act*, the *Environmental Protection Act*, the *Environmental Assessment Act*, and other legislative mechanisms should be reviewed and enhanced as necessary to address risks associated with mining operations identified by approved source protection plans.

Recommendation 44: If a significant risk to source water is identified within an existing mining operation, the Ministry of the Environment should, in consultation with the Ministry of Northern Development and Mines, investigate and, where appropriate, use its regulatory mechanisms to mitigate the impact.

Recommendation 45: The application of TSSA management approaches (e.g., inspection and updating requirements) should be extended to apply to all fuel tanks. Information collected by TSSA should be made available for source protection purposes.

Recommendation 46: For non-fuel chemicals, storage tanks should be regulated according to the level of risk to WHPA, IPZ, and VA.

Recommendation 47: The provincial government should review and consider establishing standards for the transportation and storage of petroleum fuels, solvents (petroleum, chlorinated), and inorganic fertilizers in WHPA, IPZ and VA.

Recommendation 48: The provincial government should support recent federal initiatives to establish regulations covering federal lands regarding the storage and use of petroleum products and other chemicals.

Recommendation 49: The provincial government should work with stakeholders to determine what requirements must be adopted when using, handling and storing chemicals in vulnerable areas, to ensure consistency with source protection. Approaches could include: voluntary best management practices; financial incentives; formal agreements; and/or mandatory measures such as regulations and municipal by-laws.

Recommendation 50: The provincial government should work with municipalities, and commercial and industrial partners to:

- identify SMEs that are most likely to pose a threat or significant risk to a source of drinking water and are most pervasive across the province; and
- develop appropriate management tools and measures to reduce the risk from these sectors including Best Management Practices, incentives, compliance assistance programs and appropriate education and outreach.

Recommendation 51: The provincial pesticide program (e.g., training courses and public educational material) should be reviewed and where necessary strengthened in the context of source protection objectives. Areas of focus should include:

- Continued development and verification of best management practices to minimize risks associated with the storage, handling and application of pesticides in Wellhead Protection Areas, Intake Protection Zones and other Vulnerable areas; and
- Development of programs to encourage reduced reliance on pesticides.

Recommendation 52: The provincial government should review existing monitoring programs to ensure the systems are robust and include high-risk and new pesticides (and their breakdown products).

Recommendation 53: The provincial government should prioritize inspections and enforcement of the *Ontario Pesticides Act* and Regulation 914 in high risk areas as identified by approved source protection plans.

Recommendation 54: The provincial government should review the *Ontario Pesticides Act* and Regulation 914 to determine if appropriate pesticide storage requirements exist in the context of source protection objectives.

Recommendation 55: The Ontario Pesticides Advisory Committee should be directed to review standards for storage of certain pesticide schedules in wellhead protection areas, intake protection zones and vulnerable areas.

Recommendation 56: The provincial government should encourage the use of standard and scientifically defensible requirements for municipal pesticides by-laws, including an exemption for agricultural use and forestry use. The province should seek input from the Ontario Pesticide Advisory Committee, medical officers of health, municipalities, and other key stakeholders.

Recommendation 57: The provincial government should establish additional requirements related to the sale of pesticides for home use, and consider introducing training for vendors of certain home-use products.

Recommendation 58: The provincial government should work with the federal government to expedite the:

- re-evaluation of currently registered pesticides to ensure that labels indicate the precautions for use if surface and groundwater contamination is identified as a concern;
- evaluation of new products for registration, including those of reduced risk; and
- approval of minor use pesticides.

Recommendation 59: The provincial government should ensure the necessary authorities are available to Source protection committees to identify known and potentially contaminated sites that could pose a threat to drinking water sources.

Recommendation 60: The provincial government should review the “order powers” provisions of the *Environmental Protection Act* to ensure they are available in the context of potential threats to drinking water sources as identified by the Source protection committees.

Recommendation 61: Where a source protection plan identifies a contaminated property that poses a significant risk to source water, the property should be redeveloped or remediated to reduce or eliminate the risk. The responsibility for that remediation or redevelopment is the responsibility of the property owner, or other party(ies) as proposed in the source protection plan.

Recommendation 62: Civil liability provisions pertaining to the brownfields program should be reviewed to ensure that there are no barriers to redevelopment or remediation for source protection purposes.

Recommendation 63: The Record of Site Condition Regulation (Reg. 153/04) should be amended to ensure that its provisions are consistent with source water protection plans made for the protection of potable water in wellhead protection areas, intake protection zones, and vulnerable areas.

Recommendation 64: The provincial government should review its contaminated sites program to address community involvement in the clean up of contaminated sites and to address community-wide contamination.

Recommendation 65: Approvals for new and expanding landfill and waste disposal facilities should be consistent with approved source protection plans.

Recommendation 66: The provincial government should ensure that the necessary authorities exist so that existing landfill and waste disposal facilities are required to be operated in a manner consistent with approved source protection plans.

Recommendation 67: In the case of non-approved, closed landfill sites, the provincial government should review existing powers (e.g., order powers investigation, monitoring, remediation) to ensure they can be used to address risks as identified in approved source protection plans.

Recommendation 68: The province should ensure that educational materials are provided to generators, carriers and handlers of hazardous and liquid industrial waste that emphasize the importance of proper handling and storage, particularly in high risk areas identified by approved source protection plans.

Recommendation 69: The provincial government should, where necessary, revise existing or provide additional biosolids management standards to align them with source protection objectives and to address issues related to vulnerable areas of the watershed. In particular, the province should:

- Review standards for storage and land application of biosolids as they apply to vulnerable areas including wellhead protection areas, intake protection zones and other vulnerable areas, and make any necessary modifications;
- Ensure that the standards include provincially uniform outcomes in order to ensure consistency across the province; and
- Coordinate and integrate nutrient management planning and source protection planning as much as possible.

Recommendation 70: Any future authorization or approval system for land application of biosolids and/or treated septage should include linkages to the *Nutrient Management Act, 2002*, and/or Farm Water Protection Plans, and should be consistent with the relevant approved source protection plan(s).

Recommendation 71: The provincial government should proceed expeditiously with the proposal to ban the land application of untreated septage, and with the development of standards for the land application of treated septage.

Recommendation 72: The provincial government should provide incentives and financial assistance for septage treatment costs, including addressing upgrade costs of municipal sewage treatment improvements to deal with septage and to establish appropriate financial contribution by those with responsibilities for septage (e.g. private landowners).

Recommendation 73: The requirements under the source protection legislation and the *Nutrient Management Act, 2002*, should be harmonized to ensure consistency and appropriate and co-coordinated phase-in with applicable Nutrient Management Regulations.

Recommendation 74: The provincial government should, where necessary, revise existing or provide additional nutrient management standards to address source protection and issues related to vulnerable areas of the watershed, including wellhead protection zones, intake protection zones and other vulnerable areas. In particular, the province should:

- Review standards for manure application and storage as they apply to vulnerable areas and make any necessary modifications;
- Assess the need for standards for commercial fertilizer application and storage in vulnerable areas;
- Ensure that the standards include provincially uniform outcomes in order to ensure consistency across the province;
- Ensure that Nutrient Management Plans are consistent with source protection objectives.

The review of these standards should include drinking water source protection and human health objectives.

Recommendation 75: Manure storage and land application activities in vulnerable areas should abide by applicable provincial standards and approved source protection plans.

Recommendation 76: OMAF and MOE should continue to develop and consult with key stakeholders on a planning framework for Farm Water Protection Plans (FWPP) for large farms and farms in vulnerable areas.

Recommendation 77: The provincial government should examine the implications and impacts of the number of farms and commodity groups potentially affected by Farm Water Protection Plan requirements. This would allow for informed decision-making with regard to the scope of regulatory requirements, cost sharing and associated programs that may be required. The province should also investigate policy issues and costs related to interim measures that farms may have to address in terms of immediate health risks identified in source protection assessment reports.

Recommendation 78: There should be coordination and integration of nutrient management and source protection planning/assessment and farm water protection programs, so to ensure that there is no unnecessary duplication. This should result in the streamlining of any planning processes and approvals requirements.

Recommendation 79: An education and outreach strategy should be developed to communicate Farm Water Protection Plan program objectives and the results of implementing the program.

Recommendation 80: Progress on implementation of Farm Water Protection Plans should be monitored and communicated to the SPBs.

Recommendation 81: Provincial legislation should authorize septic re-inspections of small on-site septic systems.

Recommendation 82: For larger septic systems, the Ministry of the Environment should revise its re-inspection protocols to target vulnerable areas.

Recommendation 83: Provincial legislation should provide clear authority to the septic approval authority to restrict the construction or modification of new or additional septic systems in specified vulnerable areas.

Recommendation 84: Salt management plans should be required by MTO, the relevant municipality, and private contractors that are consistent with the approved source protection plan for the watershed.

Recommendation 85: Municipal contracts for salt application should include provisions such as adherence to the federal code of practice or other applicable codes or requirements.

Recommendation 86: Salt management considerations in the source protection plan should include provisions regarding areas in the watershed that are precluded from placement of cleared snow.

Recommendation 87: Approvals and decisions regarding new road siting and construction should include consideration of chlorides and other road-carried contaminants with respect to source protection issues.

Recommendation 88: For new or expanding cemeteries, the *Cemeteries Act* should be amended to include a provision requiring an evaluation of the likelihood of contaminants from the cemetery flowing into surface water or groundwater.

Recommendation 89: The Guidelines for Reviewing Proposed Cemetery Sites Relative to Impact on Ground Water should be reviewed and kept current to account for protection of source water, with reference to currently available materials.

Recommendation 90: Monitoring should be undertaken by the owners of existing cemeteries located in wellhead protection areas, intake protection zones and other vulnerable areas. The monitoring should cover parameters specified by the province and the province should assist in this monitoring.

Recommendation 91: The provincial government should ensure that appropriate order powers are available in case of an issue involving protection of source water from contaminants emanating from a cemetery.

Recommendation 92: Municipalities should address source protection objectives in the design and implementation of storm water management processes and facilities.

Recommendation 93: The provincial government should undertake studies to better assess possible migration of pathogens and soluble contaminants through storm water management facilities, practices to improve design of the facilities, and practices to minimize their impact on sources of drinking water.

Recommendation 94: Provincial approval of infiltration systems should consider potential risks in groundwater wellhead protection areas, recharge areas or vulnerable areas. Provincial approval of storm water system discharges should consider separation distances from surface water intake zones.

Recommendation 95: The provincial government should provide for various mechanisms to deal with storm water (e.g. green roofs, roof top collection), provided that tools are available to the relevant local agencies to ensure long term operation and maintenance of such systems.

Recommendation 96: Where relevant for source protection purposes, municipalities should be provided with the authority to:

- inspect and enforce requirements for private storm water measures post-development;
- require retrofits, upgrades or the addition of storm water management measures to existing, expanding or intensifying development, including development on private lands;
- manage external changes or improvements to property that are related to storm water management (e.g. on lot controls).

Recommendation 97: The provincial government should promote the use of shared storm water collection systems that serve multiple properties. Capital costs, on-going operation and maintenance costs for retrofits could be supported by a user pay system.

Recommendation 98: The standards and requirements for the approval of storm water management systems should be continuously improved and enhanced as new information, research and techniques become available, to ensure that source protection objectives are met.

Recommendation 99: The Implementation Committee recommends that:

- the Province develop a regulation for municipal sewage treatment plant discharges to ensure clarity, consistency and enforceability;
- the Province provide adequate funding for upgrading the remaining primary level Sewage Treatment Plants;
- the Province require an enhanced minimum level of treatment for Combined Sewer Overflows, particularly those in intake protection zones;
- existing powers to enact Sewer Use by-laws be used by municipalities for source protection purposes and that the province develop a model source protection sewer use by-law; and
- analysis and repair of underground sewage and stormwater pipes should focus on vulnerable areas.

Recommendation 100: Source protection plan assessments should include consideration of the links between cumulative threats and associated land and water uses. The plans should also provide for relevant measures to address those threats on a watershed scale.

Recommendation 101: Cumulative loading that jeopardizes source water protection objectives should be addressed through regulatory and approval mechanisms for sectors that emit contaminants to source waters, air or land.

Recommendation 102: The provincial government should:

- ensure that source protection plans include measures to track long term trends with respect to cumulative loading issues;
- support research into, and the development of strategies, programs, practices and technologies to address cumulative loading issues;
- continue to explore various incentive-based methods as a way to address cumulative loading in specific circumstances.

Recommendation 103: The legislation, policy and protocols associated with land drainage activities in agricultural and urban and urbanizing areas should be reviewed and, if necessary, amended to ensure that drainage activities are consistent with approved source protection plans.

Recommendation 104: As part of the source protection planning process, the provincial government should require that water budgets be developed to govern long-term sustainable use of water for all watersheds in the province. Source waters in northern areas may not be under the same pressures as southern parts of the province. The detail of water budgets should be tailored to the intensity of water use in the watershed.

Recommendation 105: Accurate information on water use will be a critical component in developing useful water budgets and in managing water quantity; therefore the provincial government should phase in mandatory water use monitoring and reporting (e.g. as a permit condition) on an annual basis to meet the needs for accurate water budgets. The requirements for more detailed monitoring may vary depending on local watershed conditions.

Recommendation 106: In the preparation of water budgets, the provincial government should establish a mechanism to obtain information on return flow tracking (quantity and quality), and this information should be closely linked to water taking data.

Recommendation 107: The provincial government should examine how best to promote and prioritize water use and conservation for both permitted takings, as well as for takings where a permit is not required.

Recommendation 108: The provincial government should issue water taking permits consistent with the approved source protection plan. The onus for demonstrating consistency with the approved plan should rest with the proponent who is seeking the permit.

Recommendation 109: The provincial government should make available water quantity data for the purposes of transparency and openness, while recognizing the reasonable rights of water users to proprietary protection. The province should undertake measures to produce this data in a useable form to all Source protection committees.

Recommendation 110: The Ministry should consider improvements to the Permit to Take Water program, which include:

- developing clear service standards for Permit to Take Water applications;
- using previously submitted information in the consideration of permit renewals to avoid duplication and redundancy;
- examining opportunities to harmonize processes for PTTW with other environmental and water-related approvals while maintaining environmental standards;
- considering delegating the authority for certain types of permit renewals, particularly when the content of the permit is unchanged, or when any changes are relatively minor.

Recommendation 111: The provincial government should ensure that a mechanism exists to facilitate water use allocation decisions. Special consideration should be given to future water needs, together with appropriate conservation measures and within the context of a sustainable watershed plan.

Recommendation 112: The provincial government should assist various sectors (e.g. municipalities, agriculture, industry) in the development of water conservation toolkits, to aid in the protection of water quantity, and promote water conservation and water quantity restoration strategies.

Recommendation 113: The provincial government should examine opportunities and potential benefits to establishing further water-use efficiency standards by way of amendments to the *Ontario Building Code* where appropriate.

Recommendation 114: The development of cooperative, sectoral water conservation plans should be based on Ontario Low Water Response plans.

Recommendation 115: An integrated approach to managing potential threats associated with private water wells should be developed. This should include: enhanced education and outreach, comprehensive guidelines (including considerations for the siting of new wells) and identifying opportunities within the watershed for efficient and effective source protection measures to be applied to private wells.

Recommendation 116: The ten guiding principles should be used in developing a strategy to fund source protection activities.

Recommendation 117: The provincial government should coordinate and publish an annual report on source water protection expenditures and projected costs, incorporating the activities of the province, conservation authorities, municipalities, and other bodies such as the federal government and First Nations.

Recommendation 118: Funding requirements for source protection should be assessed on a continuous basis. The provincial government should consider the ongoing costs related to plan development, implementation, monitoring and review and updating as source protection proceeds through its various stages.

Recommendation 119: The provincial government should fund the development of all initial watershed-based source protection plans sufficient for Ministerial approval, with funding to begin in the 2004/05 fiscal year.

Recommendation 120: The provincial government, in cooperation with other levels of government and water users, should establish a sustainable, secure and long-term funding program to adequately support both capital and operating expenditures over a multi-year period related to ongoing source protection plan implementation, monitoring, review and updating.

Recommendation 121: Any funding program established needs to give consideration to:

- Differences in ability-to-pay, including financial hardship cases;
- Assistance in areas with limited revenue generation capacity or in areas where additional work or effort is needed to implement source protection.

Recommendation 122: In examining how to match sources of funding with activities funded, the Committee recommended some general concepts that could be considered for adoption:

- where funding is required for local, municipal level source protection activities (e.g. wellhead protection) it could be provided through municipal revenue sources;
- where funding is required for source protection implementation activities aimed at implementation activities of broader, provincial interest, it could be provided through provincial general revenue;
- where source protection activities have general benefits to users on a watershed scale (e.g. provincial agricultural programs), contributions could be made by all three levels of government- federal, provincial and municipal;

Recommendation 123: The province should help bring about the establishment of source protection trusts that could accommodate contributions from all levels of government, the private sector and non-governmental organizations to support source water protection. As well, the province should encourage non-governmental organizations to define how they will participate in supporting source protection planning and implementation.

Recommendation 124: The province should work with the federal government and First Nations to ensure adequate funding is made available to enable the full participation of First Nations in source protection planning and implementation.

Recommendation 125: Municipal councils should consider whether at least some portion of the municipal share of funding for source water protection should be recovered from municipal water and sewage rates.

Recommendation 126: The provincial government should proceed with the introduction of volume based water taking charges, with only limited exemptions permitted. Water taking charges should fund a portion of the costs of source protection implementation.

Recommendation 127: Pollution charges should be used to fund a portion of the costs of source protection.

Recommendation 128: Federal and provincial governments, municipalities, conservation authorities and other relevant groups should work together to ensure their incentive programs enhance and promote source protection and are coordinated, consistent, complementary, and accessible.

Recommendation 129: The provincial government should establish a system of cost-share incentives for Farm Water Protection Plans and projects. The program should be put in place early enough to allow sufficient lead time to ensure improvements can be made in an orderly and cost-effective manner.

Recommendation 130: The provincial government should work with the federal government to ensure the availability of federal funding to support Farm Water Protection Planning.

Recommendation 131: Municipalities should be given the authority to levy source protection charges on properties not connected to municipal sewer and water systems.

Recommendation 132: Incentive programs should be developed to assist private property owners and should include an education component.

Recommendation 133: The province should conduct a review of compensation options (how and where) for landowners where there are land use restrictions on their properties as a result of an approved SPP, to ensure a consistent approach can be taken across the province.

8.3 Glossary

Adverse effect: means any impairment, disruption, destruction or harmful alteration.

Aquifer: a saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients. Aquifers can be a few hectares to thousands of square kilometers in size.

Assimilative Capacity: Assimilative capacity establishes the maximum loading of a pollutant that a water body can receive without causing impairment.

Cumulative impact: any changes to hydrologic and hydrogeologic features and functions that are influenced by multiple or successive land use, site alteration or contamination activities over the long term.

Discharge: in a stream, the volume of water passing through a channel in a given time; in the groundwater context, the term refers to water which exits an aquifer to become surface water.

Drinking Water Source: any surface or ground water body that does or could be used as a source of water for human consumption subsequent to reasonable water treatment

Ecological/Indigenous Knowledge: is the body of knowledge associated with the long-term occupation of certain places, and refers to traditional norms and social values that regulate a people's way of living. It is a complete knowledge system with its own concepts of epistemology, philosophy, and scientific/logical validity. It has great value in understanding species, ecosystems, sustainable management, and conservation.

Erosion: process whereby the materials are loosened, dissolved, or worn away.

Groundwater: Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Groundwater recharge: means the replenishment of subsurface water,
(a) resulting from natural processes, such as the infiltration of rainfall and snowmelt and the seepage of surface water from lakes, streams and wetlands, and
(b) resulting from human intervention, such as the use of stormwater management systems that specifically direct water into the subsurface (artificial recharge).

Hydrological cycle: means the circulation of water from the atmosphere to the earth and back through precipitation, runoff, infiltration, groundwater flow and evapotranspiration, including the occurrence, circulation, distribution, and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things.

Hydrological features: means,
(a) permanent and intermittent streams,

- (b) wetlands,
- (c) kettle lakes and their surface catchment areas,
- (d) seepage areas and springs, and
- (e) aquifers and recharge areas.

Impact: The result of a land activity, contaminant, etc. on a drinking water source.

Multi-barrier: A multi-barrier approach minimizes the risk of contamination as a result of the failure of any one barrier. As the first link in the chain, source protection

“keeps the raw water as clean as possible to lower the risk that contaminants will get through or overwhelm the treatment system.”

— Part Two Report of the Walkerton Inquiry, p. 73

Protecting raw water sources must be an integral part of any system to ensure the safety of drinking water in Ontario.

Non-point source: pollution source originating over broad areas, such as areas of fertilizer and pesticide application and leaking sewer systems, rather than from discrete points.

Pathogens: an agent that causes disease.

Point source: a stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution; e.g. a pipe, ditch, ship, ore pit, factory smokestack.

Potability: refers to the level to which water is potable, or safe for human consumption.

Protection Area Delineation: uses scientific models and analysis to set out drinking water protection areas.

Risk: The combined probability that a path exists for a threat to be delivered to a source or drinking water, and the probability that it will be delivered.

Rural Water Quality Programs: co-funded by province, federal government, and municipalities, rural water quality programs (RWQP) are voluntary, and provide financial assistance to farmers to implement water quality Best Management Practices. Participating farmers are required to have completed Ontario Environmental Farm Plans.

Sedimentation: the process of settling and deposition of suspended matter in the bottom of a water body.

Source Protection Board (SPB): will be formed by the board of Director of the conservation authority (where there is a CA in existence), and will be designated by the Minister in areas where there are no conservation authorities. SPBs coordinate the submission to, and approval of source protection plans by the Minister.

Source Protection Committee (SPC): is a local multi-stakeholder committee, comprised of no more than 16 members, established by SPBs (members could include representatives from

conservation authorities, municipalities, First Nations, agriculture, the public, NGOs, health units, and industry). SPC are responsible for the development of source protection plans.

Stakeholder: for the purposes of this report, stakeholder refers to any groups and/or organizations involved in or having an interest in the planning and implementation of source protection plans. This includes, but is not limited to: the provincial government, federal government, First Nations, municipalities, conservation authorities, agricultural groups, NGOs, industry, and members of the public.

Sustainable: when used with respect to a natural resource, means that the natural resource is able to support a particular use or activity without being adversely affected.

Threat: The presence of any land use, contaminant, pathogen etc. that has the capacity to degrade present or future drinking water sources should it be delivered to the drinking water source.

Time of travel: means the time that is needed for groundwater to travel a specified horizontal distance in the saturated zone.

Topography: three-dimensional graphic representation of the elevations or inequalities of the Earth's surface.

Waste transfer station: a waste disposal site used for the purpose of transferring waste from one vehicle to another for transportation to another waste disposal site. This would include Household Hazardous Waste Facilities. Waste transfer stations are subject to Section 27 and 32 of the EPA.

Water budget: a water budget reflects the relationship between input and output of water through a region. Requires information on land cover, precipitation, temperature, geology, soils, etc.

Water table: in an unconfined aquifer it is the level to which water will rise in an open well.

Watershed: means an area that is drained by a river and its tributaries.

Watershed-based source protection: specifically targets drinking water protection, on a watershed basis. Prevents specific contaminants from entering drinking water sources. Protecting water quality and quantity by restricting land use, development and/or site alteration, and/or mitigating the adverse effects associated with these activities, within areas that are critical to drinking water.

Watershed Characterization: is the first set of actions in source protection planning, and includes completion of a watershed description, development of water budgets, and “protection area” delineations.

Watershed description: is a compilation of available background information (e.g. physical characteristics, population distribution, land uses) to provide context for source protection planning.

Wellhead protection area: means the surface and subsurface area surrounding a water well or well field that supplies a public water system and through which contaminants are reasonably likely to move so as eventually to reach the water well or well field.

Wetland: means land such as a swamp, marsh, bog or fen (not including land that is being used for agricultural purposes and no longer exhibits wetland characteristics) that,

- (a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface,
- (b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants, and
- (c) has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.

8.4 Initiatives Related to Source Protection

Ecological Land Acquisition Program

The goal of the Ecological Land Acquisition Program (ELAP) is to enhance public ownership and stewardship of natural areas across Ontario.

ELAP is a cohesive and integrated program that provides a coordinated approach to the acquisition of private lands for natural areas protection and recreational purposes. The program incorporates land acquisition and stewardship activities through Eastern Habitat Joint Venture (EHJV), Ontario Parks Legacy component, and the provincial component (focusing on Southern Ontario). The priorities for the three components include:

- Protect provincially significant natural features (e.g. ANSI, Wetland, species habitat, etc.)
- Protect biodiversity, ground water source protection, etc.
- Secure areas of high public use and recreational opportunities (e.g. Bruce Trail, Oak Ridges Trail, etc.)
- Protect waterfront and other riparian areas
- Improve air quality impacts/Carbon sequestering potential, e.g. reforestation opportunities
- Contribute to the completion of the parks and protected areas system
- Protect and restore wetland and associated upland habitat for waterfowl
- Support ecological integrity and connectivity in areas of provincial interest

<http://www.mnr.gov.on.ca/MNR/elap/>

Conservation Land Tax Incentive Program

The Ministry of Natural Resources encourages the protection of important natural heritage features occurring on private lands through the Conservation Land Tax Incentive Program. Established in 1988, the program provides tax relief to landowners who agree to maintain their property as conservation land, refraining from any activities that would degrade, destroy or result in the loss of those features identified. This program complements more recent initiatives by offering a protection incentive to landowners of ecologically significant areas, such as those recognized in the proposed Greenbelt legislation and for source water protection.

<http://www.mnr.gov.on.ca/MNR/cltip/>

Managed Forest Tax Incentive Program

The objective of the Managed Forest Tax Incentive Program (MFTIP) is to value forest land according to its current use and encourage stewardship. The program encourages forest stewardship by providing lower property taxes to participating landowners who agree to conserve and manage their forests. To be eligible for the program, the property must have at least four hectares of forest, be owned by a Canadian citizen and have an approved Managed Forest Plan. Landowners who apply and qualify, have their property classified in the Managed Forest (MF) property class, as set out under the Assessment Act and taxed at 25% of the rate

applied to residential properties. The program has grown to include over 10,000 properties with over 700,000 ha (1.75 million acres).

<http://ontariosforests.mnr.gov.on.ca/mftip.cfm>

Long-term Water and Wastewater Strategy

The Government of Ontario is developing a long-term water and wastewater infrastructure investment and financing strategy to address capital investment in our water systems in order to ensure that our drinking water remains clean and safe. On August 16, 2004, the government announced the creation of an Expert Panel to review all aspects of investment, financing, pricing, organization and governance of the Province's water and wastewater systems. The Expert Panel is to advise on how to make the investment needed to improve Ontario's water and wastewater infrastructure and on how best to organize and deliver water and wastewater services. The Panel is expected to deliver its report to the government by winter 2005 with recommendations on Ontario's Long-term Water and Wastewater Strategy.

http://www.pir.gov.on.ca/userfiles/HTML/cma_4_35488_1.html

Nutrient Management Act

The Government of Ontario (Environment) passed the Nutrient Management Act in June, 2002. The Act sets out standards for the management of nutrients including manure, biosolids, fertilizers and other prescribed materials by new livestock farms and expanding large livestock farms starting September 30, 2003. Existing large livestock farms and municipal sewage treatment plants will be phased in over time.

Under this act, farms must develop nutrient management plans to deal with animal waste and other substances that are kept on farm properties or spread on fields in order to prevent contamination of lakes, streams and groundwater. It is anticipated that nutrient management plans, as required under the Nutrient Management Regulation (O. Reg. 267/03) will eventually form part of the broader farm water protection plan framework envisioned by Justice O'Connor.

http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/02n04_e.htm

Proposed Greenbelt Act (Bill 135) and Draft Greenbelt Plan

The Government of Ontario (Municipal Affairs and Housing) introduced Bill 135, the Proposed Greenbelt Act on October 28, 2004. Bill 135, if passed, would provide the legislative authority to establish a Greenbelt Area of approximately 1 million acres in the Golden Horseshoe as well as the authority to establish a Greenbelt Plan. The draft Greenbelt Plan currently out for public consultation during November and December, 2004, proposes mapping and policies to provide permanent protection for a system of agricultural and environmentally sensitive lands in the Golden Horseshoe while also supporting existing rural settlements and providing opportunities for recreation in non-sensitive areas.

<http://204.40.253.254/envregistry/024050ep.htm>

http://www.mah.gov.on.ca/userfiles/HTML/nts_1_22087_1.html

Agricultural Advisory Team

The Agricultural Advisory Team, recommended by the Greenbelt Task Force, was appointed in June 2004 to provide advice on how to "ensure that Ontario's growth management strategy addresses the concerns of agricultural stakeholders." They held 11 stakeholder meetings throughout the province and written submissions from stakeholders and the public. They sought input on a variety of land use and planning issues from farmers and technical experts, including:

- land use planning policies that affect farm viability
- the Farm and Food Production Protection Act and Minimum Distance Separation formulae
- the identification of areas of prime agricultural land
- the role of non-government land trusts and other organizations

Their advice was submitted to the government in October 2004.

<http://www.gov.on.ca/OMAFRA/english/aat/>

Proposed Places to Grow Act

On October 28, 2004, the Government of Ontario introduced legislation to put in place the legal framework necessary for the government to designate a geographic area of the province as a growth plan area and subsequently to develop a growth plan for that area. Growth plans would identify where and how that area should grow over the next 30 years and beyond, determine the infrastructure needed to support that growth, including the public transit and road networks and what green spaces, natural resources and systems, and agricultural lands should be protected. On July 12, 2004, the Minister of Public Infrastructure Renewal released a discussion paper on the Ontario government's plan for growth and economic expansion in the Greater Golden Horseshoe (GGH). The proposed Places to Grow Act would, if passed, give the growth plan for the Greater Golden Horseshoe legal status.

http://www.pir.gov.on.ca/userfiles/HTML/cma_4_36567_1.html

Oak Ridges Moraine Conservation Act 2001/Oak Ridges Moraine Conservation Plan

The Oak Ridges Moraine Conservation Act, 2001 came into effect on December 14, 2001 and it sets out the legislative framework for establishment of the Oak Ridges Moraine Conservation Plan. The Conservation Plan provides policy direction for land use and resource management for the 190,000 hectares of land and water resources within the moraine. The Conservation Plan is implemented through the existing land use planning process under the *Planning Act* and all planning decisions must conform to it. Municipalities are also required to bring their official plans and zoning by-laws into conformity with the Conservation Plan.

http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/01o31_e.htm

http://www.mah.gov.on.ca/userfiles/HTML/nts_1_6846_1.html

Five and Ten Year Infrastructure Plan

Building a better tomorrow: an infrastructure planning, financing and procurement framework for Ontario's public sector: the new framework, released publicly in July 2004, was developed after consultations with the public and stakeholders, and contains

guidelines that will be used to assess proposals for new infrastructure, select the best way to finance the project and make sure construction is completed on time and on budget.

http://www.pir.gov.on.ca/userfiles/HTML/cma_4_35848_1.html

Provincial Policy Statement (PPS)

The Provincial Policy Statement sets out overall policy directions on matters of provincial interest related to land-use planning and development. The *Planning Act* currently requires that municipalities, provincial ministries, the Ontario Municipal Board and other decision-makers "have regard" to the Provincial Policy Statement when making decisions on land-use planning matters. This means that a decision-maker is obliged to consider the application of a specific policy statement when carrying out its planning responsibility. It is expected that decision-makers will implement policy statements in the context of other planning objectives and local circumstances. They should be prepared to demonstrate why specific provisions in the policy statements are not applicable, or are applicable to a lesser degree. The Provincial Policy Statement, which is issued under the authority of section 3 of the *Planning Act*, came into effect in May 1996.

Five-Year Review of PPS: In accordance with Section 3 of the *Planning Act*, the policies of the PPS must be reviewed every five years. Thus, the Government of Ontario (Municipal Affairs and Housing) is undertaking a review of its land-use planning policies contained in the Provincial Policy Statement to make sure that the province's land-use planning policies are effectively protecting Ontario's interests and to determine whether any changes need to be made to the policies.

The five-year review included consultation with interested stakeholders across Ontario, in summer/fall 2001 and 2002 and the summer of 2004. Public comments on planning reform initiatives, which includes a draft PPS were accepted until August 31, 2004.

http://www.mah.gov.on.ca/userfiles/HTML/nts_1_8198_1.html

Strong Communities (Planning Amendment) Act:

On November 30, 2004, the *Strong Communities (Planning Amendment) Act* was enacted. The Act amends the *Planning Act* in two ways that could support drinking water source protection. First, municipalities will be able to refuse applications that would expand urban boundaries; applicants would not be permitted to appeal the decision to the Ontario Municipal Board. Second, the Act changes the "have regard to" implementation standard for applying the Provincial Policy Statement to "shall be consistent with" the Provincial Policy Statement.

http://www.mah.gov.on.ca/userfiles/HTML/nts_1_22557_1.html#top

Safe Drinking Water Act, 2002 (SDWA)

On December 13, 2002, the Safe Drinking Water Act (Bill 195) received Royal Assent. The purpose of the Act is to protect human health through the control and regulation of drinking-water systems and drinking-water testing. In addition, the Act provides the legislative authority to implement 50 of the 93 recommendations from O'Connor's Part Two Report of the Walkerton Inquiry.

Key components of the *Safe Drinking Water Act, 2002* include:

- The authority to require mandatory licensing and accreditation of laboratories that perform drinking water testing;
- Requirements for the Minister to establish a standards advisory council and provide authority to set standards for drinking-water treatment, distribution, quality and testing;
- The authority to require the certification of all drinking-water operators;
- Requirements for an owner's license for municipal drinking-water system;
- Provisions to hold municipalities with oversight functions to a statutory standard of care; and
- The authority to strengthen compliance and enforcement provisions, including the creation of the new position of chief inspector.

http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/02s32_e.htm

Sustainable Water and Sewage Systems Act, 2002 (SWSSA)

The Sustainable Water and Sewage Systems Act, 2002 (SWSSA), once proclaimed, will require that municipalities calculate water and sewage rates based on the full cost of providing these services. The SWSSA will be proclaimed after regulations are developed that will provide the content details to municipalities for reports and plans required by the Act. The Ministry of the Environment is working in co-operation with the Ministry of Municipal Affairs and Housing and the Ministry of Public Infrastructure Renewal on the development of these regulations.

http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/02s29_e.htm

Rural Plan

The Ministry of Municipal Affairs and Housing (Rural Division) has established a rural plan framework for Ontario to support the building of strong rural communities, reflecting their diversity and uniqueness. It builds on the benefits of existing policies, programs and services and provide a co-ordinated approach across all provincial government ministries for developing new policies, programs and services to address the future needs of rural Ontario. The rural plan also articulates strategic actions for the government and key stakeholders.

http://www.mah.gov.on.ca/userfiles/HTML/nts_1_22405_1.html

The Great Lakes Charter Annex

The Great Lakes Charter Annex is a supplementary agreement to the Great Lakes Charter. The Annex was agreed to by the Great Lakes Governors (Ohio, Michigan, New York, Illinois, Indiana, Minnesota, Pennsylvania, and Wisconsin) and Premiers (Ontario and Québec) to reaffirm their commitment to the five broad principles set forth in the Great Lakes Charter. As well, the Annex reaffirms that the provisions of the Charter will continue in full force and effect, by developing an enhanced water management system that is simple, durable, efficient, retains and respects authority within the Basin, and, most importantly, protects, conserves, restores, and improves the Waters and Water-Dependent Natural Resources of the Great Lakes Basin.

http://www.mnr.gov.on.ca/mnr/ebr/gl_charter/Annex2001.pdf

8.5 Proposed Roles and Responsibilities Matrix

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
Source Protection Board (SPB) / Source Protection Committee (SPC) Establishment				
<p>SPCs will have a maximum of 15 members.</p>	<ul style="list-style-type: none"> Province will appoint Chair of the SPC Provincial government staff may sit ex-officio on SPC 	<ul style="list-style-type: none"> Municipalities will have representation on SPCs 	<ul style="list-style-type: none"> The SPB will be formed by the board of Directors of the conservation authority 	<ul style="list-style-type: none"> First Nations will have representation on SPCs Federal government may sit ex-officio on SPCs
Terms of Reference for Development of Source Protection Plans				
<p>The Source Protection Committee (SPC) coordinates the development of the ToR, with the help of working groups (i.e. CAs) and based on the requirements set by the Province.</p> <p>ToR includes (at minimum):</p> <ul style="list-style-type: none"> statement of reasons; description of boundaries; workplan for the watershed; description of studies/reports/ tech 	<ul style="list-style-type: none"> Prescribes requirements for ToR Participates in ToR preparation May make amendments to the ToR 	<ul style="list-style-type: none"> Participates in ToR preparation (through working groups, and SPC) Participates in the approval of the ToR, through Source Protection Board (SPB). 	<ul style="list-style-type: none"> Establishes coordinated workplan for assessment of the watershed Ensures workplan treats water resource as one piece where jurisdictions overlap May require negotiation Responsible for making the ToR available to the public. Approves the ToR (through the SPB) and submits to MOE for review 	<p>Federal government:</p> <ul style="list-style-type: none"> Participates in ToR preparation for Great Lakes basin and for watershed areas with federal lands and waterways Provides support for First Nation participation in conjunction with province. FN participates in ToR development (including consultations).

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
field work to be done and; • consultation plan.				
Assessment Report				
<p>The SPC develops the Assessment Report, with the help of working groups, based on requirements set by the Province.</p> <p>Assessment report will delineate vulnerable areas (wellhead, intake and other) and assess the threats and risks posed to drinking water in these areas in the watershed.</p> <p>Assessment work assigned and undertaken according to the workplan set out in the ToR.</p>	<ul style="list-style-type: none"> • Sets requirements for assessment of water resources and threats • Participates in assessment work in partnership with CAs and municipalities • Province can require the SPB to amend the Report • Province approves Assessment Report. 	<ul style="list-style-type: none"> • Responsible for Wellhead and Intake assessment work in partnership with CAs, province • Participates in Aquifer and Surface Water assessment work in partnership with CAs and province (municipalities could be given the first right to undertake components of assessment work for Aquifers and Surface Water). • Prepares Wellhead and Intake assessment information for input to assessment report • Supports preparation of Aquifer and Surface Water components of 	<ul style="list-style-type: none"> • Participates in Wellhead and Intake assessment work • Assists smaller municipalities with Wellhead and Intake assessment work • Coordinates and participates in Aquifer (focus on vulnerable areas) and Surface Water assessment; works in partnership with municipalities, province, federal government and private water suppliers. • Assists smaller municipalities with preparation of Wellhead and Intake information • SPB reviews Assessment Report for compliance-and submits 	<p>Federal government</p> <ul style="list-style-type: none"> • provides assessment information on federal lands and waterways • Work with province in supporting First Nation involvement in assessment development for FN lands • Work with the province and CAs in assembling assessment information on Great Lakes • Prepares assessment information re: FN and federal lands for input to Assessment Report

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
		Assessment Report by providing information and data	to province <ul style="list-style-type: none"> • SPB is responsible for making the Report available to the public. • SPB approves the Report and submits to province. 	
Plan Development				
<p>The Source Protection Committee (SPC) develops the Plan with the help of working groups (e.g. municipal sub-committee). SPC will Identify who is responsible for undertaking different component of source protection plans.</p> <p>The plan will identify management strategies for existing and future threats:</p> <ul style="list-style-type: none"> • mandatory for significant risks; • a choice of tools for less significant risks (may include voluntary and mandatory). 	<ul style="list-style-type: none"> • Establishes policy related to management strategies and ensures necessary tools are available to address threats (<i>i.e. legislation, regulation, guidelines</i>) • Policy could include standard restriction list in regulation (TEC to advise) • Participates in identification of management strategies for Aquifers (focus on Vulnerable Areas) and Surface Water in partnership with CAs, municipalities and federal government 	<ul style="list-style-type: none"> • Undertakes identification of management strategies for Wellhead and Intake Areas in partnership with CAs, and province • Participates in identification of management strategies for Aquifers (focus on Vulnerable Areas) and Surface Water in partnership with CAs, province and federal government 	<ul style="list-style-type: none"> • Assists smaller municipalities with identification of management strategies for Wellhead and Intake Areas • Coordinates identification of management strategies for Aquifers (focus on Vulnerable Areas) and Surface Water in partnership with municipalities, province and federal government • Coordinates/negotiates regional/watershed scale management activities as part of plan development • Coordinates 	Federal government: <ul style="list-style-type: none"> • Work with SPC where federal lands or waterways must be taken into account in developing a source protection plans, • Assist in plan development for Great Lakes basin partnership with CAs, municipalities and the province • Facilitates and supports with province First Nations capacity and participation in plan development;

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
			management strategies among municipalities • Coordinates administration and financial components of the exercise	
Plan Approval				
The SPC submits the plan to the SPB. The plan is subject to appeals (referred by appropriate body)	<ul style="list-style-type: none"> Province publishes the proposed plan on the EBR (and related materials) Approves/modifies the plan in whole or part (back through loop) 	<ul style="list-style-type: none"> Consider and comment on the plan (through council resolution) 	<ul style="list-style-type: none"> Responsible for making the plan available to the public Adopts the plan and recommends to province for approval Submits plan to MOE, along with any comments 	First Nations support sought Federal government concurrence sought and involvement approved
Plan Implementation – Future Threats				
Land Use	<ul style="list-style-type: none"> Sets standard land-use restriction list in regulation and/or threats assessment process to identify threats that may be best managed through land-use restrictions (e.g. new septic within 200 day time of travel) 	<ul style="list-style-type: none"> Implements land-use restrictions through official plans and zoning by-laws Restrictions likely to be confined to Wellhead, Intake, Vulnerable Areas Securement of sensitive lands and conservation 	<ul style="list-style-type: none"> Overall monitoring of implementation rests with CAs Assists smaller municipalities Purchase of sensitive lands/ conservation easements 	Federal government <ul style="list-style-type: none"> goal to achieve equivalent level of source water protection on federal lands provides incentives for land securement through ECOGIFTS program and stewardship activities.

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
	<ul style="list-style-type: none"> Provides incentives for land securement (e.g., MFTIP, CLTIP) 	<p>easements</p>		
<p>Regulation of New Uses (i.e., new uses allowed with conditions)</p>	<ul style="list-style-type: none"> Issues new or amended Certificates of Approval consistent with source protection plan 	<ul style="list-style-type: none"> Applies structural or operational conditions (within confines of local authority) on new uses located in Wellhead, Intake Areas and Vulnerable Areas 		<p>Federal government will aim to have new land uses on federal lands be consistent with provincial restrictions</p>
<p>Plan Implementation – Existing Threats</p>				
<p>Overview of Approach to Existing Threats (known/unknown)</p>	<ul style="list-style-type: none"> Oversees implementation of management strategies for issues of broad provincial concern (e.g., sewage treatment, nutrient management, farm water protection plans) Provides funding assistance 	<ul style="list-style-type: none"> Implements local management strategies focusing on Wellhead, Intake Areas and Vulnerable Areas 	<ul style="list-style-type: none"> Implements Aquifer and Surface Water management strategies at the watershed level 	<p>Federal government:</p> <ul style="list-style-type: none"> oversee implementation of management strategies for federal lands and waters work with the province and others on management strategies for Great Lakes
<p>Regulation of Existing Threats</p>	<ul style="list-style-type: none"> Ensures adequate precautions are instituted for issues of broad provincial interest 	<ul style="list-style-type: none"> Applies structural or operational conditions (within confines of local authority to do so) on existing land 	<ul style="list-style-type: none"> Regulation under the <i>Conservation Authorities Act</i>. Small septic systems re- 	<ul style="list-style-type: none"> Regulations of existing threats on federal land may be done through federal legislation such as the <i>Fisheries Act</i>,

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
	<ul style="list-style-type: none"> ▶ Ensures C of A and regulatory requirements are consistent with source protection plans ▶ Enforces C of A requirements. ▶ Establish legislative and regulatory parameters for local small septic system reinspection. ▶ New inspection protocol for large septic systems regulated by MOE 	<p>uses focusing on Wellhead, Intake Areas and Vulnerable Areas</p> <p>Proposed Examples:</p> <ul style="list-style-type: none"> ▶ Small septic systems re-inspection where delegated ▶ New by-law making powers to regulate existing activities in vulnerable areas. 	<p>inspection where delegated</p>	<p><i>SARA, CEPA, National Parks Act, Migratory Bird Convention Act, etc.</i></p>
Removal of Existing Threats	<ul style="list-style-type: none"> • Provides funding assistance (e.g: <ul style="list-style-type: none"> ▶ abandoned well and well upgrade programs; ▶ brownfields clean-up funds (emergency and tax incentives); ▶ expansion of funding mechanisms (re: 	<ul style="list-style-type: none"> • Brownfield Community Improvement Plans (incentive programs) • Connection of septic to municipal system • Purchase of sensitive lands • Incentives for business relocation 	<ul style="list-style-type: none"> • Purchase of sensitive lands 	<ul style="list-style-type: none"> • Federal government will examine options for removing existing threats on federal lands • Work with the province to assists FN in removing existing threats from First Nation lands • Federal action on the recommendations of the NRTEE Brownfields

Proposed Areas of Responsibility	Provincial	Municipal: Upper Tier and/or Local	Conservation Authority / SPB / Health Units	Federal & First Nations
	<ul style="list-style-type: none"> relocation)). Establishes requirements for underground storage tank decommissioning or replacement. 			<ul style="list-style-type: none"> Task Force CMHC policy revision to allow mortgage insurance to housing projects on brownfield sites.
Mitigation of Existing Threats	<ul style="list-style-type: none"> Provide education and awareness materials - delivered at provincial, CA or municipal level Compliance and enforcement New/amended/modified Cs of A 	<ul style="list-style-type: none"> Road salt reduction programs Encourage voluntary stewardship and best management practices 	<ul style="list-style-type: none"> Deliver education and awareness programs at watershed level 	<ul style="list-style-type: none"> Federal government will examine options to assist FN to mitigate significant identified threats, Examine options to mitigate significant threats on federal lands
Monitoring as a Tool for Directly Managing a Threat	<ul style="list-style-type: none"> Provincial monitoring networks - surface water and groundwater quality & quantity Monitoring compliance with Cs of A, regulations, etc. 	<ul style="list-style-type: none"> Targeted monitoring of existing threats for contaminant migration (e.g., sentry monitoring) 	<ul style="list-style-type: none"> Targeted monitoring of existing threats at watershed scale 	<ul style="list-style-type: none"> Federal government assists FN with collection, monitoring and interpretation of data Federal government will provide relevant monitoring data to SPBs/CAs.
Plan Implementation – Water Quantity Management				
Water Quantity Management	<ul style="list-style-type: none"> Establishes Permits to Take Water (PTTW) 	<ul style="list-style-type: none"> Work with province, C.A.s to review and 	<ul style="list-style-type: none"> Develop and maintain water budgets 	<ul style="list-style-type: none"> Federal government: <ul style="list-style-type: none"> provide all agencies,

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	<p>policy (e.g. regulation, guidelines, policies)</p> <ul style="list-style-type: none"> • Issues PTTWs, ensures consistent with SPPs • Develops policy/ manages Low Water Response issues • Addresses water use interference issues • Provincial water conservation programs 	<p>comment on PTTW applications</p> <ul style="list-style-type: none"> • Municipal water conservation programs (e.g. lawn watering by-law, rain barrels, low-flow toilets, business and rural water programs, etc.) • Use of By-Laws to restrict water use/over-use • Work with CAs in developing water budgets (municipal water takings and future planning needs) • Participate in low water response programs 	<ul style="list-style-type: none"> • Review and comment on PTTW applications • Assists province in managing Low Water Response issues (e.g., local collaboration) • Assists with conservation management strategies • Design/implement flood management strategy 	<p>First Nations and SPCs with water quantity data from Ontario network stations</p>
Other General Implementation Tools				
Education	<ul style="list-style-type: none"> • Develops education & outreach materials (e.g., BMPs, pollution prevention) for delivery at watershed and municipal level • Develops education materials in other areas of broad provincial 	<ul style="list-style-type: none"> • Undertakes local education & outreach initiatives (e.g., notifies landowners in wellhead area) 	<ul style="list-style-type: none"> • Coordinates watershed scale education & outreach (O'Connor recommendation #8) • Health Units to play key role in education/outreach (working with private 	<ul style="list-style-type: none"> • Federal government provides community engagement & outreach to support local activities that reduce watershed impacts (e.g. relevant to Great Lakes) • Federal government may provide assistance

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	<p>interest (e.g., agriculture, cottagers, private well management)</p>		<p>landowners</p>	<p>related to education & outreach, business incentive programs, Farm Water Protection Plans.</p> <ul style="list-style-type: none"> • Working with province, prepare and make available outreach materials to federal departments that will have role in source protection • Work with province to ensure public education & outreach available to FN
<p>Data Management</p>	<ul style="list-style-type: none"> • Maintains centralized data management systems • Provides data to CAs, municipalities and public (with appropriate confidentiality) 	<ul style="list-style-type: none"> • Manages/collects data for local drinking water system and raw water • Shares data with province, CAs, public, FN and federal government (with appropriate confidentiality) • Collection of data on existing small septic systems 	<ul style="list-style-type: none"> • Provides additional specialized watershed information and manages watershed data • Shares data with municipalities, province, federal government (with appropriate confidentiality) • Collection of data on existing small septic systems 	<ul style="list-style-type: none"> • Federal government will share relevant watershed data with all source protection partners.

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Monitoring as a Tool for Performance Measurement	<ul style="list-style-type: none"> Provincial monitoring networks - surface water and groundwater quality & quantity 	<ul style="list-style-type: none"> Critical source protection monitoring (e.g., sentry monitoring for wellhead) 	<ul style="list-style-type: none"> Operates monitoring networks in partnership with province and federal government Manages watershed scale monitoring programs 	<ul style="list-style-type: none"> Federal government will provides existing monitoring data from federal programs and work with province and First Nations on potential monitoring activities.
Enforcement	<ul style="list-style-type: none"> Enforces compliance with legislation & regulations and Cs of A. Amendments to the Building Code Act 1992 to support the reinspection of small septic systems 	<ul style="list-style-type: none"> Enforces local by-laws (e.g., sewer use) <i>Planning Act</i> provisions Local re-inspection of small septic systems 	<ul style="list-style-type: none"> Enforces <i>Conservation Authorities Act</i> regulations (e.g., flood plain, valley lands, wetlands) Local re-inspection of small septic systems 	<ul style="list-style-type: none"> Federal government enforces federal legislation (e.g., <i>Fisheries Act</i>, <i>Navigation Act</i>)
Infrastructure	<ul style="list-style-type: none"> Sets standards for infrastructure: sewage, drinking water, stormwater, financial plans (<i>Sustainable Water and Sewage Systems Act</i>) Funding assistance 	<ul style="list-style-type: none"> Provision of safe drinking water and sewage treatment, storm water management 	<ul style="list-style-type: none"> Manages CA flow control infrastructure (dams) 	<ul style="list-style-type: none"> Federal government provides funding assistance through various federal-provincial programs INAC will continue to provide capital funding for water and wastewater on First Nations lands.

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Program Integration	<ul style="list-style-type: none"> • Works with federal government to ensure integration/ coordination of source protection with other programs across departments, jurisdictions (e.g., integration with federal Great Lakes programs/ agreements- AOCs, Lamps etc.) • Ongoing integration with nutrient management 	<ul style="list-style-type: none"> • Integration/ coordination of municipal programs across watershed 	<ul style="list-style-type: none"> • Work to integrate with ecological initiatives, fisheries plans etc., to coordinate all programs to overall benefit of watershed 	<ul style="list-style-type: none"> • Federal government works with province, CAs and FN to ensure integration/ coordination of source protection with existing federal programs. •
Science and Technology	<ul style="list-style-type: none"> • Establishes permanent technical/scientific support available to CAs and municipalities • Establishes environmental standards, indicators and decision tools 	<ul style="list-style-type: none"> • Transferal of science from local studies (wellheads) to other municipalities via SPC and/or province 	<ul style="list-style-type: none"> • Technical advice to municipalities and province on watershed issues 	<ul style="list-style-type: none"> • Federal government provides expertise in the development of specific watershed targets, research agendas (e.g., climate change, agriculture, developing indicators, science networks and tools for decision making • Federal government supports development

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				of innovative technologies, to reduce point and non-point pollutants

8.6 Source Protection Planning Governance Structure

