

# **A SUSTAINABLE WATER STRATEGY FOR ONTARIO**

Prepared for

The Environmental Agenda for Ontario Project

*Brief No. 367*

*ISBN #1-894158-19-9*

By Paul McCulloch and Paul Muldoon

March 1999

## SUMMARY

### **Current Status**

Water is essential to both our health and economic well-being, as well as the health of all non-human species with which we share this earth. Ontario is fortunate to have an abundant supply of freshwater. However, our technologically advanced and industrialized society is jeopardizing this seemingly inexhaustible resource. Ontario's waters, especially those found within the Great Lakes Basin, are contaminated with numerous toxic chemicals, placing the health of humans and other species at risk. Other naturally occurring substances are found at such high levels that they too impair water quality. Local water shortages require water to be piped or shipped over great distances, using valuable energy and expensive infrastructure in the process. Proposals have been put forward to divert massive quantities of water from Ontario to other thirsty jurisdictions with little or no regard to the potential negative long term impacts. This state of affairs is not sustainable. Eventually, the costs to future generations who will be saddled with contaminated and degraded waters will far outweigh the smaller cost of taking action now to utilize our water resources wisely.

### **Causes of the Problems**

Ontario's waters have historically been used on a first-come, first serve basis, resulting in numerous conflicts among its various uses. The ecosystem and life supporting functions of water have not been given any special consideration in resolving these conflicts and often come up on the short end of the stick. Although some measures have been taken over the past twenty years to manage water, they have generally been designed only to reduce or sometimes minimize the adverse impact upon water as opposed to providing full protection. There is no commitment to the principle that there must always be adequate quantities of clean water available to maintain its ecological functions. In the end, decisions are made by balancing the ecosystem function of water with other uses for the sake of economic and industrial concerns. The result of this ad-hoc approach to decision-making is a hodge-podge of policies and programmes aimed at alleviating specific problems as they arise instead of an integrated and comprehensive water policy that provides consistent guidance to all public decision-makers and stresses the protection of water. Furthermore, recent budget cuts and deregulatory measures have jeopardized the implementation of these programmes and policies.

### **Agenda for Change**

There needs to be a public commitment guaranteeing the ecosystem function of water. The commitment should start from the following principles:

- All life depends upon a reliable source of clean water to survive.
- There must be adequate quantities of water to support a variety of ecological and economic functions, the uppermost being the life supporting function of water.
- Ontario's water should be used wisely by giving priority to those uses that are considered more important and that are sustainable over a long period of time.

In determining which uses are considered more important over others, a hierarchy of uses should be set out as follows: preservation of ecosystem function, provision of potable water, provision

of water for irrigation, recreational, industrial and commercial uses on a proportional basis, and lastly, waste disposal. Activities on the lower end of the hierarchy would only be allowed if it were demonstrated that the higher priorities would not be jeopardized by that use. Decision making over activities should also incorporate the precautionary principle, that, where an activity or substance poses a threat of harm to the environment, we should err on the side of caution; precautionary measures should be taken even in the face of scientific uncertainty.

Some will argue that the protection of water will place our economic prosperity in jeopardy. However, these arguments fail to consider the costs that society will bear if we do not take action now: the human tragedy associated with adverse health impacts and the loss of life, the irrevocable loss of other species, the much larger cost of remediating impaired water resources in the future, and the cost of health care and wildlife management programmes. Moreover, these economic doomsday arguments fail to consider that there are innovative and cost effective approaches to protecting our water resources. Pollution prevention measures, which use processes, practices, materials, products, or energy to minimize or avoid the generation and use of pollutants and wastes altogether, are effective in reducing pollution and may result in cost savings as well.

### **Key Recommendations**

- Ontario should develop a comprehensive water policy that is applied consistently to all decisions regarding water and that firmly commits to ensuring that adequate quantities of clean water are available to support a variety of ecological and economic functions, the uppermost being the life supporting function of water.
- A *Pollution Prevention Planning Act* should be enacted that requires all companies that discharge wastes into water to report annually on their use, production, release, disposal and transfer of toxic substances and to develop and implement a plan for reducing and eliminating their use of toxic substances. Certain substances should be identified for bans and phase outs, which should be incorporated into regulatory measures to provide for zero discharge of these toxics.
- A *Safe Drinking Water Act* should be enacted that guarantees the citizens of Ontario the right to clean water.
- A groundwater management strategy is needed that identifies important aquifers, groundwater recharge zones, and areas that are sensitive to groundwater pollution and protects these critical areas under the *Planning Act*.
- A conservation strategy needs to be implemented with measures that address education, building code standards, retrofitting of new homes, industrial and agricultural use of water, and water metering and pricing.
- Water transfers between different watersheds and different jurisdictions should be banned outright.

#### Authors:

Paul Muldoon is the Executive Director of the Canadian Environmental Law Association (CELA), a public interest group whose mandate is to use and improve laws to protect the environment. He also teaches environmental law and policy at the University of Toronto and York University. Paul Muldoon has written extensively on water issues and has been a member of the MISA advisory board and the Science Advisory Board of the International Joint Commission. Paul McCulloch was the 1997-98 articling student at CELA. He recently graduated from York University with a combined law and Masters in Environmental Studies degree.

#### Acknowledgements:

The authors would like to thank the following people for their comments on a draft copy of this paper: Ziggy Kleinau, Margaret Casey, Elizabeth Wharton, Mike Brouse, Mark Winfield, Al Marshall, Alan Bangay, Ray Metcalfe, Bob Gibson, Sarah Miller and Kathleen Cooper. The comments of Mr. Gibson, Ms. Cooper and Ms. Miller were particularly extensive and most welcome. The views expressed remain the responsibility of the authors.

## TABLE OF CONTENTS

Summary.....	2
<b>Overview of Water Issues In Ontario .....</b>	<b>6</b>
<b>The Importance of Water.....</b>	<b>6</b>
<b>The Nature of the Problem .....</b>	<b>7</b>
<b>The Context for Water Protection in Ontario.....</b>	<b>8</b>
<b>The Need for A Sustainable Water Policy in Ontario .....</b>	<b>11</b>
<b>Water Quality .....</b>	<b>12</b>
<b>Overview.....</b>	<b>12</b>
<b>Pollution Prevention .....</b>	<b>13</b>
<b>Direct Discharges to Ontario's Surface Waters .....</b>	<b>16</b>
<b>Indirect Discharges to Sewers/Municipal Infrastructure.....</b>	<b>19</b>
<b>Discharges to Ontario's Groundwater .....</b>	<b>20</b>
<b>Protecting Ontario's Drinking Water .....</b>	<b>24</b>
<b>Water Quantity .....</b>	<b>26</b>
<b>Overview.....</b>	<b>26</b>
<b>Surface Water .....</b>	<b>27</b>
<b>Groundwater Depletion.....</b>	<b>28</b>
<b>Intergovernmental Issues .....</b>	<b>29</b>
<b>Water Quality Agreements .....</b>	<b>29</b>
<b>Exports and Diversions .....</b>	<b>32</b>
<b>Summary of Recommendations.....</b>	<b>34</b>
<b>Acronyms.....</b>	<b>39</b>
<b>Endnotes .....</b>	<b>40</b>

## **A SUSTAINABLE WATER STRATEGY FOR ONTARIO**

### **OVERVIEW OF WATER ISSUES IN ONTARIO**

#### **The Importance of Water**

Water is fundamental to our planet. It plays an intrinsic role in sustaining life as all plants and animals must consume water to survive. Terrestrial species, including humans, specifically depend upon freshwater to sustain themselves. Water also provides habitat, not only for water dwelling species, but also by shaping and reshaping the physical world. The cycling of water between groundwater, surface water, and the atmosphere drives our climate and maintains a hospitable living environment. In addition to these critical ecosystem or ecological functions, water plays an important role in our society, supporting many social and economic activities. Thus, water, and particularly freshwater, is essential to both our health and our well-being, as well as that of all non-human species with which we share this earth.

Ontario is endowed with an abundant supply of freshwater. There are over 225,000 lakes, an uncounted number of rivers and streams, and plentiful groundwater aquifers, all located within the province's boundaries. Furthermore, Ontario borders upon four of the five Great Lakes, which together contain over 20 percent of the world's surface freshwater supply.<sup>1</sup> In comparison to other places where water is scarce, Ontario is truly blessed to have such an enormous quantity. Nevertheless, this vast supply of water is not without limits. Only one percent of the water contained in the Great Lakes is replenished each year.<sup>2</sup> Much of Ontario's water is a legacy from the great glaciers that once covered this land. Once lost or degraded, it will take many generations to replace.

Yet, our technologically advanced and industrialized society continues to place greater and greater demands on our sources of freshwater. We use water for drinking, bathing, and washing; utilize water in many industrial processes; control and redirect water in order to irrigate agricultural operations; harness water to generate energy; engineer waterways for navigation; play in and on water as part of our leisure activities; and use water bodies as a depository for waste. It is an unfortunate reality that these various needs compete for existing supplies of water, both among themselves and with water's ecosystem functions. These competing uses have the potential to upset the delicate balance that nature has developed over time to ensure that water continues to maintain life.

We can ill afford to upset this delicate balance; to do so jeopardizes our own society, the lives of other species, and our ecosystem as a whole. Water must be used carefully and its ecosystem functions preserved if it is to continue to sustain the lives of future generations and non-human species. The purpose of this paper is to explore and propose policies that, if implemented, would ensure that water will always be available in adequate quantities and quality. It starts with a few basic assumptions:

- All life depends upon a reliable source of clean water to survive;

- Water must be available in adequate quantities to support a variety of ecological, economic and social functions, the uppermost being the support of all forms of life; and
- Ontario's water should be used wisely. In evaluating whether a use is wise or not, one should consider:
  - (a) the importance of that use in relation to other uses
  - (b) whether a use of water is sustainable over a long period of time.

These simple and uncontroversial assumptions provide the building blocks for developing a sustainable water policy for Ontario.

### **The Nature of the Problem**

Unfortunately, there is ample evidence to demonstrate that the waters of Ontario are not being used wisely; they cannot be characterized as clean, are not always available in adequate quantities, and may be used by anyone without regard to whether that use is the best and most important use. This is especially true for the waters of the Great Lakes Basin. Over eight million people live in this region and rely upon these waters for drinking and other functions. Furthermore, ecosystems within the Great Lakes Basin are under severe stress. The health of these waters will have a significant impact upon the health of people and other species. While other waters within Ontario do not face the same pressures as those within the Great Lakes Basin, they too face certain problems, especially at a local level.

#### **(a) Clean Water**

Clean water is pristine. It contains no substances other than those that existed at low levels before humanity imposed its industrial society upon the planet. Many foreign and toxic chemicals can now be found in the waters of the Great Lakes Basin, including organo-chlorides, pesticides, PCBs, dioxins, lead, mercury, and radionuclides. The potential health effects of long-term exposure to these chemicals by all species are not fully understood and Ontario continues to act as an immense laboratory until more is known. In the meantime, plants, animals and citizens who live in and drink from the Great Lakes Basin remain at risk. Some organic and inert substances also contaminate our water supplies. Although naturally occurring, they are now found at such high levels that they impair the life supporting function of water. The presence of these chemicals and other substances in our water is unacceptable. Although there has been a decrease in emissions of certain toxic chemicals since the 1970s, we still have a long way to go to restore Ontario's water quality to a pristine state.

#### **(b) Adequate Quantities of Water**

The people of Ontario have the dubious distinction of being one of the most intensive users of water in the world. Although Ontario may never drain all its vast water resources, there are still significant dangers. Local shortages have occurred, especially in areas that rely upon groundwater. Water takings may have long term negative impacts on local ecosystems, even if the taking is relatively small in comparison to the body of water from which it is being withdrawn. Water shortages have resulted in water being shipped or piped over great distances, using valuable energy and resources in the process. Perhaps more significantly, there have been numerous proposals to transfer large quantities of Ontario's water to other thirsty jurisdictions. Most proposals involve massive diversion projects either by canal or long range transport.<sup>3</sup>

These proposals provide a further potential threat to Ontario's water supply in that, once initiated, they may be difficult to halt, and that the quantities of water involved may have a significant impact upon water supplies.

### **(c) Wise Uses of Water**

Ontario's water tends to be allocated on a first-come, first-serve basis. Requests to utilize water are analyzed individually, rarely in relation to that of other users. There is no societal statement as to what uses of water are to be given priority in Ontario. More importantly, it is not publicly recognized that the ecosystem function of water must be given precedence over other uses. Problems thus occur because the cumulative impact of various water uses are not considered, leading to competition for the same water supplies. Such a manner of allocating uses of water cannot be characterized as wise.

### **(d) The Need for Action**

It is apparent that Ontario's seemingly inexhaustible supply of water faces many risks. This is true in terms of both water quality and water quantity. Furthermore, the costs of inaction are staggering. The dollar cost of cleaning up impaired or degraded water sources typically involves large sums of money. Government scientists from the Canada Centre for Inland Waters estimated that it would cost \$6 billion dollars over thirty years and \$19 billion over the next one hundred years to contain, maintain, monitor and clean up four of the largest leaking dumps on the American side of the Niagara River<sup>4</sup>. This estimate only entails the cleanup of four specific sites. The cost of remediating all degraded sites within the Great Lakes Basin would be enormous. It is far more cost effective to invest in pollution prevention measures than to remediate a problem after the fact. It is even more mind numbing to contemplate the human health and wildlife impacts of not taking action now to avoid further degradation of our water resources. Pollution results in increased spending on health care, over and above the human tragedy associated with adverse health impacts and even the loss of life. Similarly, Ontario has already seen the loss of some species in the Great Lakes Basin due to pollution and loss of habitat. Once lost, these species will never return. It is impossible to put a price tag on these impacts.

In all likelihood, the risks will only increase given the enormous changes that our planet is facing. Climate change, population growth, and further industrialization will add to the stress being placed upon Ontario's water resources. The need for effective water policies to address these problems has never been greater.

Before outlining a set of policies and recommendations designed to achieve this goal, it is important to set the context in which they operate. The next section considers the political and regulatory framework that currently governs decision-making over water. In some instances, this context serves to limit what action may be taken in the short-term to address water problems in Ontario.

## **The Context for Water Protection in Ontario**

### **(a) Jurisdiction**

The provincial government has the primary mandate to deal with water issues. During the 1970s and 80s, Ontario developed and introduced a broad array of water management initiatives. However, these initiatives were often fragmented and uncoordinated and remain so to this day.



Various ministries within the provincial government have authority over different areas of water management, including the Ministry of the Environment, the Ministry of Natural Resources, the Ministry of Agriculture, Food, and Rural Affairs, and other provincial bodies such as conservation authorities and the Clean Water Agency. Moreover, within a single ministry, there may be different departments managing different aspects of water. No single policy or government body oversees and coordinates water management in Ontario.

Furthermore, it is not entirely within Ontario's jurisdiction to take action with respect to all water contained within its boundaries. Federal, provincial, and municipal governments all have jurisdiction over certain aspects of water management.<sup>5</sup> The federal and provincial governments have also both entered into inter-provincial and international agreements regarding the management of water. This combined jurisdiction over water leads, in some instances, to duplication of some activities and, more importantly, gaps in responsibility. Water also does not respect political boundaries. Water flows from one jurisdiction to another through rivers and streams and is similarly transported great distances by weather activities. Therefore, Ontario may need to persuade other jurisdictions, especially American States that lie to the south and west of the Great Lakes, to take actions that will benefit the quality of our water.

The recommendations outlined below recognize the fragmented state of water management in Ontario. As the provincial government has the broadest jurisdiction over water, most recommendations are directed to this level of government. Ontario certainly has the capacity to deal with the fragmentation between its own ministries. It is also expected that the provincial government will take the lead in resolving interjurisdictional issues. To the extent that other jurisdictions have responsibility for water, the range of actions that may be taken by Ontario alone may be limited. Nevertheless, political pressure has resulted in joint concrete actions being taken in the past. Moreover, Ontario will be more successful in persuading other jurisdictions to take action once it has implemented effective measures of its own.

### **(b) Current Political Trends**

Another set of key issues that affect water management is the changing political climate, both domestically and globally. There has been a strong movement towards less government involvement in public matters and resort to the free market to govern affairs. Four trends in particular can be observed in Ontario:

(a) **Deregulation:** Since 1995, the government has weakened regulatory standards, reduced reporting requirements, and removed public accountability of government action in an effort to streamline decision-making and reduce red tape. Changes to the *Environmental Protection Act*, the *Ontario Water Resources Act*, the *Mining Act*, the *Public Lands Act*, the *Planning Act*, the *Conservation Authorities Act*, or their regulations have essentially lessened regulatory oversight of water management, giving the public less say in how water will be utilized and making it easier for individuals and companies to exploit our water resources for economic gain.

(b) **Government Downsizing:** The provincial government has been dramatically cutting provincial spending, with some of the biggest reductions being directed towards the Ministry of the Environment and the Ministry of Natural Resources. The government has reduced its environmental protection budget by some 40%. The federal government has cut Environment Canada's budget by 30%. These cuts affect virtually every aspect of

water management, leaving less resources and personnel for monitoring, inspecting, standard setting and enforcement of environmental laws.<sup>6</sup>

(c) Downloading: Another trend has been to assign many of the responsibilities that were formerly the domain of an upper level of government to a lower level of government, from the federal government and the provinces to regional and municipal levels of government. However, the lower levels of government rarely have the resources or institutional capacity to deal with these new responsibilities. The result has been that many government services are not being delivered as effectively as before. In other instances, lower levels of government have sought assistance from the private sector to meet their obligations, insulating these activities from public oversight.

(d) Liberalized Trade: The fourth trend is the increasing globalization of world economies during the 1990s through liberalized trade, as evidenced by the passage of the North America Free Trade Agreement, the Uruguay Round of the General Agreement on Tariffs and Trade, and the negotiations over the Multilateral Agreement on Investment. These agreements may pose significant constraints on the ability of the provincial government to implement legislation that protects water if that legislation also inhibits trade.

It is apparent that the "three Ds" and liberalized trade have significant repercussions for water management in Ontario. While the authors strongly oppose these measures, some attempt has been made to recognize the current state of affairs in the recommendations that follow. For instance, cost effective and cost recovery measures have been suggested where possible. Flexible regulatory measures that enable industry to meet obligations in a cost effective and accountable manner are recommended and encouraged. However, in other instances, some of the changes that have been introduced are simply incompatible with an effective water management regime. Most definitively, there must be a strong regulatory base to ensure minimum standards for water in the province, and adequate personnel and resources to implement, monitor and enforce these policies. Some of the recommendations clearly resist the changes that have occurred and demand that these trends be reversed.

### **(c) The Limits of Science**

The state of science and technology poses another set of issues for water management. There is a great deal of uncertainty in determining the impact that human activities have on water and its ability to provide its life-giving functions. We cannot state with certainty what health impacts certain substances contained in our waters have on humans and other species. Similarly, the relationship between changes to water quantity and ecosystem health is not fully understood. This presents a quandary in that we often need to make decisions based on less than full information.

The position taken in this paper is that we should err on the side of caution at all times. Where an activity or substance poses a threat of harm to the environment, precautionary measures should be taken even in the face of scientific uncertainty. This precept is referred to as the precautionary principle.<sup>7</sup> The precautionary principle entails that a party proposing an activity that may cause harm to the environment bears the onus of establishing that the activity would have no net negative impacts, as opposed to having the government or citizens prove that it is harmful. This determination would include an analysis of the effects of the activity on sensitive

populations in society, not just the healthy adult male. Thus, emission standards should be set well below the threshold level for negative impacts to ensure there is no adverse effect on human health and that ecosystems and non-human species are not threatened. Water takings should only occur when it can be demonstrated that there will be more than enough water left to support the surrounding ecosystem. In some instances, the application of the precautionary principle demands that certain activities not occur whatsoever.

### **The Need For A Sustainable Water Policy in Ontario**

Given the perils facing Ontario's water resources, it is obvious that further action is needed. The primary need is a clear public commitment to ensuring that Ontario has an adequate supply of clean water available to support all life in the province. Decisions regarding other uses of water must be made in accordance with a hierarchy of uses if it can be demonstrated that the proposed use will not interfere with this critical ecosystem function. There is also a need to address the fragmented manner in which Ontario manages its water resources. An effective water management regime must be coordinated among the provincial government's own ministries and with other jurisdictions. Each jurisdiction should attempt to achieve the same goals and apply the same policies in making decisions over water. Therefore, there needs to be one overarching and comprehensive water policy in Ontario that each jurisdiction can use to guide their respective actions.

### **Recommendations: A Sustainable Water Policy for Ontario**

- Ontario should develop a comprehensive water policy that provides a framework that is applied consistently to all decisions regarding water under its mandate and in coordination with other jurisdictions. The policy must:
  - (a) make a clear public commitment to the principle that there must always be adequate quantities of clean water to support a variety of uses in the province, the uppermost being the ecological function of water;
  - (b) establish a hierarchy of uses of water to ensure that the most important uses are given priority over less important uses. The order of uses should be as follows: preservation of ecosystem function, provision of potable water, provision of water for irrigation, recreational, industrial and commercial uses on a proportional basis, and lastly, waste disposal;
  - (c) incorporate the precautionary principle as a basis for decision-making and place the onus on the party proposing to use water to demonstrate that there will be no negative impacts on the ecological function of water from that use; and
  - (d) develop a means of coordinating water management initiatives and decision-making among provincial bodies and with other jurisdictions.
- The policy should be supported by the following government initiatives that must be maintained on an ongoing basis:

- (a) development of an ecosystem approach to water management by identifying links between water quality and quantity with land use patterns and economic activity, links between transboundary and domestic air pollution and water quality, and considering synergistic and cumulative impacts of water uses;
- (b) maintainance of a monitoring network governing both water use and water quality with the information being publicly accessible;
- (c) promotion of research into water quality and quantity issues, including new innovative solutions, whether they be technological, demand management or public education;
- (d) publication of annual reports that outline progress in implementing the policy and those reports should assessed by an arm's length agency such as the Ontario Auditor or the Environmental Commissioner of Ontario; and
- (e) provision of adequate funding and resources to carry out these and existing programmes effectively.

## WATER QUALITY

### Overview

#### (a) Water Quality and Health

Far from the romantic image of Ontario being filled with pristine lakes and rivers, many of our water sources, especially those within the Great Lakes Basin, are contaminated. In 1995, 7,365 tonnes of pollutants were discharged into Ontario's waterways, as reported from site-specific sources.<sup>8</sup> Further discharges go unreported, including contaminated runoff from agricultural operations and urban centres, spills from industrial facilities, and seepage from the over one million septic tanks located throughout the province.<sup>9</sup> The evidence of these discharges is borne out by the fact that over 360 chemicals have been detected in the Great Lakes.<sup>10</sup> Similarly, 37% of drinking water wells surveyed in Ontario contained at least one contaminant in excess of drinking water quality objectives.<sup>11</sup> It is clear that this state of affairs does not afford all citizens of Ontario and other species access to clean water. It should be the goal of our water management regime to ensure that toxic chemicals are not discharged into Ontario's waterways and other substances that pose potential dangers are controlled in an appropriate manner.

The most obvious and direct impact of poor water quality is on the health of people, animals and the ecosystem. Toxic chemicals that are resistant to degradation accumulate in the tissue of animals and humans. Persistent toxic chemicals have been linked to various cancers, neurological disorders, genetic mutations, behavioural disorders, and growth

Contamination in Ontario Fish		
Lake	Main Contaminants	% of advisories
Superior	PCBs, Toxaphene, Mercury, Dioxins	38%
Huron	PCBs, Toxaphene, Mercury, Dioxins	24%
Erie	PCBs, Mercury	19%
Ontario	PCBs, Mercury, Mirex, Dioxins	45%

Source: Ontario, *Guide to Eating Ontario Sport Fish: 1997-98* (Toronto: Queen's Printer, 1997)

retardation.<sup>12</sup> Another recent and major concern is the presence of endocrine disrupters in our water, chemicals that have been shown to mimic the action of estrogen and disrupt tissue and organ development and growth.<sup>13</sup> The potential impacts upon sensitive human populations, such as children, the elderly, aboriginal peoples and pregnant woman, are of particular concern.

The adverse health impacts upon wildlife is also clearly documented. The effects of endocrine disruptors includes: decreased fertility in birds, fish, shellfish and mammals; decreased hatching success in fish, birds and reptiles; demasculinization of fish, birds, reptiles and mammals; and alteration of immune function in birds and mammals.<sup>14</sup> Similarly, toxic chemicals have been shown to cause deformities in reproducing birds and tumours in fish which is believed to have contributed to the collapse of the Great Lakes Lake Trout fishery. Fish in some Ontario waters remain unfit to eat. Consumption advisories continue to escalate due to contaminants in fish, including mercury, PCBs, Mirex, Toxaphene, and Dioxins.<sup>15</sup>

### **(b) The Regulation of Water Quality**

The laws, regulations, policies and guidelines currently governing water quality in the province are a complex affair. There are four different regimes or frameworks depending on the source of pollution and, more specifically, how or where the pollution is being discharged. The first regime governs direct discharges to Ontario's waterways, i.e., those polluters that emit substances into permanent bodies of water such as lakes, rivers, or streams. There is another regime pertaining to indirect discharges into sewers and sewage treatment plants. Groundwater protection again encompasses a totally separate regime. Finally, there are guidelines dealing with drinking water. Over and above this regulatory regime, the Province has initiated a pollution prevention programme. This initiative is not considered a regulatory measure because it relies entirely on voluntary participation by industry and business.

The fact that there are so many regimes support the need for a coordinated sustainable water strategy as outlined in our first recommendation. However, it is recognized that this will not occur overnight. Therefore, specific recommendations follow with respect to each regime, keeping in mind the long-term goal to move towards a more comprehensive and coordinated regime. As discussed in the next section, it is further recommended that this comprehensive regime include pollution prevention as its primary focus and incorporate pollution prevention into regulatory measures. In addition to the laws, regulations and guidelines governing the above noted areas, there is a body of intergovernmental agreements that impose obligations on the province, only some of which are legally binding, to deal with certain water quality issues. These agreements are more fully discussed later in this paper.

### **Pollution Prevention**

There are various means available to regulators to protect Ontario's waters and ensure they are kept clean. Historically, regulators have relied upon direct regulation of discharges. This type of pollution abatement, known as the "Command and Control" approach,<sup>16</sup> typically involves imposing discharge limits on polluters. This type of regulation is rather limiting for the following reasons:<sup>17</sup>

- Limits are usually stated on a per unit basis (e.g., x tonnes per thousands of litres of water). Therefore, although the amount of pollution per unit of water discharged is regulated, the *total* amount of pollution discharged is not. Reductions in total discharges are not required.
- Discharge limits incorporate dilution. Thus, the greater the volume of water being discharged, the greater the total amount of pollutants that may be discharged.
- This type of control focuses on end use solutions, those that address pollutants after they have been produced but before they are released into the environment. It fails to recognize that pollution can best be controlled by never creating the substances in the first place.
- The restrictions only apply to discharges to water. Polluters may be able to escape the restrictions by shifting their discharges to other media such as air or groundwater by disposing of waste through incinerators or landfills.
- Finally, pollution abatement is only functional in addressing discharges from fixed identifiable locations, known as point sources. It is next to impossible to regulate discharges from non-point sources such as runoff.

It has been clearly recognized that pollution prevention is a more effective means of reducing pollution.<sup>18</sup> Pollution prevention involves the use of processes, practices, materials, products, or energy that avoid or minimize the generation and use of pollutants and waste. It includes techniques such as material substitutions, process modifications, use of closed loop processes, good operating practices to minimize unwanted discharges, and end-product redesign. Pollution prevention is almost always more desirable than abatement in that it avoids the pitfalls described above. In some instances, it may even result in cost savings for industry and consumers as more efficient processes are discovered.

There are certain toxic substances that simply cannot be allowed to enter the environment at all. Examples include PCBs, dioxins, certain organo-chlorines, and radionuclides. The only effective strategy for such substances is zero discharge.<sup>19</sup> Abatement and dilution are not acceptable means of dealing with such substances. An even more attractive option is to ban the use of these substances altogether, either immediately or over a phased in period of time. This is sometimes referred to as sunsetting.<sup>20</sup> In 1993, the provincial government took the initial steps to sunsetting some toxic chemicals in releasing the *Candidate Substances for Bans, Phase-Outs, and Reductions*.<sup>21</sup> The purpose of this list was to further pollution prevention goals and further commitments in the *Great Lakes Water Quality Agreement* by identifying the inherently toxic substances and identifying opportunities to ban or phase-out the substances. Unfortunately, there has been no report on progress with respect to these commitments.

#### **Why The Need for Zero Discharge?**

- One drop of oil can render up to 25 litres of water unfit for drinking
- One gram of 2,4-D, a common herbicide, can contaminate ten million litres of drinking water
- One gram of PCBs can make up to one billion litres of water unsuitable for freshwater aquatic life
- One gram of lead in 20, 000 litres of water makes it unfit for drinking
- One gram of lead makes one thousand litres of water harmful to drink

*Source: Environment Canada, Fact Sheet: Clean Water - a Priceless Asset*

In the early 1990s, the provincial government initiated some pollution prevention programmes. These programmes included:

- P4 Pollution Prevention Pledge Program: This programme includes pledges by specific sectors to reduce the emissions by some stated amount. Various incentives are given to industry such as awards and other forms of recognition.
- Pollution Prevention Memorandums of Understanding (MOU): These agreements between government and manufacturing associations set out plans and courses of action designed to reduce pollution at member facilities.<sup>22</sup>

Another programme, Recognizing and Encouraging Voluntary Action (REVA), is now being developed. However, this programme has not been finalized or had the benefit of public consultation with non-governmental groups.

These initiatives are not comprehensive in that they each address only selected facilities within certain industrial or municipal sectors. The present government has done nothing to expand these programmes to other sectors. More importantly, it is apparent from these initiatives that the provincial government intends to rely entirely on the voluntary approach to pollution prevention. The concerns with relying strictly upon voluntary initiatives can be summarized as follows:<sup>23</sup>

- Lack of Public Participation in the Negotiation of Voluntary Programmes: With few exceptions, most voluntary programmes are undertaken outside of the public spotlight. With respect to MOUs, virtually all of them were negotiated without the benefit of public input.
- Voluntary Agreements Pre-empt Regulatory Actions: While most voluntary agreements state that governments can still take regulatory actions, the practical effect of such agreements is that governments are unwilling to regulate on any matter related to the subject matter covered in the agreement. Hence, voluntary agreements may actually replace regulatory activity with a loss of the benefits that normally arise from having a regulatory framework in place.
- Voluntary Agreements Do Not Further the Principle of Accountability: It is apparent that voluntary agreements do not promote accountability since they are not subject to public verification and there are no penalties for those industries that fail to comply with the voluntary agreement. Thus, voluntary initiatives often have the problem of free riders, that is, some industries share the success of the good performers without doing any of the work.

Thus, while voluntary programmes may in some specific instances be useful in promoting action beyond a regulatory baseline, a comprehensive and enforceable regulatory system would achieve far greater results.<sup>24</sup>

#### **THE ADVANTAGES OF POLLUTION PREVENTION**

Pollution prevention not only reduces the quantity of pollution entering the environment; it may also result in economic savings. For example:

- Torcad Ltd. saved \$30,000 a year in material costs by recycling cleaning solutions in addition to reducing the discharge of the alkaline cleaner. The payback time for the investment is one and a half years.
- A project at Ford resulted in annual reductions of 1.8 tonnes of heavy metals, 55 tonnes of solvents, 227 tonnes of paint sludge, and 90,000 tonnes of water. Ford saved \$275,000 in costs at the same time.

Source: Ontario's Progress in Pollution Prevention, MoE (1997)

## Recommendations: Pollution Prevention

- The province should enact a *Pollution Prevention Planning Act* that requires all companies that discharge wastes into water to report annually on their use, production, release, disposal and transfer of toxic substances. Companies should then be required to develop and implement a plan for reducing and eliminating their use of toxic substances.
- The province should commit to the goal of zero discharge for toxic substances. The process of identifying candidate substances for bans and phase-outs should be accelerated. Once the substances have been identified, regulatory measures should be taken to ensure that these substances are eliminated in a timely fashion. Transition plans should also be developed where the ban or phase-out of the substances will result in inequities for workers or communities.
- Voluntary measures should only be used in conjunction with, not in place of, a strong and comprehensive regulatory base. Voluntary measures, which are developed under public scrutiny and contain a means of holding participants accountable for failing to meet their objectives, may be useful in achieving results over and above minimum standards in some instances.

## Direct Discharges to Ontario's Surface Waters

### (a) Overview

Direct dischargers are those facilities that discharge contaminants directly into a receiving waterway (as opposed to discharging to a sewer or into the ground). There are approximately 600 to 800 large facilities that can be characterized as direct dischargers in Ontario. Direct discharges are governed by the *Ontario Water Resources Act* (OWRA) and the provincial *Environmental Protection Act* (EPA). Each contains a general prohibition against the discharge into water of polluting materials that "may impair the quality of water" or "cause an adverse effect."<sup>25</sup>

However, there are exceptions to these general prohibitions, the most important being that one may obtain a license known as a Certificate of Approval (CofA). A CofA is obtained from the Ministry of the Environment and basically constitutes a license to pollute as it enables the license holder to discharge substances in accordance with the terms of the CofA. The content of the certificate is negotiated on a case-by-case basis between the applicant and a ministry official. The approvals branch of the MOE relies upon a number of documents in deciding whether to issue the permit and in developing its terms and conditions, including the Provincial Water Quality Objectives and the effluent limits emanating from the Municipal-Industrial Strategy for Abatement.

### (b) Provincial Water Quality Objectives

The Provincial Water Quality Objectives (PWQOs)<sup>26</sup> set out objectives for water quality in the form of concentration limits for a list of pollutants that are being discharged from industrial and sewage treatment facilities. For example, the limit for cyanide is 0.005 mg/L of water. The range of pollutants includes conventional pollutants, oil and grease, toxics (like phenols) and heavy metals (like chromium). The limits are based on a range of toxicity tests based on a few



specific aquatic species, to the extent that information is available. It is clear that the limits are not based upon thorough scientific analysis. As noted in the PWQO document, "ideally, water quality objectives should be established based on 'no negative effect' derived from chronic long-term tests on sensitive organisms. However, current understanding of chemical dynamics and effects on aquatic life are limited to a few species and contaminant levels that are lethal in short term tests."<sup>27</sup>

PWQOs are not legally binding standards. Only once they are incorporated into a CofA do they become so. Furthermore, the PWQOs do not take into account additive or synergistic effects of pollutants.<sup>28</sup> Although individually one substance may not cause an adverse impact upon the environment in low concentrations, when added to other discharges or mixed together with other substances being discharged, there may well be a detrimental effect on the environment. The PWQOs are further weakened by the use of the mixing zone, an imaginary line around the area where the effluent is discharged. The place where the concentration is measured to determine whether the effluent meets the PWQO is at the edge of the mixing zone, not where the pollutants are immediately discharged. Mixing zones allow for dilution of the effluent without reducing the total level of emissions.

PWQOs are not set in a manner that ensures that there are no potential impacts on human or ecosystem health. Nor do they take a precautionary approach that would require adopting stringent standards to allow for the uncertainty inherent in the system. They are really just a best guess based on a limited range of knowledge. The PWQO's must be revamped to ensure that Ontario's water will be truly clean for generations to come.

### **Recommendations: Provincial Water Quality Objectives**

- The Provincial Water Quality Objectives (PWQOs) should be converted into legally binding standards. Such standards should be enforceable in and of themselves, but should also be incorporated into certificates of approvals for water discharges.
- Each PWQO standard should be reviewed every five years to ensure that each standard is stringent enough to keep Ontario's waters clean. The reviews should be based on a sound scientific assessment that includes peer review, reflects the precautionary principle, and takes into account:
  - (a) both the lethal and chronic impacts on human health;
  - (b) the impact of substances on sensitive populations, such as children, aboriginal peoples, pregnant women, and the elderly;
  - (c) any potential adverse effects on the environment; and
  - (d) the synergistic, additive and cumulative effects.

### **(c) Municipal-Industrial Strategy for Abatement (MISA)**

In 1986, the provincial government launched a new water quality program called the "Municipal-Industrial Strategy for Abatement" (MISA). The original goal was the "virtual elimination of persistent toxic pollution from our waterways."<sup>29</sup> MISA was implemented in distinct stages, the

last of which has only recently been completed. The program began with monitoring of all facilities within nine industrial sectors (organic chemicals, inorganic chemicals, iron and steel, electrical power generation, petroleum, metal mining, industrial minerals, sewage treatment, and pulp and paper). Once the monitoring phase was completed, effluent limits were developed for each of these sectors based upon expected discharges per a specified unit of production. The effluent limits assumed that every discharger was using the "best available control technology economically achievable" (BATEA). However, it remained up to each discharger to determine how they would comply with the effluent limits. The effluent limits became legally binding when a regulation for each of the nine industrial sectors was passed and promulgated in 1994 and 1995. These limits were also incorporated into the certificates of approval for those facilities.

While the goals of the MISA program are laudable, there are numerous problems with its design. These include:

- the fact that the limits are production based; the more the facility produces, the more it is allowed to pollute. There is no absolute cap on discharges;
- MISA still relies upon abatement measures; it does not further the goal of pollution prevention;
- MISA will not achieve its virtual elimination goal as the regulations still allow large quantities of pollutants to be discharged. There has been no indications that there will a next round for MISA that would take into account newer and cleaner technologies and processes that would result in more stringent MISA effluent limits; and
- The relationship between MISA and the PWQOs remains unclear; there are now two regimes for regulating water quality in Ontario.

MISA has been weakened by recent amendments introduced by the present provincial government.<sup>30</sup> These amendments include:

- reducing the frequency of chronic toxicity testing from semi-annually to annually (after three years of monitoring to ascertain the safety of the effluent);
- removing effluent limits and annual monitoring for substances that are not used, produced or stored on site;
- reducing daily monitoring requirements for some parameters if a site's performance surpasses permitted limits for 12 consecutive months; and

#### **FAILING TO ACHIEVE ZERO DISCHARGE**

The MISA pulp and paper regulations included regulation 760/93, which originally required kraft mills to reduce emissions of AOx (total adsorbable organic halides) to 0.8 kilograms per tonne of pulp by 1999 and submit reports on how they would reduce emissions to zero by 2002. AOx is an indicator of the chlorinated compounds discharged into the environment, which are a well-known threat to the Great Lakes and human health.

Recently, the government has delayed the implementation of the zero discharge component, waiting for research being conducted at the University of Toronto on pulp and paper effluent, despite the fact that there is more than enough evidence of the adverse impacts of chlorinated compounds. The removal of the requirement to develop AOX elimination plans is thus contemptible. The plan would have achieved zero discharge of AOx, keeping some of the worst toxic chemicals from Ontario's waterways.

- removing the need to reduce AOX emissions to zero by the year 2002.

These changes undermine the basis for the testing regime, which was to determine whether the effluent in question, although not acutely toxic, remains at a level that still may cause harm over a longer period of time. Furthermore, it is assumed that there is little or no variation in the level of discharges. This may not be true where dischargers use a variety of chemicals in their processes or where temperatures vary widely. Therefore, these proposals run contrary to the need to gather further information regarding the chronic effects of pollution and the need to encourage pollution prevention.

### **Recommendations: Municipal-Industrial Strategy for Abatement**

- MISA should be amended as follows:
  - (a) add a requirement that each standard be reviewed every five years to ensure that the benefits of new technologies are translated into more stringent standards;
  - (b) impose loading caps that establish absolute discharge limits on facilities;
  - (c) require annual reporting on the extent to which MISA has achieved its goals and provide public access to reporting data; and
  - (d) reverse the recent amendments that reduced reporting requirements and commit to reduce AOX emissions to zero by the year 2002.
- Over the long-term, MISA and the PWQOs should be amalgamated into one comprehensive set of legally binding baseline emissions standards based upon the best available control technology. These standards should apply to all dischargers. These standards should be viewed as minimum baseline standards only and should not in any way inhibit the pollution prevention measures set out in an earlier recommendation.

### **Indirect Discharges to Sewers/Municipal Infrastructure**

There are over 12,000 facilities in Ontario that discharge their wastes into municipal sewer systems. This poses a serious problem as these discharges are not regulated. It has been suggested that 383,000 tonnes of hazardous waste were disposed of in this manner in 1991.<sup>31</sup> A study of the composition of the waste stream entering Metro Toronto's sewer system found copper, zinc, toluene, xylene, chromium, and mercury.<sup>32</sup> Yet, sewage treatment plants are generally only designed to deal with organic wastes. The overall result is that many toxic chemicals being discharged into sewer systems end up in receiving waterways or waste residues, which are spread out over the land.<sup>33</sup>

Generally, municipal councils are empowered to enact bylaws to control or prohibit industrial wastewater discharges into their sewer systems, although a municipality may not use this power to override applicable provincial legislation. In order to facilitate greater uniformity of municipal by-laws, the MOE has circulated a model by-law. The initial model sewer use by-law was

released in 1976. An updated version was released in 1988 as part of MISA.<sup>34</sup> It was anticipated that municipalities across the province would pass a by-law that incorporated the main elements of the model by-law, with variations as required to suit local needs. However, not all municipalities have done so. Others have incorporated only certain elements of the by-law suggesting that there is little uniformity across the province in terms of regulating discharge levels. For example, rather than requiring reductions in the total loadings, many of the by-laws simply required dilution of toxics.

There is plenty of room to place greater restrictions on municipal discharges. The MISA programme originally contained a proposal to develop pre-treatment standards based on BATEA for 22 industrial sectors that release wastes into municipal sewers. These pre-treatment standards placed limits on what facilities can discharge to sewers. These proposals have never been implemented, although similar regulations exist throughout the United States.

Enforcement of by-laws has always been a problem. Many municipalities simply do not have the resources or expertise to enforce the sewer by-law. Moreover, some municipalities allow for "sewer surcharges" whereby a municipality enters into an agreement with a facility or industrial sector that allows discharges over and above the levels specified in the sewer use by-law in return for the payment of a fee intended to cover the costs of treating the pollutants at the sewage treatment plants. It is unclear whether the funds are in fact used for this purpose. The MOE proposed to prosecute municipalities who are unwilling to enforce the legal requirements regarding the discharge of industrial wastes into sewers. This component of MISA has not been implemented, mostly due to vigorous opposition by municipalities.

### **Recommendations: Discharges to Sewers**

- The province should immediately develop a set of pre-treatment standards for discharges to sewers with a view to having the standards in place by 2002. The standards should be legally binding and include both conventional and toxic pollutants.
- The province should take a more active role in persuading municipalities to pass and enforce the model by-law, with financial incentives for those municipalities that do so or penalties for those that fail to do so.

## **Discharges to Ontario's Groundwater**

### **(a) Overview**

In Ontario, approximately 23 per cent of the population relies on groundwater for drinking water. For some 90 per cent of the province's rural population, groundwater is the only source of water.<sup>35</sup> In the early 1990s, it was found that over one-third of the wells in rural Ontario had concentrations of pollutants over the provincial drinking water objectives.<sup>36</sup> Groundwater quality can be threatened by numerous sources, including landfill sites, the disposal of sewer and agricultural sludge, septic tank systems, mine tailings, and the application of pesticides to both urban and agricultural lands. Water quality is also compromised when natural recharge areas such as wetlands or aquifers are destroyed or impaired.

The regulatory and policy framework governing groundwater is far less advanced than that for surface water. Although groundwater faces many of the same problems as surface water, there are fewer laws, policies and programmes to protect its quality and quantity, and fewer remedies for people deprived of its use.<sup>37</sup> The Ministry of the Environment has the primary responsibility for the protection of Ontario's groundwater resources. The Ministry's groundwater strategy is expressed in the *Water Management* document, which states that the goal is to "protect the quality of groundwater for the greatest number of beneficial uses."<sup>38</sup> However, this policy is based on a first-come first-serve basis. There is only a general reference to the need to protect the ecosystem functions of groundwater and there is no guidance provided as to which use has priority over the other in the event of a conflict.

Moreover, the *Water Management* document is only applicable to the Ministry of the Environment. Other ministries make decisions and issue approvals involving activities that have the potential to impact groundwater. For example, the Ministry of Municipal Affairs has jurisdiction over septic tanks and land use approvals, the Ministry of Transportation controls the spread of road salt and dust suppressants, the Ministry of Consumer and Commercial Relations regulates fuel storage and underground storage tanks, and the Ministry of Natural Resources is responsible for evaluating wetlands. It is apparent that coordinated action will be necessary to effectively protect groundwater. In each of her three annual reports, the Environmental Commissioner of Ontario has recommended that a comprehensive, multi-ministry strategy be developed.<sup>39</sup> The Ministry of the Environment indicated in its 1996 business plan that it intends to take the lead in developing this strategy, but has yet to produce even a draft document or discussion paper.

Ontario has no specific legislation that is designed to protect wetlands or to protect significant groundwater recharge areas. There is a policy contained within the Provincial Policy Statement passed under the *Planning Act* that provides some protection to groundwater. However, this policy is limited in application to land use matters and is not legally binding. Municipalities must only "have regard" to the statement, not "be consistent with" it as was once required.<sup>40</sup>

### **Recommendations: Comprehensive Ground Water Management Regime**

- As part of the Sustainable Water Policy outlined in our first recommendation, the Ministry of the Environment should renew its efforts to develop an integrated and comprehensive groundwater management regime that will be applied in a consistent manner by all ministries, government agencies, and municipalities. The strategy should clearly restrict other activities unless it can be demonstrated that they will not adversely impact groundwater.

The town of Elmira understood the importance of groundwater when it was discovered that two of the town's wells were contaminated with a chemical known as NDMA in 1989. U.S. EPA studies indicated that NDMA was a potential carcinogen. The source of the contamination was a Uniroyal chemical production plant. Local citizens were forced to become deeply involved in scrutinizing the control of further discharges and the long-term remediation plan for this aquifer. This process took a heavy toll on the citizens as the process took over six years and involved three hearings before the Environmental Appeal Board.

Elmira now pipes its drinking water in from a neighbouring municipality, because the aquifer under Elmira is so badly contaminated.

- The Ministry of Environment should undertake a long-term monitoring project and develop an inventory of groundwater resources. The project should include information regarding water-well records, details of complaints, inspections and enforcement, and information about contamination and remediation, all of which should be publicly accessible.
- Important aquifers, groundwater recharge zones, and areas that are sensitive to groundwater pollution should be identified. These designated areas should be protected and land uses that can take place in those areas be legally restricted under the *Planning Act*.

### **(b) Septic Systems**

A potentially serious source of groundwater contamination is septic systems. The exact number of approved septic systems across Ontario is not known, although it is estimated that there are probably over one million septic systems in the province.<sup>41</sup> Some 22,000 new systems are approved each year.<sup>42</sup> In cottage country, as high as one-third of all septic systems are designed below standards, and one-third may be classified as a public health nuisance, although the corresponding numbers for the province in general are lower than this.<sup>43</sup>

All septic systems have a limited life span and need to be replaced at some point in time. They must also be installed correctly and continually maintained. If there is a failure to follow correct procedures at any point, septic systems can have serious environmental and human health impacts. Humans and other species can be exposed to bacteria and viruses. Septic systems, even if properly functioning, may not be able to treat nitrates, phosphorus and toxic materials that are often dumped into the system from household uses of substances such as cleaners, degreasers, paint, and chemicals.<sup>44</sup>

Historically, septic systems were governed under the *Environmental Protection Act*. However, in the spring of 1998, the province transferred the regulation of most septic systems to the *Building Code Act*. The Ministry of Municipal Affairs and Housing is now responsible for administering the septic system regime. The ministry has in turn delegated responsibility for approving new permits and enforcing the regulations to the municipalities in an attempt to integrate the septic and land use planning regimes. The septic approval now occurs at a very late stage, often after other approvals such as zoning changes have already been obtained. There may be pressure to grant septic approvals given the amount of time and money applicants have already put into a proposed development. There is also a concern that municipal building code inspectors may not have the expertise to evaluate applications properly. A similar concern arises with approval appeals, which have been transferred from the Environmental Appeal Board to the Building Code Commission.

The Commission on Planning and Development Reform in Ontario<sup>45</sup> outlined a number of important suggestions with respect to the use and management of septic systems. Some of these include:

- educational programmes for owners of existing systems about the proper use and maintenance of the systems;
- regular inspections and pump-out of systems paid for via a user fee basis;
- mandatory inspections when houses are sold; and
- time-limited permits based on the life expectancy of the system.

These suggestions were not adopted when the management over septic systems was transferred from the Ministry of the Environment to the Ministry of Municipal Affairs and Housing.

### **Recommendations: Septic Systems**

- The recommendations of the Commission on Planning and Development Reform concerning inspection requirements for existing septic systems, the need for septage disposal facilities and educational programmes for owners of septic systems should be implemented.
- A requirement should be made that septic system approvals be obtained in advance of planning approvals for developments via rezoning, severance, building permits or other approvals where a septic system will be required.
- Training and education should be provided to the Building Code Commission and inspectors to ensure they have the necessary expertise to evaluate the public health and environmental implications of both routine and innovative septic systems.

### **(c) Other Sources of Groundwater Contamination**

In addition to discharges from septic systems, there are numerous other sources of groundwater contamination that are very difficult to regulate. There are as many as 34,000 underground storage tanks containing gasoline, oil, aviation fuel, and a variety of other substances. One study suggests that 10% of these may be leaking.<sup>46</sup> These tanks are only dealt with as they are discovered.

Road salt poses another potential cause for concern. Although the Ministry of Transportation is trying to develop alternatives to road salt, salt continues to be spread onto Ontario's highways, where it then spreads into neighbouring waterways and fields. A similar problem occurs in the summer months when rural municipalities spread dust suppressants on gravel roads. Salt brine, calcium chloride and a number of recycled industrial by-products are used for this purpose. Most dust suppressants are classified as products as opposed to waste and therefore are not regulated under the *Environmental Protection Act*. Nor are they tested by the Ministry of the Environment or the Ministry of Transportation to determine their toxicity.

Pesticides from agricultural operations and both public and private lawn spraying pose yet another threat to groundwater quality. The federal

#### **DUST SUPPRESSANT THREATENS WATERWAYS**

Over 90 townships have spread Dombind®, a waste product from Domtar's Trenton pulp and paper mill, over rural roads to act as a dust suppressant. Dombind may contain a variety of contaminants, including dioxins and furans, phenols, sodium, and low levels of metals. Once spread onto roads, Dombind is highly water soluble and these contaminants find their way into roadside ditches, wetlands and waterways. Yet, the MoE has permitted the use of Dombind over the past five years through a Memorandum of Understanding negotiated with Domtar without public scrutiny. In early 1999, after intense public pressure, including a letter signed by three former Ministers of the Environment, did MOE agree to restrict the use of Dombind. Even then, there will be a two-year phase out period..

*Source: World Wildlife Fund - Action Alert: What is that Smelly Black Stuff on the Road?*

government regulates which pesticides may be lawfully used in Canada on the basis of whether the pesticide poses an unacceptable risk. This threshold does not comply with the precautionary principle. Ontario's *Pesticides Act* only governs the manner in which pesticides are applied. It does not restrict the total amount of pesticides that may be sprayed. Therefore, there are no regulations directed at curtailing the cumulative effect of pesticide use.

Another source of groundwater contamination is landfill sites. There are an estimated 1400 active and 2,500 closed landfill sites throughout Ontario.<sup>47</sup> While active sites are regulated by certificates of approval, a closed site may often no longer have an active owner. Yet, these sites may continue to leach contaminants into the groundwater. There is no policy on who is responsible for these sites. Recent changes to the *Environmental Assessment Act* and the *Environmental Protection Act* no longer require that a hearing be held to determine whether a landfill site should be approved. This removes the opportunity for the public to scrutinize proposals to ensure that the leachate will be treated effectively.

### **Recommendations: Groundwater Contamination**

- A study of sources of groundwater contamination should be conducted to determine the extent to which these sources, including their cumulative impacts, pose a threat to Ontario's water resources.
- The use and application of dust suppressants, road salt, and pesticides must be regulated. There should be programmes that encourage alternatives to these substances.
- A fund should be created to pay for the remediation of abandoned contaminated sites and underground storage tanks. The fund should be financed by means of a user fee on new related activities.
- The government should pass legally binding standards regulating leachate from landfill sites and governing the maintenance of storage tanks.

### **Protecting Ontario's Drinking Water**

All people require clean water to survive. The vast majority of Ontarians have little direct control over the water we drink; we simply turn on the tap. Although some can afford to purchase bottled water, tap water is still often used for cooking and bathing. It is clear that we rely heavily on tap water and depend upon public authorities to ensure that the water is clean and potable. All citizens of Ontario, no matter how rich or poor, should be able to trust that their tap water is safe to drink and should not feel the need to buy bottled water.

The primary legal control over the quality of drinking water is a policy entitled the "Ontario Drinking Water Objectives" (ODWO).<sup>48</sup> The ODWOs set out three types of objectives: maximum acceptable concentrations, interim maximum acceptable concentrations, and maximum desirable concentrations. Maximum acceptable concentrations set limits on the concentration of substances that are known to have human health effects or cause other serious problems with the taste or appearance of water. Interim maximum acceptable concentrations are



limits set for substances for which, although they may be known to cause chronic effects in mammals, there is insufficient information to establish the impact on humans. Maximum desirable concentrations pertain to substances that only affect the aesthetics of water. Like the PWQOs, the ODWOs are not legally binding. Instead, the drinking water objectives guide the MOE in issuing approvals to sewage treatment plants or industrial facilities. Hence, despite the fact that the *Ontario Water Resources Act* gives the Minister of the Environment the power to pass legally binding standards, they are only enforceable to the extent that they are incorporated into approvals.

The ODWOs do not include objectives for all substances that may be found in drinking water. For example, there is no standard for cryptosporidium, a protozoan parasite found in surface water. Many water treatment facilities are not able to treat this contaminant. In other instances, standards may be set too high based upon independent studies of the potential health impacts. For example, the current standard for tritium is 7000 bq/l, more than 700 times higher than that recommended by an independent advisory committee.<sup>49</sup> Standards for drinking water must be set in an objective and transparent fashion. Although it would be misleading to state that Ontario's drinking water is unacceptable, governments must be aggressive in protecting this resource and in keeping current with the science, especially as new evidence regarding long term and cumulative impacts arises.

#### ODWO'S UNDER SCRUTINY

Trihalomethanes are the by-products of the chlorination process in the treatment of drinking water. They are also a potential carcinogen. The Ontario standard for trihalomethanes is set at 350 mg/L, far less stringent than the U.S. standard of 100 mg/L and there is considerable pressure to make the U.S. number even more stringent. The difference can be attributed to differing rationales governing the risk assessment process. The precautionary principle suggests that the lowest standard should prevail until the potential effects are fully known.

Water is an absolute requirement for all people in Ontario. The Ontario public should have a guaranteed right to safe drinking water backed by enforceable standards. If governments are slow in restricting the continued discharge of toxics to the province's sources of drinking water, the public must be given means of protecting their own health. This right needs to be enshrined in legislation.<sup>50</sup>

The need for a guaranteed right to safe drinking water may become even more important in the near future as the ownership and operation of water and sewage treatment plants may be privatized and run by for-profit business.<sup>51</sup> This removes drinking water from the public sphere. If it were found that water was unsafe to drink, the public's only recourse may be through enforcing its contractual rights. There may be no political avenue open to take immediate and required action. If drinking water were to be privatized, there is also a need to ensure that it is priced appropriately to guarantee fair access for all economic groups in society.

#### **Recommendation: A Safe Drinking Water Act**

- The province should enact a *Safe Drinking Water Act*. Essential features of the Act would include the following components:

- (a) mandatory regulations specifying maximum levels of substances in drinking water that protect human health and provide clean and odour free water;
- (b) required monitoring and notification of any violations or any failure to perform any required duties;
- (c) required research into methods of treating drinking water that would reduce or eliminate the presence of organic chemicals from the finished water and the establishment of a drinking water advisory council;
- (d) the ability for citizens to bring a court action for violation of the statute and a judicial review application where the government has failed to perform a duty; and
- (e) the act would apply to both public and private water systems.

## **WATER QUANTITY**

### **Overview**

Ontarians are among the most wasteful users of water in the world. The average citizen uses more than 300 litres per day, more than any country other than the U.S.<sup>52</sup> In addition to withdrawals from major bodies of water, it is estimated that there are over 500,000 wells in Ontario drawing water, with 14,000 new wells being added each year.<sup>53</sup> One reason for our extravagant use of water is that it is cheap. Typically, Canadians are charged \$0.36 per 1000 litres of water. In comparison, Australians are charged \$1.47 per 1000 litres of water.<sup>54</sup> As a result, we use freshwater lavishly, do not recirculate water effectively, and do not invest significantly in developing efficient municipal water and treatment technologies.<sup>55</sup> Furthermore, water has become a commodity to trade and sell like any other good. Bottled water, drawn mainly from groundwater aquifers throughout the province, is now a major industry in Ontario, and much of this product is exported abroad.<sup>56</sup>

While Ontario is by no means in danger of exhausting its immense water supplies, there are still good reasons to practice water conservation. First, water quantity is inextricably linked to water quality. The more water used, the more that becomes degraded or contaminated. Second, water must be transported. Whether it is piped or trucked, the transport of water requires energy and substantial investment in infrastructure. The more water used, the greater the cost of energy and of building and maintaining this infrastructure. It has been estimated that Ontario's municipalities have invested over \$50 billion in water and sewage treatment infrastructure, and spend \$1.7 billion in annual maintenance costs.<sup>57</sup> Third, local water shortages do occur, especially in areas that rely on groundwater. Local water shortages often have severe impacts on local ecosystems that also rely on water to sustain its life cycles. Local water shortages increase the demand to ship water greater and greater distances, even across entire watersheds. These proposals involve great amounts of money to build and maintain. Moreover, the long-term impacts on ecosystems of large-scale water diversions are not understood. For these reasons, water conservation is an important component of an environmentally sustainable way of life.

In early 1992, the Ministry of Natural Resources launched a “Water Efficiency Strategy for Ontario.”<sup>58</sup> The strategy was laudable. It promoted the principle that the users of water resources should pay the full cost for the water and wastewater treatment. It also provided for educating the consumer on water conservation matters. Despite the fact that the strategy underwent extensive consultation during its development, the strategy has not been implemented. The province does not have an operative programme to promote and achieve water conservation.

### **Recommendation: An Effective Conservation Strategy**

- The province should continue its efforts to further develop an effective conservation strategy and ensure that it is implemented by the year 2002. This conservation strategy must be an integral part of the sustainable water policy in our first recommendation and at a minimum should include the following:
  - (a) comprehensive educational programmes for industry and the public on water conservation;
  - (b) amendments to the building code and other such acts to ensure that new homes and industrial facilities are fitted with water efficient appliances and processes;
  - (c) mandatory water conservation programmes pertaining to retrofitting homes and industrial processes;
  - (d) prohibition on the funding of water or sewer expansion projects unless municipalities can demonstrate that they have undertaken water conservation measures;
  - (e) the development of specific programmes to reduce agricultural use of water; and
  - (f) review of the pricing of water to ensure consumers understand the cost of water.

### **Surface Waters**

Ontario's surface waters face water quantity issues despite the immense number of lakes, rivers, and streams present in the province. Human activity has altered the landscape to such a degree that water no longer flows in natural watercourses in some places. The result of these changes include disruption of plant and animal habitat and species loss, flooding in spring and during storms, drought in the summer, erosion, and well water loss. Furthermore, the loss of natural water flows is inextricably linked to water quality. Urban runoff and channel diversions result in water being dumped more quickly into receiving waterways without the benefit of percolating underground and through wetlands to filter out sediment and contaminants.

In the early 1990's, the government of Ontario invested significant time and resources into developing the concept of watershed management.<sup>59</sup> Watershed management entails developing plans on a watershed basis that provide for the management of water and land-water interactions. It identifies the form and function of natural systems, land uses, natural features, surface and groundwater systems, and linkages between these features within the watershed. Areas in need of protection, rehabilitation or enhancement are set out, and means of controlling land-water interactions identified.

Since 1995, the government has abandoned efforts to further watershed management. Most notably, conservation authorities, whose mandates are set on a watershed basis, have had their powers severely curtailed. Conservation authorities are now limited to implementing flood control and erosion measures. Additionally, they have had their budgets cut by 70% since 1995. The MNR and MOE have similarly incurred significant budget cuts and relegated watershed management to the backseat.<sup>60</sup>

### **Recommendation: Watershed Planning**

- The province should renew efforts to develop watershed planning as a decision-making tool. Conservation authorities should be provided with the mandate and the necessary resources to implement watershed planning.

### **Groundwater Depletion**

The water that exists under the surface of the land – groundwater - is invisible and unknown. The role groundwater plays must not be overlooked. In addition to supplying drinking water to many Ontarians, groundwater often forms the headwaters of important cold water creeks. It also supports wetlands and bogs and the variety of life that depends on this type of habitat. Some regions of Ontario suffer from widespread groundwater shortages.<sup>61</sup> Other areas may experience shortages only on a very localized basis. Nevertheless, these local shortages may still pose significant threats to the ecosystems that depend upon groundwater for survival.

The primary regulatory vehicle to protect groundwater is the water-taking permit issued under section 34 of the *Ontario Water Resources Act*. A permit is required for any activity that withdraws more than 50,000 litres of water in a day from the ground or from surface water. However, water takings for domestic uses, for farm purposes other than irrigation of crops for sale, or for fighting fires do not require permits.

#### **THE OAK RIDGES MORaine**

The Oak Ridges Moraine is a 160 km ridge of sand, silt and gravel that stretches across the northern reaches of the Greater Toronto Area. The moraine is an important groundwater recharge area, supporting a number of deep aquifers that feed springs and coldwater streams that flow through the GTA into Lake Ontario and supply drinking water to numerous towns and hamlets. Since 1990, the province has indicated a provincial interest in the moraine and issued interim guidelines regarding development within its boundaries. However, the guidelines are not legally binding and do not apply to all development activities. The Province has not acted upon the recommendations of a 1994 report to provide permanent protection to the Moraine. In the meantime, development continues to encroach upon the Moraine, jeopardizing its ecosystem functions.

Ontario's "Water Management" document<sup>62</sup> does not provide an extensive policy framework for water taking permits. One of the key elements of the policy is that if a water taking permit interferes with other water supplies that were in use prior to the issuance of the permit, the permittee shall restore the affected supplies or reduce the taking so as to eliminate the interference. There is only passing reference to the need to ensure that the ecosystem functions