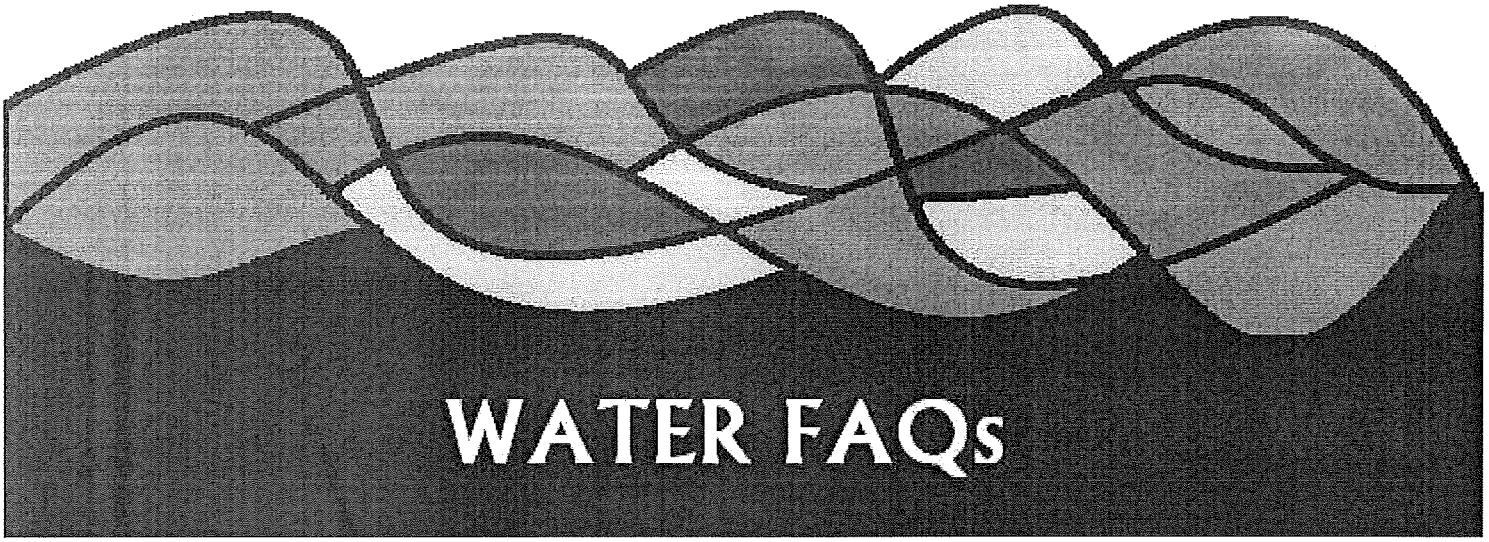

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Water FAQs: Weighing Water Protection

Much effort is underway in Ontario to protect water resources, largely due to the recommendations that flowed from the Walkerton Inquiry. Many of Ontario's laws, regulations, policies and programmes are being reformed to reflect these recommendations and to respond to other issues concerning both short-term and long-term sustainability of water resources. Change is occurring through amendments to existing laws as well as the creation of new laws and regulations. As a result, the road map of water regulation is not a simple one.

The Resource Library for the Environment and the Law and the Canadian Environmental Law Association provide here fourteen series of Frequently Asked Questions (FAQs), relating to water. Intended to foster a better understanding of the context of regulatory changes pertaining to water, these FAQs provide a range of perspectives and internet links to useful information. Additional fact sheets are provided to address aspects of water quality and quantity that go beyond the challenges that the events in Walkerton created.

Please note that information is current to the date indicated on each FAQ series

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Water Quality and Drinking Water Protection

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ACKNOWLEDGMENTS AND FEEDBACK: The Resource Library for the Environment and the Law and the Canadian Environmental Law Association (CELA) gratefully acknowledge the support of the Ontario Trillium Foundation, which made these FAQs on Water possible. Funding support does not imply any endorsement by the Trillium Foundation of the information or views presented here. Thanks also go to Author Anne Wordsworth and CELA staff for their help in producing these educational materials. Please send feedback to Sarah Miller, Project Coordinator at millers@lao.on.ca

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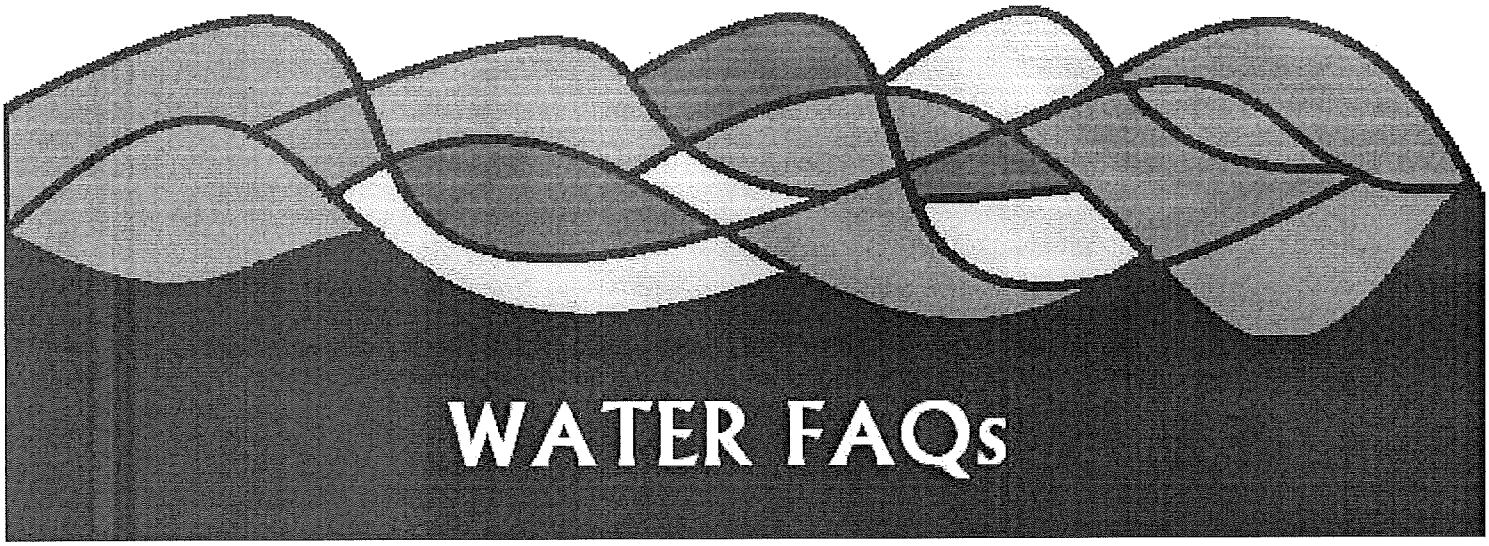

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Canada Water Legislation FAQs (January 2004)

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1. Who has responsibility for regulating water in Canada?

Canada's Constitution Act, 1867 allocates legislative powers to the federal and provincial levels of government. The Constitution Act gives each respective level of government exclusive jurisdiction to pass laws with respect to specific matters listed under the Act.

The Constitution Act does not say specifically which level of government has jurisdiction over "water", "environment", or "public health". The provinces have traditionally taken the lead in regulating water management, but the federal government also plays a role in certain water-related matters.

Although there is no power for "environment" per se, the Constitution Act list of provincial powers gives provincial legislatures authority over various aspects of the environment (including water) and public health. These heads of power include:

- Hospitals (section 92(7)),
- Municipal institutions (section 92(8)),
- Local works and undertakings (section 92(10)),
- Property and civil rights (section 92(13)),
- Matters of a "merely local or private nature" (section 92(16)), and
- Natural resources, forestry and electrical energy (sections 92A and 109).

There is also constitutional authority for significant federal participation in water management and protection. The federal list of powers under the Constitution Act gives the Government of Canada jurisdiction over various aspects of the environment (including water) and public health. These heads of power include:

- Peace, order and good government (section 91),
- Trade and commerce (section 91(2)),
- Navigation and shipping (section 91(10))
- Sea coast and inland fisheries (section 91(12)),
- Criminal law (section 91(27)),
- Federal works and undertakings (section 92(29) and 92(10)),
- Canals, harbours, rivers and lake improvements (section 108).

This constitutional division of powers means, in effect, that the federal and provincial governments share jurisdiction over water, environmental protection and public health. The provinces and the federal government also have shared jurisdiction over agriculture.

In addition, Ontario has enacted legislation that empowers municipalities in the areas of water management and public health. This means that, in Ontario, all three levels of government have roles and responsibilities for environmental protection in general, and water in particular. In practice, they have assumed separate and complementary roles with respect to water management.

For information on the laws governing water in Ontario, see the Ontario Water Regulation FAQ.

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2. What is the role of the federal government in regulating water?

The federal government has focused primarily on its constitutional responsibility for fisheries and navigation, and for waters that lie on or across international

borders. In recent years, however, the federal government has assumed a greater role in relation to water quality, particularly with respect to toxic substances.

The key water-related statutes administered by the federal government include:

- Canada Shipping Act – controls pollution from ships by imposing penalties for discharging pollutants without a permit or failing to report a spill; administered by Transport Canada;
- Canadian Environmental Protection Act, 1999 – establishes a regime for identifying, assessing and controlling toxic substances; imposes reporting requirements on anyone releasing a toxic substance; creates a national inventory of toxic releases; requires the development of Pollution Prevention Plans; controls nutrient discharges and marine pollution; administered by Environment Canada;
- Fisheries Act – protects fish by prohibiting habitat disturbances and the deposit of "deleterious substances" in water frequented by fish; ensures construction of fish- ways around any obstruction in a waterway; administered by Fisheries and Oceans;
- International Boundary Waters Treaty Act – implements the 1909 Boundary Waters Treaty between the United States and Great Britain (on behalf of Canada) establishing principles and guidelines for the management of boundary and transboundary waters in order to prevent or resolve disputes over water quality and water quantity; administered by Foreign Affairs and International Trade;
- International Rivers Improvement Act – prohibits damming, building a canal, a reservoir, or changing the natural flow of a river flowing out of Canada without a licence; administered by Environment Canada;
- Navigable Waters Protection Act – prohibits dumping of wastes that may interfere with navigation and prohibits construction of works in navigable waters without approval; administered by Transport Canada.

Where applicable, the Canadian Environmental Assessment Act also provides an opportunity to identify, assess and mitigate the effects of projects that could have significant impacts on groundwater or surface water.

Other federal statutes that play a less significant role in the regulation of water include:

- Arctic Waters Pollution Prevention Act – controls pollution from ships in Arctic waters by prohibiting any deposit of waste in Arctic waters or where it may enter Arctic waters without authorization; requires anyone who deposits waste or who is in danger of depositing waste to report it; administered by Indian Affairs and Northern Development;
- Canada Water Act – authorizes agreements with the provinces for the designation of water quality management areas, and for the delineation of flood plains and hazardous shorelines to control flooding and erosion; administered by Environment Canada;
- Dominion Water Power Act – requires authorization from the Minister to use public lands for hydroelectric projects; administered by Parks Canada; and
- Northwest Territories Waters Act and Yukon Waters Act – authorizes the federal government to take responsibility for inland waters and to delegate water management responsibilities to territorial governments; prohibits depositing waste in these waters without being authorized by a licence or regulations; administered by Indian Affairs and Northern

Development.

In addition, another general grant of legislative authority is relevant to jurisdiction over water -- the power of the federal government to implement treaties concluded by the British Empire on Canada's behalf. This power supports the International Boundary Waters Treaty Act, and the International Boundary Waters Treaty signed by Canada and the United States to resolve disputes over lakes and rivers shared by the two countries.

The federal government has also used this authority to ratify internationally agreed-upon conventions. Canada was the first country to ratify the Stockholm Convention on Persistent Organic Pollutants in May 2001, with the objective of protecting human health and the environment from persistent organic pollutants. Canada also ratified the Kyoto Protocol in December 2002, making a commitment to meet specific targets by reducing carbon dioxide emissions.

See the Climate Change and Water FAQ.

In addition, the federal government has proposed a new Canada Health Protection Act that would give the federal Ministry of Health a role in regulating drinking water. The proposed Act would confirm the authority of the Minister of Health to develop guidelines with regard to drinking water quality, in cooperation with other orders of government and other federal departments. Moreover, the Act would apply to the production of bottled water and water served on passenger conveyances. It would also apply to drinking water materials such as treatment devices and additives and system components. Public consultations are currently being held on what will be included in the new Act.

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3. What is the role of the federal government in First Nations' drinking water?

Federal government documents describe the shared roles in First Nations' drinking water provisions as follows:

> Programs and services for the provision of potable water on reserves are provided through First Nations Band Councils, Health Canada and Indian and Northern Affairs Canada (INAC)

Generally, First Nations Band Councils, together with departments of the federal government, have responsibility for designing, constructing, maintaining and operating water facilities in accordance with federal or provincial standards, whichever are more stringent. INAC provides funding to First Nations to assist them in the provision of these services to their communities. As well, INAC monitors design, construction and maintenance of these facilities. Health Canada, in collaboration with the provinces and territories, establishes the Guidelines for Canadian Drinking Water Quality and insures that water quality and surveillance programs are in place in First Nations communities. This support can extend to training programs for water treatment operators and community based water monitors on First Nations lands. Further information on these shared roles and responsibilities can be located at the following site: http://collection.nlc-bnc.ca/100/200/301/inac-ainc/safe_drinking_water-e/wqr_e.pdf

In the Part Two Report of the Walkerton Inquiry, Mr. Justice O'Connor stated

that "The water provided to many Metis and non-status Indian communities and to First Nations reserves is some of the poorest quality water in the province. Submissions by the Ontario Metis Aboriginal Association and the Chiefs of Ontario, as well as the federal government's reports about the quality of water on reserves, make it clear that water is not provided for aboriginal people at the standards that generally prevail throughout Ontario." Justice O-Connor went on to make recommendations to improve the protection of drinking water on reserves. These recommendations on the report can be found at: http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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4. What are the most important federal laws governing water?

Of these statutes, the most important ones for federal involvement in water management are the Canada Water Act, the Canadian Environmental Protection Act and the Fisheries Act.

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5. What does the Canada Water Act do?

Enacted in 1970, the Canada Water Act, administered by Environment Canada, contains a number of provisions that govern water quality in general. The Canada Water Act:

- Authorizes various federal-provincial arrangements such as joint subcommittees, programs or agreements with respect to water resource management (Part I);
- Regulates discharges of waste into "prescribed water quality management areas" and establishes federal water quality management programs for inter-jurisdictional waters (Part II);
- Establishes advisory committees to assist in the implementation of the Act (section 28); and
- Requires the Minister of the Environment to report annually to Parliament on operations under the Act (section 38).

Persons convicted of contravening the Canada Water Act face small fines (sections 30 and 31) and prohibition orders (section 32).

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6. What does the Canadian Environmental Protection Act do?

The new Canadian Environmental Protection Act, 1999 is the centrepiece of the federal government's pollution control regime. It is principally administered by Environment Canada, although Health Canada has certain responsibilities in relation to the assessment and regulation of toxic substances.

The underlying principles are to ensure pollution prevention, achieve sustainable development, protect biological diversity, exercise caution in cases of scientific uncertainty, adopt an ecosystem approach to environmental management, and virtually eliminate persistent and bioaccumulative toxic substances.

The Canadian Environmental Protection Act, 1999 contains numerous provisions which address water pollution and environmental enforcement, and, as a result, provides some degree of protection for surface waters. For example, the Act:

- Creates a public right to formally apply for an investigation of suspected contraventions of the Canadian Environmental Protection Act (sections 17 to 21);
- Creates a public right to bring a civil "environmental protection action" in respect of contraventions of the Act (sections 22 to 38);
- Creates a civil cause of action for loss or damage resulting from contraventions of the Act (sections 39 and 40);
- Requires pollution prevention plans from companies whose commercial, manufacturing, processing, or other activities, involve toxic substances from Schedule 1 of the Act (Part 4);
- Establishes a regime for identifying, assessing and regulating toxic substances (Part 5);
- Establishes a regime for identifying, assessing and regulating "animate products of biotechnology" (such as genetically modified organisms) (Part 6);
- Regulates nutrients such as phosphates that may adversely affect or degrade aquatic ecosystems (sections 116 to 119);
- Regulates ocean dumping and protects the marine environment from land-based sources of pollution through non-regulatory means (sections 120 to 137);
- Controls Canadian sources of international water pollution through regulations, interim orders or pollution prevention planning (sections 175 to 184);
- Controls transboundary movement of hazardous waste, hazardous recyclable material and prescribed non-hazardous waste for final disposal (sections 185 to 192);
- Requires companies or facilities to prepare emergency plans for toxic substances (Part 8); and
- Imposes a duty on corporate officers and directors to take all reasonable care to ensure that the corporation complies with the Act and its regulations, orders and directions (section 280).

A number of water-related regulations have been promulgated under the Canadian Environmental Protection Act with respect to ocean dumping, phosphorus concentrations, pulp and paper effluent, chlorinated dioxins and furans, and pulp and paper mill defoamer and wood chips.

The Canadian Environmental Protection Act makes it an offence to contravene the Act or regulations, orders or directions made under the Act (section 272). Persons convicted of contravening the Act face substantial penalties – up to $1 million in fines, jail terms, profit-stripping restoration and restitution orders (sections 272 to 294). In certain circumstances, a person charged with an offence may avoid prosecution by agreeing to undertake prescribed "environmental protection alternative measures" (sections 295 to 297).

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7. What does the Fisheries Act do?

The Fisheries Act was first enacted in 1868 and is administered by the Department of Fisheries and Oceans. It is primarily aimed at protecting fish and their habitat. However, the Act contains some strong provisions relating to water pollution, and, therefore, provides some protection for surface water. The Fisheries Act:

- Prohibits the harmful alteration, disruption or destruction of fish habitat (section 35(1));
- Prohibits the deposit of "deleterious substances" into or near waters frequented by fish (section 36(3));
- Enables the passage of regulations in relation to the deposit of waste, pollutants or deleterious substances (sections 36(4), 36(5) and 43), and
- Imposes civil liability for loss or expenses caused by the unlawful deposit of deleterious substances (section 42).

A number of regulations have been made under the Fisheries Act in relation to the liquid effluent from various industrial sectors, including chlor-alkali plants, meat and poultry plants, metal mining facilities, petroleum refiners, potato processing plants, and pulp and paper mills.

Persons convicted for contravening "fish habitat" and "deleterious substance" provisions face substantial penalties under the Act, such as $1 million fines, jail terms, profit-stripping, licence suspensions and restoration orders (sections 40 (2), 79.1 and 79.2).

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8. What role does the federal government have with respect to international agreements related to water?

The federal government has the power to implement treaties concluded by the British Empire on Canada's behalf. The International Boundary Waters Treaty Act, passed by the federal government, implements the 1909 Boundary Waters Treaty between the United States and Canada. The Treaty recognizes that each country may be affected by the other's actions in the lake and river systems along their common border. Its purpose is to prevent and resolve disputes concerning these boundary waters.

The Treaty also creates the International Joint Commission to prevent and resolve these disputes. The Commission is an independent advisor to both governments. It rules on applications for approval of projects affecting boundary and transboundary waters and may regulate the operation of these projects.

In 1972, the governments of United States and Canada signed the Great Lakes Water Quality Agreement. This was superseded by a new agreement in 1978, which was amended in 1987. Its purpose is "to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem".

The International Joint Commission assists in the implementation of the Great Lakes Water Quality Agreement, in the improvement of transboundary air quality, and alerts the governments to emerging issues along the boundary that may give rise to disputes. It also assesses the effectiveness of programs and progress pursuant to the Great Lakes Water Quality Agreement.

See the Great Lakes and St. Lawrence Ecosystem FAQ.

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9. What are the views of the Canadian Environmental Law Association on the regulation of water in Canada?

The Canadian Environmental Law Association (CELA) was established in 1970 with a mandate to protect the environment using existing laws and to advocate environmental law reform. CELA has numerous publications that address the need to protect and conserve the quality and quantity of surface water and groundwater resources. These documents can be found at: http://www.cela.ca/publist.htm

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10. How can I find out more about federal laws governing water management and protection?

The full text of these federal laws can be found on the website of Justice Canada.

Information is also available on Environment Canada's website on Water Policy and Legislation at: http://www.ec.gc.ca/water/en/policy/e_policy.htm

Another helpful site for researching Canadian laws is offerred by the Canadian Legal Information Institute.

The Canadian Water and Wastewater Association also provides summaries of water-related legislation in Canada and the provinces and territories.

For a starting point to researching water regulation in the other provinces and territories, see: http://www.ec.gc.ca/water/en/policy/prov/e_prov.htm

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11. How can I find out more about Ontario laws governing water?

For information on the laws governing water in Ontario, see the Ontario Water Regulation FAQ.

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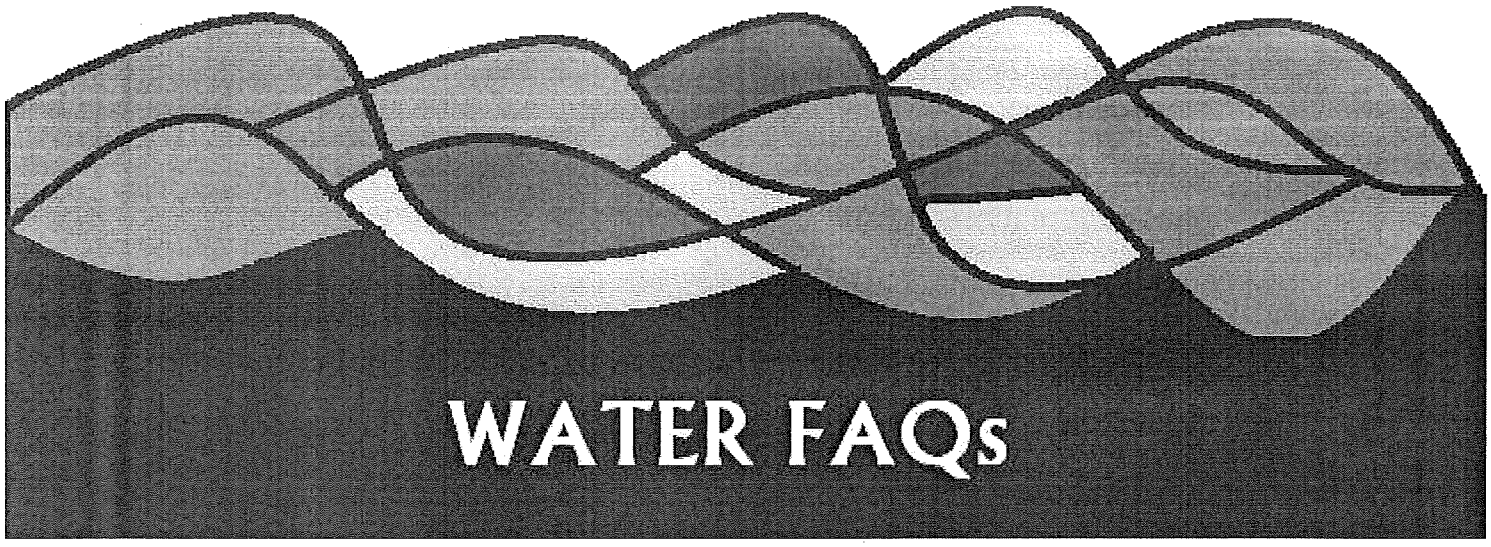
ACKNOWLEDGMENTS AND FEEDBACK: The Resource Library for the Environment and the Law and Environmental Law Association (CELA) gratefully acknowledge the support of the Ontario Trillium Foundatic these FAQs on Water possible. Funding support does not imply any endorsement by the Trillium Fou information or views presented here. Thanks also go to Author Anne Wordsworth and CELA staff for their he these educational materials. Please send feedback to Sarah Miller, Project Coordinator at millers@lao.on.ca



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Ontario Water Legislation FAQs (January 2004)

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1. How is water regulated in Ontario?

The Constitution Act, 1867, which allocates powers to the federal and provincial levels of government, has resulted in shared jurisdiction between Canada and Ontario over water, environmental protection and public health. However, the federal government has focused primarily on its constitutional responsibilty for fisheries and navigation, and for waters that lie on or across international borders, while Ontario has assumed the primary responsibility for water management and drinking water safety.

See the Water Regulation in Canada FAQ.

Ontario uses legislative and non-legislative mechanisms, such as policies and guidelines, to regulate water quality and quantity in the province. The Ontario statutes governing water are primarily administered by the Ontario Ministry of the Environment, which is responsible for overseeing environmental management of air, land, and water in the province, as well as drinking water safety.

However, the Ministry of Natural Resources also has some responsibility for regulating water, primarily because it is the lead conservation and resource management agency. As such, its responsibilities include provincial parks, forests, fish, wildlife, and Crown lands and waters, as well as public safety and emergency response in the case of forest fires, floods and drought.

In addition, Ontario has enacted legislation that confers certain responsibilities on local institutions such as municipalities, boards of health and conservation authorities. This includes public health legislation (the Health Promotion and Protection Act), as well as legislation allocating specific duties with respect to the production and delivery of potable water (the Municipal Act), watershed management (the Conservation Authorities Act) and planning (the Planning Act).

Ontario also shares responsibility with the federal government and the government of Quebec for implementing the Great Lakes Water Quality Agreement between Canada and the United States.

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2. What statutes govern water in Ontario?

The principal environmental statutes in Ontario that govern water quantity and quality may be summarized as follows:

- Environmental Protection Act – prohibits discharge of any contaminant to the environment in amounts exceeding limits prescribed by the regulations; prohibits discharge of contaminants into the environment that cause or are likely to cause adverse effects; requires spills of pollutants to be reported and cleaned up promptly and establishes liability on the party at fault; administered by the Ministry of the Environment;
- Lakes and Rivers Improvement Act – generally regulates public and private use of lakes and rivers; regulates construction, repair and use of dams; prohibits deposit of refuse, matter or substances into lakes and rivers contrary to the purposes of the Act; administered by the Ministry of Natural Resources;
- Nutrient Management Act - provides a framework for setting standards for nutrient management on farms; enables the passage of regulations for nutrient management through the creation of farm plans and strategies, and restrictions on other related farm practices; administered by the Ministry of the Environment with the Ministry of Agriculture and Food;
- Ontario Water Resources Act – enables the passage of regulations regarding Ontario's water supplies; regulates sewage disposal and "sewage works"; prohibits discharge of materials that may impair water; regulates water-taking by requiring permits for the taking of more than 50,000 litres of water per day from a ground or surface source of water; regulates well construction, operation and abandonment; regulates the approval, construction and operation of "water works"; administered by the Ministry of the Environment;
- Public Lands Act – generally regulates the use, management, sale and disposition of public lands and forests; regulates public and private roads on public lands; empowers the province to construct and operate dams; administered by the Ministry of Natural Resources;
- Safe Drinking Water Act – generally regulates drinking water treatment and distribution systems; establishes legally-binding standards for contaminants in drinking water; makes it mandatory to use licensed and accredited laboratories for drinking water testing; makes it mandatory to report adverse test results and to take "corrective action"; requires that drinking water system operators be trained and certified; administered by the Ministry of Environment;
- Sustainable Water and Sewage Systems Act, 2002 – provides the framework for implementing full cost accounting; requires municipalities to assess the costs of water and to develop plans to charge appropriate rates and generate sufficient revenue to finance capital and operating costs of sewer and water systems; administered by the Ministry of Environment;

In addition, there are two pieces of legislation in Ontario that govern the processes by which water-related projects are reviewed and approved. These are:

- Environmental Assessment Act – generally requires environmental assessment of any major public or designated private undertaking; establishes a "Class Environmental Assessment" process for planning certain municipal projects (i.e. water works); administered by the Ministry of Environment;
- Environmental Bill of Rights, 1993 – sets up an Environmental Registry

to notify the public of important environmental decisions and to solicite public comment; establishes an independent Environmental Commissioner; gives the public the right to request reviews of inadequate laws, regulations, policies or instruments; gives the public the right to seek an investigation of environmental violations; creates a new civil cause of action; administered by the Ministry of the Environment.

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3. How were recent laws in Ontario governing water developed?

Until the summer of 2000, the primary laws governing the use and quality of waters in Ontario were the Ontario Water Resources Act, and the Environmental Protection Act. These two laws were used during the 1970s and 1980s to address point sources of water pollution and to regulate the discharge of contaminants into water. Rather than creating a single comprehensive statute governing water, the Ontario government generally used these two Acts to address problems as they arose. For example, a program to regulate wastewater discharges from various industrial sectors, called the Municipal Industrial Strategy for Abatement ("MISA"), was put into effect using the provisions of the Environmental Protection Act.

In May 2000, however, a decisive event occurred in the province. In the small rural town of Walkerton, Ontario, deadly bacteria carried in animal manure, including the lethal E. coli 0157:H7, infiltrated the public water supply and contaminated the drinking water. Seven people died from waterborne disease and thousands of others became sick. This tragedy compelled the Ontario government to introduce a wide-ranging set of legislative, regulatory and administrative reforms in order to better protect drinking water quality.

One of the most important initiatives was the June 2000 establishment of the Walkerton Commission of Inquiry headed by Mr. Justice Dennis O'Connor, who investigated the circumstances and the failures that led to the tragedy. The mandate of the Inquiry was to determine the cause of the problems in Walkerton, and to make recommendations to enhance the protection of drinking water quality in order to avoid a recurrence of the tragedy.

Mr. Justice O'Connor's Part One Report of the Walkerton Commission of Inquiry was released in January 2002. It examined the events, physical factors, and systemic failures that caused or contributed to the Walkerton tragedy, and recommended numerous measures that were needed to ensure drinking water safety in Walkerton and elsewhere. At that time, the Premier of Ontario committed the government to implementing all Justice O'Connor's recommendations. Mr. Justice O'Connor's Part Two Report of the Walkerton Commission of Inquiry was released in May 2002, and contained 93 recommendations to improve and protect drinking water quality across Ontario. The Ontario government also committed to adopt and implement these wide-ranging recommendations.

As a result of the deaths at Walkerton and the far-reaching Inquiry, the government of Ontario introduced several significant new statutes intended to protect drinking water. The new laws include the Safe Drinking Water Act, the Sustainable Water and Sewage Systems Act, and the Nutrient Management Act. Justice O'Connor also recommended that legislation to protect sources of drinking water be enacted in Ontario. Source protection legislation is currently being developed by two government-appointed committees - a technical committee and an implementation committee.

For more information on protecting sources of drinking water, see the Source Protection FAQ.

The Report of the Walkerton Commission of Inquiry, Parts 1 and 2, is available at:
http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

All Ontario Acts and the Walkerton Reports are also available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

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4. What does the Ontario Water Resources Act do?

The Ontario Water Resources Act is the most important law governing water quality and quantity in the province. It is a general water management statute whose origins date back to the 1950s. It applies to both groundwater and surface water.

Administered by the Ministry of the Environment, the Ontario Water Resources Act contains a number of important mechanisms that protect water resources. The Ontario Water Resources Act:

- Prohibits the discharge of polluting material in or near water (section 30);
- Prohibits or regulates the discharge of sewage (section 31);
- Enables the issuance of orders requiring measures to prevent, reduce or alleviate impairment of water quality (section 32);
- Enables the designation and protection of sources of public water supply (section 33);
- Regulates water takings in excess of 50,000 litres a day (section 34);
- Regulates well drilling and construction (sections 36 to 50);
- Requires approvals for water works (section 52);
- Requires approvals for sewage works (section 53);
- Enables the Ontario Clean Water Agency to provide or operate water works or sewage works for municipalities (sections 63 to 73);
- Designates and regulates areas of public water or sewage services (section 74);
- Imposes a duty on corporate officers and directors to take all reasonable care to prevent the corporation from discharging materials into or near water that may impair water quality (section 116);

In addition, regulations under the Ontario Water Resources Act have been enacted on a variety of water-related matters. These include:

- Water taking and transfers (O.Reg. 285/99);
- Exempting minor watermain, sewer or stormwater management projects from approval requirements (O.Reg. 525/98);
- Classifying water works and sewage works, licencing of facility operators and operating standards (O.Reg. 435/93);
- Licencing of well contractors and technicians and requirements for well construction, operation and abandonment (Regulation 903); and
- Contraventions by secured creditors, receivers and trustees in

bankruptcy (O.Reg.299/02).

For more information on water taking (O. Reg. 285/99) in Ontario, see the Water Taking FAQ.

The Ontario Water Resources Act makes it an offence to contravene either the Act, regulations, orders, licences, permits or approvals under the Act (section 107). Various penalties -- fines, jail terms, profit-stripping, restitution, restoration orders, forfeiture or licence suspension -- may be imposed against individuals or corporations convicted under the Act (sections 108 to 112). In addition to prosecution, administrative penalties may be available (section 106.1).

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5. What does the Environmental Protection Act do?

The Environmental Protection Act is the principal pollution control statute in Ontario. It is used interchangeably with the Ontario Water Resources Act to address sources of water pollution. Administered by the Ministry of the Environment, the Act contains a number of general provisions that can be used to protect surface water and groundwater against contamination.

The Environmental Protection Act:

- Prohibits discharges of contaminants into the natural environment in an amount, concentration or level in excess of prescribed regulatory standards (section 6);
- Authorizes the issuance of binding administrative orders to prevent, control, minimize or remediate discharges of contaminants into the natural environment (sections 7 to 12, sections 17 to 18, section 97, Part XI and Part XIV);
- Prohibits the discharge of contaminants into the natural environment that cause or are likely to cause an adverse effect (section 14);
- Regulates the approval, construction, operation and closure of waste disposal sites and waste management systems (Part V);
- Imposes duties to report and clean up pollutant spills and imposes civil liability for loss or damage arising from spills (Part X);
- Authorizes conditions of approval (including permits and approvals under the Ontario Water Resources Act) which require proponents to provide financial assurance to secure performance of environmental protection measures (Part XII);
- Imposes a duty on corporate officers and directors to take all reasonable care to prevent the corporation from causing or permitting unlawful discharges of contaminants into the natural environment (section 194).

In addition, the Environmental Protection Act creates broad regulation-making authority on a long list of environmental matters (sections 175.1 to 177). This authority has been used to enact water-related regulations such as:

- Deep Well Disposal (Regulation 341),
- Discharge of Sewage from Pleasure Boats (Regulation 343),
- Marina Facilities (Regulation 351),

- Sewage Systems (Regulations 358 and 359).

The Ministry of the Environment has also used the Environmental Protection Act, rather than the Ontario Water Resources Act, to enact regulations for limiting discharges into waterways from different industrial sectors. Under the Municipal Industrial Strategy for Abatement (MISA) program, regulations have been set to control pollution from the petroleum industry in Ontario, the pulp and paper industry, metal mining, industrial metals, metal casting, organic chemical and manufacturing, inorganic chemical industry, iron and steel manufacturing industry and the electrical power generating industry.

The Environmental Protection Act makes it an offence to contravene either the Act, regulations, orders, licences, permits or approvals under the Act (section 186). Various penalties – fines, jail terms, profit stripping, restitution, remedial orders, forfeiture or licence suspension – may be imposed against individuals or corporations upon conviction under the Environmental Protection Act (sections 187 to 193). Administrative penalties may also be available (section 182.1).

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6. What does the Environmental Assessment Act do?

The Environmental Assessment Act, administered by the Ministry of the Environnment, is Ontario's primary environmental planning statute.

The general rule is that public sector undertakings (such as provincial or municipal projects) are caught by the Environmental Assessment Act unless exempted. Conversely, private sector undertakings are not caught by the Environmental Assessment Act unless they are specifically designated by regulations as undertakings to which the Act applies. For example, private proposals to establish or expand waste disposal sites are typically designated under the Act.

If caught by the Act, proponents are generally required to identify and evaluate ecological, social, cultural and economic impacts that may be caused by the undertaking and its alternatives.. Such undertakings cannot proceed unless the proponent completes the required environmental assessment with agency and public input, and receives approval to proceed from the Minister of the Environment. The Minister may reject environmentally unsound undertakings, or may approve environmentally sound undertakings, subject to terms and conditions which prevent, reduce or mitigate adverse environmental effects. The Minister also has the power to refer the matter, in whole or in part, to the Environmental Review Tribunal for public hearings.

In addition, the Ministry of the Environment has used the Environmental Assessment Act to approve "Class Environmental Assessments", which prescribe streamlined planning procedures for certain defined classes of projects. Unlike the individual environmental assessment process, the proponent of a class environmental assessment project follows the prescribed planning process without the need for project-specific approval from the Minister of the Environment or the Environmental Review Tribunal. Most class environmental assessments, however, include "bump up" provisions which allow the Minister to order proponents to carry out an individual assessment of particularly significant or controversial projects.

The Minister of the Environment has approved a class environmental assessment process for municipal road, water, and sewage and stormwater

projects. For water projects, the purpose of the municipal class environmental assessment is to ensure that projects will be "undertaken to address problems affecting the operation and efficiency of existing water systems, to accommodate future growth of communities, or to address water source contamination problems".

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7. What does the Environmental Bill of Rights, 1993 do?

The Environmental Bill of Rights, 1993 is a procedural statute designed to ensure public participation in environmental decision-making, increase governmental accountability for environmental decision-making, and increase citizens' access to the courts for environmental protection. Although the Environmental Bill of Rights does not specifically regulate water, many of its mechanisms may be used by the public to address water quality and quantity issues.

The Environmental Bill of Rights:

- Establishes an electronic registry to provide information to the public about environmental matters (section 5 and 6);
- Requires certain ministries (such as Environment, Natural Resources, Health, Agriculture and Food) to develop "Statements of Environmental Values" which explain how they intend to apply the purposes of the Environmental Bill of Rights in their decision-making (sections 7 to 11);
- Requires certain ministries to provide public notice and comment opportunities in relation to proposed laws, regulations, instruments or policies that are environmentally significant (sections 12 to 37);
- Creates a public right to seek leave to appeal certain instruments to an appellate body under certain circumstances (sections 38 to 48);
- Establishes an independent Environmental Commissioner who monitors, investigates and reports upon governmental compliance with the Environmental Bill of Rights (Part III);
- Creates a public right to seek a review, repeal or revocation of existing laws, regulations, instruments or policies on the grounds that they are inadequate to protect the environment (Part IV);
- Creates a public right to seek an investigation of suspected contraventions of prescribed laws, regulations or instruments (Part V);
- Creates a new civil cause of action to protect "public resources" against unlawful conduct causing significant environmental harm (sections 82 to 102);
- Enhances the ability of persons to sue in relation to public nuisances causing environmental harm (section 103), and
- Expands "whistle-blower" protections for employees who report environmental misconduct by their employers (Part VII).

Pursuant to Part III of the Environmental Bill of Rights, the Environmental Commissioner of Ontario files annual reports with the Ontario Legislature. In these reports, the Commissioner has raised concerns about drinking water and permits to take water. A special report filed in July 2000 by the Environmental Commissioner in the wake of the Walkerton tragedy expressed concerns about the problems of groundwater contamination from intensive farming.

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8. What does the Nutrient Management Act, 2002 do?

Enacted in June 2002, the Nutrient Management Act, 2002 is intended to control nutrients on farms so that they do not enter surface water or infiltrate groundwater. It is also designed to control pollution from biosolids (i.e. sludge from sewage treatment plants) when they are spread on land. The Act is administered by both the Ministry of the Environment and the Ministry of Agriculture and Food.

A general regulation (O.Reg.267/03) has been passed under the Nutrient Management Act in order to set out requirements regarding the application (and phasing-in) of the Act; the development and approval of nutrient management strategies and plans; and standards respecting land application, facility siting and construction, and sampling and analysis.

For more information on the Nutrient Management Act and its regulation, see the Nutrient Management Act FAQ.

For more information on biosolids and septage, see the Biosolids and Septage FAQ.

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9. What does the Safe Drinking Water Act, 2002 do?

Enacted in December 2002, the Safe Drinking Water Act, 2002 establishes a regulatory regime for drinking water protection. However, the Act is largely focused on the treatment and distribution of drinking water, and does not address protecting sources of drinking water. Under this Act, a comprehensive regulation has been passed to establish standards for contaminants in drinking water. A number of other key implementation regulations (i.e. definitions, drinking water systems, testing services, etc.) have been passed under the Act.

For more information on the Safe Drinking Water Act and its regulations, see the Safe Drinking Water Act FAQ and the Drinking Water Quality Standards FAQ.

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10. What does the Sustainable Water and Sewage Systems Act do?

Enacted in December 2002, the Sustainable Water and Sewage Systems Act requires municipalities to identify and recover the costs necessary to sustain water and sewer services. In particular, municipalities must assess the costs in a full cost report, and then develop a plan to recover the costs.

For more information on the Sustainable Water and Sewage Systems Act, see the Water Financing FAQ.

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11. How are administrative instruments used to regulate water in Ontario?

In general, there are three key instruments that are used in Ontario to address sources of pollution: (i) certificates of approval; (ii) program approvals; and (iii) orders :

- Certificates of approval are issued by the Ministry of the Environment under legislation such as the Environmental Protection Act or the Ontario Water Resources Act. These approvals describe the terms and conditions under which an activity, such as discharging effluent into a waterway, may be carried out. The terms and conditions have the force of law. There are statutory rights of appeal against the issuance (or refusal) of certificates of approval (or terms and conditions thereunder) that are available to the approval applicant and members of the public (see Answer #12).
- Program approvals are used to set up "voluntary agreements" between the Ministry and a company. The company must agree to adopt a defined program of pollution reduction or control during a specific time frame. If the Ministry approves the program, and if the company remains in compliance with the approved program, then the Environmental Protection Act provides that the company cannot be convicted for subsequent offences involving matters dealt with by the program approval.
- Ontario's environmental legislation establishes a variety of legally enforceable orders that may be issued by Ministry officials. For example, "control orders" may be issued to compel a polluter to correct a specific environmental problem. Control orders may require that certain discharges be stopped or that certain equipment be installed, but the polluter may be given time to do studies and phase out an activity. "Stop orders" may require that the polluter immediately stop an activity that poses an immediate danger to human health or property. In addition, "remedial orders" may be issued to require a clean up of environmental harm, and "preventive orders" may be issued to prevent environmental harm from occurring. There are statutory rights of appeal respecting the issuance of orders that are available to the orderee and members of the public (see Answer #12).

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12. What opportunities are there to appeal environmental decisions in Ontario?

The independent Environmental Review Tribunal has jurisdiction to hold public hearings regarding appeals against certain Ministry of the Environment decisions (i.e. to issue orders or approvals) under the Environmental Protection Act, Ontario Water Resources Act, and Pesticides Act. Traditionally, only approval applicants or orderees had the right to appeal such decisions. However, under Part II of the Environmental Bill of Rights, concerned members of the public may also seek leave to appeal to the Tribunal, provided that they can demonstrate that the Ministry's decision was unreasonable and could result in significant environmental harm.

Under Ontario's Environmental Assessment Act, the Environmental Review Tribunal also has jurisdiction to hold public hearings to assess the environmental impacts of undertakings caught, and to decide whether the proponent should be granted approval to proceed, with or without terms and conditions. It should be noted that there is no absolute right to a public hearing under the Environmental Assessment Act; instead, the Minister of the Environment has discretion whether to refer a matter, in whole or in part, to the Tribunal for a public hearing and decision.

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13. What non-legislative mechanisms are used for water management in Ontario?

The Ministry of the Environment has developed an extensive policy framework consisting of guidelines, objectives, manuals and codes of practice that are important tools for managing the province's water resources. In general terms, these non-legislative tools are taken into account when the Ministry is deciding whether to grant approvals or issue orders.

In the context of water, one of the most important documents is "Water Management – Policies, Guidelines and Provincial Water Quality Objectives" (Guideline B-1-3). This document gives direction on how to manage the quality and quantity of both surface and groundwater. The Provincial Water Quality Objectives, found in this document, are numerical and narrative criteria for chemical and physical characteristics of water. They are set at levels intended to protect all forms of aquatic life, and are used to regulate waste discharges into water.

Other documents that provide guidance, and affect the overall management of water in Ontario, include:

- Protection and management of aquatic sediment quality (Guideline B-1-3),
- Fill quality guidelines for lakefilling (Guideline B-1-4),
- Resolution of well water quality problems resulting from winter road maintenance (Guideline B-3),
- Evaluation of construction activities impacting water resources (Guideline B-6),
- Incorporation of "reasonable use" concept in groundwater management activities (Guideline B-7),
- Determination of contaminant limits and attenuation zones (Guideline B-7-1),
- Resolution of groundwater quality interference problems (Guidelines B-9),
- Potable water storage structures (Guideline B-12),
- Design of water supply systems for small residential developments (Guideline B-14-2),
- Use and storage of pesticides at water works (Guideline B-15),
- Planning for sewage and water services (Guideline D-5),
- Application of municipal responsibility for communal water and sewage services (Guideline D-5-2),
- Servicing options statement (Guideline D-5-3),
- Water quality impact risk assesment for individual on-site sewage systems (Guideline D-5-4),
- Treatment levels for municipal and private sewage works discharging to surface waters (Guidelines F-5 to F-5-5),
- Separation distances for sewer and watemain construction (Guidelines F-6 and F-6-1),
- Phosphorus removal facilities at municipal, institutional and private sewage treatment works (Guidelines F-8 and F-8-1),
- Use of holding tanks in sewage systems (Guideline F-9) and

- Sampling and analysis requirements for municipal and private sewage treatment works (Guidelines F-10 and F-10-1).

For a complete list of all policy directives on water (including drinking water) or in other areas (i.e. waste management), see the Ministry of the Environment's Manuals and Guidelines Catalogue.

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14. What role does the government of Ontario play with respect to international agreements such as the Great Lakes Water Quality Agreement?

Under the Great Lakes Water Quality Agreement, first signed in 1972 by Canada and the United States, the two governments agreed "to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem".

Four of the five Great Lakes are within the borders of Ontario, and Ontario's environmental policies and programs directly affect the quality and quantity of the lakes. Therefore, Ontario shares the responsibility with the federal government for implementing the Great Lakes Water Quality Agreement. This has been formalized in another agreement between the federal government and Ontario – "Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem".

As well, Ontario has signed another separate agreement with the province of Quebec and the eight states bordering the Great Lakes called the Great Lakes Charter. This agreement outlines principles for the collective management of the Great Lakes.

For more information on Ontario's role in international agreements, see Great Lakes and St. Lawrence Ecosystem FAQ.

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15. What provincial laws give municipalities responsibility for water management?

Ontario has enacted a number of laws creating, empowering and regulating local institutions with respect to water management and public health – municipal corporations, conservation authorities and medical officers of health. Some of the important laws that affect water quality and quantity at the local level may be summarized as follows:

Municipal Act, 2001

Municipal governments in Ontario are regulated by the Municipal Act, 2001, administered by the Ministry of Municipal Affairs and Housing. The Municipal Act, 2001 contains a comprehensive code for the creation, expansion, restructuring and dissolution of municipalities in Ontario. It also prescribes the composition, duties and meeting requirements of municipal councils, and establishes various officers of the municipal corporation).

The Act allows municipalities to construct and operate municipal sewer and water systems, and empowers municipalities to enact and enforce by-laws on

a wide variety of water-related matters, such as industrial discharges into municipal sewers.Another important municipal power is the authority to set water rates. This is directly affected by the new provincial legislation, the Sustainable Water and Sewage Systems Act.

More specifically, the Municipal Act, 2001 allows municipalities to pass by-laws in relation to:

- Waste management, public utilities (i.e. sewage/water services), and drainage and flood control (Parts II and III);
- Health, safety and nuisance matters (sections 115 to 134); and
- Natural environment (i.e. trees, energy conservation)(sections 135 to 147).

In addition, the Municipal Act, 2001 broadly empowers municipalities to "regulate matters not specifically provided for in this Act or other Acts for purposes related to the health, safety and well-being of the inhabitants of the municipality" (section 130). This provision has recently been judicially interpreted to allow municipalities to regulate pesticide usage.

Persons convicted of offences under by-laws passed under the Municipal Act, 2001 face fines and prohibition orders Part XIV). In addition, the Municipal Act, 2001 provides that local ratepayers may bring civil actions to restrain contraventions of municipal by-laws (section 443).

Conservation Authorities Act

Administered by the Ministry of Natural Resources, the Conservation Authorities Act establishes a statutory framework for the creation, funding and operation of local or regional Conservation Authorities within Ontario. The Conservation Authorities Act gives the Conservation Authorities the mandate to undertake "a program designed to further conservation, restoration, development and management of natural resources" (section 20).

Conservation Authorities have been established throughout the province in many major watershed areas. Because of their long history and their unique involvement in watershed-based management, Justice O'Connor recommended that the Conservation Authorities take the lead in developing local watershed-based source protection plans.

Many provisions in the Conservation Authorities Act directly affect surface and groundwater. The Act:

- Enables the establishment of a Conservation Authority a the request of municipalities within a watershed (sections 2 and 3) or adjoining watersheds (sections 8 to 9),
- Specifies procedural requirements respecting municipal representation on the Conservation Authority (section 14),
- Empowers Conservation Authorities to undertake watershed management programs, acquire or expropriate lands, enter into landowner agreements, construct dams or reservoirs, and undertake flood control or watercourse diversion projects (section 21),
- Authorizes Conservation Authorities to make capital expenditures and apportion costs and expenses among participating municipalities (sections 25 to 27),
- Empowers Conservation Authorities to make regulations which restrict

or regulate water use, prohibit or regulate watercourse diversion or channelization projects, and prohibit or regulate development which may affect flood control, erosion, pollution or land conservation (section 28),

- Empowers Conservation Authorities to make regulations respecting the use of their lands or facilities (section 29).

Health Promotion and Protection Act

The purpose of the Health Promotion and Protection Act, administered by the Ministry of Health, is to organize and deliver public health programs, to prevent the spread of disease and to promote and protect health (section 2). It contains important provisions that require the investigation, reporting and reduction of waterborne diseases in Ontario.

The Medical Officer of Health has an important role with respect to protecting citizens from waterborne disease and avoiding tragedies like Walkerton. When bacteria detected in water supplies is deemed to pose a threat to health, the Medical Officer of Health may impose a boil water order or take other action to prevent exposure to a health hazard. The Health Promotion and Prevention Act:

- Creates boards of health for each local health unit (Part VI) and requires boards of health to undertake public health programs and services for local residents (sections 4 and 5),
- Requires each board of health to hire a full-time medical officer of health (section 62),
- Imposes a mandatory duty upon the medical officer of health to carry out inspections for the purposes of preventing, eliminating and decreasing the effects of "health hazards" within the health unit (section 10),
- Requires the medical officer of health to keep informed on matters related to environmental health (section 12),
- Empowers the medical officer of health to issue written orders requiring persons to take actions in relation to a health hazard (section 13),
- Requires owners of residential buildings to provide potable water for residents of the building (section 20),
- Imposes a duty upon physicians, health laboratories and other institutions to notify the medical officer of health about "reportable diseases" they have detected or suspected (sections 25 to 30),
- Gives medical officers of health and public health inspectors broad rights of entry, investigation and sampling (section 41),
- Empowers the Minister of Health to investigate causes of disease or mortality in Ontario (section 78) and to establish public health laboratories (section 79),
- Enables the passage of regulations on various public health matters, including potable water (section 96(3)).

Persons convicted of offences under the Health Promotion and Protection Act face small fines and prohibition orders (sections 100 to 102).

Planning Act

The purposes of the Planning Act, administered by the Ministry of Municipal

Affairs and Housing, include promoting "sustainable economic development in a healthy natural environment". The Act enables municipalities to regulate land use and development at the local or regional level, subject to a provincial policy framework.

A number of provisions in the Planning Act can be used by municipalities to protect aquifers or surface watercourses. They include:

- Declaring a provincial interest in protecting ecological systems and functions, conserving natural resources, ensuring the supply and efficient use of water, ensuring adequate provision of sewage and water services, ensuring the orderly development of safe and healthy communities, and protecting public health and safety (section 2);
- Enabling the provincial government to issue policy statements on matters of provincial interest, and requiring municipalities to have regard for such policy statements (section 3);
- Establishing procedures for the preparation, approval, appeal and amendment of municipal Official Plans, which provide long-term planning direction (Part III);
- Prohibiting the undertaking of public works, or the passage of by-laws, that are not in conformity with an approved Official Plan (section 24);
- Establishing procedures for the preparation, approval, appeal and amendment of zoning by-laws, holding by-laws, interim control by-laws, site plan control by-laws, and other related by-laws (Part V);
- Empowering municipalities to prohibit or restrict the use of land, or the erection or use of buildings or structures, particularly in areas containing significant natural heritage or land that is "a sensitive groundwater recharge area, or headwater area, or land that contains a sensitive aquifer" (section 34(1));
- Empowering the Minister of Municipal Affairs and Housing to exercise zoning and subdivision control powers on any lands in Ontario (section 47); and
- Establishing procedures for the preparation, approval, appeal, and amendment of plans of subdivision (Part VI).

Persons convicted of offences under the Planning Act face fines and prohibition orders (section 67).

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16. What are the views of the Canadian Environmental Law Association on the regulation of water in Ontario?

The Canadian Environmental Law Association (CELA) was established in 1970 with a mandate to protect the environment using existing laws and to advocate environmental law reform. CELA has numerous publications that address the need to protect and conserve the quality and quantity of Ontario's surface water and groundwater resources. These documents can be found at: http://www.cela.ca/publist.htm

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17. How do I find out more about Ontario laws?

The full text of all Ontario laws can be found at: http://www.e-laws.gov.on.ca

For more information on the water-related policies and programs of the Ministry of the Environment, see:
http://www.ene.gov.on.ca/water.htm

For more information on the water-related policies and programs of the Ministry of Natural Resources, see:
http://www.mnr.gov.on.ca/MNR/water

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18. How is water regulated in the other provinces and territories?

For a starting point to researching water regulation in the other provinces and territories, see: http://www.ec.gc.ca/water/en/policy/prov/e_prov.htm

The Canadian Water and Wastewater Association also provides summaries of water-related legislation in Canada and the provinces and territories at:
http://www.cwwa.ca/legislation/

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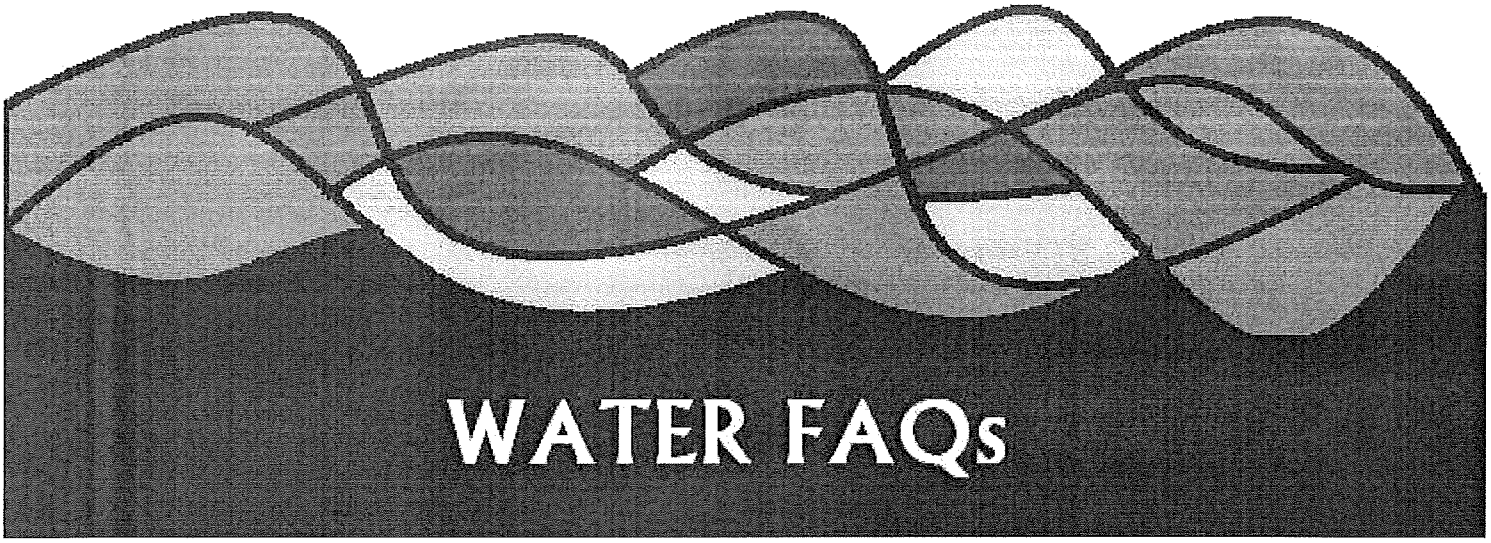

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Drinking Water Quality Standards FAQ (January 2004)

1. What are drinking quality water standards?

Drinking water quality standards are legally enforceable limits on contaminants in drinking water. They are designed to protect public health by limiting the amount of specific contaminants allowed in drinking water. Under Ontario's Safe Drinking Water Act (Safe Drinking Water Act) and the new Ontario Drinking-Water Quality Standards Regulation (O.Reg. 169/03), the province has established standards for numerous contaminants. Water supplied by drinking water systems subject to the Safe Drinking Water Act must legally meet these standards.

For more information, see the Safe Drinking Water Act FAQ.

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2. What contaminants do Ontario's drinking water quality standards cover?

Drinking water quality standards under O.Reg. 169/03 cover three different types of contaminants:

- Microbiological:

  The province has set standards for E. coli, fecal coliforms and total coliforms. Under O.Reg. 169/03 these parameters should not be detectable in drinking water. This Regulation also prescribes numerical limits for general bacteria populations that may be present in drinking water.

  Coliforms are bacteria common in the environment and come from human and animal waste. Although most are harmless, their presence may indicate that there are other harmful bacteria in the water.

  In addition, some bacteria can have a wide range of adverse health impacts -- they may cause acute illnesses such as gastroenteritis, or they may be a serious public health risk. For example, the infiltration of E. coli 157:H7 bacteria into a municipal well was a cause of seven deaths in Walkerton, Ontario, in May 2000.

  Operators at drinking water treatment plants are required to test regularly for coliform bacteria. The disinfection of drinking water by chlorination is designed to eliminate harmful bacteria.

  Other pathogens that can cause gastrointestinal illness include viruses and parasites such as giardia lamblia and cryptosporidium. These are not currently regulated under Ontario's drinking water quality standards.

- Chemical:

  The province has set numerical standards for both inorganic and organic chemicals. These standards are expressed in milligrams per litre (for example, 1.01 mg/l. for lead) as maximum concentrations allowed in drinking water.

  Many of the chemical contaminants come from industrial discharges or agricultural runoff into the source water, and are not necessarily removed by drinking water treatment. These chemicals can cause health problems if, over a lifetime, they are consumed in drinking water at levels above these limits. Mercury, for example, can cause kidney damage. Some organic chemicals, such as the pesticide alachlor, may pose an increased risk of cancer.

  The province has also set a numerical limit on total trihalomethanes. These chemicals are formed as a result of the chlorine treatment of drinking water and, at unacceptably high levels, can cause liver, kidney or central nervous system problems or increase the risk of cancer.

- Radiological:

  O.Reg. 169/03 prescribes numerical standards for natural and artificial radio nuclides. These standards are expressed as maximum allowable concentrations in becquerels per litre. Radiological contaminants include radio nuclides, such as radium 228, that result from the erosion of naturally-occurring deposits, or artificial radio nuclides, such as tritium, released into the water by nuclear power plants.

  For further information, Ontario's Drinking-Water Quality Standards Regulation (O.Reg. 169/03), including the numerical limits for these contaminants, can be found at: www.e-laws.gov.on.ca/dblaws/source/regs/english/2003/r03169_e.htm

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3. Does Ontario have drinking water quality standards for problems like taste and odour?

Like many other jurisdictions, Ontario has not regulated cosmetic or aesthetic problems in drinking water such as taste and odour.

Odour and taste, as well as colour and clarity, are considered to be aesthetic parameters, and not a risk to health. While the colour, taste or odour of drinking water may not have health effects, it is not desirable in drinking water. Research into the compounds, such as geosmin, that create musty taste and odour, particularly in Lake Ontario, can be found at: www.owwrc.com/TO.htm

The U.S. Environmental Protection Agency (EPA) has developed a chart that can be used as a general guide in determining the cause of any drinking water problems that consumers can smell, feel, taste or see. They suggest treatments that can be applied at the tap to reduce or eliminate these problems. This information can be found at: www.epa.gov/safewater/faq/signs.html

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4. How do contaminants find their way into drinking water sources?

Some contaminants found in drinking water sources may occur naturally, such as arsenic. The majority of contaminants, however, are the result of human activities and come from industrial discharges, agricultural runoff, sewage treatment plant outflows, nuclear power plants and other sources of pollution.

Not only are such contaminants directly discharged into waterways, but they may also find their way into water from aerial deposition and other pathways. These contaminants are not necessarily eliminated when drinking water is treated. Although the province has set standards for 78 contaminants, there are many chemicals in raw water for which no standards have been set, and many that are not even monitored.

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5. What contaminants are removed through drinking water treatments?

Raw water is treated by physical and chemical processes to remove contaminants. The standard treatments in Canada are coagulation, flocculation, sedimentation, followed by filtration and chlorination. Coagulation, flocculation, sedimentation and filtration remove dirt, bacteria, viruses and other impurities from the water. The final treatment is the addition of chlorine to disinfect and eliminate any organisms that might have survived the filtration process. Although these treatments do reduce the contaminants in drinking water, they are not designed to remove organic or inorganic chemicals, or radiological contaminants. Chlorine itself can combine with naturally occurring organic material in the water to form trihalomethanes.

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6. What is the federal role in establishing drinking water quality standards in Canada?

In Canada, a Federal-Provincial-Territorial Committee on Drinking Water develops and recommends national drinking water guidelines. It includes representatives of federal, provincial and territorial departments of health and the environment. It reviews toxicological and epidemiological evidence, and then makes recommendations on adding new substances to the guidelines or revising old guidelines. The Federal-Provincial-Territorial Committee makes recommendations for drinking water standards based on a process known as risk assessment. Provinces and territories then decide which of the guidelines to adopt for their jurisdictions. The provinces and territories may choose to adopt them as guidelines or as enforceable drinking water standards.

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7. How are drinking water quality standards set in Ontario?

For many years Ontario adopted the national guidelines as the Ontario Drinking Water Objectives. After the deaths at Walkerton in May 2000, the objectives were incorporated into enforceable regulatory standards, initially as O.Reg. 459/00 under the Ontario Water Resources Act, and then, in June 2003, as O.Reg. 169/03 under the Safe Drinking Water Act, 2002.

Currently, recommendations from the federal-provincial-territorial process are

reviewed by Ontario, and if they are considered appropriate, they are then included in revisions to the schedules in the Regulation.

The Safe Drinking Water Act requires that Ontario establish an Advisory Council on Drinking-Water Quality and Testing Standards to consider issues relating to standards for drinking water quality and testing (although this section of the Act is not yet in force). This Council may publish information in the electronic registry, established under the Environmental Bill of Rights. The recommendations of the Advisory Council are to be considered by the Minister of the Environment in establishing and revising standards for drinking water quality and testing, although the Minister is not legally obliged to adopt them.

For more information on the Environmental Registry, see the web site of the Environmental Commissioner of Ontario.

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8. Can drinking water quality standards be changed?

Drinking water quality standards are not static, and some standards can, and do, change over time. Emerging threats like cryptosporidium, or concerns such as endocrine disruption, need to be considered. Moreover, there may be new scientific evidence of harm from an already regulated contaminant, or new advances in treatment technology that mean a more stringent standard could be adopted.

The Federal-Provincial-Territorial Committee posts a list of priority contaminants that are candidates for guidelines or standards, as does the U.S. Environmental Protection Agency.

Aside from participating in this Committee process, Ontario does not yet have a formalized system for examining new candidate substances for regulation or for revising current standards. Under the Safe Drinking Water Act, however, once the required Advisory Council is established, it would be empowered to make recommendations on revising old standards or establishing new standards not on the federal-provincial agenda. As of June 1, 2003, the section of the Act establishing the Advisory Council had not been proclaimed in force.

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9. How can I participate in the standard-setting process?

The Federal-Provincial-Territorial Committee on Drinking Water posts summaries of its proceedings on its web site. It also posts proposed recommendations and supporting technical evidence. Members of the public may comment on these recommendations when they are being considered. See:
www.hc-sc.gc.ca/hecs-sesc/water/sub_committee.htm

The report of Justice O'Connor after his inquiry made recommendations to strengthen public involvement in setting standards for drinking water. He recommended that the federal-provincial-territorial process for proposing drinking water quality guidelines be refined to provide for greater transparency and public participation.

Justice O'Connor also saw the yet-to-be-established Advisory Council on

Drinking-Water Quality and Testing Standards as an important means of increasing transparency and public access in the standard-setting process. The Council would solicit public views on proposed regulations, and its recommendations to the Minister of the Environment would be made public. The Advisory Council would also have the ability to hold public hearings on matters of broad public concern. He recommends that the Advisory Council make full use of the Environmental Bill of Rights Registry to post proposals.

In the meantime, the public can use their participation rights under the Environmental Bill of Rights in order to address drinking water quality issues. For example, if the Ministry of the Environment proposes to revise the current standards in Reg. 169/03, then notice of this proposal should be placed on the Environmental Registry, and a public comment period should be provided.

Similarly, if citizens believe that a current standard is outdated or inadequate, then an Application for Review can be filed under Part IV of the Environmental Bill of Rights.

For further information on these and other public participation rights, see the web site. of the Office of the Environmental Commissioner.

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10. How can I find out if my drinking water meets current Ontario standards?

Under Ontario's Drinking-Water Systems Regulation (O.Reg 170/03), owners of drinking water systems are required to prepare annual reports. The results of all drinking water tests must be reported, including the total number of adverse results. A copy of the annual report prepared by your drinking water supplier must be given to you upon your request and without charge. It must also be provided to the office of every "designated facility" (such as schools or health care facilities) served by the drinking water system.

For large municipal residential systems serving more than 10,000 people, the annual reports must be available for free on a web site. on the Internet. The water quality report of the City of Toronto, for example, may be found at: www.city.toronto.on.ca/water/quality_report.htm

On its web site. the Association of Municipalities of Ontario lists municipal web sites in Ontario, where water quality reports should be accessible, at: http://199.202.235.157/ylg/ontario.html

In addition, test results must be available for inspection by members of the public without charge during normal business hours at the office of the owner. If the owner's office is not at a reasonably convenient location, then the report must be available at another location that is convenient. If the drinking water system serves a municipality, the information must be available at the office of the municipality whether or not the municipality owns the system.

You can also find more immediately available information on specific "adverse drinking water quality incidents" on the web site. of the Ministry of the Environment. Instances in which water quality standards in Ontario have been exceeded are listed according to region. However, the Ministry only reports health-related adverse water quality incidents involving high levels of E. coli or fecal coliforms, or where a boil water advisory or order has been issued. These incident reports can be found at: www.ene.gov.on.ca/envision/adverse/adversewater.htm

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11. What happens if the drinking water exceeds the Ontario drinking water quality standards?

Ontario's Drinking-Water Systems Regulation (O.Reg. 170/03) specifies that when adverse test results are obtained, then verbal and written notice must be given immediately to the Ministry of the Environment, and to the local Medical Officer of Health. This reporting obligation is imposed upon the owner/operator of the drinking water system, as well as upon the laboratory that performed the testing.

This Regulation also prescribes the "corrective action" that must be undertaken after adverse test results have been reported. Depending on the nature of the problem, "corrective action" may include: resample and test; increase chlorination; and other steps as may be directed by the Medical Officer of Health.

In addition, owners of certain drinking water systems are required to post warning notices if they are not doing the required microbiological tests for coliforms. These notices must be posted in prominent locations to alert users of the system that the water may not be safe.

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12. What is Canadian Environmental Law Association's position on drinking water quality standards?

The Canadian Environmental Law Association (CELA) has always supported the creation of a Safe Drinking Water Act, and setting enforceable standards for contaminants in drinking water. However, meaningful public participation is necessary for determining what standards should be adopted and which ones should be revised. CELA would like a periodic review of the Act and the regulation governing drinking water standards. In addition, CELA believes that community-right-to-know principles should be strengthened in the Act. For example, all annual drinking water reports should be mailed to consumers so that this information is easily accessible.

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13. How can I get more information about the drinking water quality standards in Ontario?

The Ontario Ministry of the Environment has more information on the Safe Drinking Water Act and other drinking water concerns at: www.ene.gov.on.ca/water.htm

The Safe Drinking Water Act, 2002 and Regulations are available at: www.ene.gov.on.ca/envision/water/sdwa/index.htm and at: www.e-laws.gov.on.ca/

The Report of the Walkerton Commission of Inquiry, part 2, chapter 5, contains information on Justice O'Connor's recommendations regarding drinking water quality standards. Appendix A contains an interjurisdictional comparison of water quality standards. The Report is available at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

The Canadian Drinking Water Guidelines are available at: www.hc-sc.gc.ca/hecs-sesc/water/dwgsup.htm

The U.S. EPA has a strong Safe Drinking Water Act. For a comparison of Ontario's Act with the U.S. SDWA, see the CELA publication: "The Establishment and Implementation of the Safe Drinking Water Act in Ontario: Some Helpful Lessons from the United States (Speaking Notes) Meeting Your Obligations Under Ontario's New Safe Drinking Water Act".

For more information on the Safe Drinking Water Act see the Safe Drinking Water Act FAQ and for information on bottled water, see the Bottled Water FAQ.

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14. How can I get information about standards in other jurisdictions?

For information on drinking water standards and the standard-setting process in other jurisdictions, see:

A guide to the water legislation of all Canadian provinces, and drinking water legislation where it exists, can be found at: www.csae-scgr.ca/Othernews/Waterlaws.shtml

The World Health Organization's current edition of its Guidelines for Drinking Water Quality is available at: www.who.int/water_sanitation_health/dwq/guidelines2/en/

For the United States, the Environmental Protection Agency's Office of Ground Water And Drinking Water lists information about U.S. standards and how they are set at: www.epa.gov/OGWDW/mcl.html

For environmental legislation in Europe including drinking water standards set by the European Union, see: http://europa.eu.int/comm/environment/legis_en.htm

For drinking water standards in Australia, see: www.health.gov.au/nhmrc/publications/synopses/eh19syn.htm

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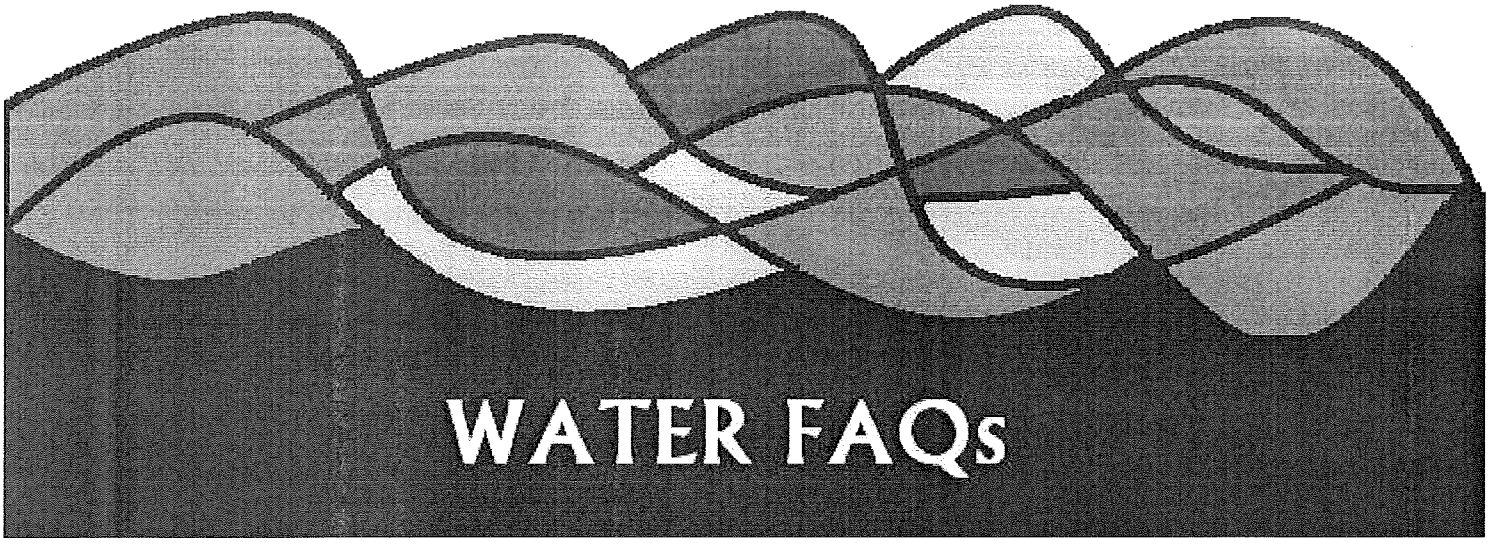
ACKNOWLEDGMENTS AND FEEDBACK: The Resource Library for the Environment and the Law and the Canadian Environmental Law Association (CELA) gratefully acknowledge the support of the Ontario Trillium Foundation, which made these FAQs on Water possible. Funding support does not imply any endorsement by the Trillium Foundation of the information or views presented here. Thanks also go to Author Anne Wordsworth and CELA staff for their help in producing these educational materials. Please send feedback to Sarah Miller, Project Coordinator at millers@lao.on.ca



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Ontario Safe Drinking Water Act, 2002 and Regulations FAQs (January 2004)

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1. How safe is Ontario's drinking water?

Drinking water in Ontario is drawn from surface water sources like lakes and rivers, and from groundwater sources like public or private wells. Municipal systems provide approximately 8.9 million people in Ontario, or 82 per cent, with drinking water, while 18 per cent of Ontarians rely upon non-municipal water systems or private wells.

Although the quality of raw water may vary from one community to another, the ultimate safety of drinking water depends on a multi-barrier approach. The elements of this approach include: protection of the source of the drinking water; effective treatment; frequent and comprehensive testing; vigilant monitoring and reporting; the training and competence of waterworks operators; a secure distribution system; and a quick response when problems are found.

Communities in Ontario have learned not to be complacent about drinking water. In May 2000 the province's drinking water became the focus of intense concern when 7 people from the Town of Walkerton died, and more than 2300 others became ill, from drinking contaminated water. This tragedy underlined the importance of protecting public health against the risks of unsafe drinking water, and led to a public inquiry conducted by Mr. Justice Dennis O'Connor and the subsequent development of provincial legislation intended to ensure drinking water safety.

Based on monitoring results collected by the Ontario Ministry of the Environment, it appears that public drinking water usually meets Ontario's drinking water quality standards. High levels of contaminants are rarely found. Not every community in Ontario, however, is free of drinking water problems. In recent years, a number of municipalities and First Nation communities have suffered outbreaks of waterborne disease, and boil water advisories have been imposed on residents.

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2. What is Ontario's Safe Drinking Water Act?

The Ontario Safe Drinking Water Act, 2002 (hereafter referred to as the Safe Drinking Water Act) was enacted in December 2002, in response to recommendations made by Justice O'Connor in his Report of the Walkerton Inquiry, Part 2. In essence, the Act consolidates legislative and regulatory requirements regarding the treatment and distribution of drinking water in Ontario.

Before the passage of this Act, drinking water was generally governed by the Ontario Water Resources Act as part of the province's overall regime for protecting surface and groundwater. During the 1980s and 1990s, several members of the Ontario Legislature introduced private members' bills to enact specialized safe drinking water legislation. However, none of these private members' bills were enacted into law.

In the aftermath of the Walkerton tragedy, the Ontario government intensified its efforts to ensure drinking water safety under the "Operation Clean Water" program. Initially, the government introduced a Drinking Water Protection Regulation (O. Reg. 459/00) that converted drinking water objectives into legally binding standards.

The government also convened the Walkerton Commission of Inquiry under Justice O'Connor to advise the government on the changes necessary to protect the province's drinking water. The Safe Drinking Water Act is one of four legislative changes recommended in the Report of the Walkerton Commission of Inquiry. While this Act is an important part of the overall protection framework, the Inquiry also recommended legislation to address source protection, agricultural issues, and financing water systems.

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3. What are the major features of the Safe Drinking Water Act?

The Safe Drinking Water Act has a number of important features designed to protect drinking water consumers:

- The Act creates, through regulation, legally-binding standards for contaminants in drinking water:

  These standards are intended to protect public health. See the Drinking Water Quality Standards FAQ.
- The Act makes it mandatory to use licensed and accredited laboratories for drinking water testing:

  The Safe Drinking Water Act generally requires laboratories that conduct drinking water tests to be licensed under the Act. The Safe Drinking Water Act and the Drinking Water Testing Services Regulation (O. Reg. 248/03) require any laboratory that performs drinking water testing to obtain a licence effective October 1, 2003. In addition, the Safe Drinking Water Act requires owners and operating authorities of drinking water systems regulated under the Drinking Water Systems Regulation (O. Reg. 170/03) to use a licensed laboratory for drinking water testing.

  In order to obtain a licence, laboratories must be accredited for the tests they conduct. Licences may be issued with conditions, and the Director has the authority to amend the conditions or to revoke or suspend the licence if the laboratory is not in compliance with the requirements of the Act.

  Drinking water system owners are also generally prohibited from using water testing services from out-of-province laboratories, unless the laboratories satisfy the eligibility criteria under the Act.

  There are some limited circumstances where the Director may authorize the use of non-accredited laboratories, such as the existence

of geographic constraints or if there is no accredited method for a particular test.

- The Act makes it mandatory to report adverse test results where contaminants in drinking water do not meet the drinking water quality standards:

  The Act imposes a duty to report adverse test results to the Ministry of the Environment and to the local Medical Officer of Health. Both the operator and owner and the laboratory must comply with this reporting requirement.

  These reports will have to be made in accordance with the requirements established by Ontario Regulation 170/03. This Regulation requires the report to be made in situations such as the violation of a chemical or physical standard or the presence of an indicator of adverse water quality such as E. coli. The reports are to be made immediately -- either in person or by telephone -- and confirmed in writing within 24 hours.

  Where adverse test results are reportable, the owner of the drinking water system must undertake the appropriate corrective action to address the particular drinking water problem.
- All operators of municipal drinking water systems must be trained and certified:

  Drinking water system operators must hold a valid operator's certificate issued under the regulations. For now, existing unexpired licences issued under O.Reg. 435/93 under the Ontario Water Resources Act are deemed operator's certificates until the successor regulation is in place.

  The proposed successor regulation, the Certification of Drinking-Water Systems Operators and Water Quality Analysts, sets out the requirements for certification and training. "Grandfathered" operators will be required to be recertified within 1 or 2 years, depending on their responsibilities in the system. Training is defined to include continuing education and on-the-job training. Operators will be recertified every 3 years if they successfully complete a specific number of hours of training. The more responsibility an operator has, the more training will be required.

- The Act establishes a licencing regime for drinking water systems:

  All municipal drinking water systems must obtain an approval from the Director of the Ministry of the Environment. The Act sets out timing and content requirements for approval applications, including copies of drinking water works permits, operational plans, and, in some cases, financial plans and permits to take water.

  The Director may refuse an application, or impose terms and conditions upon the approval. The Director may also grant partial or complete relief from regulatory requirements regarding treatment, sampling, testing, or monitoring.

  In addition, all other regulated drinking water systems (including municipal non-residential systems serving community centers and sports complexes) are required to have a professional engineer certify that the system is in compliance with regulatory requirements. This certification has to be renewed every five years for surface water systems and every 10 years for groundwater systems.

- The Act gives broad inspection powers to officers of the Ministry of the Environment, and creates a new position of Chief Inspector who oversees inspections and enforcement:

  Provincial officers may conduct inspections without a warrant or court order in order to determine compliance with the Act or regulations.

  During inspections, provincial officers have a wide range of powers similar to provisions found in other Ontario environmental legislation such as the Ontario Water Resources Act and the Environmental Protection Act. Among other things, these include the authority to enter into or on any part of the natural environment, or any place where a drinking water system is located. They have the authority to take samples, conduct tests, require production of documents, take photographs and videotapes, stop and search vehicles and place locks or fences to secure places.

  If a prescribed deficiency (that is, a violation that poses a drinking water health hazard) is found during an inspection, the provincial officer must conduct a follow-up inspection within a year.

  The Act requires the passage of a "compliance regulation" be made that would set out specific inspection requirements such as the frequency of inspections, the actions required and response time in the event of a deficiency, and the procedures to be followed for investigations and enforcement. To date, a compliance regulation has been proposed, but not passed, by the Ministry of the Environment (see Answer #5).

  The Act also requires the appointment of a Chief Inspector with responsibility for overseeing inspections and enforcement activities under the Act. The Inspector must submit annual reports on inspection and enforcement matters to the Legislature.

- The Act imposes a statutory standard of care upon managers of municipal drinking water systems (not yet in force):

  It states that specified persons must:

  - exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and

  - act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system.

  This standard of care would apply to the owner of the municipal drinking water system, the person who oversees the accredited operating authority or who exercises decision-making authority over the system, or the officers and directors of the corporation that owns the system.

  Failure to carry out this standard is defined as an offence under the Safe Drinking Water Act, and individuals may be convicted of the offence regardless of whether the owner of the system is prosecuted or convicted.

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4. Will the Safe Drinking Water Act ensure that drinking water is safe?

The Safe Drinking Water Act enhances the level of drinking water protection across the province by creating a clear and comprehensive framework for drinking water treatment and distribution. However, it is only one part of an overall source-to-tap drinking water framework. Justice O'Connor endorsed a multi-barrier approach as necessary to ensure safe drinking water. He identified source protection as a crucial first step and recommended that the province mandate watershed source protection plans. Work on developing source protection legislation is currently underway but not yet in place.

See the Source Protection FAQ.

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5. When does the Safe Drinking Water Act come into effect?

The Safe Drinking Water Act has numerous sections that are being phased in, as the regulations to support them are prepared. Many provisions of the Act came into force on June 1, 2003. These sections include:

- Ministerial powers and duties (subsection 3(1) to (3)),
- Duties of owners and operating authorities (subsection 11(1) and (2)),
- Duty to report adverse test results (section 18),
- Prohibition against contaminating drinking water systems (section 20),
- Approvals for municipal drinking water systems (sections 31, 32, 34 to 39, 41, 45, 51)
- Regulation of non-municipal drinking water systems (sections 52, 53, 54 (1), (3) to (6), 55 to 61),
- Drinking water testing (sections 62 to 80),
- Inspections, compliance and enforcement (sections 81 to 120, 122 to 125),
- Appeals (sections 126 to 136)
- Offences (section 137 to 155),
- Miscellaneous provisions and regulation-making (section 156 to 170)

Related regulations also came into force in 2003. These regulations are:

- Ontario Drinking Water Standards (O.Reg. 169/03)
- Drinking Water Systems (O.Reg. 170/03)
- Definitions of Words and Expressions Used in the Act (O.Reg. 171/03)
- Definitions of "Deficiency" and "Municipal Drinking Water System" (O.Reg. 172/03)
- Schools Private Schools and Day Nurseries (O.Reg. 173/03)
- Drinking Water Testing Services Regulation (O.Reg. 248/03)

Other proposed regulations, such as the Certification of Drinking Water Systems Operators and Water Quality Analysts, and the Compliance and Enforcement Regulation, have been posted on the Environmental Bill of Rights Registry for public comment, but have not yet been finalized.

Several important sections of the Act have not yet come into force. These include: the requirement for the Minister to prepare an annual report on drinking water (subsection 3(4)), the establishment of the Advisory Council on Drinking-Water Quality and Testing Standards (subsection 4(1)), the imposition of a statutory standard of care upon owners of municipal drinking

water systems (subsection 19(1)), and administrative penalties (section 121).

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6. What opportunities are there for public participation under the Ontario Safe Drinking Water Act?

The Safe Drinking Water Act is subject to Ontario's Environmental Bill of Rights, which creates opportunities for public participation in environmental decision-making. For example, notices of proposed drinking water regulations are posted on the Environmental Bill of Rights registry. Once they are posted, members of the public are invited within a time period of 30 days to send the Ministry of the Environment their comments on the strengths and weaknesses of the regulations and to suggest improvements. At some time after this 30 day period, the Ministry of the Environment will post a decision notice on the Registry.

The Safe Drinking Water Act provides for the establishment of an Advisory Council on Drinking-Water Quality and Testing Standards (subsection 4(1)). The duties of this Council are to advise the Minister of the Environment on new standards for drinking water or the revision of already existing standards. Members of the public could bring the need for the establishment or improvement of specific water quality standards to the attention of the Council when it is set up. However, this section of the Act has not yet come into force and the Advisory Council has not been appointed.

New and expanded water treatment facilities must be planned in accordance with the Municipal Class Environmental Assessment under Ontario's Environmental Assessment Act. As part of the process of a class environmental assessment, the public must be given notice and comment opportunities regarding proposals to build or expand waterworks. These requirements for public notice and comment give the public another opportunity to participate in decisions about water supply and delivery in their communities.

For more information on how to exercise your rights under the Environmental Bill of Rights, see the web site of the Environmental Commissioner of Ontario at: www.eco.on.ca/english/ebryou/index.htm

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7. What information is available about drinking water in my community?

The Safe Drinking Water Act gives the public the right to detailed information about the quality of their drinking water. The Safe Drinking Water Act also ensures that water suppliers make reports available to the public at their facilities.

The Drinking Water Systems Regulation (O. Reg. 170/03) under the Safe Drinking Water Act specifies that the following information must be available for inspection:

- Records of operational checks (sampling data);
- Test results with respect to testing for microbiological and chemical parameters;

- Any approval and order that applies to the system and is still in effect, if the approval or order was issued after December 31, 2002;
- Every annual report;
- A copy of the Regulation.

The owner of a drinking water system must also prepare an annual report, and submit it to the Director and to the operator (and relevant provincial agency or Ministry) for each designated facility served by the system. The annual report must contain:

- A brief description of the drinking water system;
- Summaries of any reports or notices submitted to the Director during the year;
- Summaries of operational checks, microbiological, and chemical tests;
- A description of any corrective actions taken in response to adverse water quality indicators;
- A description of any major expenses incurred during the year to install, repair or replace equipment.

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8. How can I get access to this information?

The information must be accessible to any member of the public during business hours, without charge, at the office of the owner. If the owner's office is not at a reasonably convenient location, then the report must be available at another location that is convenient. If the system serves a municipality, the information must be available at the office of the municipality, whether or not the municipality owns the system.

The annual reports must be given without charge to anyone who requests a copy, and every time a report is prepared, the owner of the drinking water system must ensure that effective steps are taken to advise users of the system, and of each designated facility served by the system, that copies of the report are available without charge, and how to obtain copies.

If a drinking water system serves more than 10,000 people, the owner must also post the annual reports on a web site on the Internet.

The Association of Municipalities of Ontario lists municipal web sites in Ontario on its web site at:
http://199.202.235.157/ylg/ontario.html

In addition, the Minister of the Environment is required by the Safe Drinking Water Act to table annual reports in the Ontario Legislature on the state of Ontario's drinking water (although this section of the Act is not yet in force). The Ministerial reports must include the following information:

- The status and development of drinking water quality standards;
- New and emerging information on pathogens, chemicals and other potential causes of drinking water health hazards;
- A summary of inspections and audits for drinking water systems and testing;
- A summary of enforcement activities;

- A review of raw water quality and source protection initiatives across Ontario.

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9. Are private wells in Ontario subject to the Safe Drinking Water Act?

Private well owners are not required to meet the regulatory standards under the Safe Drinking Water Act. Residents using private wells are responsible for taking samples of their own water supply. Ontario's Ministry of Health currently offers free bacteriological testing of drinking water samples taken by well owners.

For more information on water testing, contact your local Public Health Unit. For a complete listing of all Public Health Units in Ontario, see: www.healthunit.org/aboutus/hea_unit.htm

The construction and decommissioning of private wells is governed by Ontario Regulation 903 under the Ontario Water Resources Act, as amended by O.Reg. 128/03. Well owners are legally responsible for wells on their property. For further guidance, contact the Ministry of the Environment office in your region or see the Ministry's web site at: www.ene.gov.on.ca/envision/water/wells.htm

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10. How will the Safe Drinking Water Act be enforced?

The Ministry of the Environment will be responsible for the enforcement of the Safe Drinking Water Act. If a provincial officer believes that a person has contravened the Safe Drinking Water Act, the officer may issue an order to remedy non-compliance. Orders may contain directions that require measures such as repairing a drinking water system, providing an alternative supply of water, treatment, testing, sampling or reporting, preparing plans or retaining consultants. There may be a requirement to post notice of the order.

Similar provisions apply if a provincial officer considers that the purposes of the Act require an order against the owner, manager or controller of a municipal or regulated non-municipal drinking water system. "System" orders may also require anything that poses a drinking water health hazard to be disconnected or repaired.

In the event of an imminent drinking water health hazard, the Director and the Minister both have the power to issue orders requiring the elimination or amelioration of the hazard. Any Ministerial order will prevail over orders issued by the Director or a provincial officer.

In certain cases such as continuing non-compliance with an order or abandonment of drinking water systems, the Director may issue a notice of emergency response that can be used to direct the Ontario Clean Water Agency (OCWA) to step in to remedy matters.

Director's orders may also be used for other purposes such as to decommission or replace all or part of drinking water systems, to appoint interim operating authorities, to require OCWA to prepare an operational plan for a drinking water system, and to require municipalities to provide service from a municipal drinking water system to persons served by deficient drinking

water systems.

In addition to issuing administrative orders, the Ministry may bring prosecutions or commence civil actions against those in contravention of the Act.

The Ministry has proposed a Compliance and Enforcement Regulation which includes the following elements:

- All municipal residential drinking water systems shall be fully inspected annually;
- At least one out of every three inspections at such systems shall be unannounced;
- Inspection reports shall be sent to the system, owner/operator, medical officer of health, conservation authority and other parties within 45 days after the inspection;
- "Mandatory action" (that is, provincial officers' orders, director's orders, or referral to the Investigations and Enforcement Branch) must be undertaken by the Ministry of the Environment within 14 days if the inspector finds a deficiency. If the deficiency poses an immediate drinking water health hazard, then the Ministry must immediately undertake "mandatory action";
- Laboratories that provide drinking water testing services shall be inspected at least twice per year (including at least one unannounced inspection).

At this time, the proposed Compliance and Enforcement Regulation is not yet in force.

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11. What opportunities are there for public involvement in the enforcement of the Safe Drinking Water Act?

The Ministry's proposed Compliance and Enforcement Regulation (see Answer #10) includes a "public enforcement right". This right closely resembles the Application for Investigation provisions under Part V of the Environmental Bill of Rights, and it essentially permits citizens of Ontario to apply to the Ministry's Investigations and Enforcement Branch for the investigation of alleged contraventions under the Safe Drinking Water Act (or Regulations). At the present time, the proposed Compliance and Enforcement Regulation is not in force.

In addition, where a person has reasonable and probable grounds to believe that an offence has been committed under the Safe Drinking Water Act (or Regulations), then that person may commence a private prosecution against the alleged offender in accordance with the Provincial Offences Act.

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12. What are the penalties under the Safe Drinking Water Act?

The Director may impose administrative penalties with respect to contraventions under the Safe Drinking Water Act, with a maximum of $10,000 for each day that the contravention occurs (although the administrative penalty

provisions of the Act are not yet in force).

For individuals convicted under the Safe Drinking Water Act, the fines range between $20,000 and $7 million, depending on the offence. Convicted individuals may also be imprisoned for certain offences. For corporations convicted under the Act, the maximum fines payable range between $100,000 to $10 million, depending on the offence. The court may also impose other orders and monetary penalties such as profit stripping, restitution orders, or orders to prevent damage.

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13. What are Justice O'Connor's recommendations in his Report of the Walkerton Commission of Inquiry?

The Report of the Walkerton Commission of Inquiry, parts 1 and 2, contains information on Justice O'Connor's recommendations regarding the need for a Safe Drinking Water Act. The Report is available at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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14. What are the views of the Canadian Environmental Law Association (CELA) on the Safe Drinking Water Act?

CELA supports the Safe Drinking Water Act and its Regulations. In order to be effective, however, the Act must be properly enforced, adequately funded, and be accompanied by legislation to protect drinking water at the source. For detailed information on CELA's views on the Safe Drinking Water Act, 2002, see the following CELA publications:

Publication #440: In the Wake of the Walkerton Tragedy: The Top 10 Questions. Prepared for "National Symposium on Water Law" (Canadian Bar Association, Vancouver, March 28 & 29, 2003).

Publication #439: Overview of the Safe Drinking Water Act: What's In, What's Out? Prepared for Water and Wastewater: Regulation and Management Forum, Insight Conference - Toronto, March 24 & 25, 2003.

Publication #438: Submission of Canadian Environmental Law Association to Ministry of Environment re: Proposed Drinking Water Regulation under the Safe Drinking Water Act, 2002, EBR Registry #RA03E0001.

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15. How can I get more information about the Ontario Safe Drinking Water Act?

The Safe Drinking Water Act, 2002 and Regulations are available at:
www.ene.gov.on.ca/envision/water/sdwa/index.htm
And at: www.e-laws.gov.on.ca/

Both the Safe Drinking Water Act and the Report of the Walkerton Commission of Inquiry are also available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

The Safe Drinking Water Act is only one of the four legislative changes recommended in the Report of the Walkerton Commission of Inquiry in order to ensure safe drinking water. For information on the other recommended legislative changes, see the Nutrient Management Act FAQ, Source Protection FAQ and the Water Financing FAQ.

Reports of adverse drinking water quality incidents and information on the Ministry of the Environment's Drinking Water Surveillance Program are available on the Ministry's web site at:
www.ene.gov.on.ca/water.htm

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16. How can I find out more about drinking water legislation in other jurisdictions?

For information on drinking water in the United States and the full text of the U.S. Safe Drinking Water Act, see: www.epa.gov/safewater/sdwa/sdwa.html

A starting point for finding information on drinking water issues in other provinces is:
www.csae-scgr.ca/Othernews/Waterlaws.shtml
Or, search "drinking water legislation" and the name of the province.

For British Columbia, for example, its recently passed drinking water legislation can be found at:
www.healthplanning.gov.bc.ca/protect/water.html

For a comparison of the Ontario Safe Drinking Water Act with the United States' Safe Drinking Water Act, which is often considered the gold standard of drinking water legislation, see CELA publication #446, "The Establishment and Implementation of the Safe Drinking Water Act in Ontario: Some Helpful Lessons from the United States"

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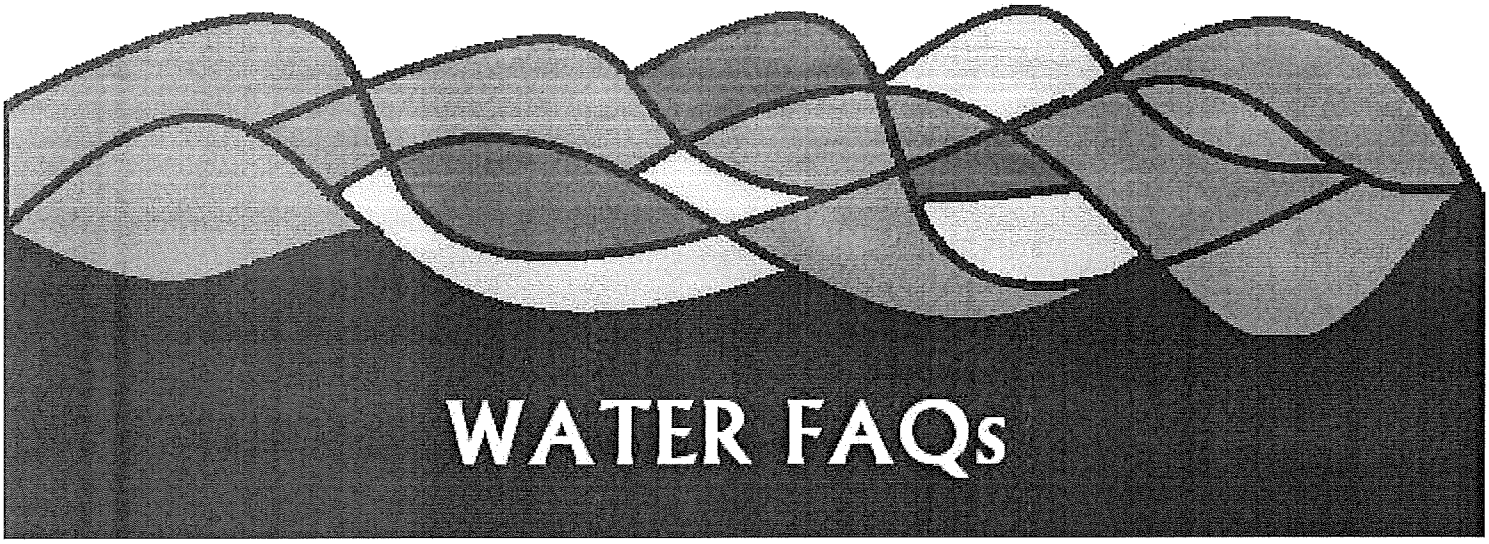

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Nutrient Management FAQs (January 2004)

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1. What is nutrient management?

Farmers have traditionally spread raw manure on their land to help grow crops for food and for livestock. Not only animal manure, but other nutrient-rich materials containing primarily nitrogen, phosphorus and potassium, can be used to fertilize fields. These materials include commercial fertilizers, human waste generated by sewage treatment plants (called biosolids), and pulp and paper sludge. The controlled application of these nutrients is referred to as nutrient management.

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2. Why is it important to control nutrients?

If manure and other materials are not properly controlled, they can become a significant source of contamination for water systems. Farmers need to store manure carefully and they need enough acreage to absorb all the nutrients that are applied. If there are spills or if there is excess manure on the fields, it can result in runoff to streams and lakes, or leaching from soil into groundwater.

This problem has been aggravated in the last two decades by the development of intensive livestock operations that produce large quantities of manure. These new farms may support as many as 3,000 pigs or 1,200 cattle. According to a Special Report of the Environmental Commissioner of Ontario, the province currently has over 3.4 million hogs which together produce as much raw sewage as the 10 million people in the province.

For background information on the problems associated with intensive farming in Ontario, see The Environmental Commissioner's Special Report #3, "The Protection of Ontario's Ground Water and Intensive Farming", July 27, 2000,

under Publications at: www.eco.on.ca

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3. Has drinking water in Ontario been affected by agricultural practices?

Drinking water in rural areas is showing signs of contamination from agricultural sources. In Ontario 34 per cent of rural wells have elevated levels of coliform bacteria and 14 per cent have elevated levels of nitrates.

The most serious event was the contamination of drinking water with E. coli bacteria that led to seven deaths in Walkerton in May 2000. It came from the infiltration of a town well by bacteria from animal manure. As a result, the Walkerton Commission of Inquiry gave serious consideration to ways of protecting drinking water from agricultural sources and Mr. Justice Dennis O'Connor made many significant recommendations.

In the past the Ontario Ministry of Agriculture and Food relied on guidelines, called Best Management Practices, and a voluntary approach to the management of manure, rather than regulation. Many of the province's farmers developed Environmental Farm Plans to address the problems of agricultural pollution. However, no legislated requirements existed for the storage and handling of manure.

The provincial government was taking steps to address this problem before May 2000. After the tragic events at Walkerton, the provincial government committed itself to province-wide standards to address the potentially harmful effects of agricultural practices on the environment.

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4. What are Justice O'Connor's recommendations on nutrient management from the Walkerton Inquiry report?

Justice O'Connor in his Report of the Walkerton Commission of Inquiry recommended that every large or intensive farm, and every small farm located in a sensitive or high-risk area, develop a legally binding water protection plan to protect drinking water sources, consistent with the local watershed-based source protection plan.

This recommendation was based on an assumption that broader source protection plans would be put in place first. He described his recommendations as a "nested approach" to source protection, in which site specific farm plans would fit into the larger source protection plan for the area.

As Justice O'Connor envisioned it, farm plans would identify how farming operations affect drinking water sources, including those used by farmers and their families, and find ways to reduce their impacts.

He also recommended that the province pass binding legislation that would set a regulatory "floor" for manure storage and handling. In his view, manure storage and handling that does not follow the guidelines for minimum distances from wellheads, or improper manure storage, has the potential to threaten drinking water everywhere.

The Report of the Walkerton Commission of Inquiry, parts 1 and 2, contains information on Mr. Justice O'Connor's recommendations regarding the need for nutrient control. The Report is available at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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5. What does Ontario's *Nutrient Management Act, 2002* govern?

For the first time, Ontario has passed legislation setting out legal requirements for the storage and handling of manure and other nutrients .

The *Nutrient Management Act, 2002,* (hereafter referred to as the *Nutrient Management Act*) was developed by the Ministry of the Environment and the Ministry of Agriculture and Food, as part of the government's Clean Water program. The Act provides a framework for setting clear consistent standards for nutrient management on farms. It is enabling legislation that supports the development of regulations for nutrient management and other related farm practices. The Act was passed in June 2002. It came into force on July 1, 2003.

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6. What regulations are in place now?

The General Regulation, (O.Reg 267/03), under the *Nutrient Management Act* , is an important part of the legislation governing nutrient management. It was passed on June 30, 2003 and came into force on September 30, 2003. It sets out the specific details of the legal requirements for the handling and storage of nutrients.

This Regulation has thirteen parts which establish the province's standards. In addition, there are four important Protocols which explain the Regulation in greater detail. The four are: Nutrient Management Protocol, Construction and Siting Protocol, Local Advisory Committee Protocol, Sampling and Analysis Protocol for Soil and Land Applied Materials.

This final Regulation was the product of extensive public consultation on two sets of proposed regulations. The first proposed Stage 1 Draft Nutrient Management Regulations were released in September 2002 for discussion. The proposed Stage 2 Regulations were released in December 2002.

The Stage 1 draft regulations dealt with the content of Nutrient Management Plans and Strategies. It also proposed categories of farm operations and dates by which new, expanding or existing operations would have approved plans. The Stage 2 draft regulations incorporated the Stage 1 regulations and addressed additional issues such as biosolids, the construction of barns, setbacks from water, training, winter spreading and local advisory committees.

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7. What farms are covered by the *Nutrient Management Act* and Regulation?

Currently the Regulation is limited to new farms, and farms that are expanding to become large operations. It applies to:

- Operations that are placing new barns on a separate property where farm animals will generate more than 5 nutrient units*;
- Large livestock operations where there are enough farm animals present to generate 300 nutrient units or more; and
- Existing large livestock facilities that are expanding and will move into the large category (at or over 300 nutrient units).

(*A nutrient unit is the amount of manure that gives the fertilizer replacement value of the lower of 43 kg of nitrogen or 55 kilograms of phosphate. For example, one beef cow may constitute one nutrient unit, while 8 goats could equal one nutrient unit. A large livestock operation, then, could have more than 300 beef cows or more than 2400 goats to be subject to this regulation, depending on the relevant calculations made under the Nutrient Management Protocol.)

By September 30, 2003 all new and expanding livestock farms must complete a nutrient management strategy or plan.

On July 1, 2005 these regulations will apply to all existing operations of 300 nutrient units or more (not just new and expanding operations). The previous government decided to postpone extending this regulation to smaller farms until 2008 at the earliest. Whether they will be subject to this Regulation depends now on the advice of the Provincial Advisory Committee on Nutrient Management, the availability of funding and the decisions of the current government.

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8. What are nutrient management plans?

One of the most important features of the Regulation is the requirement for farms to prepare nutrient management plans and nutrient management strategies.

The Regulation requires farmers to prepare Nutrient Management Strategies and/or Nutrient Management Plans (Parts II and III). It also sets out the information that farmers must include in their plans and strategies.

Farms that generate manure that requires removal must complete a *nutrient management strategy* . This document shows how much manure or other materials prescribed by the Regulation are produced, how they will be stored and where they will be used. A strategy consists of:

- A description of the type of operation,
- Status of the Strategy, whether it is new or a renewal,
- A farm unit declaration and sketch,
- A list of all prescribed materials and the amount generated annually,
- A description of nutrient storage,
- Analysis of nutrient content of materials,
- A list of nutrient uses with the appropriate agreements,
- Storage facilities – yearly capacity,
- Contingency plan for problems
- Certification form.

Farms that store or use manure on their land, but do not generate manure for

removal, must have a *nutrient management plan* . A plan consists of:

- Description of the type of operation and status of the plan (new or renewal),
- Farm unit declaration and sketch,
- Analysis of nitrogen, phosphorous, potassium and total solids,
- Storage information, if applicable,
- Contingency plan (if weather prevents application or storage gets too full),
- Certification form,
- List of nutrients to be applied and total quantity,
- Field information, cropping practices and application rates,
- Landowner agreements that show adequate land base for application.

In addition to the preparation of plans and strategies, the regulation requires that they be approved by the Ministry of Agriculture and Food. Every five years when plans and strategies are renewed, farmers must also get a new approval (Part IV). In some cases, farmers with farms that are considered low-risk will be able to do short-form plans.

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9. What are the other major features of the *Nutrient Management Act* Regulation and Protocols?

The Regulation and its Protocols have a number of other important provisions designed to control nutrients and protect the environment from pollutants from agricultural sources:

- The Regulation restricts how and where farmers can apply nutrients to their land. Farmers must take into account particular features of the land and adjust the application of manure and other nutrients to prevent excessive runoff and to protect water sources (Part VI). For example,
- Farmers are not allowed to apply manure or fertilizers within certain distances of wells or surface water.
- Although farmers are allowed to spread manure on their farms in winter, certain restrictions apply when the ground is saturated, snow-covered or frozen. When the ground is not snow covered during the period from the beginning of December to the end of March, wider setbacks from water are required.
- Soils that have less potential for runoff may receive higher rates of liquid nutrients while soils with slopes that are more susceptible to runoff will be allowed less.
- There is a ban on the use of high-trajectory guns for manure injection on all farms, regardless of size.
- There are controls for animals that are kept outdoors in Outdoor Confinement Areas (Part VII).

Animals who are kept outdoors where more than half their feed requirements are supplied, rather than provided by pasture, are subject to requirements under this Regulation. The Regulation stipulates that different sizes of confinement areas have different requirements in terms of soil characteristics, nutrient management plans, manure handling, and animal limits.

- New and expanding barns that contain manure must meet certain

specifications (Part VIII):

- New barns must be set back from sensitive features such as wells
- No new barns can be built within 100 metres of a municipal well.
- Barns must be monitored for leaks.
- There is a sampling and analysis protocol for sampling nutrients and soil (Part IX). Sampling is required for agricultural materials such as manure and for non-agricultural materials such as sewage biosolids. The Regulation sets standards for non-agricultural materials that are applied to land, including standards for metals and pathogens.
- Training in the preparation of nutrient management plans and strategies will eventually be mandatory for everyone that is required to prepare them (Part X)

Initially farmers will be able to prepare their own plans and strategies without training. Third party contractors, who offer their services in the preparation of plans and strategies, must be trained so that farmers have confidence in their abilities. After 2005 the Regulation will require that everyone who prepares a plan and strategy must have training.

- The Regulation provides for the creation of Local Advisory Committees by municipalities, although they are not mandatory (Part XII).

Their function would be to educate the community, to mediate disputes that are not legal problems, and to consult with the municipalities. If they are set up by the municipality, the majority of their members must be farmers or representatives of the agricultural community. A Local Advisory Committee Protocol has been developed to guide the work of these committees.

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10. Who administers the *Nutrient Management Act*?

The *Nutrient Management Act* is jointly administered by the Ontario Ministry of Agriculture and Food (OMAF) and the Ministry of the Environment (MOE). The Ministry of Agriculture and Food is responsible for the training of farmers and consultants involved in the preparation of Nutrient Management Plans and Strategies, and for reviewing the completed Plans and Strategies. The Ministry of the Environment is responsible for the enforcement and monitoring of the regulations.

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11. How will the *Nutrient Management Act* be enforced?

The legislation provides for provincial government officers with specialized knowledge of agricultural operations and environmental problems to inspect farms and to issue compliance and preventive orders if necessary. Officers of the Ministry of the Environment will be responsible for ensuring compliance with the *Nutrient Management Act.*

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12. Will the *Nutrient Management Act* protect drinking water?

To safeguard drinking water, Justice O'Connor has stressed that multi-barrier protection must be put in place. This means safe sources of drinking water,

effective treatment, secure distribution, continuous monitoring and a quick response to problems.

This Act helps to address the protection of drinking water sources. It will ensure better controls, and help prevent the infiltration of wells and surface water from animal manure and other nutrients. However, when source watershed protection plans for all drinking water sources in the province are introduced, farm plans must be integrated into the larger watershed planning process.

Although the *Nutrient Management Act* puts into place controls on manure, it does not address the problems of other agricultural pollutants in drinking water such as pesticides.

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13. What other kinds of nutrients are covered by this Regulation?

This Regulation (O.Reg. 267/03) also covers the land application of biosolids (treated human waste) and other non-agricultural nutrients. Other non-agricultural source materials are, for example, pulp and paper sludge, or brewery and meat processing byproducts, that can be used to enrich agricultural land. Like animal manure, the runoff from fields treated with these wastes can cause contamination of water supplies. They, too, need to be carefully monitored and controlled. The Regulation imposes minimum quality standards for the use of these materials.

See the Biosolids and Septage FAQ.

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14. What is the role of municipalities?

In some rural areas residents became concerned about manure storage and handling, as large livestock operations set up in their communities. Many municipalities tried to restrict the size of farming operations and the number of animals allowed through the use of municipal bylaws. Either they placed short-term moratoria on new large livestock operations or they required nutrient management plans.

One of the original goals of nutrient management legislation was to replace the numerous bylaws with one standard that would apply everywhere. However, because the Regulation is limited to new farms and to large farms, municipalities will remain responsible for nutrient management bylaws for livestock operations that are expanding but still under 300 nutrient units.

The municipality may also, if it chooses, set up a Local Advisory Committee for mediating nutrient management disputes in the community, as stipulated in the Regulation and Protocol.

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15. What is the next step in the province's legislative scheme?

The province has established the Provincial Advisory Committee for Nutrient Management. The purpose of this Committee is to consider implementation

dates for other types and sizes of agricultural operations. It is also meant to consider seasonal outdoor feeding area standards, manure storage issues for existing operations, and odour-related setbacks and standards.

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16. How can I participate in protecting water from agricultural pollution?

If you believe that someone is not controlling the manure from their farm as required by the *Nutrient Management Act* and its Regulation, or you have other concerns about nutrient management in your community, you can make a complaint: to the Ministry of Agriculture and Food, the Ministry of the Environment, your local municipality or the Local Advisory Committee, if your municipality has established one.

If your municipality does not have a Local Advisory Committee, you can ask them to establish one. These Committees are designed to help resolve disputes at the local level related to nutrient management issues. The Local Advisory Committee Protocol has a flow chart for handling nutrient management incident reports.

If a Local Advisory Committee exists, the municipality will refer any complaints that are not spills or violations to them. If it is a spill or a violation, it will be referred to the Ministry of the Environment. A written complaint will be sent to the Local Advisory Committee if the citizen agrees. The Committee reviews the complaint and assigns a panel to investigate it.

If the panel determines that the incident is valid and there is no violation, the panel meets with the parties to reach a resolution. At the conclusion of the mediation the panel provides recommendations to the parties for the resolution of the matter, and files the results with the Local Advisory Committee. If either of the parties are not satisfied with the outcome, they may request a hearing by the Normal Farm Practices Protection Board or request that the matter be referred to the municipality as appropriate.

The public's right to know what is included in nutrient management plans or strategies is limited. The *Nutrient Management Act* is not subject to the *Environmental Bill of Rights* . This means that regulations under the Act do not have to be posted. Public participation in the development of new regulations or changes in the current regulation will be at the discretion of the government.

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17. Where can I test my well for possible contamination?

Residents using wells should test regularly to be sure their drinking water is safe. Advice is available from local Public Health Units. Ontario's Ministry of Health currently offers free bacteriological testing of drinking water samples taken by well owners.

For more information on water testing, contact your local Public Health Unit. For a complete listing of all Public Health Units in Ontario, see: www.healthunit.org/aboutus/hea_unit.htm

As well, information on the Baseline Well Water Testing Program which is administered by the Ontario Federation of Agriculture, is available to all rural

private well owners by contacting the Ontario Federation of Agriculture at 1-800-668-3276.

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18. What are the Canadian Environmental Law Association's views on nutrient management?

The Canadian Environmental Law Association (CELA) wants the *Nutrient Management Act* to be integrated with source protection legislation, which the government has yet to introduce.

For a summary of CELA's concerns, see "Responding to the Ontario Government's Stage 1 Proposals under the Nutrient Management Act", Intervenor, December 2002, Theresa McClenaghan at: www.cela.ca/Intervenor/27_3&4/27_3&4mna.htm

The complete CELA brief, "Proposed Stage 1 Draft Nutrient Management Regulations under the Nutrient Management Act" can be found at: www.cela.ca/land&EA/430nma.pdf

A second CELA brief on the Proposed Stage 2 Draft Nutrient Management Regulations entitled " Comments by CELA to the Ministry of Agriculture, Food and Rural Affairs, Strategic Policy Branch re: EBR Registry Number: RC02E0002 on the Proposed Stage 2 Draft Nutrient Management Regulations under the Nutrient Management Act" can be found at: www.cela.ca/land&EA/436nma2.pdf

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19. How can I get more information about Ontario's nutrient management legislation?

The *Nutrient Management Act* and Ontario Regulation 267/03 are available at: www.e-laws.gov.on.ca/

Both the *Nutrient Management Act* and the Walkerton report are available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

The Ministry of Agriculture and Food has set up the " *Nutrient Management Act* Home Page" to provide information about the development of the Act and Regulation. It can be found at: www.gov.on.ca/omafra/english/agops/index.html

The Ministry of the Environment also has information about nutrient management available at: www.ene.gov.on.ca/envision/land/nutrient_management.htm

The *Nutrient Management Act* is one of four legislative changes recommended by the Report of the Walkerton Commission of Inquiry. For information on the other three, see the Safe Drinking Water Act FAQ, Source Water Protection FAQ, and the Water Financing FAQ.

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20. What have other jurisdictions done to address nutrient problems?

The United States Environmental Protection Agency (EPA) now requires animal feeding operations to have discharge permits. EPA has designated farms where animals are kept and raised in confined situations (based on the number of animals) as point source dischargers. Like other major industrial dischargers, they are required to have a permit under the National Pollutant Discharge Elimination System (NPDES). This information is available on the EPA's web site at:
www.epa.gov/Region7/water/cafo/what_is_cafo_final_rule.htm

The Ontario Ministry of Agriculture and Food has compiled a guide with links to nutrient management programs in Canada, the United Sates, Europe and Australia . This can be found at:
www.gov.on.ca/OMAFRA/english/agops/nutmgtlinks.htm

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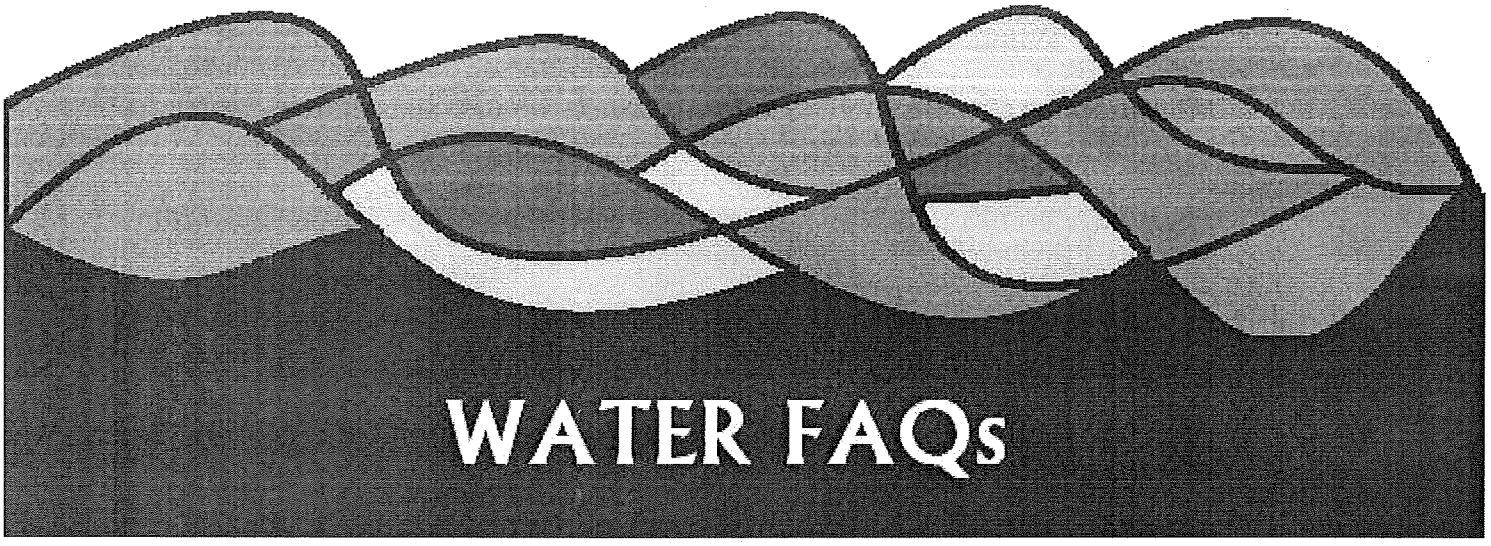

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Source Water Protection FAQs (January 2004)

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1. What is source protection?

Source protection is the first barrier in a multiple-barrier approach to protecting drinking water. As Justice O'Connor stated in the Report of the Walkerton Commission of Inquiry, "keeping contaminants out of drinking water sources is an efficient way of keeping them out of drinking water." A multi-barrier approach starts with the protection of the drinking water source, and is followed by treating the water effectively, monitoring its quality and taking action when problems are found.

Justice O'Connor recommended that protection of drinking water sources be carried out in an ecologically meaningful way -- at the watershed level. A watershed is an area of land drained by a river and its tributaries into a particular body of water such as a lake or an ocean.

Source protection is not a new idea. Several other jurisdictions have already incorporated it into their drinking water regimes. The United States' Safe Drinking Water Act requires that all states prepare a source water assessment for every drinking water source in their state.

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2. Do we have source protection in Ontario now?

There are no overall provincial guidelines, policies or legislation on source protection. The province has, however, some experience with managing watersheds and creating plans to revitalize polluted areas of the Great Lakes.

The establishment of Conservation Authorities was the first initiative to address water problems at a watershed level. In the late 1920s and 1930s

when drought and deforestation caused extensive soil loss and flooding in Ontario, many conservation organizations and municipalities pressed the government for a new initiative to address the problems. In 1946 the government created conservation agencies to deal with flood control and erosion on a watershed basis.

Under the Conservation Authorities Act conservation authorities were established, jointly funded by the province and municipalities, in every watershed area. Their mandate was "to further the conservation, restoration, development and management of natural resources". Since their establishment Conservation Authorities have been active in controlling flooding and erosion, and in public education.

Although Conservation Authorities have broad powers to develop watershed management plans and have developed them for some important watersheds, they have not had the legal authority to impose plans on other activities in the watershed.

In 1987 another initiative was launched in the province to create plans for reversing pollution problems. The Great Lakes Water Quality Agreement between Canada and the United States targeted 42 areas around the Great Lakes where water quality was badly degraded and needed to be restored. Ontario and Canada made a commitment to developing Remedial Action Plans for each of these areas. Local Public Advisory Committees were established for 17 of the areas located in Canada. These Committees have spent many years now identifying local pollution problems, doing extensive public consultation and producing plans for restoring and protecting the water quality. This process, however, has been limited to the areas identified as problems rather than to all communities on the Great Lakes.

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3. What were Justice O'Connor's recommendations regarding source protection in the Report of the Walkerton Commission of Inquiry?

In Part Two of his Report of the Walkerton Commission of Inquiry, Justice O'Connor identified source protection as a crucial first step in protecting drinking water. He recommended that watershed source protection plans be mandated by the province and binding on decisions regarding water use.

He recommended that the Ministry of the Environment should take the lead on establishing the framework for developing watershed-based source water protection plans, and help fund their development. As well, they would be the final approving body for completed plans.

A source protection plan would be developed for each watershed through a local process coordinated by the Conservation Authorities. Where Conservation Authorities do not exist in the province or do not have the capacity to do planning, the Ministry could step in and do the work. This process would be completely open to public scrutiny.

Once a plan is developed, it would have to be approved by the Ministry of the Environment to ensure consistency and thoroughness throughout the province. The Ministry's decisions on Permits to Take Water (which permits large water takings) and Certificates of Approval (permits for discharges of contaminants to waterways) would have to respect the approved plans.

Justice O'Connor also recommended the development of farm water

protection plans that would be consistent with watershed-based source protection plans in vulnerable areas. As well, farm nutrient management plans have been introduced by the province in a Regulation under the recently passed Nutrient Management Act.

See the Nutrient Management FAQ

The Report of the Walkerton Commission of Inquiry, part 2, Chapter 4, "The Protection of Drinking Water Sources", contains Justice O'Connor's recommendations on source protection planning. The Report is available at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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4. What are source protection plans?

Justice O'Connor suggested a minimum"list of ingredients" that should be included in watershed-based source protection plans:

- A water budget for the watershed, or a plan for developing a water budget where sufficient data are not yet available,
- The identification of all significant water withdrawals, including municipal intakes,
- Landuse maps for the watershed,
- The identification of wellhead areas,
- Maps of areas of groundwater vulnerability, that include characteristics such as depth to bedrock, depth to water table, the extent of aquifers and recharge rates,
- The identification of all major point and non-point sources of contaminants in the watershed,
- A model that describes the fate of pollutants in the watershed,
- A program for identifying and properly decommissioning abandoned wells, excavations, quarries, and other shortcuts that can introduce contaminants into aquifers,
- The identification of areas where a significant direct threat exists to the safety of drinking water, and
- The identification of significant knowledge gaps and or research needs to help target monitoring efforts.

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5. What was the Ontario government's response to the recommendations of the Walkerton Inquiry?

The provincial government, after receiving the Report of the Walkerton Commission of Inquiry in May 2002, made a commitment to implement all of Justice O'Connor's recommendations.

Justice O'Connor recommended that the first step in the process be the development of a framework for source protection planning.

In November 2002 the government established an Advisory Committee on Watershed-Based Source Protection Planning to provide advice to the government on a framework for

watershed-based source protection planning.

The resulting report, "Protecting Ontario's Drinking Water: Towards a Watershed Based Source Protection Planning Framework", was completed in April 2003. The government then consulted the public on the Framework by posting the report on the Environmental Registry.

The full report of the Advisory Committee on Watershed-Based Source Protection Planning is available on the Ministry of Environment's web site at: www.ene.gov.on.ca/envision/water/spp.htm

In November 2003, a new government announced the formation of two committees – a technical committee and an implementation committee – to start the process of developing legislation to protect drinking water sources. A technical committee, made up of members with expertise in managing and protecting ground and surface waters, will assess the various threats posed to water sources. In addition, an implementation committee has been set up to provide the government with advice on watershed-based source protection planning.

In February 2004, the government will release a White Paper to consult on the planning aspects of source protection legislation including the preparation, roles and responsibilities, approvals and appeals of source protection plans.

For more information on the Ministry of the Environment's Source Protection Planning, see the Minister's Press Release of December 18, 2003 at: www.ene.gov.on.ca/envision/news/index.htm

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6. What are the main elements of the Source Protection Framework as outlined by the Advisory Committee on Watershed-based Source Protection Planning?

The Source Protection Framework is divided into four main sections:

1. Fundamentals that should guide source protection planning
2. The planning process
3. Risk management
4. Information management

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7. What are the concepts that should guide source protection planning in Ontario?

The Advisory Committee identified the key elements that should guide source protection planning. They include:

- Responsibility and Accountability:
  The ultimate responsibility for ensuring source protection will be with the province, and specifically, with the Ministry of the Environment. At the same time, responsibility for specific outcomes is shared among water managers, users, and landowners such as farmers, industry, and developers.
- Goal of Source Protection Plans:

The framework establishes that an effective source protection regime will be done best through locally developed watershed-based Source Protection Plans.

- Legislative Basis:
  The framework should be set out in new stand-alone watershed-based source protection legislation, with a timeline for completion of the Source Protection Plans. Once the plans receive approval, municipal official plans, provincially-issued Permits To Take Water, and provincial Certificates of Approval would all have to be consistent with them.
- Identification of Gaps in the Current System:
  The framework lists a number of gaps in the current system of municipal and other powers that should be addressed through awarding new powers either to municipalities or to other agencies where appropriate.
- New Powers for Municipalities:
  The province should work with municipalities and other stakeholders to identify new municipal powers that should be made available, and then provide them with the new powers.
- First Nations:
  First Nations should be full participants in source protection planning and implementation.
- Financing Initial Source Protection Plans:
  A formal funding strategy should be developed.

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8. Is legislation needed in Ontario for source protection planning?

The Advisory Committee has recommended that new stand-alone watershed-based source protection legislation be developed. The legislation would include a schedule setting out the timeline for completion of initial Source Protection Plans, requiring that all plans be started within two years of the effective date of legislation and that all plans be completed within three years of their starting date. All plans would be completed by the end of the fifth year. The legislation will also set out the details for completion of the Source Protection Plans.

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9. Who would take the lead in developing source protection planning?

The Advisory Committee recommended that Conservation Authorities be the lead organization with responsibility for the coordination and development of the Source Protection Plans. Justice O'Connor believed Conservation Authorities were the most appropriate body to lead a local process because of their experience with watershed management. Once the plans were developed locally, the Ministry of Environment would approve them. There would be 16 Planning Areas in Southern Ontario, and 8 Planning Areas in Northern Ontario.

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10. How will the planning process get underway?

Once legislation is passed, the first step would be the creation of a Source Protection Planning Committee for each Planning Area. The minimum composition recommended for all Committees is:

- 1/3 municipal representatives,
- 1/3 provincial, First Nations, and federal representatives,
- 1/3 local public health officials and other stakeholders.

The Chair would be appointed by the Minister of the Environment on the recommendation of the Board of Directors of the Conservation Authority. Beyond that, the composition of Source Protection Planning Committees would vary according to local interests and issues. Each stakeholder would select its own representative for the committee. Membership would be limited to a maximum of 18 plus the Chair.

In addition, the Committee would establish an independent expert panel to assist with the technical and scientific aspects of the planning process. The Committees could also establish any working groups required, which would provide further opportunities for input into the planning process.

Each Source Protection Planning Committee would start the planning process, and report to the Board of Directors of the Conservation Authority. The Source Protection Planning Committee would act as an Advisory Committee to the Board. The Board of the Conservation Authority would ultimately submit the Source Protection Plan to the Ministry of the Environment for approval.

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11. Will the planning process be accessible to the public?

The Advisory Committee recommended that the Source Protection Planning Committee establish and coordinate a transparent local planning process. The Source Protection Framework sets out the minimum requirements of a transparent local planning process, such as:

- Meetings of the Source Protection Planning Committee are to be advertised and open to public attendance;
- Meetings will allow for involvement of public and other affected local parties;
- Draft plans and proposals will be published widely;
- There will be adequate time and information to allow for a range of views to be heard and considered;
- Invitation will be made for public comment in writing; and,
- Where appropriate, documentation of response to public input will be provided.

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12. What will the initial Source Protection Plan look like?

The plans envisioned by the Advisory Committee will include technical information about the watershed and will identify source protection issues. It would contain:

- A water budget, including future water needs;
- Maps that identify high, medium, and low vulnerable areas, and sensitive water

resources;

- A baseline map to identify the state of the watershed;
- Natural features including wetland, woodlands, and riparian zones;
- Areas that may pose a significant direct threat to drinking water;
- Maps of all significant water takings;
- Inventory of major point and non-point sources of contaminants;
- Potential water allocation problems;
- The need for special limits to water taking;
- Areas where the plan should affect municipal land use;
- Contaminated site issues;
- Areas where farm water protection plans are needed;
- Areas where biosolids and septage are a concern; and
- Identification of knowledge gaps and research needs for the watershed.

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13. What opportunities are there for public participation in the process to establish a source protection regime in Ontario?

1. Initial Involvement:

The critical stage of public involvement is right now. The most important task is to ensure that the government enacts this legislation. For information on what you can do to support source protection legislation, see the CELA Source Protection Action Alert.

2. Second Stage of Involvement:

When the legislation has passed, the public can get involved at the Source Protection Planning Committee level. If you have special technical expertise or knowledge of the local watershed, or if you have simply been involved in water issues, you can try to get on the Source Protection Planning Committee. You can write to the Conservation Authority in your area and ask to be a member of the Committee. If you are not selected, you can still be involved with the working groups that assist them.

If you want to be involved with a single issue, you can attend the Source Protection Planning Committee meetings, which are open to the public.

One of the key things will be the terms of reference prepared by the Committee which will set out the process for local public consultation. The Board of Directors of the Conservation Authority have to agree to these terms of reference early in the planning process. It will be important to ensure that the terms of reference provide ample opportunity to allow the public to make its views known. If you think that the process is not adequate, make sure you document your concerns to both the Source Protection Planning Committee and the Board of Directors in writing.

If you participate by attending the Source Protection Planning Committee meetings and have serious concerns about an issue – if, for example you think that the water budget does not accurately reflect the water takings in the watershed, put your concerns in writing and submit it to the Committee. One of the things the Source Protection Planning Committee is required to do is to document its response to public input.

If you fail to document your concerns, it may be more difficult to challenge the source protection plan in the appeal process. If you don't have the time or resources to be attending meetings, you can always comment on the draft plans. Again it is important to document your concerns in writing.

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14. Is there any opportunity to appeal the source protection plan?

The Source Protection Advisory Committee recommended that once the plan is finalized, the Source Protection Planning Committee submits it to the Board of Directors of the Conservation Authority which then submits it to the Ministry of Environment for approval. If the Plan gets approved and your concerns have not been addressed, one option would be to appeal the plan. The right to appeal will be limited and has not been defined in the Advisory Committee's report. However, it is expected that the legislation will set out some right of appeal.

In addition, there will be limited rights also to appeal provincial and municipal decisions that are inconsistent with the plan. For example, if a Permit to Take Water was issued which was not consistent with the plan, it is expected there will be a right to appeal. The same right applies to Official Plans as well.

Where there is a risk to human health, it is recommended that Source Protection Plans supersede other legislation. Otherwise, provincial decisions regarding Permits to Take Water as well as planning decisions have to be consistent with source protection plans.

Finally, if your local source water protection plan was approved,and you have since found critical information that was missed in the plan, there will still be an opportunity for involvement. The Source Protection Plan will be reviewed and revised as necessary, and there will be an opportunity for new participants, as well as the groups who were initially involved, to periodically review and revise the plan.

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15. What can the provincial government do to address source protection while a source protection regime is being developed?

The judicious use of existing legal tools can provide a reasonable degree of interim protection for drinking water sources while legislation to mandate watershed-based source protection plans is being developed.

At the provincial level, the Advisory Committee identified the Ontario Water Resources Act as providing legal authority for designating interim drinking water sources for protection and prohibiting certain land uses and development within such areas.

For example, section 33 empowers the Director, Ontario Ministry of the Environment to define areas of "sources of public water supply" in which "no material of any kind that may impair the quality of water therein shall be placed, discharged, or allowed to remain", and in which "no act shall be done and no water shall be taken that may unduly diminish the amount of water available in such areas as a public water supply". Similarly, section 36 of the Ontario Water Resources Act empowers the Director to control water well construction within designated areas.

In addition to these provisions, the Ontario government has other legal tools to protect water resources, including:

- Investigate and enjoin sources of groundwater or surface water pollution pursuant to section 29 of the Ontario Water Resources Act;
- Issue administrative orders under section 32 to require measures to alleviate the effects of water quality impairment;
- Enforce water pollution standards and ensure compliance with discharge limits prescribed under statutory approvals such as certificates of approval under the Environmental Protection Act;
- Rigorously apply the Environmental Assessment Act to all public and private undertakings that may pose a threat to drinking water sources; and
- Refuse to issue permits to take water under section 34 of the Ontario Water Resources Act where there is an unreasonable risk to drinking water sources.

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16. What can municipalities do now to address source protection while a source protection regime is being developed?

Under the Planning Act, municipalities have powers that they can use to control land use and development. For example, under Parts III and V of the Planning Act, municipalities may pass or amend Official Plans and zoning by-laws that identify and protect watercourses, wetlands, riparian zones, headwater areas and other water-related natural heritage features. This existing authority can be used to limit activities that would have a negative impact on drinking water sources.

Municipalities are also empowered under section 38 of the Planning Act to enact interim control by-laws that effectively freeze the status quo for up to two years within designated areas in order to allow more detailed planning or environmental studies to occur.

In addition to these powers, there are other tools currently available to municipalities to protect water resources, including:

- Enact and enforce sewer use by-laws and pesticide by-laws;
- Enact and enforce nutrient management by-laws for the various classes of agricultural operations that will not be subject to provincial standards under the Nutrient Management Act;
- Undertake public education and landowner contact programs;
- Consider land acquisition options to secure vulnerable or sensitive areas in the watershed (for example, purchase, land swap, expropriation or other mechanisms such as stewardship agreements and conservation easements)

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17. What tools can Conservation Authorities use now to address source protection?

Under Section 21 of the Conservation Authorities Act, conservation authorities

are empowered to:

- Develop programs to conserve, restore and manage natural resources within watersheds;
- Purchase, lease or expropriate lands, and
- Control surface water flow to prevent pollution

Under section 28 of the Conservation Authorities Act, conservation authorities may make regulations that:

- Restrict surface water use;
- Regulate watercourse alterations; and
- Control development near or within floodplains, wetlands, and river and stream valleys.

Conservation Ontario, the association of Conservation Authorities, has carried out a series of watershed-based demonstration projects. Reports on these projects can be found at:
www.conservation-ontario.on.ca/projects/projects.htm

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18. What are the views of the Canadian Environmental Law Association on source protection?

The Canadian Environmental Law Association(CELA) is a member of the source protection implementation committee, following up on its work as a member of the Advisory Committee. CELA supports the Final Report of the Advisory Committee on Watershed-based Source Protection Planning, "Protecting Ontario's Drinking Water: Toward a Watershed-Based Source Protection Planning Framework". CELA has put up a Source Protection Action Alert on its web site This Action Alert contains CELA's views on source protection planning as well as links to material produced by CELA for its Source Protection Workshop.

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19. How can I get more information about source protection and the source protection planning framework process?

Contact your local Conservation Authority and ask for information on source protection or watershed management. Information on Conservation Authorities and their work can be found at:
www.conservation-ontario.ca

The Watershed Science Centre is located at Trent University. Its web site features workshops and publications on watershed management including The Ministry of Natural Resources' Guide to Watershed Action. See:
www.trentu.ca/wsc

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20. How can I get information about source protection in other jurisdictions?

There is considerable information available in the United States, and from many individual states, on source water assessments. A starting point is the Source Water Protection page of the U.S. Environmental Protection Agency at: www.epa.gov/safewater/protect.html

New York City has a special waiver from the U.S. Environmental Protection Agency's requirement that all drinking water be treated. Instead it has put in place a watershed agreement that includes land acquisitions to protect its drinking water reservoirs from pollutants. Information on its program can be found at: http://nyc.gov/html/dep/html/agreement.html

In Canada New Brunswick has developed specific provincial laws to protect watersheds and wellheads. Descriptions of this legislation can be found at: www.gnb.ca/0009/0003-e.asp

For information on the European Union's new watershed-based River Directive, see:
http://europa.eu.int/comm/environment/water/

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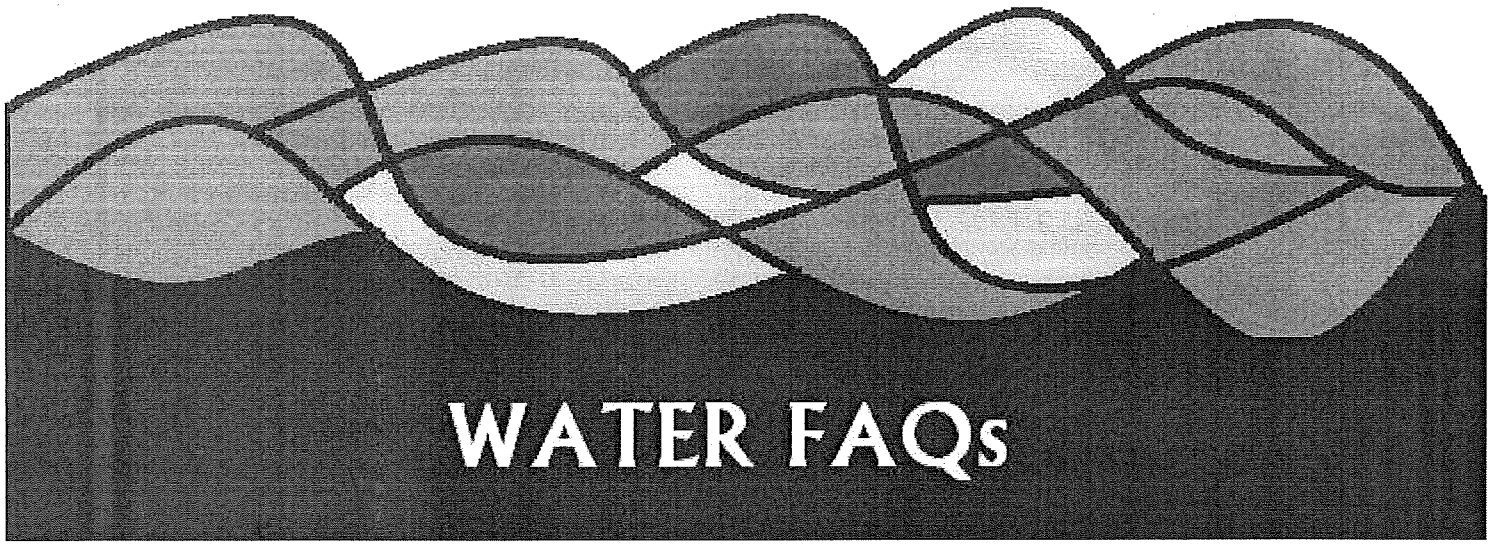

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Biosolids and Septage FAQs (January 2004)

1. What are biosolids and septage?

Biosolids and septage both refer to human waste.

Biosolids are treated wastes from sewage treatment plants that remain after the water is removed. In Ontario, solids are settled out at municipal sewage treatment plants after primary and secondary treatment. These solids are treated by bacterial decomposition and the resulting material is called "stabilized" sewage sludge or biosolids. The stabilizing process reduces the pathogens (viruses, bacteria, fungi and protozoa) in the biosolids, but does not eliminate them. Biosolids may also be contaminated by heavy metals and other industrial pollutants.

Septage is untreated human waste pumped out of septic tanks, portable toilets or holding tanks, and usually hauled away by trucks. Treatment is not required for septage. This means septage is likely to have higher concentrations of pathogens.

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2. Why are biosolids and septage used on agricultural land?

Municipal sewage treatment plants in Ontario produce about 300,000 tonnes of treated sewage or biosolids every year. There are three possible options for disposal – incineration, landfill, or spreading on agricultural land and land farms.

Currently, less than half is incinerated or sent to landfills. Most of it is spread on land. Because the options of incineration and landfill are more expensive, municipalities are increasingly choosing to apply sewage sludge to land.

Septage can be disposed of through municipal sewage treatment plants, in waste stabilization lagoons, sent to waste disposal sites such as landfills that are approved for septage, or applied to land.

Moreover, biosolids and septage can be beneficial to soil. Both contain nutrients – such as phosphorus and nitrogen -- that can be used by farmers as fertilizer. However, like animal manure and other nutrients, they can degrade the environment if they are not properly monitored and controlled. Pulp and paper biosolids and other non-agricultural materials, such as brewery and meat processing waste byproducts, are also spread on land as fertilizer.

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3. What are the environmental risks from spreading biosolids on land?

Environmental damage can occur when sewage sludge or other nutrient-rich materials wash off fields and into waterways. Phosphorus and nitrogen can cause algal blooms, oxygen depletion and fish kills.

Another problem is the possibility that pathogens from biosolids leach into ground or surface water, and cause contamination of drinking water supplies.

Biosolids may be contaminated with heavy metals such as chromium, cadmium and lead, or other contaminants that come from industries discharging to the sewage treatment plants. These metals may enter the food or water supply if they are applied to agricultural land.

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4. How are these wastes regulated in Ontario?

Land application of biosolids is regulated under Part V of Ontario's Environmental Protection Act, and Ontario Regulation 347. The Ministry of the Environment currently approves the spreading of biosolids or non-agricultural wastes through the Ministry of the Environment Land Application Program. The Ministry has been reviewing this program.

Municipalities or contractors must apply to the Ministry of the Environment's Regional Offices for a Certificate of Approval for an "organic soil conditioning site". Certificates of approval usually contain site-specific conditions and require compliance with general standards set out in Regulation 347. Before issuing an approval, the Ministry staff may inspect proposed sites to make sure that they meet the standards.

The Ministry also uses the "Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Lands", issued in March 1996, to evaluate the suitability of sites. The guidelines state that "the use of biosolids and other waste materials must be of benefit to crop production or soil health". Furthermore, they require that "such use shall not degrade the natural environment or cause any degradation in drinking water supplies".

Farmers who plan to use biosolids on their land also submit an application to the local Ministry of the Environment District Office. These applications must be accompanied by an analysis of the soil for each field on which biosolids will be used, including levels of nutrients like nitrogen and potassium, as well as heavy metals. Maps of the proposed sites must show their proximity to homes, wells and waterways, the land slope and soil permeability.

The "Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Lands" (Publication 3425 under Waste-Nutrient Management) can be found at: www.ene.gov.on.ca/envision/gp/

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5. What concerns were raised by the Environmental Commissioner of Ontario?

In his Annual Report of 2000/2001, "Having Regard", the Environmental Commissioner of Ontario identified concerns raised by farmers and citizens about the land application of biosolids and septage. He recommended that the Ministry of the Environment and the Ministry of Agriculture and Food ensure that new legislation and policies for sewage sludge and septage address the need for overall ecosystem protection and the protection of groundwater recharge areas.

He identified the following problems with Ontario's rules for sewage and septage spreading:

- Nutrient management plans are not required for an approved site that is

receiving sewage. This means that there is no accurate or current information about nutrient loads being applied, soil or weather conditions, or actual crop nutrient needs. This lack of information increases the risk of run-off to ground or surface water.
- There is no recognition of groundwater recharge areas or environmentally sensitive areas that are more prone to contamination.
- There is no public notification -- the Ministry of the Environment is not required to post notice of proposed approvals for sludge or septage spreading sites on the Environmental Bill of Rights Registry.
- There is no public registry of spreading sites.
- There is no requirement that operators applying sludge be trained and certified.
- There are no restrictions on applying sludge to farmlands with tile drains that can carry contaminants directly to waterways.
- There is no prohibition against land application onto frozen soil.

The 2000/2001 Annual Report of the Environmental Commissioner of Ontario can be found under publications at: www.eco.on.ca/

In addition, information on sewage treatment plant discharges and their potential impact on Ontario's lakes and rivers can be found at the same web site in the 2002/2003 Annual Report.

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6. What are Justice O'Connor's recommendations on biosolids and septage from the Report of the Walkerton Commission of Inquiry?

As part of his inquiry into the ways in which the province could protect drinking water sources, Mr. Justice Dennis O'Connor looked at specific threats such as the spreading of biosolids on agricultural land. He was satisfied that concerns about biosolids and septage could be addressed by the source protection planning process that he envisioned. He specifically recommended that the Ministry of the Environment should not issue certificates of approval for the spreading of waste materials like biosolids and septage unless they were compatible with the applicable source protection plan. He also recommended strict enforcement by the Ministry of the Environment of certificates of approval.

The Report of the Walkerton Commission of Inquiry, Parts 1 and 2, contains information on Justice O'Connor's recommendations regarding the need for nutrient control. For recommendations on Biosolids and Septage, see Part Two, Chapter 4, Source Protection, Section 4.4, Specific Threats. The Report is available at:
www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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7. Does the Nutrient Management Act, 2002, apply to these materials?

In the wake of the tragedy in Walkerton in May 2000, the provincial government committed itself to province-wide nutrient management standards. The Nutrient Management Act was part of a package of initiatives announced in June 2001, that included a province-wide ban on the land application of untreated septage, to be phased in over 5 years.

The Nutrient Management Act, 2002, was developed by the Ministry of the Environment and the Ministry of Agriculture and Food and came into force in July 2003. It is enabling legislation that supports the development of regulations for nutrient management and other related farm practices, including the land application of biosolids.

In addition, the General Regulation under the Nutrient Management Act, O. Reg 267/03, sets out specific details of the legal requirements for the handling, storage and land application of nutrients. This Regulation came into force on September 30, 2003, and was amended on December 19, 2003. However, the requirements of the Regulation are phased in over a period of 5 years.

See the Nutrient Management FAQ.

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8. What does the Nutrient Management Act and Regulation mean for biosolids?

As well as regulating agricultural nutrients like animal manure, Regulation 267/03, under the Nutrient Management Act, applies to the land application of biosolids and other nutrient-rich materials that are not from animal sources These are defined as "non-agricultural materials" in the Regulation. They include: sewage biosolids, pulp and paper biosolids, and other non-agricultural nutrient materials capable of being land-applied (brewery and meat processing byproducts, for example).

All generators of these non-agricultural materials, such as municipalities, are required to have a nutrient management strategy in place by 2008. The strategies will outline how they manage these materials, including:

- A description of the type of operation and the material generated,
- The total annual volume of material generated,
- A description of the storage capacity,
- An analysis of the nutrient content and other tests of materials,
- A list of nutrient uses with appropriate agreements.

The strategies must be submitted to the Ministry of Agriculture and Food for approval. They must also be renewed every five years, or earlier if there is a change: in the control or ownership that adversely affects the capacity to implement the strategy, a 20 per cent or more increase in the amount of nutrients generated, a change in the use of the materials generated, or a loss of available destinations resulting in more material than can be accommodated.

Municipalities and other generators of these materials will still be required to obtain a certificate of approval from the Ministry of the Environment, in addition to meeting their obligations under the Nutrient Management Act.

The other provisions of the Regulation also apply to biosolids and the other non-agricultural source materials. Like farm nutrient management plans, strategies must be approved by the Director every five years. Non-agricultural source materials must be set back the legally-required distances from drilled wells, municipal wells and other watercourses. There are restrictions on the application of these materials to frozen or snow-covered ground as well as restrictions from December 1 to March 31. No new storage is allowed close to tile drains.

Biosolids and other non-agricultural source materials, and the land where it will be applied, must meet the sampling requirements set out in Part IX of the Regulation. Biosolids must be tested for pH, potassium, pathogens and eleven metals before they are approved for use on fields.

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9. Are there other changes to the handling of biosolids and other non-agricultural nutrient problems?

In addition to the requirements of the Nutrient Management Act and Regulation 267/03, the Ministry of the Environment has proposed an amendment to Regulation 347, R.R.O. 1990, the general waste management regulation under the Environmental Protection Act. The proposed Consultation and Notification Requirements would require that municipalities are consulted and given an opportunity to present any relevant technical application. (Although municipalities generate sewage sludge, it may be applied to land in another municipality referred to as the "host" municipality. This change would require municipalities and others that generate biosolids to notify municipalities where they are used.) The Regulation also proposes that neighbours are notified before there is an approval for land application of biosolids.

It was originally proposed that the amendment would require that municipalities be consulted effective December 1, 2003 and notice given to neighbours effective September 1, 2003. This proposed amendment was posted on the Environmental Bill of Rights Registry on April 25, 2003. A decision can be posted at any time after the 30 day comment period is finished.

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10. What are the Ministry of the Environment's plans for septage in Ontario?

As part of the nutrient management initiatives, in June 2001 the government made a commitment to phase out the land application of septage over a five year period. The Ministry of the Environment planned to introduce a regulation on the phase-out of septage following consultations on the draft regulations of the Nutrient Management Act.

Their proposal for the five-year phase out contained these key provisions that would take effect as soon as the regulation was in place:

- There would be an immediate ban on the land application of portable toilet waste;
- As the first step in the phase-out of the land application of septage, the Ministry of the Environment would not approve any new sites to receive untreated septage;
- Existing certificates of approval would be reviewed when they were up for renewal to see if the septage could be accepted by a local sewage treatment plant or another treatment facility;
- Where there are no immediate alternatives, existing certificates of approval will be renewed, but only for a three year period;
- In the last 12 months before the final ban on land application of septage, the Ministry will not accept any applications for renewals of certificates of approval;

- The Ministry of the Environment would require municipalities to prepare strategies for the management of septage that would be the equivalent of a Nutrient Management Strategy;
- The restrictions on winter spreading and the land application standards (such as setbacks from surface water and municipal wells) would apply to septage.

The Ministry has also promised a full consultation with all stakeholders who are affected by the phase-out. This would include particularly rural homeowners served by septic systems.

The Ministry of the Environment's "Proposed Strategy for Five-Year Phase-out of the Land Application of Untreated Septage" can be found at: www.ene.gov.on.ca/envision/land/septage.htm

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11. What are the Canadian Environmental Law Association's views on biosolids and septage?

The Canadian Environmental Law Association (CELA) is concerned that the Nutrient Management Act and its Regulation will not be integrated with source protection legislation, which the government has yet to introduce.

For a summary of CELA's concerns, see "Responding to the Ontario Government's Stage 1 Proposals under the Nutrient Management Act", Intervenor, December 2002, Theresa McClenaghan.

The complete CELA brief, "Proposed Stage 1 Draft Nutrient Management Regulations under the Nutrient Management Act" can be found at: www.cela.ca/land&EA/430nma.pdf

A second CELA brief on the Proposed Stage 2 Draft Nutrient Management Regulations is entitled, "Comments by CELA to the Ministry of Agriculture, Food and Rural Affairs, Strategic Policy Branch re: EBR Registry Number: RC02E0002 on the Proposed Stage 2 Draft Nutrient Management Regulations under the Nutrient Management Act".

For CELA's brief on Septage entitled, "Comments on Ban on the Land Application of Untreated Portable Toilet Waste and Consultation and Notification Requirements under the Environmental Protection Act for land application sites for biosolids and other non-agricultural waste. EBR Registry Numbers: RA03E00016 & RA03E0017", see: www.cela.ca/447biosolids.pdf

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12. How can I find more information on biosolids in Ontario?

The Nutrient Management Act, 2002, and its General Regulation 267/03 can be found at:
www.e-laws.gov.on.ca/

Both the Nutrient Management Act and the Report of the Walkerton Commission of Inquiry are available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

The Ministry of Agriculture and Food has set up the "Nutrient Management Act Home Page" to provide information about the development of the Act and Regulation. It can be found at:
www.gov.on.ca/omafra/english/agops/index.html

The Ministry of the Environment also has information about nutrient management at:
www.ene.gov.on.ca/envision/land/nutrient_management.htm

A critique of the use of biosolids on land by Maureen Riley, "The Case Against Land Application of Sewage Sludge Pathogens", The Canadian Journal of Infectious Diseases, July/August 2001, can be found at:
http://pulsus.com/Infdis/12_04/reil_ed.htm

The Nutrient Management Act is one of four legislative changes recommended by the Report of the Walkerton Commission of Inquiry. For information on the other three, see the Safe Drinking Water Act FAQ, Source Protection FAQ, and the Water Financing FAQ.

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13. How can I find more information about biosolids and septage in other jurisdictions?

The United States Environmental Protection Agency has established a voluntary "Environmental Management System" for applying biosolids to land. This program aims to set up a partnership with communities to handle biosolids in a "community-friendly" fashion, including public disclosure and control of noise, odour and dust. For more information on how biosolids are handled in the United States, see:
www.epa.gov/owm/mtb/biosolids

For septage land application information in the United States, see "A Guide to the Federal EPA Rule for Land Application of Domestic Septage to Non-Public Contact Sites" at:
www.epa.gov/OW-OWM.html/mtb/biosolids/septage_guide.pdf

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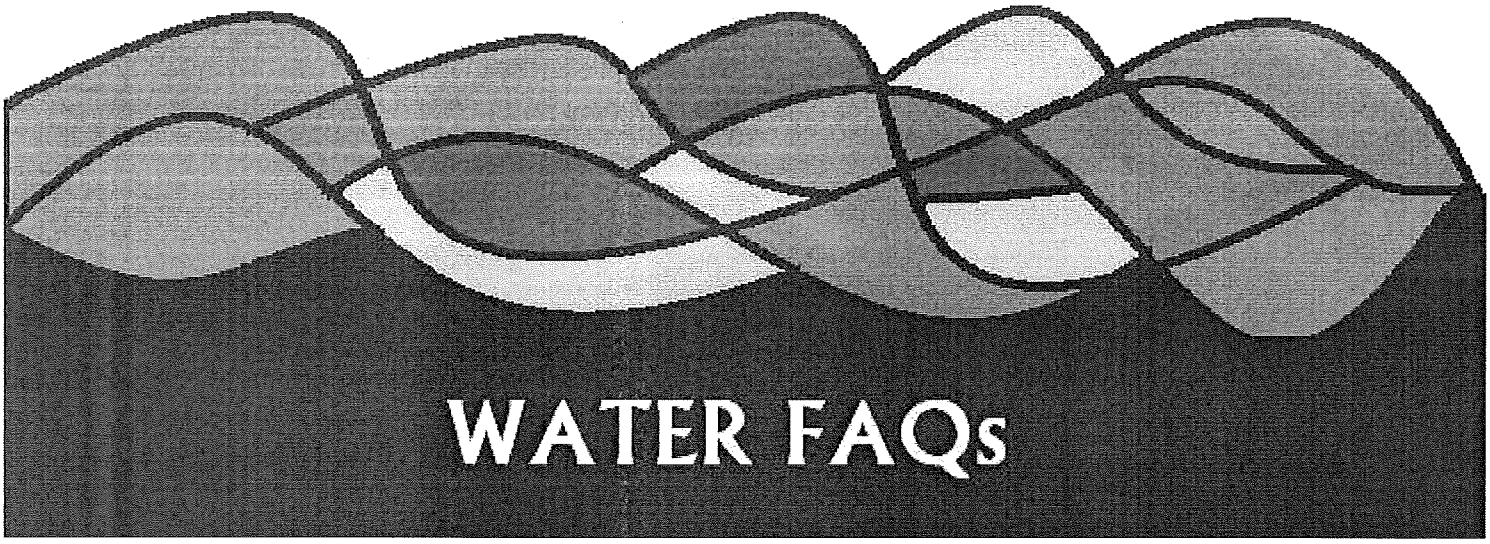

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Water Financing FAQ (January 2004)

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1. How does financing water systems affect drinking water safety?

Safe drinking water depends on a good source, effective treatment, secure distribution, continuous monitoring, and quick action when problems are found. If any part of this system is deficient, then the safety of drinking water may be jeopardized.

Therefore, it is essential that all municipalities are able to pay the costs of maintaining their drinking water systems. This includes operating costs such as proper training of managers and operators, and frequent monitoring and testing of water quality. It also includes major capital costs such as the repair and replacement of aging pipes and the expansion and renewal of infrastructure.

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2. How do municipalities finance water and sewage systems?

Municipalities can raise money for water and sewage systems in four different ways:

- They can get money directly from water rates or other revenue sources, such as development charges;
- They can retain money for longer term projects by setting aside money in reserve funds for future use;
- They can borrow money when they need to make significant investments;
- The federal and provincial governments may assist municipalities with grants and loans for infrastructure renewal, or
- The municipality can enter into agreements with private companies to finance and manage operations.

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3. Are all municipalities in Ontario able to pay for their water systems?

In Ontario, approximately 80 per cent of water treatment facilities are operated by municipalities. About 20 per cent are operated by the Ontario Clean Water Agency (OCWA), an agency that manages municipal water and sewage treatment facilities and their distribution systems.

According to Justice O'Connor in the Report of the Walkerton Commission of Inquiry, it is unclear whether municipalities are providing adequate resources to support the province's water systems. Some municipalities appear to have planned well for infrastructure renewal and future capital costs, while other municipalities may not have adequately addressed their fiscal needs.

In order to keep rates low or to attract development, some municipalities have not set water rates high enough to cover the costs of maintaining their drinking water systems. Similarly, some municipalities have attempted to delay or defer capital costs of long-term infrastructure replacement or upgrades. In Walkerton, for example, many distribution pipes had not been replaced for years and were, in some instances, almost completely blocked from inadequate flushing.

In other cases, municipalities have used the surplus revenue from water rates to finance other municipal projects or services, rather than keeping an adequate reserve fund.

Smaller systems, in particular, may have difficulty maintaining their water systems because they have fewer customers to bear the costs of their water services.

These problems have led to serious underfinancing of drinking water systems in the province. Estimates of the amount of money needed for infrastructure investment and expansion in the province vary tremendously, but one estimate put it as high as $12.6 billion (Canadian Water and Wastewater Association, 1998 study). The Ontario government has encouraged amalgamations as a way of cutting costs for smaller municipalities by combining system operations, staff and purchasing.

For the past 15 years investment in water infrastructure has been diminishing. During this same period there has been a corresponding decrease in the amount of funding that federal and provincial governments have provided for infrastructure projects. Moreover, provincial and federal grants are an unreliable and unpredictable source of funding for municipalities. In some cases municipalities have relied on the possibility of government grants, rather than adequately planning for their infrastructure needs.

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4. What is the new Sustainable Water and Sewage Systems Act, 2002?

In the aftermath of the Walkerton tragedy, the Ontario government announced its intention to move toward full cost recovery for water and sewer services. Full cost recovery means that all costs are identified, budgeted for and recovered through a variety of user fees and charges, including rates. In December 2001 the government proposed the Sustainable Water and Sewage Systems Act (Bill 155).

This legislation was then re-introduced by the Ministry of the Environment as Bill 175 in September 2002. In December 2002 this Act was passed by the Ontario Legislature. However, it has not yet been proclaimed in force because the government has not completed drafting the regulations that are necessary to implement the Act.

The goal of Ontario's Sustainable Water and Sewage Systems Act, 2002 (hereafter referred to as the Sustainable Water and Sewage Systems Act) is to ensure that municipalities can finance essential water and sewer services and ensure clean, safe drinking water. The Act makes it mandatory for municipalities to assess the costs of providing water and sewage services, and to recover the amount of money needed to operate and maintain them.

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5. What are the major features of the Sustainable Water and Sewage Systems Act?

The Sustainable Water and Sewage Systems Act provides the framework for implementing full cost accounting and recovery. Municipalities must assess the costs of water in order to charge appropriate rates and generate sufficient revenue to finance capital and operating costs. This is a two-part process –

first preparing a full cost report, and secondly a cost recovery plan. The main requirements of the Act are:

- All designated municipalities that provide water and sewage services must first prepare a report, called a Full Cost Report, containing:

  - an inventory and management plan for their infrastructure;
  - an assessment of the full costs of providing water services, including source protection costs, operating costs, financing costs, renewal and replacement costs, and improvement costs; and
  - revenue obtained to provide water and sewage services;

- Two or more municipalities may produce a joint report, if it is considered appropriate by the Minister;
- The report must be reviewed by the municipal auditor before it is approved by the municipality and submitted to the Minister by the date by regulation;
- The Minister may approve the municipalities' reports or may require changes to be made before approving it;
- After the full cost report is approved, within 6 months the municipality must prepare a plan, called a Cost Recovery Plan, that shows how it will pay for the full cost of water services;
- The Cost Recovery Plan must also be reviewed by the municipal auditor and approved by the municipality before it is submitted to the Minister of the Environment for approval;
- If a municipality refuses to prepare a report or a plan, the Minister may prepare a report or plan and recover the costs from the municipality;
- The Act also requires municipalities to set up dedicated reserve accounts to pay the full cost of water and sewage services.

The regulations under this Act will specify sources of revenue that municipalities are allowed, or not allowed, to use in their cost recovery plans.

The regulations may also specify the maximum increases that a municipality may charge for water services. With the Minister's approval, the municipality may be able to exceed these limits on water rate increases.

Regulations will require regular progress reports by the municipalities on the implementation of their approved cost recovery plans.

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6. How will non-municipal sources of drinking water be funded?

Non-municipal sources of drinking water are not subject to the requirements of the Sustainable Water and Sewage Systems Act.

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7. What are Justice O'Connor's recommendations from the Walkerton Commission of Inquiry regarding the Sustainable Water and Sewage Systems Act?

Justice O'Connor supported the Sustainable Water and Sewage Systems Act. Throughout his report, he considered the difficulties of appropriately financing water systems. He concluded that, if the Sustainable Water and Sewage Systems Act were passed into law, it would address many of the important issues concerning the financing of water systems in Ontario.

He further recommended that municipalities submit plans as a condition for obtaining a licence to operate a water treatment plant. This recommendation is reflected in Part V of the Safe Drinking Water Act, which cross-references the Sustainable Water and Sewage Systems Act.

To read Justice O'Connor's recommendations on financing water systems, see The Report of the Walkerton Commission of Inquiry, Part Two, Chapter 10, "The Role of Municipal Governments" at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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8. What does the Sustainable Water and Sewage Systems Act mean for our water rates?

When municipalities assess the true costs of water services, it is likely that rates will increase in many cities and towns across the province.

People in Ontario have enjoyed relatively inexpensive water. Water rates are lower in Canada than in most developed countries, like England, France, and Australia.

Justice O'Connor pointed out that water rates in Ontario are comparable to the cost of cable television or internet services. He stated that there "appears to be room for water rates to rise in cases where consumers are not paying the full cost of safe water".

He also recognized that his recommendations for a Safe Drinking Water Act, and the requirement that municipalities implement full cost recovery, would lead to higher water rates. Nevertheless, he was concerned that everyone in the province should be able to afford and enjoy safe clean drinking water.

The implementation of the Sustainable Water and Sewage Systems Act will give municipalities an incentive to promote conservation to avoid expanding or constructing new water treatment facilities. Ontario municipalities have been slowly introducing water meters into their communities. As opposed to a flat rate, metering means consumers will pay for the amount of water actually used. This generally leads to conservation when people realize that they will pay less for water if they use less. Some Ontario municipalities have also introduced increasing block rates. This means charging a higher unit price as use rises, which is another incentive for conservation.

The Act will also encourage municipalities to plan for long-term renewal and replacement of drinking water distribution systems. Life cycle financing for these systems will be encouraged.

The provincial government has also considered the problem of major rate increases, and incorporated provisions to avoid rate shocks. Under the regulations for the Sustainable Water and Sewage Systems Act (which have not yet been released) a cap on municipal rates will likely be established. The Minister, however, will have the discretion to allow municipalities to set higher rates in special circumstances.

See the Water Conservation FAQ.

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9. What are the Canadian Environmental Law Association's views on the Sustainable Water and Sewage Systems Act?

The Canadian Environmental Law Association (CELA) generally supports full cost recovery of water and sewage services by the municipalities. CELA was especially concerned that the definition of "full cost" in the Act include source protection. The government responded by accepting this recommendation and amended the definition of "full cost" to include source protection in the final version of the Act.

However, CELA sees the need for the government to provide help for small water systems, and to protect low income people in Ontario who may not be able to afford higher rates for these services. CELA believes this Act must be integrated with the source protection framework that the government has promised but not yet introduced. More information on CELA's views are available in the following publications:

Publication #434. Submission of the Canadian Environmental Law Association to the Standing Committee on General Government re: Sustainable Water and Sewage Systems Act, 2002 (Bill 175), EBR Registry no. XA02E0006.

Publication #415. Comments by the Canadian Environmental Law Association concerning Bill 155, "An Act respecting the cost of water and waste water services."

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10. How can I find more information on the Sustainable Water and Sewer Services Act and financing water systems?

The Sustainable Water and Sewer Services Act can be found at: www.e-laws.gov.on.ca

The Report of the Walkerton Commission of Inquiry, part 2, Chapter 10, contains a discussion of the need to finance water systems adequately. The Report is available at:
www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

Both the Act and the Walkerton report are also available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

The Ontario Ministry of Public Infrastructure Renewal has prepared a number of reports on water and sewer systems, including an inventory of assets in the province, financing, and pricing. These are available through:
www.pir.gov.on.ca/

Reports on financing were prepared for the Walkerton Inquiry, including C.N. Watson & Associates' report, prepared on behalf of CELA at the Walkerton Inquiry, "Financial Management of Municipal Water Systems in Ontario".

The Sustainable Water and Sewage Services Act is one of the four legislative changes recommended in the Report of the Walkerton Commission of Inquiry

in order to ensure safe drinking water. For information on the other three requirements, see the Nutrient Management Act FAQ, Source Water Protection FAQ and the Safe Drinking Water Act FAQ.

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11. How can I find out more about financing water systems and water rates in other jurisdictions?

For a review of other jurisdictions, see Annex B of "The Management and Financing of Drinking Water Systems", Pollution Probe, April 2001, at: www.pollutionprobe.org/Publications/Water.htm

Under the U.S. Safe Drinking Water Act, the Drinking Water State Revolving Fund was established to provide infrastructure funds. For more information on this fund, see: http://epa.gov/safewater/dwsrf.html

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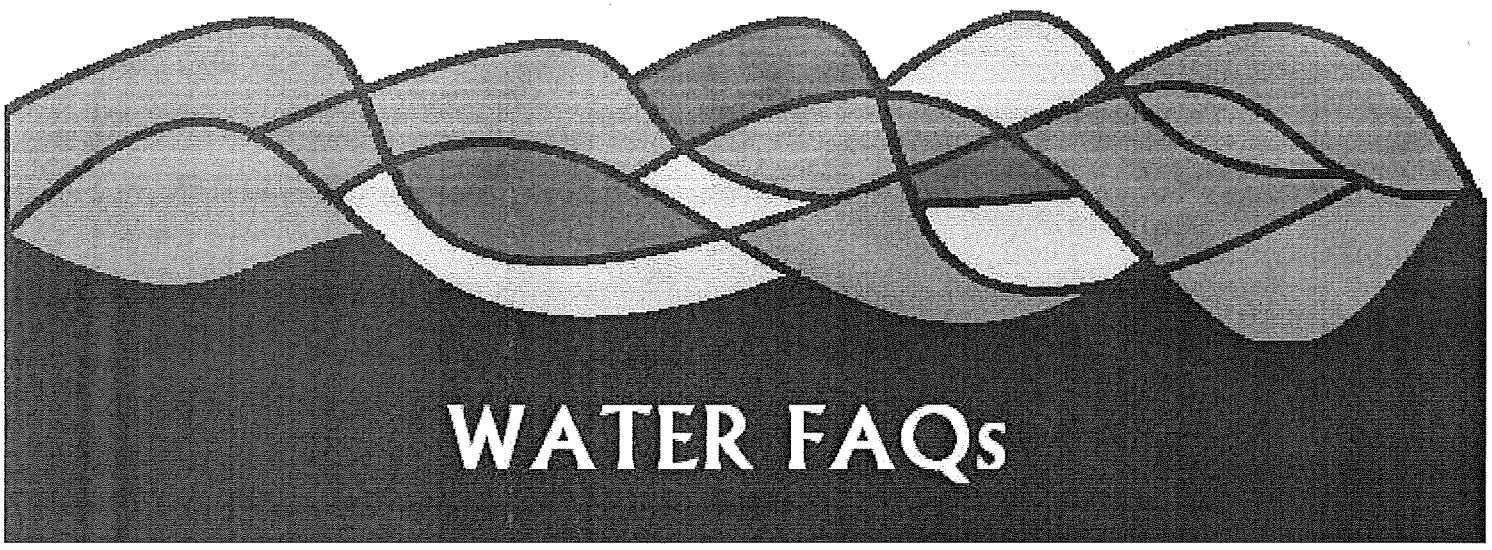

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Great Lakes and St. Lawrence River Ecosystem FAQ (January 2004)

A. Background

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Background

1. What is the Great Lakes and St. Lawrence River ecosystem?

The Great Lakes are a unique chain of five glacial lakes that contain one-fifth of the world's freshwater. These five lakes are a single interconnected system with the water from Lake Superior flowing into Lakes Michigan and Huron, then into Lake Erie, Lake Ontario, along the St. Lawrence River and finally mixing into the Atlantic Ocean.

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2. How are the Great Lakes and the St. Lawrence River governed?

The Great Lakes and the St. Lawrence River are shared by Canada and the United States. They are governed by a complex legal network that includes international treaties and agreements, federal laws and regulations of the two countries, laws of the eight Great Lakes' states (New York, Pennsylvania, Michigan, Ohio, Wisconsin, Illinois, Indiana and Minnesota) and the provinces of Ontario and Quebec and the rights of Aboriginal Peoples and Indian tribes under both Canadian and American laws.

One of the most important documents governing the Great Lakes is the Boundary Waters Treaty. In 1909 the United States and Great Britain, on behalf of Canada, signed this historic treaty ushering in almost a century of cooperation between the two countries. The Boundary Waters Treaty committed Canada and the United States to cooperate in the management of the lakes and rivers along their shared border. The treaty set out the legal principles to deal with boundary and transboundary waters and established the International Joint Commission to anticipate problems and resolve disputes between the two countries.

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3. What is the International Joint Commission (IJC)?

The International Joint Commission is an independent body of six commissioners, three from Canada, appointed by the Governor in Council, and three from the United States, appointed by the President with advice from the Senate. Of the six commissioners, there are two co-chairs, one representing the United States and one representing Canada. The Commission carries out most of its functions through Boards.

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4. What are the responsibilities of the IJC?

The International Joint Commission (IJC) has four principal functions, as defined by the Boundary Waters Treaty -- an approval function, an investigative function, an administrative function, and a rarely-used arbitral function.

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5. What is the approval function of the IJC?

The Boundary Waters Treaty gives the IJC the authority to approve or disapprove applications for the use, obstruction or diversion of boundary waters on either side of the border that would affect the natural level or flow on the other side (Article III). It may also regulate the operation of these structures. This responsibility involves primarily the approval and management of

structures built for hydroelectric generation and navigation.

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6. What is the investigative function of the IJC?

The Boundary Waters Treaty also allows the governments of Canada and the United States to refer issues to the Commission to investigate and make recommendations to help the countries resolve problems with boundary waters. These are called references. For example, the IJC in the late 1970s issued a landmark reference study on pollution from land use activities, one of the first in-depth studies to be done on non-point source pollution. In the year 2000 the IJC completed a reference study on the controversial issue of consumption, diversion and removals of water from the Great Lakes. The IJC has been given references by both countries on many important issues over the last 94 years, not just on issues affecting the Great Lakes, but in many other cases of potential conflict with respect to waters along the shared border.

In the 1970s the IJC was given a standing reference by Canada and the United States that conferred another important responsibility on it – overseeing the implementation of the Great Lakes Water Quality Agreement. This Agreement was first signed by the two countries in 1972 and amended in 1978 and 1987. It is currently up for review. The Agreement commits the governments to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lake Basin ecosystem. The IJC tracks progress in the implementation of the Agreement and makes recommendations for furthering its goals.

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7. What is the administrative function of the IJC?

Because of its mandate to approve dams and other structures in the Great Lakes, the IJC exercises considerable control over the movement of water through the Great Lakes. The IJC has issued orders of approval for major structures in three different areas of the basin. These structures are managed by Boards of Control that report to the IJC. The Boards must balance the sometimes conflicting interests of navigation, hydroelectric generation and environmental concerns such as the protection of fisheries and shorelines.

- The International Lake Superior Board of Control

The IJC's first order of approval in the Great Lakes Basin was in 1914 for control structures for navigation and hydroelectric generation above the St. Mary's Rapids at Sault St. Marie. These structures include power canals, navigation locks and a control dam. The Lake Superior Control Board was set up to supervise the operation and maintenance of these works and to regulate the outflow from Lake Superior in order to balance the levels of Lake Superior with Lakes Michigan and Huron.

- The International St. Lawrence River Board of Control

The St. Lawrence River Board was established in the IJC's 1952 orders of approval for the construction of the St. Lawrence River hydropower and

navigation project. The control structures on the St. Lawrence River include hydroelectric generators, dams and ice-booms. The Board regulates the outflow from Lake Ontario into the St. Lawrence River to maintain adequate depths for navigation, provide water for hydroelectric generation and balance the water levels of Lake Ontario and the St. Lawrence River.

- The International Niagara Board of Control

In 1950 Canada and the United States signed the Niagara Treaty in order to ensure that the use of Niagara Falls for power generation did not detract from its value as a tourist attraction. The treaty specifies certain minimum flows over the Falls during tourist and night times. The Niagara Board of Control was set up in 1953 by IJC orders of approval. The Board is responsible for supervising the operation of a partial dam that allows for adjustment of the flow of Niagara Falls.

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8. Can the levels and flows of the Great Lakes be controlled?

Over the last century the Great Lakes have experienced years of extremely high water levels and years of very low levels. To a certain degree, the Control Boards are able to affect the levels and flows. However, numerous studies have shown that the effects of artificial controls are dwarfed by the influence of climate.

The major factors that decide the amount of water in the Great Lakes are natural – evaporation, precipitation and runoff. This is known as the hydrological cycle. Water evaporates from the surface of the lakes as it comes into contact with dry warm air and forms water vapour. Water vapour falls into the Great Lakes Basin as rain or snow, either directly onto the surface of the lakes or as runoff from the drainage basin. These factors caused high water levels in the early 1950s and mid-1980s, and low levels in the 1930s and mid-1960s.

More recently in 1998 and 1999 low precipitation in the Lake Superior region in winter resulted in less runoff to the lake and reduced flows to Lake Michigan and Lake Huron, causing dramatic drops in lake levels. As well, warm air temperatures throughout the Great Lakes area caused warmer water temperatures that increased evaporation rates. As a result, beaches have become wider today than at any time during the last 30 years.

Wetlands are also an important natural influence on lake levels. Their thick vegetation acts as a buffer to protect shorelines. During high water levels wetlands store water and release it as the water recedes. During low water levels wetland vegetation expands and stabilizes in readiness for higher waters.

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9. Has the IJC studied the possibility of controlling lake levels?

Concerned about the effects of fluctuations in water levels, governments have always had an interest in exploring whether the Great Lakes could be maintained at more constant levels. In 1964 when water levels were very low, the IJC was asked by Canada and the United States to investigate the feasibility of controlling levels in the Great Lakes. By 1973 when the report was completed, lake levels had risen to record highs. The IJC reported that the high cost of engineering further regulation of lakes Michigan and Huron could not be

justified by the benefits. The IJC reached the same conclusion during another study in 1983 on regulating levels in Lake Erie.

In a 1993 study the IJC again concluded that the costs of major engineering works to regulate levels and flows o the Great Lakes would outweigh the benefits. Instead they recommended that land-use and shoreline management programs be implemented in order to reduce the damage from flooding and erosion.

Now that water levels have once more fallen into a low cycle, the IJC has again been asked to look at lake levels – this time in Lake Ontario and the St. Lawrence River. Since 1959 when the St. Lawrence Seaway was completed, levels have been controlled primarily for hydroelectric generation and navigation. For a number of years people living around Lake Ontario and the St. Lawrence River have pressed the governments to consider the effects of lake levels on other interests such as tourism and the environment. The five-year study now underway will review the criteria used to regulate Lake Ontario outflows taking into account how water fluctuations affect all interests and considering the future impacts of climate change.

For more information on this reference study, see the study group's own web site at: www.losl.org

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10. What are the effects of lake levels on power generation?

The Great Lakes have served as a reliable low-cost source of power. Low lake levels reduce the amount of water flowing through the power dams. This in turn reduces the amount of power that can be generated by these stations and decreases the revenues from selling electricity.

The hydroelectric plants on the Niagara River contribute a significant part of the electricity used in Ontario – about 25 per cent. Ontario Power, responsible for the province's generating capacity, would like to increase the capacity of the Niagara River generating stations. They announced in 2002 that they planned to expand their hydroelectric capacity at Niagara Falls by building a third tunnel at Sir Adam Beck 2 Generating Station. Plans for new diversion tunnels and an intake structure for the proposed underground power plant were completed, but construction has been deferred.

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11. What are the current issues with respect to navigation on the Great Lakes?

The Great Lakes have also served as a valuable shipping lane for large cargo ships transporting goods to and from cities around the perimeters of the lakes. Recently the U.S. Congress has shown interest in reviving the declining shipping industry. Consequently, it funded the Army Corps of Engineers to update the 1985 Connecting Harbors and Channels study to explore the possibility of increasing commercial navigation in the Great Lakes.

Although the original Harbors and Channels study found that it was not economically viable, the Army Corps of Engineers reconnaissance study, "The Great Lakes Navigation Study Report" (February 2003) argues that an

expansion of the navigation system would attract large-volume container vessels away from ports on the east coast of Canada and the United States and boost shipping traffic in the Great Lakes. To facilitate these larger ocean-going ships, the governments of Canada and the United States would have to build bigger locks and deepen shipping channels throughout the Great Lakes and St. Lawrence River system.

Although the Army Corps of Engineers has received funding from both Canada and the United States to proceed with a supplementary study, an independent study commissioned by Great Lakes United, a coalition of non-governmental organizations around the Great Lakes, refutes their conclusions. This report released in September 2003, "Analysis of the Great Lakes/St. Lawrence River Navigation System's Role in U.S. Ocean Container Trade" by the Pennsylvania Transportation Institute, found that container cargo is time sensitive. The longer transit times and uncertainties of the Great Lakes navigation system, therefore, make it unlikely that container ships would use the Great Lakes rather than East Coast ports.

Great Lakes United is opposed to the re-engineering of the navigation system primarily for environmental reasons. They point out that the reconnaissance study does not consider environmental consequences of expansion such as the introduction of new invasive species from foreign commercial shipping, the effects of dredging on aquatic habitats and shorelines, and the impacts of deepening and widening channels on lake levels.

The Georgian Bay Cottagers' Association also opposes further studies of the navigation system. They have already seen the waters of Georgian Bay and Lake Huron recede away from their docks and marinas, and are concerned about further deepening of connecting channels. Their own research has revealed that there has been shoreline alteration and dredging of the channel at the outflow of Lake Huron beyond the depths allowed by international agreements. Since there are no control structures at the outflow of Lake Huron, any deepening or widening of the channel has a major impact on the levels of Lake Huron and Georgian Bay.

To see the Great Lakes Navigation Study and to follow the progress of the supplementary study, see the web site of the Detroit District of the Army Corps of Engineers.

For more information on the issue of expanding the navigation system, see the work of the Biodiversity and Habitat Task Force on the web site of Great Lakes United.

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12. Can large quantities of water be removed from the Great Lakes?

Another issue that has galvanized governments and groups around the Great Lakes is the issue of large-scale removals of water. Although the Great Lakes are large, only one per cent is renewed every year by rain, snow and runoff. The volume of freshwater in the Great Lakes, however, has attracted proposals from private companies that would like to export it for sale to water-poor areas of the world.

In the spring of 1998 the Ontario Ministry of the Environment granted a water-taking permit to the Nova Group in Sault Ste. Marie. This permit would have allowed the company to take by tanker more than 600 million litres of freshwater per year for export to Asia. A public outcry and concern from the governors of

the Great Lakes' states prompted the Ontario government to rescind the permit.

However, the granting of this permit underscored the vulnerability of the lakes to private proposals.

Consequently, the governments of Canada and the United States asked the International Joint Commission for a reference to study the impacts of major water withdrawals on the Great Lakes. In its preliminary conclusions the IJC found that there is never a surplus of water in the Great Lakes system and that removals of water reduce the system's resilience. The IJC released its final report in March 2000 recommending that the Canadian and U.S. federal, provincial and state governments should not permit the removal of water from the Great Lakes Basin unless the proponent can demonstrate that it will not endanger the integrity of the Great Lakes ecosystem. This report can be found at: www.ijc.org/php/publications/html/finalreport.html.

In addition to their recommendation on removals of water, the IJC also found that the cumulative effects of using the lakes wantonly could also eventually alter their levels. Increases in the consumptive uses – for homes, power, industry and agriculture – are expected to increase in the future as the population grows. These escalating demands will further stress the integrity of the lakes and their ability to respond to change. The IJC has pointed out that people in Canada and the United States use much more water per capita than Europeans -- according to Statistics Canada, two to four times as much. They recommended that the Great Lakes states and provinces adopt a basin-wide water conservation initiative.

In December 2001 the Canadian government moved to stop large withdrawals of Great Lakes water. The government passed amendments to the International Boundary Waters Treaty Act that prohibit the bulk removal of boundary waters from the water basins in which they are located.
See: http://laws.justice.gc.ca/en/I-17/77063.html The amendments also require persons to obtain licenses from the Minister of Foreign Affairs for water-related projects that affect the natural level or flow of waters on the American side of the border.

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13. What actions have the states and provinces taken to control water removals?

The Great Lakes governors and the governments of Ontario and Quebec also acted quickly to address the issue of large-scale water withdrawals with the aim of avoiding future threats. The eight governors and the premiers of Ontario and Quebec set up a process to protect and manage the Great Lakes collectively by strengthening their own agreement, the Great Lakes Charter.

The Great Lakes Charter is an agreement signed in 1985 by the eight governors of the Great Lakes states and the premiers of Ontario and Quebec. The original voluntary agreement outlined a series of principles for the collective management of the lakes. The governments agreed that no state or province would proceed with a new or increased diversion or consumptive use over 5 million gallons a day without seeking the consent of the other affected governments.

After the Nova controversy, the governors and premiers agreed to develop a more binding agreement to manage the Great Lakes. In June 2001 they signed a supplementary agreement, Annex 2001, to the Great Lakes Charter. In doing

so, the jurisdictions committed to complete by June 2004:

- A binding agreement(s) to protect, conserve, restore, improve, and manage use of the waters and water-dependent natural resources of the Great Lakes Basin; and,
- Establish a decision-making standard based on the following principles: to prevent or minimize Basin water loss through return flow and implementation of environmentally sound and economically feasible water conservation measures; to cause no significant adverse individual or cumulative impacts to the water quality, quantity or natural resources of the Great Lakes Basin: and, to improve the waters and water-dependent natural resources of the Great Lakes Basin.

As one of their commitments in the supplementary agreement, the Governors agreed to notify and consult with the Premiers of Ontario and Quebec on all proposals subject to the United States Water Resources Development Act (1986, amended 2000). This Act prohibits "any diversion or export of Great Lakes water by any State, federal agency, or private entity for use outside the Great Lakes basin unless such diversion is approved by the Governor of each of the Great Lakes States". As well, the projects already approved under this Act are being reviewed.

Ontario also joined with other provinces and the Canadian government in signing The Accord for the Prohibition of Bulk Water Removal from Drainage Basins in 1999 at the Canadian Council of Ministers of the Environment. This agreement prohibits the bulk removal of surface and groundwater from the Canadian portion of major basins. For more information, see: www.scics.gc.ca/cinfo99/83067000_e.html

To assist the governors in coordinating activities under the Charter, the Council of Great Lakes Governors was established. For more information about the Great Lakes Governors and the work of the Council, see: www.cglg.org

For information on the responses of non-governmental organizations to Annex 2001, see the work of the Sustainable Waters Task Force on the Great Lakes United web site

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Water Quality

14. How does pollution affect water quality in the Great Lakes and St. Lawrence River?

The Great Lakes have been a magnet for industry and urban development, both of which have strained the capacity of the lakes to absorb the resulting pollution and degradation of its waters. Because the lakes are one interconnected system, contaminants starting their journey in Lake Superior will eventually find their way to the St. Lawrence River.

A special feature of these impressive "sweetwater seas" is the long retention time of their waters. Pollutants, particularly long-lived toxic chemicals that find their way into the lakes can only be moved very slowly through the system. Lake Superior, which is the largest of the Great Lakes, takes almost two hundred years to flush out. Lake Erie, in contrast, takes less than three years.

The lakes are vulnerable to two types of pollution – often described as "point" and "non-point". Point sources are easily identified – smokestacks, discharge pipes and waste outlets. Non-point sources are harder to identify and to monitor. They include contaminants such as road salt or pesticides washed into the lakes by rain or melting snow. The Great Lakes also act as a sink for airborne contaminants in North America.

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15. How did awareness of water quality problems in the Great Lakes begin?

In the 1960s people living around the lakes became alarmed about the deteriorating quality of water in the Great Lakes. They found their favourite beaches closed because of high bacteria counts, they were warned against eating contaminated fish and they began to worry about the safety of their drinking water. These obvious signs of pollution put pressure on governments to begin the formidable task of reversing the steady degradation of the lakes.

One of the earliest successes was the revival of Lake Erie. In the 1960s this shallowest of Great Lakes was being slowly strangled by the growth of excessive algae, a process called "eutrophication". The problem was identified as an excess of nutrients flowing into the lake from phosphate detergent, sewage treatment plants and farm runoff. A concerted effort to address this problem paid off in bringing Lake Erie back to better health. Both governments co-operated in limiting phosphates from detergents, in constructing and upgrading sewage treatment plants and in developing programs to reduce nutrient-rich fertilizers from running into the lake. Phosphorus loadings were cut in half.

Lake Erie, however, has once again become the first lake to show fresh signs of trouble. The lake has experienced a three-year epidemic of botulism that has killed millions of fish and thousands of loons, ducks and other fish-eating birds. And oxygen-poor "dead zones" that afflicted Lake Erie in the 1960s are resurfacing as a problem.

The reasons for Lake Erie's most recent problems are not clear but a combination of factors are suspected. It is believed that exotic species – goby fish, zebra and quagga mussels – are robbing the lake of oxygen. The mussels, introduced by ocean-going ships discharging their ballast water, are now growing in dense mats on the lake bottom. Another possible factor in creating this dead zone is the aging sewage treatment plants. Because of increasing urbanization, sewage treatment plants, already at capacity, are overloaded and flood into the lakes whenever there is a rainfall. Scientists are looking at low lake levels, warmer climate and increased water clarity caused by zebra mussels, all as possible factors contributing to the problem.

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16. What influence has the Great Lakes Water Quality Agreement had on the Great Lakes?

The International Joint Commission was given the responsibility by both Canada and the United States for monitoring the Great Lakes Water Quality Agreement. As a result of this responsibility, the IJC has been an important catalyst prodding the government to improve water quality in the Great Lakes. For thirty years the IJC has called both Canada and the United States to

account for their mutually agreed upon obligations under the Great Lakes Water Quality Agreement. The IJC has also inspired the scientific research on the lakes which is the foundation for all the agreements and disseminated this information to the broader public. However, the IJC's effectiveness has been hampered by the lack of legal authority to enforce the provisions of the agreement.

The Great Lakes Water Quality Agreement was first signed by the two countries in 1972. The eutrophication of Lake Erie influenced the focus of the first agreement – to control oxygen depletion of the lakes due to nutrient loadings. This first agreement also established the Great Lakes Water Quality Board to help implement its provisions. In addition, it created the Science Advisory Board to provide the scientific research capability for identifying water quality problems.

For an evaluation of the Great Lakes Water Quality Agreement, see "The Great Lakes Water Quality Agreement: Its Past Successes and Uncertain Future", by Lee Botts and Paul Muldoon, March 1997, for the Institute on International Environmental Governance, available at:
www.on.ec.gc.ca/glwqa/glreport-5-e.html

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17. How has the Great Lakes Water Quality Agreement changed since the first agreement?

The Great Lakes Water Quality Agreement was renewed in 1978. This second agreement was intended to address problems that were not in the original one. By 1978 the perceived threats to the Great Lakes had changed significantly and toxic substances were recognized as a critical concern. Many areas were contaminated with PCBs (polychlorinated biphenyls, DDT, dioxins, heavy metals and other chemicals being discharged directly into the lakes. As well, toxic substances were discovered to be finding their way into the lakes by different pathways – through the air, contaminated groundwater and polluted sediments. Evidence increased that fish and wildlife were being negatively affected by these toxins.

An important goal of the 1978 agreement was to rid the lakes of persistent toxic substances, chemicals that stay in the environment for a long time, build up in the food chain and pose a threat to fish, wildlife and human health. They were found to bioconcentrate or biomagnify as they moved up in the food chain. The 1978 Great Lakes Water Quality Agreement introduced the concept of "virtual elimination". The governments agreed that "the discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated" (Article II). Virtual elimination recognizes the reality that zero discharge may not be easily accomplished but it establishes the principle that elimination of these toxic chemicals should be pursued both as a strategy and as a goal. The inclusion of the ecosystem – recognizing that the lakes were a crucial part of a complex web of air, water, land and biota that included humans – was another pioneering aspect of this agreement.

In 1987 a third agreement was negotiated. Canada and the United States signed the 1987 Protocol to the Great Lakes Water Quality Agreement. This time the agreement stressed the importance of human and ecosystem health. It aimed to restore degraded areas identified around the lakes, to prevent and control pollution and to conserve and protect human and ecosystem health.

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18. What is the Canada-Ontario Agreement?

On the Canadian side, the province of Ontario is largely responsible for the programs that are necessary to implement the Great Lakes Water Quality Agreement. In anticipation of the Great Lakes Water Quality Agreement, the governments of Canada and Ontario first signed the Canada-Ontario Agreement in 1971 and have renewed this agreement four times since then, most recently in 2000. The agreement sets out how the two governments will co-operate and coordinate efforts to restore, protect and conserve the Great Lakes Basin ecosystem. These agreements reflect the goals and strategies of the Great Lakes Water Quality Agreement.

For more information on the Canada-Ontario Agreement, see Environment Canada's web site at:
www.on.ec.gc.ca/coa/intro_e.html

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19. What are the areas of concern around the Great Lakes?

In 1985 the International Joint Commission identified the most severely degraded areas around the Great Lakes. These 43 "Areas of Concern" were areas where there were problems with contaminated sediments, degraded fish and wildlife habitat, restrictions on fish and wildlife consumption and impaired beaches. The 1987 Protocol provided for the development of Remedial Action Plans (RAPs) by the Canadian and American governments to restore water quality in the Areas of Concern. It also allowed for the development of Lakewide Management Plans (LaMPs) to address broader contaminant issues in each of the five Great Lakes. In addition, this Protocol included new annexes that targeted non-point source contaminant sources, contaminated sediment, airborne toxic substances and contaminated groundwater as important for cleaning up the Great Lakes.

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20. What are remedial action plans?

Remedial action plans have been a major project of the IJC since 1985. Both governments agreed to develop a plan to improve water quality for the 43 areas of concern, with an emphasis on involving the local community in each area. The development of these plans was conceived as a three-stage process. Stage One was to determine the severity of the pollution problems and identify the factors causing the degradation. Stage Two was to identify goals and recommend actions that would restore the health of the ecosystem, and Stage Three was to implement the recommended actions and evaluate progress. When Stage Three was completed, the Area of Concern could be "delisted".

Delisting an Area of Concern means that the goals identified in the Remedial Action Plan have been achieved. Of the 43 Areas of Concern, 26 are solely in the United States, 12 are in Canada and 5 are shared by the two countries. The International Joint Commission released a report in May 2003 that discussed the progress being made in cleaning up these areas. In more than 15 years since they were identified, only two have made enough progress to be "delisted". Both are in Ontario – Collingwood Harbour and Severn Sound. Two other areas, Presque Isle Bay in Pennsylvania and Spanish Harbour in Ontario,

are recognized as being in a recovery stage.

The IJC commended the two countries on their investments in sewage treatment plants and sediment remediation in some areas of concern. They concluded, however, that "the job is not finished and much of the needed information on actions taken to restore beneficial uses and activities planned for the future is either unavailable or incomplete".

The complete IJC report on the progress to restore Great Lakes Areas of Concern, "The Status of Restoration Activities in the Great Lakes Areas of Concern", April 2003, can be found at: www.ijc.org

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21. What health studies have been done on the degraded areas of the Great Lakes?

As part of the Canada-Ontario Agreement to consider the impacts of pollution on human health, Health Canada undertook health studies focusing on Areas of Concern. They studied the 17 original Canadian sites, and compiled statistics on the incidence of disease and death for each community. Although they did not suggest a direct correlation between environmental contaminants and health problems, they looked at those health problems where environmental contaminants could be a contributing factor.

One of the areas of concern with a significantly high incidence of disease and death was the Windsor and Essex County area, in the Detroit Area of Concern. Health Canada's data showed that over a seven-year period there were a thousand excess deaths and forty thousand excess hospitalizations in the Windsor area. Cancer rates among men were 7 per cent higher than the Canadian average. Diseases occurring at elevated rates in Windsor included lung cancer, cancers of the digestive and reproductive system, lymphoma, leukemia, heart and circulatory diseases, chronic bronchitis, diabetes, asthma, ovarian failure, diseases of the immune system, thyroid disorders, infertility, endometriosis and degenerative nerve diseases. In addition, these diseases occurred prematurely, many years earlier than expected. Health Canada suggested that their study should be a starting point for further investigations and Windsor groups are also calling for more work to be done on the links between pollution and disease.

Health Canada's "Health Data and Statistics Compilations for Great Lakes Areas of Concern", including statistics on disease and mortality for each of the 17 Canadian areas of concern, is no longer available on Health Canada's web site However, information about this study can still be found at: http://ehpnet1.niehs.nih.gov/members/2001/suppl-6/817-826elliott/EHP109s6p817PDF.pdf

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22. What are the problems with airborne toxic chemicals in the Great Lakes?

After the initial concern over toxic chemicals being discharged or leaking into the lakes, scientists began to realize that pollutants transported hundreds of miles through the air were also degrading the Great Lakes. As early as 1966 Canada and the United States asked the International Joint Commission to monitor air quality and alert them to problems. The IJC set up an International

Air Quality Advisory Board to provide advice on transboundary air pollutants. Their first task was to define the airshed of each country by analyzing the potential of air pollutants from one country to have an impact on the other.

In the late 1970s scientists were surprised to discover that lakes on Isle Royale, a remote wilderness island in Lake Superior, were contaminated with PCBs and toxaphene. A few weeks after a toxaphene was sprayed on cotton crops in the southern United States, it could be detected in fish in these lakes. Because the only possible source of these contaminants was the air, this discovery confirmed that the atmosphere was indeed a critical pathway.

Contaminants from the atmosphere can be either rained or washed out onto land or water. Dry particles can be blown into lakes from land or dissolved in water from the air. Once they arrive in the lakes, they can settle into the sediment and become part of the food chain, contaminating and accumulating in fish and wildlife. The IJC has established that most of the PCB's in the upper Great Lakes come from airborne sources.

Annex 15 of the 1987 Protocol committed the governments to address the problems of transboundary air pollutants, and in March 1991 Canada and the United States signed a separate Air Quality Agreement formalizing these commitments. A bilateral Air Quality Committee was set up to review its progress. Their periodic reports are submitted to both governments and to the IJC.

Mercury was identified in 1985 as one of the 11 critical pollutants targeted for virtual elimination because of its persistence and toxicity in the Great Lakes. A current priority of the IJC is to determine the amount of mercury entering the Great Lakes from the air and to develop monitoring and control programs. The primary sources are incinerators for municipal garbage and medical waste, coal fired generating plants and metallurgical processes. Recently sewage treatment plants have been identified as significant sources of mercury to the Great Lakes.

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23. How are the Great Lakes today?

One of the goals of the Great Lakes Water Quality Agreement was to make the waters "drinkable", "swimmable" and "fishable". The International Joint Commission is required to report on progress towards the goals of the agreement every two years. Despite decades of research and work to improve the Great Lakes, the most recent IJC Report, the Eleventh Biennial Report on Great Lakes Water Quality, issued in September 2002, found that greater efforts must be invested by both countries in order to realize any real improvements.

The IJC requested that the governments of Canada and the United States use a system of biological indicators to monitor the health of the lakes. Based on these indicators, the IJC deemed the drinkability of treated Great Lakes water as "good". With respect to fishability, the chemical contamination of edible fish was described as "mixed, improving". The improvement was based on very slow declines in the concentrations of PCBs in fish samples, although warnings are still in effect in all five lakes. The swimmability of water at beaches around the lakes is also described as "mixed", with many beaches continuing to close because of elevated bacteria levels.

The report also highlighted two problems that continue to plague the Great

Lakes – contaminated sediments and invasive species.

Sediment in the Great Lakes continues to be a reservoir of toxic substances such as pesticides, PCBs and heavy metals. These persistent toxic chemicals pose a threat to human health. They are taken up by fish and, in turn, the fish are consumed by people around the lakes. In 1990 the IJC found that mothers eating large quantities of Lake Michigan fish caused harm to their children. Research has confirmed the health impacts from exposure to toxic substances in the Great Lakes. The Commission concluded that injury is occurring and political leaders must act to protect citizens from further injury.

In addition, new invasive species are heading towards the Great Lakes. The lakes have been continually threatened by the introduction of new and diverse alien aquatic invasive species. The first highly publicized invader was the lamprey eel. Because of its devastating impact on fisheries, both governments have spent millions of dollars on control programs. Another alien species, the zebra mussel, has already cost the economies of both Canada and the United States an estimated $10 billion in damage to water intake pipes since it first came to the Great Lakes 15 years ago.

The current most imminent threat is the Asian Carp, making its way up the Chicago Canal and threatening to enter Lake Michigan. Three species of carp, native to China, were imported in the early 1970s for use in the aquaculture industry of Arkansas. They were used to control algae and snails in aquaculture ponds. During floods in the early 1990s, they escaped and rapidly multiplied in the Mississippi watershed. Known as an "aquatic vacuum cleaner", the infiltration of the Great Lakes by these fish could potentially turn the Great Lakes into a carp pond and destroy a $4.5 billion fishery.

A temporary barrier was set up in the Chicago Canal near Romeoville, Illinois, in April 2002. It is a type of electrical barrier that has been used before to stop fish from entering power plant intakes. This barrier, however, will only last two or three years and will not be effective in the event of a power failure. At the urging of the IJC, the U.S. government has agreed to construct a second barrier.

For more information on the IJC's recommendations on controlling invasive species, see:
www.ijc.org/rel/news/030604b.html

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24. What are the emerging and future threats to the Great Lakes?

Although governments and citizens are struggling to come to terms with the known problems that have damaged the Great Lakes, new concerns continue to come to light. Ongoing scientific research in the Great Lakes Basin confirms the complexity of the past problems, that have not yet been resolved, and reveals areas that need attention. The old, new and emerging threats identified by the IJC include:

- **Unmonitored chemicals**
  The IJC is concerned that the number of chemicals being monitored in the Great Lakes is inadequate. The environmental consequences of many unmonitored chemicals that find their way into the lakes are unknown -- notably pharmaceuticals, flame retardants and high volume chemicals such as the new generation of biodegradable pesticides. Nor are there any objectives set for these chemicals under the Great Lakes

Water Quality Agreement.

- **Endocrine disruptors**
  Chemicals such as dioxin, PCBs, DDT and some other pesticides are now known to be endocrine disruptors. This means that, when synthetic chemicals of this kind are absorbed into the body, they either mimic or block hormones, and disrupt the body's normal functions. Many fish, contaminated with PCBs and other man-made chemicals, have numerous reproductive problems, as well as abnormal swelling of the thyroid glands. Fish-eating birds of the Great Lakes, such as eagles, terns and gulls, have shown similar problems.
- **Pharmaceuticals**
  The Great Lakes have been found to be contaminated with pharmaceuticals. Tests done by Environment Canada, the federal environment department found trace levels of pharmaceuticals near sewage treatment plants and in open waters around the Great Lakes. Pharmaceuticals include antibiotics, growth hormones, contraceptive drugs, veterinary products, and pesticides for animals and household pets. Some of these chemicals have endocrine disruptor properties, while others induce antibiotic resistance to bacteria.
- **Invasive species**
  Invasive species cause severe ecological damage by disrupting food chains and threatening biodiversity. The IJC has identified three open "doorways" into the Great Lakes: the front door is the discharge of untreated ballast water or sludge brought in by foreign ships; the side door is the Chicago Canal that allows foreign species such as the Asian Carp to find their way from the Mississippi River to the Great Lakes; and the back door is the fish markets that sell live bait and live fish for aquariums or aquaculture that are dumped into the lakes. In addition to promoting a second barrier in the Chicago Canal, the IJC has recommended that Canada and the United States develop workable, enforceable ballast water standards and fund public education programs.
- **Urban development**
  Annex 13 of the Great Lakes Water Quality Agreement seeks to reduce pollution from non-point sources such as runoff from urban and agricultural lands. All around the Great Lakes basin, farmland and green spaces are being converted to residential areas even though the populations are relatively stable. This urban sprawl increases polluted runoff from paved surfaces and the new roads that are built to service these communities. It increases air pollution by increasing the number of people commuting long distances and the number of vehicles on the road, and it destroys animal and plant habitat. The IJC has been promoting the management of growth around the Great Lakes as an important part of creating sustainable cities and protecting land and water.
- **Water use**
  The IJC has pointed out that water quality and water quantity are inextricably linked. They are concerned about the risk to the Great Lakes of future consumption of water, small-scale removals, diversions and climate change. All of these could reduce the amount of water available in the lakes and affect water quality.
- **Climate change**
  Climate change is expected to bring warmer temperatures and more severe storms to the Great Lakes regions. It is predicted that there will be lower water levels in the Great Lakes as moisture evaporates because of warmer temperatures and less ice cover. This will have a significant impact on navigation and hydro generation in the Great Lakes. It will also have negative environmental effects such as reducing wetlands. The IJC is also studying the impact of climate change on

groundwater. For more information, see the Climate Change and Water FAQ.

- **"Dead zones" in Lake Erie**
  The outbreak of botulism in Lake Erie and the re-emergence of "dead zones" are old problems in a new guise, causing concern.

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25. What is Canada doing to address new and existing water quality problems in the Great Lakes?

In Canada the Great Lakes Action Plan 2000-2005 has been developed to co-ordinate the activities of the federal government, the government of Ontario and the actions taken in cooperation with the United States federal and state agencies. The framework for the Plan focuses on the restoration of the environment in Areas of Concern, the problems with exotic species and the root causes of many of the stresses on the environment and human health in the Great Lakes Basin.

For more information on Canada's Great Lakes Action Plan, see Environment Canada's web site at:
www.on.ec.gc.ca/water/greatlakes/action-plan-e.html

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26. What is the United States doing to address new and existing water quality problems on the Great Lakes?

The United States General Accounting Office did a study to assess progress in restoring the Great Lakes Basin. The study identified numerous federal and state programs directed toward restoration activities, but concluded that there was not enough co-ordination between the strategies to be effective. They recommended that the Environmental Protection Agency's Great Lakes National Program Office develop an overarching Great Lakes strategy.

In response to this study, Representatives of Great Lakes states in the House of Representatives introduced legislation that would authorize funding for the restoration of the Great Lakes. The bill, called the Great Lakes Restoration Financing Act of 2003, would give states funding for restoration in the form of block grants, authorizing $4 billion over 5 years.

It would also create a Great Lakes Advisory Board, including governors of the Great Lakes states, representatives of the federal government, local mayors and the business, scientific and advocacy communities. Previously, funding has been provided for similar restoration projects in the Florida Everglades and for Chesapeake Bay in Virginia and Maryland. In a similar move, the Great Lakes Environmental Restoration Act was introduced into the United States Senate.

For ongoing information about the activities of the U.S. Environmental Protection Agency in the Great Lakes States, see: www.epa.gov/region5/

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27. What are the Canadian Environmental Law Association views on the

Great Lakes and the St. Lawrence River ecosystem?

The Canadian Environmental Law Association (CELA) has been actively involved in the cleanup and protection of the Great Lakes for three decades. CELA is a coalition member of Great Lakes United. CELA's Great Lakes work can be found in numerous presentations and publications available on the CELA web site

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28. How can I find out more about the Great Lakes and St. Lawrence ecosystem?

Information about the International Joint Commission, its reports and current and past activities, including the Boundary Waters Treaty and the Great Lakes Water Quality Agreement, can be found on the IJC web site

Environment Canada is the lead agency in Canada responsible for the Great Lakes Water Quality Agreement. Information about all aspects of the Agreement can be found on its web site at:
www.on.ec.gc.ca/glwqa/

In the United States, the Great Lakes Office of the Environmental Protection Agency is responsible for ensuring that the eight states implement the provisions of the Great Lakes Water Quality Agreement. Information on activities related to the agreement in the United States can be found at:
www.epa.gov/glnpo/glwqa

In Ontario, the Ministry of the Environment provides information on its activities related to the Great Lakes, including its fish advisories, at:
www.ene.gov.on.ca/envision/water/greatlakes/

Information on all critical Great Lakes issues from the perspective of non-governmental organizations can be found on the web site of Great Lakes United, including a comprehensive study called "The Fate of the Great Lakes: Sustaining or Draining the Sweetwater Seas?" at: www.glu.org

A web site containing daily environmental articles on the Great Lakes is available at:
www.greatlakesdirectory.org

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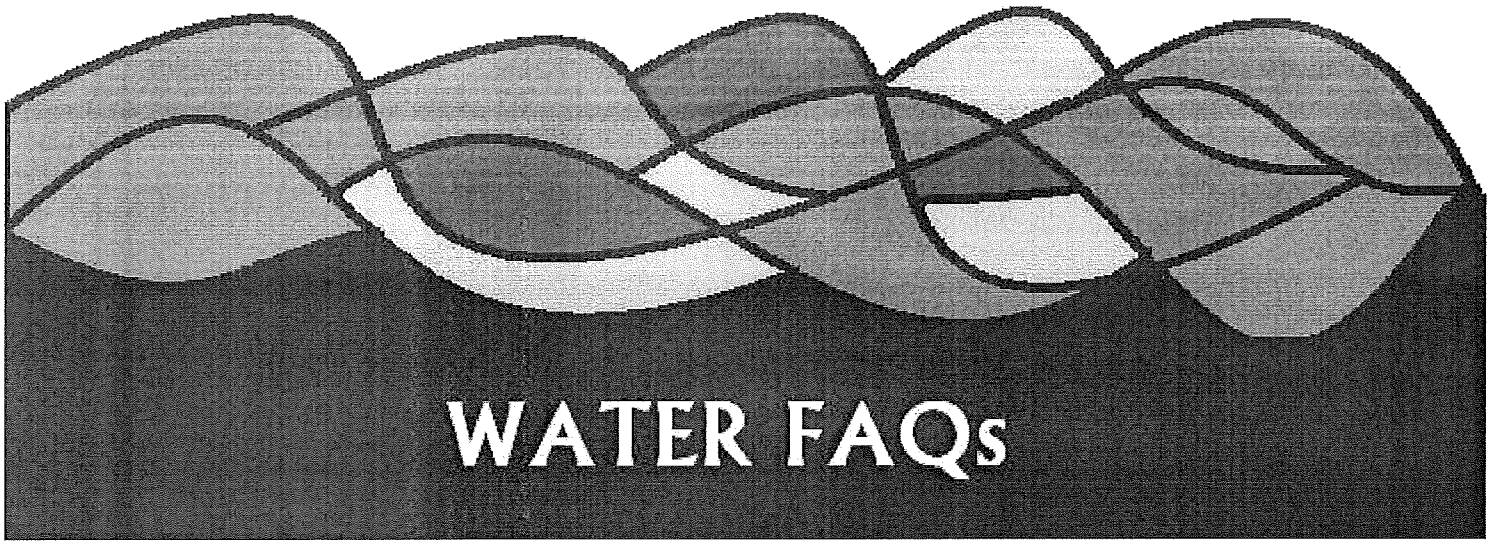

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Water Taking FAQs (January 2004)

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1. What is water taking?

Every day in Ontario billions of litres of water are taken out of the ground, or from lakes and rivers, for a variety of uses – municipal drinking water supplies, agricultural irrigation, industrial uses like aggregate extraction, mining, hydroelectric power generation and beverage manufacturing.

Ontario has traditionally been blessed with an abundance of fresh water, and as long as water flowed freely, there were few conflicts. However, in the last few years, a growing awareness of limited water resources, drinking water contamination, and water shortages in some rural areas have highlighted the need to assess and protect our water supplies.

Concerns have been raised particularly over consumptive uses, such as water bottling and beverage manufacturing, where water is taken but not returned to a watershed. Municipal drinking water supplies are considered a non-consumptive use because water is used but not removed from the watershed.

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2. What potential damage is there to the environment from taking large amounts of water?

One of the most immediate and serious impacts of taking water is water shortage. In the late 1990s, Ontario had several years of lower than average rainfall that led to low water levels in some lakes and rivers, and contributed to the problem of water shortages. In the summer of 2000, Spencer Creek in southwestern Ontario "disappeared" temporarily because of excessive takings in the local watershed. The Ministry of the Environment then restricted ground water takings and the creek reappeared.

When too much water is taken from a watershed, it can also result in the loss of habitat for aquatic plants, birds and fish. Reducing the biodiversity of species can be an extreme outcome.

Taking excessive amounts of water can affect drinking water quality. When there is less water available, it becomes more difficult for lakes and rivers to dilute contaminants, and reduced water flow can increase siltation and turbidity (cloudiness of water) of the raw water, making treatment more difficult and

costly.

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3. What Ontario legislation governs water taking?

The Ontario Water Resources Act is the primary statute in Ontario governing water. The Ministry of the Environment regulates the taking of large amounts of water from surface or groundwater sources under Section 34 of the Ontario Water Resources Act.

According to Sect. 34 (3), a person is required to obtain a water taking permit from a Ministry of the Environment Director for water takings over 50,000 litres per day. Sect. 34 (4) provides the Director with the authority to prohibit water taking that is deemed to be interfering with any public or private interest in water.

The process for water taking approvals is further elaborated in O.Reg. 285/99, the Water Taking and Transfer Regulation, introduced by the Ministry of the Environment in 1999.

The Water Taking and Transfer Regulation authorizes a Director of the Ministry of the Environment to issue, amend, refuse or cancel water taking permits over 50,000 litres a day.

The purpose of the Regulation is "to provide for the conservation, protection, wise use and management of Ontario's waters." It requires the Director to consider the protection of the natural functions of the ecosystem, as well as the impacts on surface and ground water of the water taking. The Director may also consider existing and planned uses for water, including livestock uses, municipal water supply, agricultural uses, private domestic uses and other uses. As well, the Director can decide whether it is in the public interest to grant a permit or not.

The Regulation leaves it to the discretion of the Director whether the Ministry will require the applicant to consult with others.

Permits are not needed for emergencies such as firefighting, watering of livestock and for domestic use. There is no requirement to regulate, report or document takings of less than 50,000 litres per day.

Bulk water transfers out of a water basin are not permitted.

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4. How does Ontario's permit system work?

Applications with supporting technical reports are made to the Ministry of the Environment Regional Office appropriate to the location of the water taking. The Regional Office reviews the application and the Director either issues a permit (with terms and conditions), or denies the application. Permits generally include a permit expiry date, acceptable rates and amounts of water withdrawal and source identification and location.

The Ministry's assessments are guided by the "Permit To Take Water Guidelines and Procedure Manual, 1999".

Permit proposals that are subject to the Environmental Bill of Rights are posted on the Environmental Registry for 30 days of public comment. At some time after the comment period, the Ministry posts a decision notice indicating whether the permit was issued or not, and why. Water taking applications that are not posted on the Registry include most municipal water takings, takings for irrigation of crops and takings for less than one year.

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5. Is there a right to appeal a water taking permit in Ontario?

Those who want to take water and are refused can appeal to the Environmental Review Tribunal to request that the refusal be overturned. The Ministry of the Environment staff generally imposes conditions on permits rather than denying them. The applicant can also appeal to the Environmental Review Tribunal to modify conditions in a permit.

Under the Environmental Bill of Rights the public also has the right to ask the Environmental Review Tribunal for leave to appeal. For example, citizens in the Perth area were concerned with a permit granted by the Ministry of the Environment that allowed a Swiss company to take 4.5 million litres of water from the Tay River in two separate phases. The Environmental Review Tribunal decided in February 2002 that the company, OMYA, could take only 1.5 million litres a day, the amount allowed in the first phase of the permit by the Ministry of Environment. Further legal proceedings ensued, but were overtaken by the moratorium on new and expanding permits to take water, announced by the Ontario government in December 2003 (see Answer #9).

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6. What concerns have been raised about water taking?

In the past few years many questions have been raised by concerned parties such as the Environmental Commissioner of Ontario, the Association of Municipalities of Ontario, and community groups among others, about the water taking permitting process and whether it protects the quantity and quality of water in the province.

- There is concern over the scale and the number of water taking permits issued by the Ministry of the Environment; and that permits are issued without complete or accurate information on the total number of water takings in the area.
- There is also concern that the Ministry does not adequately evaluate the potential local and cumulative impacts of multiple water takings on the ecosystem because of the lack of scientific data available on stream flows, aquifers and groundwater supplies.
- There is currently no formal notification process that would inform municipalities or local residents when a water taking permit is being considered. This is left to the discretion of the Director.
- The administration of the water taking approval process has suffered from inaccuracies and inconsistencies. An extensive review of the permits posted on the Environmental Bill of Rights Registry concluded that the problems with the Registry notices threatened public accountability and transparency.

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7. What role does the Environmental Commissioner of Ontario play in water taking permits?

The Environmental Commissioner's Office, established under the Environmental Bill of Rights, monitors the quality of information in postings on the Environmental Bill of Rights Registry and ensures public comments are considered when decisions are made.

The Environmental Commissioner's Office did an extensive review of water taking permits. This resulted in a report entitled, "Ontario's Permit to Take Water Program and the Protection of Ontario's Water Resources", presented to the Walkerton Inquiry in January 2001.

In the review, the Commissioner found that there were inconsistencies and deficiencies in permits and Registry notices, as well as in the issuing of permits, such as:

- Notices had inadequate or inaccurate descriptions of water taking proposals and permits, including sources and quantities;
- The Ministry of the Environment made it difficult to track or assess water taking proposals by mixing Metric and Imperial measures in proposal and decision notices;
- There were differences in evaluations from the Ministry's Regional offices that contributed to variations in administration;
- The Ministry of the Environment permitted water takings without considering the quantity of water available in certain watersheds;
- There was no evidence that the Ministry applied an ecosystem approach, as the regulation requires.

The Environmental Commissioner concluded that these deficiencies made it unreliable for assessing how much water was taken against how much was available. Nor was it possible to assess whether the permit to take water program was being carried out in accordance with the Regulation.

For the full report, see "Ontario's Permit To Take Water Program and the Protection of Ontario's Water Resources", Brief to the Walkerton Committee, January 2001, Environmental Commissioner's Office. It can be found under News Releases, February 1, 2001, "Study by Environmental Commissioner Documents Problems in Management of Ontario's Water" at: www.eco.on.ca

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8. Does the Environmental Registry show the total amount of water taken in the province?

Even though notices of proposed water takings are posted on the Environmental Registry, the Registry is not a database. It shows much less water taking than the actual amount being drawn from the province's lakes and rivers and underground sources.

Municipal water taking, for example, is by far the largest user in terms of sheer volume of water. These permit applications are not posted on the Registry for comment because of an exemption in the Environmental Bill of Rights for approvals issued under the Environmental Assessment Act. Residents are unable to challenge Ministry of the Environment decisions on these municipal

water-taking permits.

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9. What changes has the Ministry of Environment made to its approval process?

In December 2003, the Ontario government passed Ontario Regulation 434/03 establishing a moratorium on new and expanding permits to take water. The regulation applies to permits to take water in Southern Ontario and in areas for which Conservation Authorities have been established in Northern Ontario.

The moratorium will apply to beverage manufacturing, including bottled water; fruit or vegetable canning or pickling; ready-mix concrete manufacturing; aggregate processing where the product is a slurry; and manufacturing or production of products that contain more than 50,000 litres per day of water. It does not apply to municipalities; water used for agricultural purposes; renewals of existing permits for the same volume from the same location; or existing permits to take water.

The government is proceeding with a review of the decision-making process and rules governing the Permit to Take Water program, and with the implementation of Justice O'Connor's recommendations on source protection.

See the Source Water Protection FAQ.

The moratorium will allow the government time to put in place new rules for water taking and water charges. The government also plans to institute charges for water-bottling companies and other permit holders that remove water from watersheds.

For more information, see the Ministry of the Environment's web site at: www.ene.gov.on.ca/water.htm

Previously, in April 2003 the Ontario government had proposed improvements to the Water Taking and Transfer Regulation and posted the amended Regulation on the Environmental Bill of Rights registry for public comment. Although no final decision had been issued, the proposed amendments would have:

- Require new permit applicants to notify municipalities, conservation authorities and adjacent landowners about proposed water taking,
- Require reporting of water use by permit holders, and
- Define potential impacts that will be considered when reviewing permit applications.

The Ministry proposed to further define in the revised Regulation what must be considered in the ecosystem approach. In considering the ecosystem, the Director must consider "the natural variability of the flows or levels of waters including minimum in-stream flows and habitat that depends upon the flow or levels of waters".

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10. What are Justice O'Connor's recommendations in the Report of the

Walkerton Commission of Inquiry regarding water taking?

To ensure that sources of drinking water are protected, Justice O'Connor stressed the importance of watershed planning. He recommended that all watersheds in the province have mandatory watershed-based source protection plans. These plans would include a water budget for the watershed, or a plan for developing a water budget where sufficient data is not available. They would also include the identification of all significant water withdrawal including municipal intakes.

Furthermore, he recommended that the total amount of water allocated for a water permit not exceed the supply of water that can be sustained according to the watershed-based source protection plan. Where permits to take water and certificates of approval allow unacceptable levels of water withdrawal, agreements must be negotiated among users.

The Report of the Walkerton Inquiry, Part 2, Chapter 4, "The Protection of Drinking Water Sources" contains information on watershed source protection plans with respect to permits to take water. The Report can be seen at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

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11. What are the municipalities doing to protect water supplies?

Because of the number of conflicts between municipalities and companies seeking water taking permits, the Association of Municipalities of Ontario set up a Water Taking Task Force to propose improvements to the permitting process.

In their report released in December 2000 they recommended a formal notification process for municipalities when an application for taking water is submitted (which the Ministry proposed in its earlier amendments to the Regulation). They argue that the water taking permitting process should be integrated into municipal planning. They view commercial water taking as a land use under the Planning Act, and want it addressed as a land use activity in municipalities' Official Plans.

They have also asked the government to consider the possibility of imposing fees or charges on the bottled water industry, similar to fees charged to the aggregate industry.

For the complete report, "Proposed Improvements to Ontario's Water Taking Permitting Process: Recommendations to the Government of Ontario", Association of Municipalities of Ontario Water Taking Task Force, December 19, 2002, see: www.greycounty.on.ca/council/2003-AMOwatertaking.pdf

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12. What role do the Conservation Authorities play in water taking?

Conservation authorities are bound by their legislation, the Conservation Authorities Act, to consider the impacts of water takings on the watershed. The association of Conservation Authorities, known as Conservation Ontario, has been concerned about the impacts of water taking. One, the Credit Valley Conservation Authority, found in the 1990s that if all permitted water takings in the watershed were added together "there would not be adequate supplies of

water to meet the demand".

Justice O'Connor recommended that conservation authorities take a lead role in watershed planning and source protection plans because of their history and knowledge of the province's watersheds.

Conservation Ontario, with other partners, has carried out a series of watershed-based demonstration projects. Reports on these projects can be found at:
www.conservation-ontario.on.ca/projects/projects.htm

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13. How can I find out about water taking in my area?

The Ministry of the Environment posts notices of applications for water taking permits on the Environmental Bill of Rights Registry. This is the only public notice required and these notices are only posted during the time they are reviewed. You may comment on these proposals during the public comment period. Otherwise, you can contact your local Ministry of the Environment office for information on permits already approved in your area.

See Environmental Bill of Rights Registry at:
www.ene.gov.on.ca/envision/env_reg/ebr/english/

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14. Who controls large-scale water taking from the Great Lakes?

In the spring of 1998 the Ministry of the Environment approved a controversial water-taking permit for the Nova Group of Sault Ste. Marie, Ontario. This permit would have allowed the company to take 10 million litres of water per day from Lake Superior and ship it to Asia for sale.

Although it was rescinded, the public outcry over the permit alerted the Council of the Great Lakes Governors and the Premiers of Ontario and Quebec to the problem of large-scale water removals from the Great Lakes. (The Council of Great Lakes Governors is made up of the governors of the 8 states bordering on the Great Lakes and the Premiers of Ontario and Quebec.)

The Council of Great Lakes Governors, in an effort to manage future threats to the Great Lakes from water takings or diversions, proposed the Great Lakes Water Initiative and the development of a new binding agreement called Annex 2001, an annex to the Great Lakes Charter. The Great Lakes Charter is a voluntary agreement which the Governors and Premiers signed in 1985.

This Annex commits the Governors and Premiers to manage the Great Lakes waters with regard to diversions and consumptive uses. The agreement will review the water takings from the Great Lakes approved by the United States under the Water Resources Development Act of 1986. It is intended to improve data collection. It also proposes new conditions on large takings. Annex 2001 is expected to be in place by June 2004. When it is finalized, this agreement will affect Ontario's program to permit water takings.

In addition, the Canadian government in December 2001 moved to stop large withdrawals of Great Lakes water. The government passed amendments to the International Boundary Waters Treaty Act that prohibit the bulk removal of

boundary waters from the water basins in which they are located. See: http://laws.justice.gc.ca/en/I-17/77063.html

The amendments also require persons to obtain licenses from the Minister of Foreign Affairs for water-related projects that affect the natural level or flow of waters on the American side of the border.

Ontario also joined with other provinces and the Canadian government in signing The Accord for the Prohibition of Bulk Water Removal from Drainage Basins in 1999 at the Canadian Council of Ministers of the Environment. This agreement prohibits the bulk removal of surface and groundwater from the Canadian portion of major basins. For more information, see: www.scics.gc.ca/cinfo99/83067000_e.html

For more information on the Council of Great Lakes Governors and the Great Lakes Charter, see: www.cglg.org

See also the Great Lakes and St. Lawrence Ecosystem FAQ.

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15. How much water do bottled water companies take in Ontario?

In the year 2000, large bottled water companies took approximately 690 million litres of water in Ontario, most of it from rural areas. Unlike other uses of water like municipal water supplies, the manufacturing and production of bottled water is a consumptive use -- the water that is taken from the source is shipped away from the community, rather than eventually being recovered.

Although the Ministry of the Environment has approved permits to these companies, it does not track the extent to which the current water taking permits are used. In many cases, the permits allow much more water to be taken than the companies actually use. Additionally, smaller water bottlers (under 50,000 litres per day) do not require a water taking permit.

See the Bottled Water FAQ.

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16. What are the Canadian Environmental Law Association's views on water taking?

The Canadian Environmental Law Association (CELA) has been concerned that the regulation governing water taking permits does not adequately assess or protect water supplies in the province.

For more on CELA's views, see CELA publication #444: "Submission on the Proposed Amendments to the Water-Taking and Transfer Regulation (Regulation 285/99 under the Ontario Water Resources Act). EBR Registry No. RA03E0009".

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17. How can I get more information about water taking in Ontario?

For the Ministry of Environment's Water Taking and Transfer Regulation, see: http://192.75.156.68/DBLaws/Regs/English/990285_e.htm

The Ministry of Environment's moratorium on water taking regulation is posted on the EBR Registry. See: www.ene.gov.on.ca/envregistry/021840er.htm

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18. How can I get more information about water taking in other jurisdictions?

Information on water taking and bulk water removals in other provinces is available through Environment Canada at: www.ec.gc.ca/water/en/links.cfm?category_id=all&sub_section_id=18

In the United States, permits to take water are issued by individual states. The regulations for New Hampshire, for example, can be found at: www.des.state.nh.us/desadmin.htm#water

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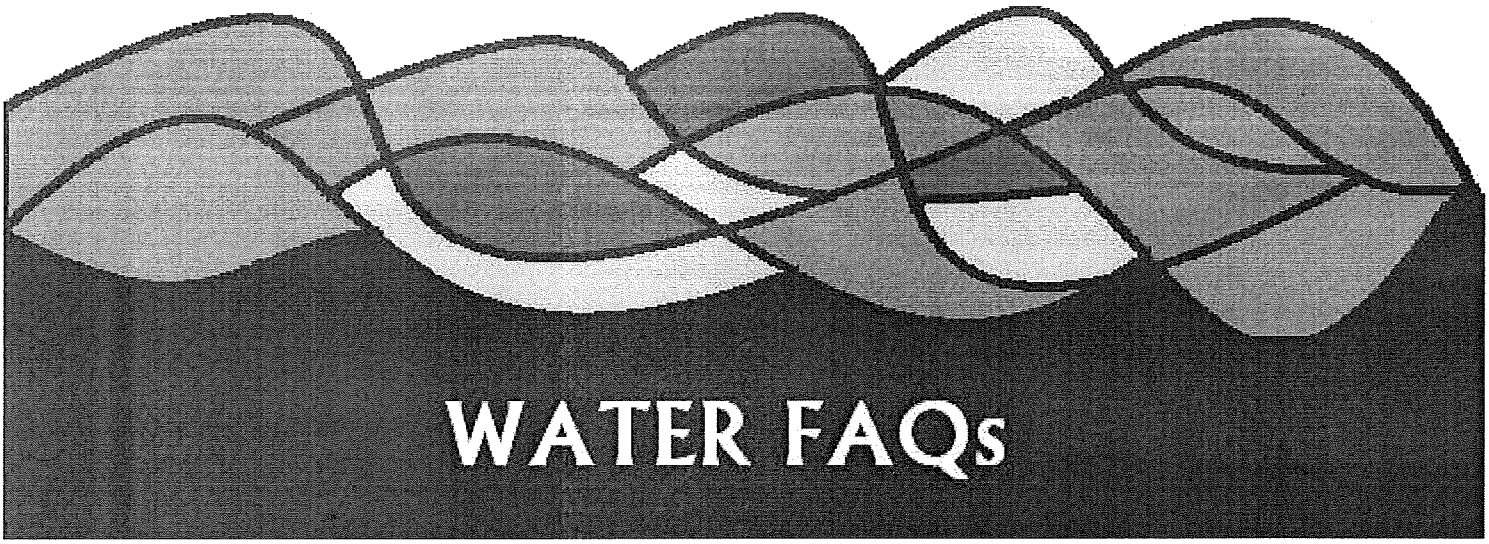

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Water Conservation FAQs (January 2004)

1. Why is water conservation important?

As Mr. Justice Dennis O'Connor pointed out in his Report of the Walkerton Commission of Inquiry, Ontario is one of the world's favoured places with respect to the amount of water available. It has a stock of old water that includes the Great Lakes – one fifth of the world's freshwater – and groundwater stores created millions of years ago. However, even though the province is not in danger of running out of water, there are important reasons to take care of it.

First, water quantity is inextricably linked to water quality. As more water is used, it becomes more degraded or polluted.

Second, water must be treated and distributed for municipal drinking water supplies and agricultural or industrial uses. This requires energy and significant investments in infrastructure. The greater the amount of water that has to be treated, the higher the cost of energy, and of building and maintaining this infrastructure.

Third, local water shortages do occur, especially in areas that rely on groundwater. Water shortages often have severe impacts on ecosystems. They also increase the demand to ship water greater and greater distances, even across entire watersheds. Proposals for pipelines and large-scale diversions are expensive, and can cause considerable environmental damage.

Fourth, climate change will alter the weather patterns that have provided a predictable and sustainable amount of water. Even the Great Lakes are expected to experience significant declines in lake levels.

For these reasons, water conservation is an important component of an environmentally sustainable way of life.

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2. How does using too much water affect water quality?

Removing too much water can change the natural flow of water in rivers or streams. If a certain level of flow is not maintained, the water levels can fall low enough to alter, or even destroy, the habitat of fish and wildlife.

If too much groundwater is taken, the small streams and rivers that are fed by groundwater can dry up, and groundwater storage areas themselves may be depleted.

Lower water levels in lakes and rivers also mean pollutants will not be diluted as effectively and will require more treatment to remove them from drinking water.

Using too much water for activities like farming or household use can also cause problems with water quality. Excessive irrigation of agricultural lands or landscaped areas can increase the amount of pesticides, soil and nutrients carried into waterways.

The demand for more water also means building more infrastructure to treat and deliver water, drilling more and deeper wells, withdrawing more water from natural water bodies and constructing more pipelines to reach remote supplies. In addition to withdrawals from major bodies of water, it is estimated that there are over 500,000 wells in Ontario alone. Little is known about groundwater resources in the province, and better monitoring is needed to determine groundwater recharge rates.

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3. Does Ontario have to worry about the amount of water available?

Although the province is well endowed with water, some communities in Ontario do have problems with water supply and periodic episodes of low water.

In the last few years Ontario has experienced unusually low amounts of rainfall that have caused drought-like conditions in parts of the province, particularly southwestern and eastern Ontario. Historically droughts were relatively uncommon – occurring every 10 to 15 years --but the late 1990s saw a prolonged period of low rainfall and high temperatures. This resulted in some of the lowest surface water levels and driest soils recorded for several decades. Two of the Great Lakes – Huron and Superior – were lower than they have been for many years.

Climate change is also expected to affect the amount of water available. Warmer temperatures will change precipitation patterns, bringing less snow in winter and more intense heavy rains in summer followed by dry spells and more pronounced droughts. This will lead to reduced water levels and drier soils, particularly in vulnerable areas of the province. Water levels in the Great Lakes are expected to fall by one metre or more over the next 100 years.

See the Climate Change and Water FAQ.

In addition, demands for water continue to escalate. Municipalities need to withdraw more to service large suburban developments. There are competing demands from increasingly intensive agricultural operations, aggregate extraction, golf course development, bottled water and beverage manufacturers as well as other users. Canadian water has also been looked at by companies like the Nova Group of Sault Ste. Marie as a marketable commodity that could be shipped to water-scarce parts of the world. This demand could result in large-scale water takings. Only with the development of comprehensive water budgets for each watershed can the sustainability of these many small-scale or large-scale demands be determined.

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4. What has the province of Ontario done to address drought problems?

In low water conditions or periods of drought, water conservation becomes extremely important in preserving enough supply for essential uses such as drinking water.

In the late 1990s in response to several consecutive years of drought problems, the province developed the Ontario Low Water Response plan. This program is designed to ensure that the province is prepared for low water or

drought conditions. The plan is set out in guidelines called the Ontario Low Water Response, available through the Ministry of Natural Resources. It can be implemented under existing provincial legislation including the Municipal Act, the Lakes and Rivers Improvement Act and the Ontario Water Resources Act.

As part of this program local watershed-based committees have been established to monitor water levels and to co-ordinate action when levels fall below a certain percentage of their normal flows. Conservation Authorities are designated as the lead agency and are responsible for establishing local Water Response Teams across different watersheds. Water Response Teams include representatives from the Ministries of Environment and Natural Resources, municipalities, agricultural and industrial users.

The Ontario Low Water Response guidelines, as well as the Ministry of Natural Resources' reports on low water and flow conditions, are available at: www.mnr.gov.on.ca/MNR/water/p774.html

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5. How does the Ontario Low Water Response plan work?

To decide when action is needed on low water levels, the Conservation Authorities assess the precipitation and stream flow figures for each of their watersheds. Conservation Authorities under the Conservation Authorities Act have the authority to control water for domestic purposes.

The provincial guidelines define low water and drought, and the actions that must be taken under certain conditions. There are three levels:

- Level I is considered a warning level. It is the first indication of a water supply problem. It triggers voluntary conservation with a goal of reducing use by ten per cent.
- Level II is identified as the conservation level, an indication of a potentially serious problem. At this level the Water Response Teams advise conservation and restrictions on non-essential uses such as lawn watering and car washing with the intention of reducing water use by a further 10 per cent.
- Level III is the most serious level. It occurs when the water supply is so low that it fails to meet usual demand. At this point conservation, restrictions and regulations are imposed to restrict water use. When Level III conditions develop, water managers will have to make decisions on priorities for water use based on non-essential, important and essential uses. Essential uses include a reasonable supply of water for drinking, sanitation and health care.

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6. What Ontario laws govern water taking?

The Ministry of the Environment is responsible for deciding how much water can be taken from the province's water sources under the Permit to Take Water Program, a regulation under the Ontario Water Resources Act. Any proposal for water withdrawals over 50,000 litres per day must be approved by the Ministry of the Environment.

See the Water Taking FAQ.

In December 2003 the Minister of the Environment imposed a moratorium on all new and expanded water taking permits. The government is proceeding with a review of the decision-making process and rules governing the Permit to Take Water program, including charging fees for water taking.
Historically all water taking has been free. This means that there is no value placed on the water taken under the Permit to Take Water program and, therefore, no incentive for conservation.

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7. Are there laws in Ontario governing water conservation?

There are no specific provincial laws mandating water conservation. However, the recent introduction of the Sustainable Water and Sewage Systems Act is likely to result in higher water rates and provide an incentive for conservation programs.

Canadians are among the most wasteful users of water in the world. According to Environment Canada surveys, the average Canadian uses more than 300 litres per day, more than any country except the United States. One reason for our extravagant use of water is that it has historically been underpriced.
In December 2002 the government of Ontario passed the Sustainable Water and Sewage Systems Act that requires municipalities to assess and recover the full cost of providing water and sewage services, although this Act has not yet come into force. Its purpose is to ensure that municipalities operate their water treatment plants on a sound financial basis incorporating all costs of treatment. By assessing and allocating the full costs, municipalities will have good reasons to promote conservation.

See the Water Financing FAQ.

For more information on water use in Canada, see Environment Canada's web site at: www.ec.gc.ca/water/en/manage/use/e_data.htm

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8. What are Justice O'Connor's recommendations from the Report of the Walkerton Commission of Inquiry on water conservation?

One of the most important recommendations, made by Justice O'Connor in his Walkerton Inquiry Report, was the development of mandatory watershed source protection plans throughout the province. Conservation planning would be the foundation of source protection plans.

He recommended that every source protection plan include a water budget. A water budget would assess the amount of water available in the watershed and the amount of water being removed. Protection plans would have to identify all significant withdrawals of water, all sources of pollution, areas of groundwater vulnerability and wellhead areas. Vulnerability mapping would show where source protection measures are most urgently needed.

In watersheds where shortages occur, Justice O'Connor recognized that the Ministry of the Environment may have granted permits to take water or certificates of approval that exceed the available supply or the capacity of the system to absorb all the pollutants. He suggested the Ministry of the Environment lead a process of deciding a fair allocation of the available water

to avoid overtaxing particular water supplies.

See the Source Protection FAQ.

The Report of the Walkerton Commission of Inquiry, part 2, Chapter 4, "The Protection of Drinking Water Sources", contains Justice O'Connor's vision of source protection plans. The Report is available at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

It is also available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

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9. What can be done to implement water conservation?

All levels of government have responsibility for water management. The federal or provincial governments can introduce legislation, programs or incentives to implement conservation, such as mandating standards for water efficiency or conservation.

Municipalities, however, have the most to gain by promoting water conservation. Environment Canada has found, however, that the lack of full-cost pricing and conservation-oriented price structures has led to increased water use. When Ontario's Sustainable Water and Sewage Systems Act comes into force, municipalities will have to incorporate the true costs of supplying water into the rates. It also means that the costs of maintaining and building new water and sewage infrastructure (including source protection costs related to infrastructure) will have to be calculated and taken into account when rates are set. These costs can be mitigated by water conservation measures.

One of the most effective ways for municipalities to affect water conservation is the installation of meters. Meters measure the amount of water consumed. Where meters are installed and customers are charged on the basis of how much water they use, the amount of water consumed generally declines.

Metering also enables municipalities to create price structures that lead to water conservation. Under the Municipal Act, municipalities have broad powers to impose fees and charges by enacting bylaws to charge users for services from which they benefit. This allows them to decide how rates are set for water and sewer services.

Environment Canada's survey found some Ontario municipalities were introducing increasing block rates in the residential sector and successfully reducing water use. This price structure means charging a higher unit price as use rises.

Other pricing options include seasonal rates (for example, imposing higher rates from April to October when water use is higher), excess loading or use charges, and repealing volume discounts to large water users.

Municipalities in Ontario have also used by-laws to impose water restrictions, usually with respect to watering lawns and washing cars. The Environment Canada survey shows that municipalities are less likely to restrict specific users such as golf courses. Some municipalities conserve water by carrying out regular maintenance programs that reduce water losses through leak reduction and repair.

Municipalities have also, in some instances, initiated public education programs aimed at reducing water use. These are sometimes accompanied by the promotion of water-saving devices for the home, water audits and retrofitting programs. Water audits, like energy audits, assess the amount of water being used in homes, businesses and industry and identify areas where it can be reduced.

Environment Canada's survey of municipal water pricing can be found at: www.ec.gc.ca/water/en/info/pubs/sss/e_price99.htm

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10. What are the benefits of water conservation?

Water conservation has both economic and environmental benefits:

- If a municipality can reduce its water use, it can extend the lifespan of its current infrastructure;
- Municipalities can postpone or avoid the need to expand or construct new water and sewage treatment plants;
- They can defer, or avoid, the need to switch to a new water supply source; they can avoid changing from groundwater to surface water supplies, and they can defer or avoid building expensive pipelines to increase the water supply;
- Municipalities can save on the actual operation and maintenance costs of water treatment plants;
- Water conservation makes more money available to municipalities to practice conservation through such measures as leak detection, public education or installing meters in homes;
- Water conservation keeps rivers and lakes cleaner by minimizing the environmental impacts of new water supply infrastructure;
- Water conservation helps maintain water levels and preserve habitat for fish and wildlife, and dilutes point source and non-point source pollution;
- Conservation reduces the risk of low water and drought conditions.

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11. What can I do to conserve water?

Toilets use more water than anything else in your home. Six-litre toilets have been installed in every new home in Ontario since 1996 under the Ontario Building Code. As well, some municipalities offer incentives for homeowners to replace their old toilets with new water-efficient ones. Check with your municipality to see what programs they may have. This replacement can save substantial amounts of water. However, the performance of different models varies considerably. The Canadian Water and Wastewater Association has published a report of its testing program that identifies the most effective models. It is available at:
www.cwwa.ca/toilet.htm

The Green Communities Association, a community-based Canadian organization that delivers environmental services, including advice on water and energy efficiency, can be found at: www.gca.ca

For helpful tips on saving water in all parts of the home, the California Urban

Water Conservation Council has a graphic web site that takes you on a tour of the whole house, and identifies opportunities for water conservation. It can be found at: www.H2ouse.net

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12. What are the Canadian Environmental Law Association's views on water conservation?

The Canadian Environmental Law Association (CELA) believes that water conservation is essential to environmental sustainability, and that conservation planning must start on a watershed basis using mandatory source protection plans. For more information, see the following CELA publications: www.cela.ca/publist.htm

CELA's recommendations for a long-term water policy framework for Ontario can be found in publication #390: "Comments to Doug Galt, Chair, Water Resources Management Committee re: Water Resource Management Committee Development of Long-Term Water Strategic Water Policy Framework for Ontario", T. McClenaghan, S. Miller, June 2000.

CELA has developed a Model Water Bill that includes requirements for water conservation planning that can be found in publications #401 and #402: "An Act to Conserve Ontario's Water: Model Bill and Commentary", by CELA and Joseph P. Castrilli, May 200l.

For CELA's views on preserving water quality and quantity, see publication #36: "A Sustainable Water Strategy for Ontario", prepared for the Environmental Agenda for Ontario Project. P. Muldoon, P. McCulloch, March 1999.

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13. How can I find out more about water conservation in Ontario and Canada?

The Canadian Water and Wastewater Association publishes on their web site, Water Efficiency Database Experiences, from communities all across Canada at: www.cwwa.ca

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14. How can I find out about water conservation in other jurisdictions?

The United States Environmental Protection Agency has published Guidelines for Water Conservation as required by the U.S. Safe Drinking Water Act of 1996. When communities apply to the states for federal/state funds for water infrastructure projects, states may require conservation programs as a condition of receiving a loan. The EPA also presents advice for water efficiency in different sectors – agricultural districts, municipal, commercial, industrial, residential, and landscaping. For more information on water conservation in the United States and the EPA's Water Efficiency Program, see:
www.epa.gov/OW-OWM.html/water-efficiency/index.htm

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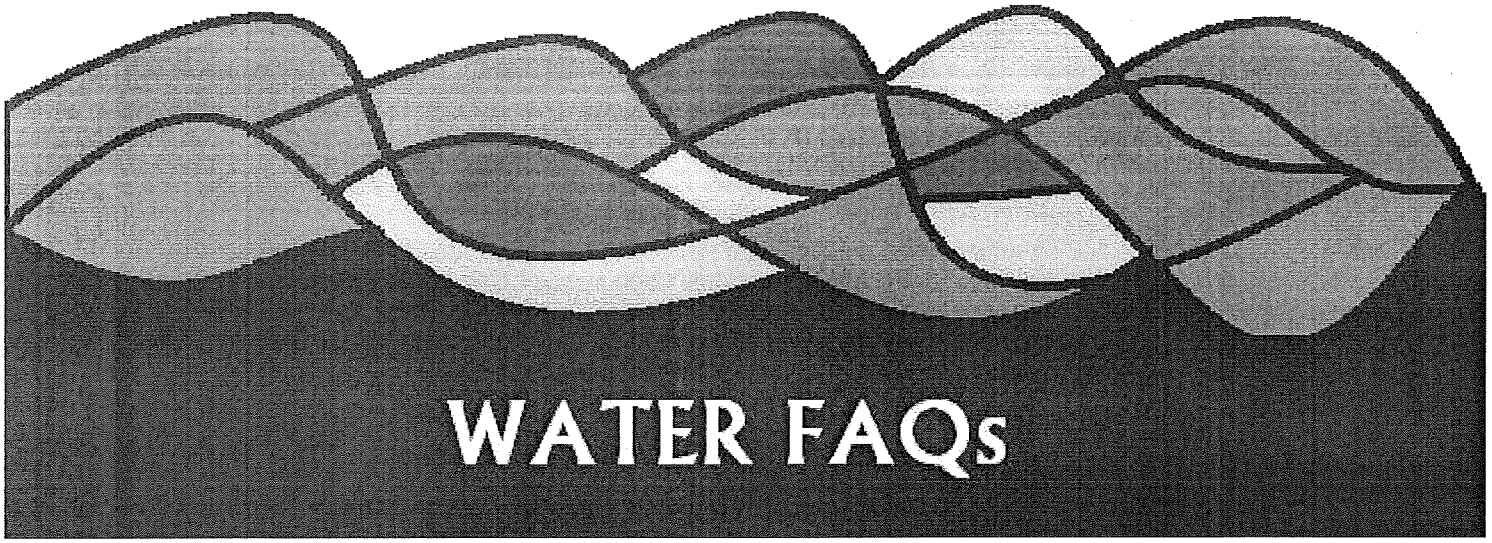

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Bottled Water FAQs (January 2004)

15. How can I find out more about bottled water in other jurisdictions?

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1. How popular is bottled water in Canada?

Sales of bottled water over the last ten years have been steadily increasing – in Canada per capita consumption has risen from 14.6 litres per person in 1994 to about 15.8 litres per person in 1998. In the United States the increase has been much more dramatic – with bottled water sales up by 68 per cent, and an average consumption of 53 litres per person.

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2. Why are the sales of bottled water increasing so quickly?

The increase in sales has been fueled by successful marketing of bottled water as an alternative to soft drinks, coffee and other beverages. Its popularity also reflects a growing concern about chemical contamination of municipal drinking water supplies.

In Canada, the majority of bottled water production is exported to the United States. Most of the plants are located in Ontario, Quebec and British Columbia. The top four bottled water producers in Ontario are located in rural communities with easy access to the American market.

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3. What are the issues related to bottled water?

Public concern about bottled water has focused on two different aspects – first, the discrepancy between the strict requirements set for municipal drinking water supplies and the less stringent regulations for bottled water. A second major concern is the mining of water supplies by bottled water companies without adequate assessments of groundwater reserves or the impact on surface water flows.

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4. How is bottled water regulated in Canada?

Bottled water is currently regulated as a food product by the federal government through Health Canada. It is addressed in Division 12 of the Food and Drug Regulations under the *Food and Drugs Act*. However, the federal government has proposed a new *Canada Health Protection Act* that would strengthen the provisions of the *Food and Drugs Act* . Bottled drinking water would be part B1.1.16. Public consultations are currently being held on what will be included in the new Act. The new Act may have the effect of strengthening the requirements for bottled water safety.

Bottled water is not covered under Ontario 's *Safe Drinking Water Act* or its regulations. It is, therefore, not subject to the same treatment and testing regimes that apply to municipal water supplies in the province.

For more information on Health Canada 's proposed legislation, see:
www.hc-sc.gc.ca/english/media/releases/2003/2003_42bk1.htm

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5. What standards do the federal regulations impose on bottled water?

Bottled water comes from many sources and may undergo different kinds of treatment and alterations. Health Canada under Division 12 of the Food and Drugs Act determines the classifications:

- If bottled water is labeled as spring or mineral water, Division 12 of the Food and Drug Regulations requires that the water must come from an underground source. It cannot come from a public water supply.
- Mineral water is the same as spring water except that it contains a larger amount of dissolved mineral salts, usually more than 500 milligrams per litre of dissolved solids.

Under the regulations, chemicals cannot be used to change the composition of mineral and spring waters. However, carbon dioxide and ozone may be added to protect the freshness. In addition, the source of the spring or mineral water must be identified.

- If bottled water is not labeled as spring or mineral water, it can come from any source, and be treated to make it fit for human consumption. This type of bottled water may come from a well or even a municipal water supply.

Bottled water that is not from a spring may be altered before it is presented for sale. It can be treated in different ways including carbonation, ozonation, ultraviolet radiation or filtration to remove harmful bacteria. It may be distilled or deionized to remove the minerals. The regulations require that these treatments be identified on the label as "carbonated", "demineralized", or "distilled", for example. Carbonated or sparkling water contains carbon dioxide.

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6. How are these regulations enforced?

Federal law requires that all bottled water offered for sale must be safe to drink. The Canadian Food Inspection Agency periodically samples and analyses both imported and domestic bottled waters. This monitoring focuses primarily on testing bottled waters for bacterial contamination.

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7. What is the difference between the requirements for bottled water and for tap water?

A regulation (O. Reg.169/03) under Ontario 's new *Safe Drinking Water Act, 2002* sets numerical limits on contaminants in drinking water. Under this regulation, maximum levels of chemical, bacterial and radiological parameters are set for municipal drinking water supplies. All drinking water in Ontario must meet these standards. However, bottled water is not legally required to meet these same standards.

In addition, the requirements for monitoring municipal drinking water for chemical and bacterial contamination have been strengthened under the *Safe Drinking Water Act* . The regulations also require that all test results of municipal drinking water must be available to the public on demand.

Bottled water may also contain contaminants. The Canadian Food Inspection Agency is responsible for checking for possible contamination. Yet it is not known how frequently or how thoroughly the Agency tests.

There is no requirement that the bottled water companies themselves do comprehensive or regular sampling of their sources or of their products. Nor is there any information readily available to the public about the quality of particular bottled water products.

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8. What is being done to address this difference?

In both Canada and the United States, there have been legislative initiatives to bring the requirements for bottled water into line with those for municipal drinking water in order to better guarantee consumers the safety of all drinking water.

In Ontario a Private Member's Bill was introduced that would regulate bottled water. This Bill was given second reading on October 17, 2002 with all party support, although it was not passed into law. The Bill was called an *Act to Amend the Ontario Water Resources Act* .

The bill would give the province the authority to:

- prescribe standards for chemical and radiological contaminants for bottled water;
- forbid selling bottled water unless it meets provincial standards;
- require an analysis of the groundwater sources of bottled water and the conditions resulting from natural run-off through aquifers.

Similarly, in September 2003 a bill was introduced in California , the leading state in bottled water consumption. The proposed bill also addresses the issues of consumer protection and the labeling of bottled water. Its intention is to require bottlers to prepare a "consumer confidence report" that would be available to each customer. These reports would be the equivalent of the consumer confidence reports that all American municipalities must deliver to their drinking water customers under the U.S. *Safe Drinking Water Act*. The bottled water companies' reports would have to include information about the brand's source, any regulated contaminant that is detected and if a contaminant is present, the level of the contaminant and what it means for human health.

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9. How does the withdrawal of water for bottling affect water supplies?

The earth's water continually circulates in a hydrological cycle. Rain and snow can either run directly off the land into streams or infiltrate the earth to recharge groundwater. Groundwater moves through the earth and eventually resurfaces into streams and lakes. Natural springs occur where groundwater

surfaces on land, often forming the headwaters of a stream. These natural springs are the most common sources for bottled water supplies.

Removing water for bottling is considered to be a consumptive use of water. This means water is withdrawn from a source for use and not returned to its local ecosystem. A use that is considered non-consumptive returns water after it is used back to its source; a consumptive use removes it entirely.

There is a growing concern that taking too much water can reduce or deplete groundwater reserves and reduce the flow of streams and lakes, causing stress on ecosystems. Although groundwater systems can be recharged, it has not usually been clear what amount of water can be taken without causing water tables to drop and streams and rivers to dry up.

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10. How is water taking regulated in Ontario?

In Ontario companies must apply to the Ministry of the Environment for approval to take water if they are withdrawing more than 50,000 litres of water a day from a surface or groundwater source under the Ministry's Permit to Take Water program. This is required under Section 34 of the *Ontario Water Resources Act* . It is further elaborated in the Ministry's Water Taking and Transfer Regulation (O. Reg. 285/99). Before a permit is approved, the Ministry posts the information on the Environmental Bill of Rights Registry for public comment.

Many small bottled water companies in Ontario take less than 50,000 litres per day and are not required to get Ministry of Environment approval.

For more information on water taking, see the Water Taking FAQ.

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11. What are the concerns of communities where bottled water companies are located?

As the sales of bottled water continue to rise, bottling companies as well as companies that manufacture beverages such as beer or soft drinks are increasingly coming into conflict with communities that do not want large quantities of water removed from their local water sources.

Many of the bottled water companies are now owned by multinational corporations such as the Perrier Group (owners of Poland Spring, Arrowhead and Deer Park) and Group Danone (owners of Crystal Springs in Ontario and Naya in Quebec). In addition, Coca Cola and Pepsi Cola are entering the bottled water markets in both Canada and the United States .

The Ministry of the Environment calculates that they have already given bottled water companies permits that allow an estimated 1800 billion litres a year to be pumped out of underground aquifers. However, the actual quantities being taken are believed to be less than one per cent of this allowable amount. In most cases, permits to take water have been granted without an adequate evaluation of groundwater supplies or an assessment of the environmental impact on the local ecosystem.

In addition, bottlers are not required to pay for the water that they take. The

Association of Municipalities of Ontario has recommended that the government charge a standard volume-based fee that could be used to compensate municipalities for the wear and tear on their roads and to provide a contribution to the protection of water resources.

Proposals to pump large quantities of water from small rural communities has created a backlash against the bottled water companies not only in Ontario, but in other provinces such as British Columbia and Quebec, and across the United States. Lawsuits have been filed by citizens' and native groups in Wisconsin and Michigan to stop the Perrier Group (a subsidiary of Nestle) from pumping thousands of litres a day from groundwater supplies that feed into the Great Lakes . After two attempts to locate a new bottling plant in Wisconsin , Perrier has now located their plant in Mecosta County, Michigan, north of Grand Rapids.

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12. What action has the Ontario government taken?

In December 2003 the Ontario government passed Ontario Regulation 434/03 establishing a moratorium on new and expanding permits to take water. The regulation applies to permits to take water in Southern Ontario and in areas for which Conservation Authorities have been established in Northern Ontario .

The moratorium will apply to beverage manufacturing, including bottled water; fruit or vegetable canning or pickling; ready-mix concrete manufacturing; aggregate processing where the product is a slurry; and manufacturing or production of products that contain more than 50,000 litres per day of water. It does not apply to municipalities; water used for agricultural purposes; renewals of existing permits for the same volume from the same location; or existing permits to take water.

The government is proceeding with a review of the decision-making process and rules governing the Permit to Take Water program, and with the implementation of Justice O'Connor's recommendations on source protection.

See the Source Water Protection FAQ.

The moratorium will allow the government time to put in place new rules for water taking and water charges. The government also plans to institute charges for water-bottling companies and other permit holders that remove water from watersheds.

For more information, see the Ministry of the Environment's web site at: www.ene.gov.on.ca/water.htm

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13. What are the Canadian Environmental Law Association's views on bottled water?

The Canadian Environmental Law Association (CELA) believes that Ontario 's Permit to Take Water system needs to be strengthened. See "Bottling Ontario's Groundwater Fact Sheet" at: www.cela.ca/water/bottles.htm

CELA has also expressed its concerns about water exports and trade

agreements in many papers and presentations. See "The Case Against Water Exports" by Paul Muldoon, March 2000, at: www.cela.ca/water/w-opin.htm

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14. How can I find out more about bottled water?

Health Canada has prepared answers to questions about the regulation of bottled water in Canada. This information can be found at: www.hc-sc.gc.ca/food-aliment/mh-dm/mhe-dme/e_faqs_bottle_water_eng.html

The bottled water companies have the latest news and information about their industry on their web site at: www.bottledwaterweb.com

The Ontario Ministry of Agriculture and Food has done an "Evaluation of the Strengths, Weakness, Opportunities and Threats to the Ontario Bottled Water Industry" that can be found at: www.gov.on.ca/OMAF/english/food/sector/pdf/bottled _water_text.htm

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15. How can I find out more about bottled water in other jurisdictions?

A public interest group in the United States, the Natural Resources Defense Council, has done a four-year study of bottled water – "Bottled Water: Pure Drink or Pure Hype". A key finding from their report is the inadequacy of regulations in the United States to assure the safety of bottled water. The results of their survey can be found at: www.nrdc.org/water/drinking/nbw.asp

For information about struggles to protect groundwater in the United States, see: www.saveamericaswater.com/

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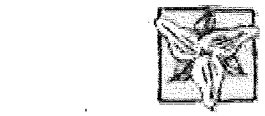

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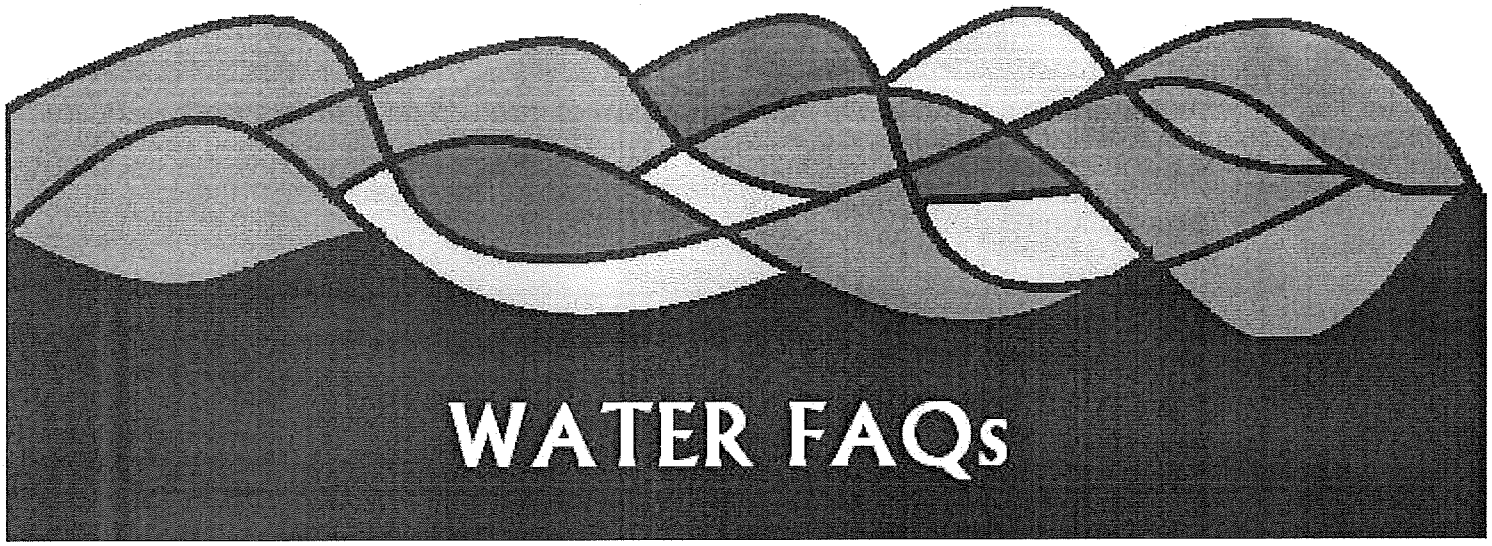

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Climate Change and Water FAQs (January 2004)

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1. What is Climate Change?

Climate change refers to altered long-term weather patterns. The most significant of these is global warming -- the gradual warming of the earth caused by carbon dioxide and other gases collecting like a blanket in the atmosphere.

Although temperatures around the globe fluctuate naturally, cooling and warming in different places at different times, the overall temperature of the earth has increased by more than half a degree Celsius since the beginning of the twentieth century. This rate of increase over the last hundred years has been the fastest and most dramatic in the history of the world.

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2. What is causing this rapid warming?

Carbon dioxide, nitrous oxide, and methane are becoming too concentrated in the atmosphere. These gases, called greenhouse gases, already exist naturally in the atmosphere in small concentrations. They allow sunlight to pass through and heat the earth. They also absorb heat radiated by the earth and return it back. In this way they warm the earth like glass warms a greenhouse. However, the unnatural release of these gases from burning fossil fuels has upset the balance of these gases in the atmosphere.

For more information on climate change and weather patterns, see the web site of the Meteorological Service of Canada: www.msc-smc.ec.gc.ca/saib/climate/climat_e.cfm

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3. How do we know what causes climate change?

Although greenhouse gases are released into the atmosphere naturally, the significant increases over the last century are clearly the result of human activity. Scientists have shown that the rate of increase in greenhouse gas emissions in the last 100 years matches the rate of increase of human-caused emissions.

This has been unequivocally confirmed by the Intergovernmental Panel on Climate Change (IPCC), a United Nations-sanctioned panel of hundreds of climate change experts convened to report on the science of climate change and to provide policy advice to governments. The IPCC in their 2001 report stated that "emissions of greenhouse gases...due to human activities continue

to alter the atmosphere in ways that are expected to affect the climate."

The IPCC has observed that changes consistent with warmer temperatures are already occurring. Mountain glaciers are retreating. There is reduced snow cover and earlier spring melting of ice on rivers and lakes, and the global sea level is rising.

To read the Climate Change 2001 reports of the IPCC, "The Scientific Basis" and "Impacts, Adaptation and Vulnerability" see: www.ipcc.ch/pub/pub.htm

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4. How fast is climate change happening?

The pace of the earth's warming is accelerating. The twentieth century was the warmest century of the last millennium. The 1990s were the warmest decade of the last century. And, 2003 was the third warmest year on record just behind 2002, the second warmest year on record. The hottest year on record is still 1998.

In this century, scientists expect a doubling of carbon dioxide concentrations in the atmosphere. They estimate that this could result in a global increase of temperatures between 1 and 6 degrees Celsius by the year 2100.

For updated information on changes in the world's temperature, see the press releases, particularly the year-end releases, of the World Meteorological Organization at: www.wmo.ch/web/Press/Press.html

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5. What are the sources of greenhouse gas emissions?

Carbon dioxide (the key factor in climate change) and other greenhouse gases come mainly from the exhaust pipes of cars, trucks and other vehicles, and from the stacks of power plants and industries that burn coal, oil, and gas.

In Canada the biggest source of carbon dioxide is transportation -- approximately one-quarter of the total. Industries are not far behind contributing 19 per cent. Electricity generation -- coal and natural gas-fired power plants -- accounts for a significant 16 per cent of emissions, while production of oil and natural gas mainly from the oil sands in Alberta is 15 per cent.

The other sources are residential heating and lighting at 8 percent. Commercial and institutional sectors are 4 per cent of the total.

Agricultural activities are responsible for 9 percent of Canada 's total greenhouse gas emissions. However, they are almost completely from non-energy sources. Rather than carbon dioxide, farming contributes two different greenhouse gases -- nitrous oxides from nitrogen fertilizers, and methane from livestock.

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6. What will the effects of climate change be?

The increase in global temperatures will cause more extreme weather events – more intense storms, flooding, droughts and hotter longer heat waves. Throughout the world it is expected that diseases like cholera and malaria will spread.

Simulations of Ontario 's climate suggest that here there will be an average annual warming of 2 to 5 degrees C by the end of the century. Rain and snow patterns will change bringing more frequent and heavier rainstorms but less snow and ice in the winter. This will mean an earlier snowmelt and more runoff in winter, and in summer less runoff and more dry spells.

Drier hotter summers will probably increase the number and severity of forest fires. There will be more heat waves in southern Ontario , and these very hot days are likely to cause more cases of heat stress and a higher incidence of air pollution. Warmer temperatures could extend the growing season in Ontario and increase yields. However, it is also likely that less rainfall could increase the need for irrigation, and that less snow cover could damage crops.

For more regional information on climate change in Ontario , see the web site of the Canadian Climate Impacts and Adaptation Research Network at: www.c-ciarn-ontario.ca/english/science.html

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7. What will the impact be on Ontario 's lakes and rivers?

Ontario 's water is very vulnerable to the effects of climate change. As a result, Ontario 's lakes and rivers are likely to experience the following problems:

- Water levels around the province will decline as moisture evaporates because of warmer temperatures and less ice cover. This would affect inland lakes and the Great Lakes where dramatic decreases in lake levels could occur. It is possible that the levels of all the Great Lakes will go down by one metre or more by the middle of the century. In shallow lakes such as Lake St. Clair and Lake Erie the existing shoreline could move up to six kilometres offshore.
- Water supplies from both groundwater and surface water are expected to decrease in southern Ontario . Because of seasonal changes in precipitation, the province's water supplies may suffer in summer when rainfall can't compensate for the drying effects. Reduced summer water levels can affect the recharge of groundwater causing small streams to dry up.
- Wetlands may shrink and disappear. This would harm spawning grounds, reduce wildlife habitat, and result in generally poorer water quality.
- Warmer summer temperatures in lakes and rivers will cause prized cold water fish such as lake trout, brook trout and whitefish to decline dramatically. Other cold water species such as muskie and walleye, along with warm water species such as bluegill and small mouth bass, may go northward, while new species move in from the south. Warmer temperatures will also extend the range of invasive species such as zebra mussel and carp.
- Lower water levels and warmer temperatures can increase concentrations of mercury and other contaminants in the food chain.
- The longer stratification of lakes in summer will increase, adding to the risk of oxygen depletion and the formation of deep water "dead zones". This could create problems for shallow lakes like Lake Ontario and Lake

Erie.
- Predictions of rising sea levels in the Atlantic coupled with lower flows from the Great Lakes have led some scientists to speculate that seawater could advance up the St. Lawrence River as far as Montreal altering freshwater ecosystems and compromising drinking water supplies.

For more information on the impacts on Ontario , see "Confronting Climate Change in the Great Lakes Region", released by the Suzuki Foundation in April 2003 at: www.davidsuzuki.org/climate_change/impacts/greatlakes.asp

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8. What are the economic effects in Ontario of changes in water levels and supply?

Lower water levels and water supplies can have serious economic consequences for Ontario :

- Lower water levels can affect the capacity of hydroelectric generation. In the Great Lakes record low levels in the 1960s caused losses of hydroelectric power between 19 and 26 per cent on the Niagara and St. Lawrence Rivers.
- Reduced ice levels in the Great Lakes could extend the shipping season. However, extremely low lake levels would limit the cargo capacity of vessels and increase operating costs of harbours and shipping channels because of the need for more dredging.
- With the loss of important sports fish species, the sports fishery would be damaged.
- Shoreline based infrastructure could be negatively affected by lower lake levels. Some docking facilities could become inaccessible. Municipalities would have to consider moving water intakes and sewage disposal outlets further out into the lakes in order to protect drinking water quality.
- Crops that have historically been grown in the Great Lakes Basin may no longer thrive in a warmer climate. More drought tolerant crops may need to be substituted.
- Extreme heat waves, similar to the ones that devastated Europe in the summer of 2003 could cause premature deaths, could occur, straining our health care systems and exceeding the capacity of our energy supplies to meet air conditioning demands.

For more information on the environmental and economic effects on the Great Lakes Basin, see the Report of the Great Lakes Water Quality Board to the International Joint Commission, "Climate Change and Water Quality in the Great Lakes Basin" at: www.ijc.org/php/publications/html/climate/index.html

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9. What are Justice O'Connor's recommendations on climate change from the Walkerton Commission of Inquiry?

Many people appearing at the Walkerton Inquiry raised the concern that climate change might affect the safety of future drinking water supplies. Justice O'Connor felt his mandate did not extend to long-term issues such as the impact of climate change.

Nevertheless, he suggested that certain recommendations, if implemented, would provide tools for adaptive management. These recommendations included preparing water budgets for watersheds to identify areas of vulnerability to water takings, improving contingency plans for extreme events, encouraging best management practices in rural areas to reduce sources of pollution, and encouraging community-based environmental stewardship.

The Report of the Walkerton Commission of Inquiry, part 2, Chapter Four (4.2.3), The Protection of Drinking Water Sources, contains Justice O'Connor's brief remarks on climate change. The Report is available at: www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/

The Walkerton report is also available in print from the Ontario Government Bookstore at: http://pubont.stores.gov.on.ca/pool/

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10. What legislation governs climate change?

Climate change is an international concern. Rather than a single national or provincial law governing climate change, there is an overarching international agreement that binds countries to reductions in greenhouse gases.

Under the sponsorship of the United Nations, Canada along with more than 150 other nations first signed the Framework Convention on Climate Change at the Earth Summit in Brazil in 1992. This was followed in 1997 by the negotiation of the Kyoto Protocol, an international agreement that sets specific targets to reduce greenhouse gas emissions.

Under the Kyoto Protocol Canada and other developed countries have made a commitment to reduce their emissions to 6 per cent of 1990 emissions levels. They agreed to meet these targets by the five-year period between 2008 and 2012.

This Protocol becomes legally binding when 55 countries responsible for 55 per cent of global 1990 carbon dioxide emissions sign the agreement. On December 17, 2002, Prime Minister Jean Chretien ratified the Kyoto Protocol on behalf of Canada . Although more than 100 countries have ratified the Protocol, these countries represent only 44 per cent of the world's carbon dioxide emissions.

The federal government and the provinces have been working together to formulate a plan for meeting these targets. In October 2000 Canada released its National Implementation Strategy on Climate Change and the First National Business Plan.

In 2002 the federal government issued "A Discussion Paper on Canada 's Contribution to Assessing Climate Change" and held cross-Canada forums on the different options to meet the targets of the Kyoto Protocol.

For more information on the status of the Kyoto Protocol, see the web site of the United Nations Framework Convention on Climate Change.

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11. Is Canada meeting the targets set by the Kyoto Protocol?

Canada 's greenhouse gas emissions have increased significantly since 1990, the benchmark year for greenhouse gas emissions. Although some important actions have been taken in the last decade to reduce greenhouse gas emissions primarily by industries, other factors have caused an overall increase. This means carbon dioxide emissions would have been even higher, had these reductions not been made.

The actual volume of emissions for the country is now about 726 million tonnes of greenhouse gases per year. The emissions goal for Canada under the Kyoto Protocol is 571 million tonnes. This represents 6 per cent less than the amount of carbon dioxide that Canada emitted in 1990. It means the government must make overall reductions 21 per cent from today's total to meet the targets agreed to in the Kyoto Protocol. If no action is taken – the "business as usual" scenario -- the emissions for the year 2010 are predicted to be 809 million tonnes annually.

In Ontario there has been a similar pattern of increases. Greenhouse gas emissions in the ten years between 1990 and 2000 rose 14 per cent – from 181 million tonnes to 207 million tonnes. These increases were primarily due to the increased reliance on coal-fired generating stations, the growing use of vehicles like minivans and Sport Utility Vehicles that are not as energy efficient as cars and to new low-density developments.

A report on the outlook for Canada 's greenhouse gas emissions, " Canada 's Emissions Outlook: An Update", December 1999, is available at the site of Natural Resources Canada at:

http://nrcan.gc.ca/es/ceo/update.htm

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12. What laws apply indirectly to climate change?

Although neither Canada nor Ontario has specific legislation directed at climate change, there are federal and provincial laws that can be used to reduce carbon dioxide emissions.

Federal legislation that applies to climate change includes:

- Fuel Efficiency Standards

  The Canadian government passed legislation in 1981 to limit car emissions – the *Motor Vehicle Consumption Standards Act* . However, this Act was never proclaimed. The fuel efficiency standards for Canadian automobiles were effectively set by American regulations in the mid 1980s when the U.S. established the Corporate Average Fuel Economy Standards. Canada currently has a voluntary agreement to meet U.S. fuel efficiency standards. These standards, however, have not been changed since the 1980s. The United States has not signed the Kyoto Protocol and has no obligation to improve their fuel efficiency standards. Canada, however, has voluntarily agreed to a new motor vehicle fuel efficiency initiative as part of the Canada Action Plan 2000, that would significantly reduce carbon dioxide emissions starting as early as 2004. Because cars, trucks and other vehicles contribute the largest percentage of carbon dioxide in Canada to the atmosphere, fuel efficiency is one of the most important areas to control.

- Model National Energy Code

  The federal government developed a Model National Energy Code for Buildings and a Model Energy Code for Homes that sets out minimum standards for energy efficiency in all new homes and buildings. Model Codes can be adopted by the provinces as regulations under their Building Code Acts. However, except for Quebec , none of the provinces have done this. Ontario has referenced the Model National Energy Code for Buildings in its Building Code.

In addition, Ontario has provincial legislation that it can apply to reduce carbon dioxide emissions:

- *Ontario Energy Efficiency Act*

  Under the *Ontario Energy Efficiency Act* , designated appliances and consumer products must meet government-imposed standards for energy efficiency. New efficiency standards under this Act can be added to improve the energy efficiency of all energy using products. The federal government also has an *Energy Efficiency Act* that applies to all dealers importing into Canada or shipping from one province to another.

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13. What can be done in Canada about climate change?

The only way to slow global warming is to reduce our reliance on burning fossil fuels.

The government of Canada has released a discussion paper that identifies the options being considered to meet the Kyoto targets. One option is to reduce carbon dioxide and other greenhouse gas emissions in Canada by targeting all sources. This would be done through incentives, covenants, and regulations in co-operation with federal, provincial and municipal governments. The proposals are a sector-by-sector catalogue of how to reduce carbon dioxide and other greenhouse gases in Canada :

Transportation:

- Improve new vehicle fuel efficiency;
- Require more gasoline in Canada to contain 10 per cent ethanol;
- Invest in public transit;
- Increase parking fees, introduce tolls and enforce speed limits;
- Encourage alternative fuels, anti-idling technology and replacement of older vehicles in the goods transport industry;
- Encourage production of bio-diesel fuel;
- Provide energy efficiency rebates for light duty vehicles;
- Link rail and road systems.

Environmentalists also argue that not only must improved fuel efficiency standards be set for new cars, but fuel efficiency standards must also be applied to Sport Utility Vehicles (SUVs), minivans and trucks.

Industries:

- Invest in energy efficiency measures;
- Make major investments in low emissions capital stock such as co-generation or electric arc furnaces.

Electricity Generation:

- Encourage zero or low emission technology for all new generating stations;
- Reduce emissions from existing generating stations;
- Expand east-west transmission systems;
- Increase hydraulic generation;
- Develop and commercialize technologies for clean coal combustion;
- Retrofit western coal plants with carbon dioxide capture and storage;
- Expand and extend renewable energy production incentives.

In Ontario the government has been looking at ways to phase out coal-fired electric generating plants. However, they have not yet presented a clear plan. Environmental groups have urged Ontario to replace coal with cleaner-burning natural gas while making a transition to renewable energy sources such as wind, water and biogas. They have also urged the establishment of an energy conservation board. CELA and other environmental groups also urge the phase-out of nuclear power in Ontario by 2020.

For more information on Ontario 's energy alternatives, see the web site of the Clean Air Alliance.

Or, see the report "Phasing Out Nuclear Power in Canada – Toward Sustainable Electricity Futures" on the web site of the Campaign for Nuclear Phaseout.

For information on one municipality's efforts to reduce their contribution to climate change see: www.toronto.ca/taf/

Oil and Gas Production:

- Reduce leaks from natural gas production, processing, transmission and distribution;
- Improve the capture and recovery of carbon dioxide from oil sands production;
- Reduce flaring from oil production.

Residential and Commercial Buildings:

- Require that all new homes meet R2000 standards;
- Require that all new buildings exceed the Model National Energy Code;
- Provide incentives to accelerate retrofits on existing buildings;
- Require that all space and water heaters using fossil fuels attain technically feasible performance levels.

Agriculture:

- Provide rebates on soil testing and payments to change fertilizer

application;
- Encourage conservation tillage through incentive payments;
- Improve grazing management by providing incentives to bring more land under improved management regimes;
- Reduce nitrous oxide emissions from livestock by providing some costs of feed analysis.

Municipalities should also be setting up systems for the capture of methane gas from landfills, and finding ways to encourage planning that reduces energy use.

Under the Kyoto Protocol, there are three Mechanisms that allow countries and companies to buy or generate permits from emissions reductions abroad. The federal government has proposed two other options that incorporate these mechanisms – domestic emissions trading, and government purchases of international permits.

For the complete "Discussion Paper on Canada 's Contribution for Addressing Climate Change", see:
www.climatechange.gc.ca/english/actions/what_are/canadascontribution/

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14. What can I do to help alleviate the problems of climate change?

- Practice energy efficiency at home:

  The federal government is offering grants to encourage homeowners to retrofit their homes. Under the Government of Canada Action Plan 2000 on Climate Change, Canada set a goal for energy efficient retrofits of 20 per cent of existing low rise housing by 2010 as part of its commitment to meet the targets of the Kyoto Protocol. This program starts in the fall of 2003.

  For more details, see the web site of Natural Resources Canada's Office of Energy Efficiency at:
  http://oee.nrcan.gc.ca/houses-maisons/english/homeowners/grant/grant.cfm

- Choose your vehicle carefully:

  An energy efficient car or truck contributes far less carbon dioxide to the atmosphere than a Sport Utility Vehicle (SUV). In Ontario emissions from transportation increased from 29 million tonnes in 1990 to 33 million tonnes in 2000. Emissions from cars actually decreased by 2 million tonnes over the decade but emissions from SUVs, trucks and minivans increased by 6 million tonnes because they are less fuel-efficient than cars. Or, instead of relying on cars, choose public transit, bicycle or walk.

For more information on how to reduce energy use, see Environment Canada's suggestions at: www.ec.gc.ca/climate/action_youdo-e.html

Or, the Ontario Ministry of Energy's Energy-Saving Tips at:
www.energy.gov.on.ca/index.cfm?fuseaction=conservation.tips

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15. What are the views of the Canadian Environmental Law Association on climate change?

The Canadian Environmental Law Association (CELA) believes that all regulations and programs should incorporate the precautionary principle. CELA advocates the phase-out of coal and nuclear generation in Ontario and across Canada, as well as measures to reduce sprawl and to increase the use of energy-efficient transportation. CELA also advocates conservation as a significant tool to reduce energy and water consumption.

See the Water Financing FAQ and Water Conservation FAQ

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16. Where can I find more information on climate change in Ontario?

The International Joint Commission (IJC) has identified Climate Change as one of its priorities for 2002-2003. In September 2003 at the Biennial meeting of the IJC the Great Lakes Water Quality Board also released its report, "Climate Change and Water Quality in the Great Lakes Basin", available at: www.ijc.org/php/publications/html/climate/index.html

For more information on the impacts on Ontario , see "Confronting Climate Change in the Great Lakes Region", released by the Suzuki Foundation in April 2003 at: www.davidsuzuki.org/climate_change/impacts/greatlakes.asp

The Ontario Ministry of the Environment's report on climate change, "Air Quality and Climate Change", can be seen at: www.ene.gov.on.ca/programs/4143e.pdf

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17. Where can I find more information on other provinces and other jurisdictions?

The Ministry of Natural Resources is the lead Ministry on climate change for the government of Canada . For general information on Canada, the provinces and climate change, see: http://climatechange.nrcan.gc.ca/

The United States has decided that it will not ratify the Kyoto Protocol although they have the highest dioxide emissions in the world. For information on the United States and other countries, see the U.S. Environmental Protection Agency's climate change information at: http://yosemite.epa.gov/oar/globalwarming.nsf/content/index.html

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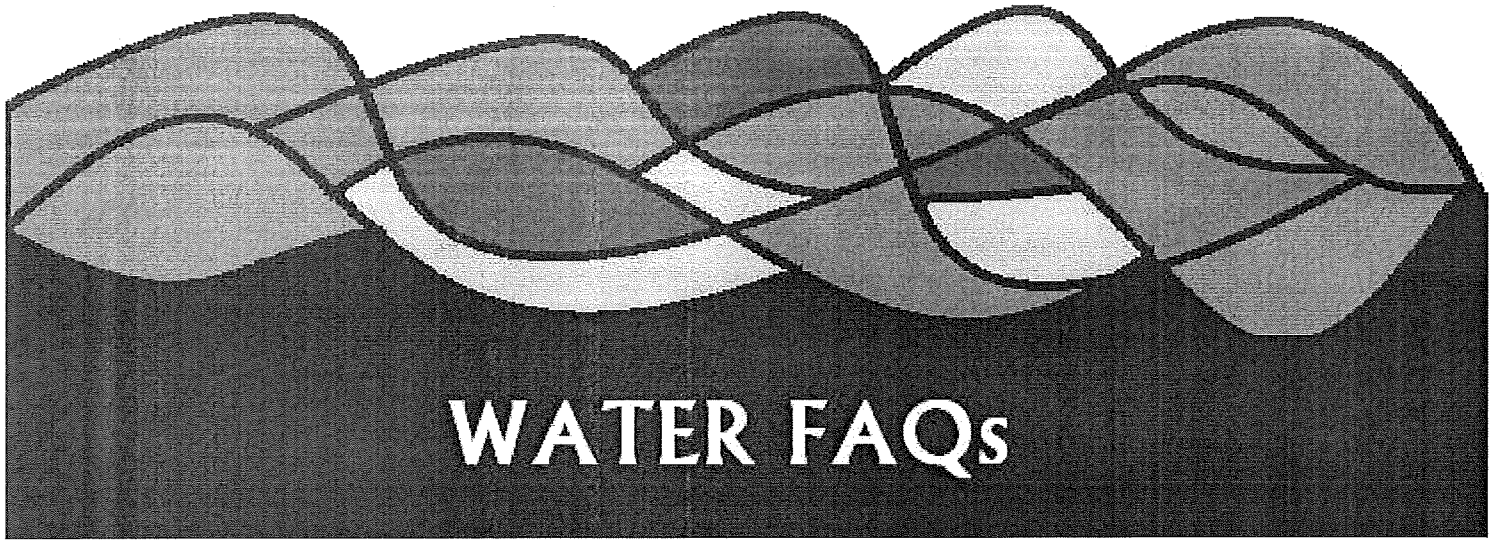

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Global Water Challenges FAQ (January 2004)

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1. Does the world have enough water?

Millions of people in the world today do not have access to clean safe drinking water. According to the United Nations, more than 1.1 billion people cannot find safe water. This is nearly 20 per cent of the world's population.

And the number of people without safe water is expected to rise as the population grows and more water supplies become contaminated or depleted. By 2025, almost 50 per cent of the world's population – around 3.5 billion people -- will be struggling to find enough water to meet their basic needs.

Concern is mounting that climate change could also increase these projections.

Although precipitation may increase in some northern areas as a result of climate change, many tropical and sub-tropical regions, where rainfall is already a problem, will probably get less. As a result, rivers and streams in these areas are likely to have longer, drier periods. Climate change is also predicted to bring extreme weather conditions such as floods, droughts, typhoons and cyclones. These effects could reduce the amount of freshwater available in countries already facing shortages.

See the Climate Change and Water FAQ

For statistics on world population and water use, see the United Nations' "World Water Development Report" available at: www.unesco.org/water/wwap/wwdr/index.shtml

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2. Why are there problems with water?

Only 2 percent of the water available on earth is fresh water, and this water is not evenly distributed around the globe. Many of the largest river basins in the world run through thinly populated regions, while, in many populated areas, there is much less water than people need.

In these parts of the world we are running up water deficits – using more water than is being replaced naturally. This is not only because of an expanding population, but also because of increasing demands for agricultural irrigation, for industry, urbanization and rising living standards. In fact global water consumption rose sixfold in the last century – more than double the rate of population growth.

It is estimated that in 1996, 54 per cent of all the available freshwater in the world was being used. By 2025 this is expected to climb to 70 per cent – just to meet the needs of a growing population. This does not take into account that people in wealthier parts of the world are increasing their individual (per capita) use of water. Already North Americans consume three times the amount of water that Europeans do and more than 30 times the amount used by people in developing countries.

In addition, pollution has aggravated the problems with the world's water supply. Agricultural chemicals, sewage effluents and industrial pollution continue to contaminate freshwater all over the world.

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3. Which countries have the most serious water shortages?

Several countries and regions are already facing critical shortages of water. Most of these countries are in the Near East and North Africa, or in sub-Saharan Africa. Water tables are also falling in northern China, northwest

India, parts of Pakistan, the United States, and the Middle East . For example:

- In the important agricultural areas of Northern China there are severe and increasing water shortages. Water extraction has led to falling groundwater tables in the North China Plain. And, so much water is being taken from the Yellow River in northern China that the lower part of the river now dries up several months of the year before it reaches the sea.
- In the United States, too, groundwater is being used at a rate 25 per cent greater than it is being replenished. The huge Ogallala aquifer that lies under 6 states is heavily mined for irrigation in the southwest and has lost more than half its water in some regions. States, such as Arizona and California, will soon face water shortages.
- Twenty countries in North Africa and the Middle East have the most immediate problems. Jordan and Yemen, for example, draw 30 per cent more water from the ground than is being replenished ever year. Many of the Gulf states that have almost run out of freshwater now rely on desalinization -- converting seawater into freshwater – for their daily needs.
- In southeastern Pakistan, for three years farmers have been demonstrating in protest over the lack of water in the southern part of the Indus River, one of the largest rivers in the world. After decades of building dams and canals upstream, problems with water scarcity in the southeastern part of the country have been compounded by recent droughts. In its last eighty miles the Indus River carries only a ribbon of salt water draining back from the Arabian Sea. More than a million acres of once fertile farmland in the river's delta are now covered by the sea, forcing thousands of people into the slums of Karachi .
- In Spain water has also pitted the northern part of the country against the south. The government has announced a plan to re-route the Ebro, Spain 's longest river, through a pipeline running from the north to the more arid southeastern regions. This megaproject will destroy an ecologically important wetland, flood many valleys and villages in the Pyrenees and require the construction of 100 dams.
- Around the world rivers are shared by many countries. Africa has 50 rivers like the Nile that are used by two or more countries. Egypt is almost entirely dependent on the lower Nile River that is also used to its maximum capacity by Sudan and Ethiopia . When any one country withdraws water from the Nile now, it does so at the expense of the other two countries. By necessity these countries must work out agreements over the joint use of these water resources. However, with the populations escalating in all three countries, they could face serious water conflicts in the future.

For more information, see "Solutions for a Water-Short World", prepared by Population Reports for John Hopkins School of Public Health, at: www.infoforhealth.org/pr/m14edsum.shtml

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4. What are the consequences of taking too much water?

Freshwater is perhaps the most critical resource issue in the world. Unless action is taken to manage the world's water more effectively, water shortages will have many far-reaching and undesirable consequences:

- Lack of safe available water will cause more disease and death.

Nearly 2.4 billion people of world's 6 billion people do not have adequate sanitation, according to the United Nations. They are forced to use contaminated water for drinking, washing and cooking. As a result, water-borne diseases take a high toll, causing illness and death in many developing countries, primarily Asia and Africa. It is estimated that polluted water contributes to the deaths of 5 million children each year from diarrheal diseases.

- Water shortages will result in food shortages around the world.

Powerful diesel and electrically-driven pumps have led to the drilling of millions of wells and the overpumping of water from water tables that are unable to fully recharge and are falling rapidly. As well, many of the world's most important rivers are being used so heavily for irrigation that they no longer flow at the same level with the same volume of water.

Agricultural irrigation accounts for about 70 per cent of the freshwater being used in the world. Because so much water is used for irrigation, as water tables and rivers are depleted, shortages of water will cause food shortages.

Northern China and India are important food-growing regions where water tables are going steadily down. They both produce large quantities of grain and rice. As the water tables drop, these countries will no longer be able to sustain the same level of agricultural production, and the amount of rice and grain being grown will also fall resulting in serious food shortages and possibly famine.

For more information on global water shortages, see press releases by Sandra Postel, director of the Global Water Policy Project of the Worldwatch Institute at: www.worldwatch.org/

- Consumption and degradation of water cause damage to the environment, such as loss of habitat and biodiversity.

In virtually the whole world, careless use of water has damaged the natural environment.

Freshwater is needed to sustain marshes and wetlands where millions of species of fish, birds and other wildlife live. As these wetlands are filled in and converted to agriculture or development, valuable habitat is destroyed and species are lost. Over 20 per cent of freshwater fish species are either endangered or vulnerable. Many species have become extinct. California, for example, has lost 90 per cent of its wetlands and, with this loss of habitat, nearly two thirds of its native fish are extinct or in decline.

When freshwater rivers are polluted, they contribute to the deterioration of coastal waters by ushering these contaminants into the sea. When rivers are so exploited that they can no longer flow to the sea, rich river deltas are destroyed and become salty wastelands. The United Nations found that half of all coastal regions, where 1 billion people live, have been degraded through pollution or overdevelopment.

- Disputes over water could lead to political instability and even wars.

As water becomes scarce, it becomes more valuable. Many experts have predicted that water will replace oil as the most likely resource to trigger wars. In water-starved areas like the Middle East, water is a potential source of

conflict in a part of the world where there are already many other explosive political problems.

Water resources are not usually the source of war, but there is a long history of conflicts over water resources. Competition between countries, and within countries, for scarce water is already causing tensions. In India, in 1992 over 50 people were killed in riots over the allocation of water for irrigation. These conflicts threaten to escalate unless water management can be improved.

Peter Gleick at the Pacific Institute has collected a chronology of historical data on water-related conflicts, available at: www. worldwater.org

To demonstrate how water is fast being viewed as a potential cause for global conflict, there are academic studies underway, including the Woodrow Wilson Center's Environmental Change & Security Project, called "Navigating Peace: Forging New Water Partnerships". It can be found at: http://wwics.si.edu/index.cfm?topic_id =1413&fuseaction=topics.item&news_id=25569

There is also a transboundary Freshwater Dispute Datadase Project that lists transboundary agreements over water available at: www.transboundarywaters.orst.edu/

- Water shortages will cause economic problems.

The Aral Sea in the former Soviet Union is a striking example of a freshwater lake that has become an environmental and economic disaster. Two rivers that flowed into the Aral Sea were diverted to desert regions of Uzbekistan to grow cotton, an extremely water-intensive crop. As cotton grew, the Aral Sea shrank losing 75 per cent of its volume. Seaside resorts and fishing villages now sit miles away from the shoreline of the Sea. The fisheries, canneries and shipbuilding industries that once thrived are gone, and a large part of the exposed lakebed has become heavily salted toxic dust. It is predicted that the Aral Sea – at one time larger than all the Great Lakes except Superior -- will be completely gone in ten years, and with it, the livelihood of the whole region.

For more information on the Aral Sea, see: www.envirolit eracy.org/article.php/519.html

- Water problems cause cultural losses and destroy the lives of many aboriginal peoples.

Large projects, such as dams and canals, have boosted agriculture in some areas, often at the expense of people living downstream. Without water for farming or fishing and unable to make a living, many people are forced into cities. These forced migrations destroy the lives of many indigenous peoples and destroy their unique cultures.

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5. What can be done to anticipate and prevent these problems?

In the middle of this century engineered solutions such as dams, canals and pipelines were favoured as solutions to solving water problems. However, the environmental consequences of many of these projects were not considered, and experience has shown that, not only were these projects costly, but the

environmental losses were severe. Although there are still pressures for large construction projects in many developing countries, local solutions exist that are affordable, effective and much more easily implemented.

- Alter irrigation and farming practices

Since agriculture accounts for 70 per cent of water use, the greatest potential for conservation is by increasing the efficiency of irrigation. More than half the water used for irrigation is wasted through evaporation or runoff.

Drip irrigation - the use of piping installed on the surface or below ground to deliver water directly to the roots of crops - is one technique that is being used to improve the efficiency of irrigation. Another method - low-energy precision application - delivers water in a more targeted way than sprinkler spray systems. In poorer areas, farmers are going back to ancient methods of collecting water in rainy periods for use in the dry season.

- Reusing water

Treated urban sewage can be recycled by using it to fertilize farm fields. In Calcutta, India, raw sewage is channeled into a system of natural lagoons where fish are raised. The lagoons act as natural water treatment systems. Lagoons and wetlands can be an alternative to modern water treatment systems in poor urban areas of the world.

- Improve land use planning

Paving over natural areas causes increased stormwater runoff, non-point source pollution, and loss of agricultural lands and forests. Land use planning can prevent or mitigate water problems by directing development to areas where it will do the least damage to water resources. Sensitive wetlands, for example, should be protected from urban development.

- Protect sources of drinking water

Many communities are acknowledging the importance of protecting their sources of drinking water as the first step in a multi-barrier approach to safe, clean drinking water. In the United States , the *Safe Drinking Water Act* requires every community to assess its drinking water source. One of the largest cities in the world, New York City, has developed an extensive agreement with neighbouring communities, and invested millions of dollars, to protect reservoirs in upstate New York that supply drinking water to the city from contamination.

- Practice water conservation

Better management can alleviate the strain on water supplies. Twenty per cent of water is used by industry, and 10 per cent for household use.

Many industries, such as steel, pulp and paper and the chemical industry, are extremely water intensive. Driven by costs to reduce water use, some of these industries have developed processes that recycle and reuse water. In developing countries, such as China , however, industries rarely treat their wastewater, and conservation and recycling are limited. Processes for reusing and recycling water need to be adopted by industries worldwide.

Governments can introduce metering or other pricing structures for municipal water services that promote conservation while still protecting the poor from unaffordable price increases. Individuals can reduce their water use by installing water saving devices such as low-flow showerheads or water-efficient toilets.

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6. What is being done on an international level to address global water problems?

The provision of safe drinking water to desperate communities has become the focus of global, as well as local, debates. Large institutions, like the World Bank and the United Nations Environment Program, are now wrestling with questions of water security -- how to sustain water supplies to developing nations, how to avoid water conflicts, and how to ensure that there is adequate water to grow food for the world's population.

One of the major problems with supplying safe clean drinking water has been the chronic underfunding of water and sewage treatment systems. The United Nations estimates that more than $20 billion a year is needed for more than 10 years to provide clean water and sanitation to the poorest countries in the world. Although this problem is most severe in developing countries, even in North America and Europe governments have failed to provide adequate funding to maintain water delivery systems.

A number of international conferences have been held in the last 15 years to focus attention on these issues and to stimulate action. Many of the conferences have embraced laudable goals but progress towards these goals has been limited. At one of the most influential -- the United Nations Summit held in 2000 -- the United Nations' Millennium Declaration set a goal for the year 2015 to reduce the number of people without access to safe drinking water by half.

The conferences have also become forums for a debate over whether water should be viewed as an economic good or a public trust. Several global water forums in the 1990s called upon the private sector to finance solutions by making water a public good. For example, the International Conference on Water and the Environment in Dublin in 1992 offered the four Dublin principles:

> 1) fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment,
>
> 2) water development and management should be based on a participatory approach involving users, planner and policymakers at all levels,
>
> 3) women play a central part in the provision, management and safeguarding of water, and
>
> 4) water has an economic value in all its competing uses and should be recognized as an economic good.

The World Water Council, a group that includes the World Bank, the United Nations Environment Program, governments and global water companies, has sponsored three World Water Forums - the First World Water Forum in Marrakech, Morocco in 1997, the Second in the Hague, the Netherlands in

2000, and the Third World Water Forum in Kyoto, Japan in 2003. These forums have promoted a shift in responsibility for water from the public sector to the private sector embracing the idea that private sector management of water would provide improved efficiencies.

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7. Should water be an economic good or a human right?

The transfer of water from public to private ownership has been opposed by many non-governmental organizations and civil society groups present at these conferences. They have raised concerns about the implications of the private sector obtaining contracts that give them control over water resources in exchange for investment. Members of these groups with direct experience of privatized water and wastewater have drafted dissenting statements promoting an alternative vision of water - that water is a basic human right, not a public good.

They have also argued that, if water becomes an article of trade, it would be subject to international trade agreements such as the General Agreement on Trade in Services (GATS). Trade panels could, then, make water management decision without any knowledge of the social or environmental consequences of their actions.

The World Bank has promoted the privatization model by making loans for water services to developing countries conditional on privatization and full cost recovery. Recent high profile failures, however, have put the viability of this model in doubt for two reasons - first, privatization initiatives have met with considerable public opposition, and second, companies have lost millions on their investments in water services.

In Ghana , for example, fierce protests and allegations of corruption forced the World Bank to withdraw from a major contract to provide water for the capital city, Accra .

One of the world's largest water companies, Suez, lost millions of dollars in Argentina after the economy collapsed and its private water concessions were no longer economically viable. It also withdrew from its commitments in Manila, capital of the Philippines, after a currency collapse there caused heavy financial losses.

The world's largest multinational water companies – Suez, Vivendi and Saur – are all now reconsidering their investments, and Suez has already announced that it is withdrawing from further ventures in developing countries because they consider the risks to be too great.

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8. How should water services be provided?

Although 95 per cent of the water treatment facilities around the world have been publicly owned and run, private companies have been increasingly involved in taking over public water supplies, particularly in poor countries.

The willingness of private sector companies to take over public services for profit has led to an examination of different models of delivering water services. Governments around the world, both large and small, are

considering the structure of water services and how to make water accessible and affordable.

There are a variety of models in use for governance of water utilities that include a spectrum from fully public to fully private. Different models may be appropriate for different places depending on the local culture and history. For example, a cooperatively run system in Santa Cruz, Bolivia, has been very successful and is considered to be a better service than the privately-managed system in La Paz or the municipally-run system of Cochabamba.

Even in Canada, different models have been adopted across the country. In Edmonton, a corporatized utility, Epcor, owned by the City of Edmonton, runs both water and electricity services for the city and has recently been contracted by the town of Canmore in British Columbia to manage their water supplies. In the region around Vancouver, the municipal governments have joined together to purchase water from a collectively managed water system. One of the oldest examples of a public-private partnership is Hamilton where ten years ago the City Council gave the management and operation of its water and wastewater treatment systems to a private operator. In ten years the contract was carried out by four different companies.

These different models are identified and discussed in a recent report, sponsored by the Federation of Canadian Municipalities and the University of Toronto 's Munk Institute Program on Water. They are:

- Direct ownership and operation by the municipal government;
- Operation by a municipal board or commission with municipal government ownership;
- Creation of a user-owned cooperative as owner and operator of water utilities;
- Creation of a government-owned Crown corporation as operator;
- Creation of a corporate utility owned either by government or a private company;
- Delegated management of water services;
- Direct ownership and operation by a private company;

The full report, "Good Governance in Restructuring Water Supply: A Handbook", is available at the website of the Federation of Canadian Municipalities at: http://kn.fcm.ca

Or, at the website of the Munk Institute Program on Water at: www.powi.ca

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9. What are the views of the Canadian Environmental Law Association on global water issues?

The Canadian Environmental Law Association (CELA) has been researching water governance options since the previous government of Ontario announced their intent to privatize Ontario water systems. For Phase II of the Walkerton Commission of Inquiry, CELA was invited by Justice O'Connor to author a report on the benefits of keeping water in public control. This report is entitled "Water Services in Ontario: For the Public, By the Public -- Submission from the Canadian Environmental Law Association in conjunction with the Canadian Union of Public Employees and the Ontario Public Service Employees Union to Part II of the Walkerton Inquiry".

CELA has also been active for several decades in international water management issues in the Great Lakes Region. Most recently CELA has worked on an advisory committee to the negoiations to draft a legally binding regime shared among the Great Lakes States and Provinces to prevent harmful water withdrawals from the Great Lakes.

See the Great Lakes and St. Lawrence River Ecosystem FAQ

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10. How can I find out more about global water issues?

For more information on water privatization and the first decade of global water privatization, see the investigative report, "Water Barons", presented by the International Consortium of Investigative Journalists and the Canadian Broadcasting Corporation at: www.icij.org,
or at: www.cbc.ca/news/features/water/business.html

The Canadian Union of Public Employees (CUPE) has been monitoring privatization projects in Canada . Information from a union perspective is available on their website at: www.cupe.ca/www/P3Alerts

Information on private/public partnerships from the Canadian business perspective is available at: www.pppcouncil.ca

In the United States, a non-governmental organization, Public Citizen, has the "Water for All Campaign". Information on public ownership versus privatization can be found on their website at: www.citizen.org/cmep/Water/

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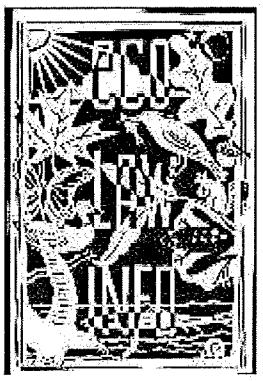

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