

Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem

THIS AGREEMENT IS EFFECTIVE THE X DAY OF XXXXXX, 2007

BETWEEN

HER MAJESTY THE QUEEN IN RIGHT OF CANADA (CANADA)

AND

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO (ONTARIO)

**THE 2007 AGREEMENT BETWEEN CANADA AND ONTARIO RESPECTING
THE GREAT LAKES BASIN ECOSYSTEM**

WHEREAS Canada and Ontario (the Parties) affirm that this Agreement is guided by the shared vision of a healthy, prosperous and sustainable Great Lakes Basin Ecosystem for present and future generations;

AND WHEREAS the Parties recognize human dependence on the Great Lakes Basin as it is the home to approximately one-third of Canada's population, contains eight of Canada's twenty largest cities, and the Great Lakes directly provide drinking water to over eight million residents of Ontario;

AND WHEREAS the Parties acknowledge that the Great Lakes Basin plays a vital role in the physical, social and economic life of Canada, supporting almost 40 per cent of Canada's gross domestic product, 25 per cent of Canada's agricultural production, and more than 50 per cent of Canada's manufacturing activity;

AND WHEREAS the Parties acknowledge that the Great Lakes contain approximately 20 per cent of the surface freshwater in the world, and that less than 1 per cent of the water is renewed annually by precipitation;

AND WHEREAS the Parties acknowledge that the Basin is ecologically important, supporting outstanding biological diversity and significant fisheries;

AND WHEREAS since 1971 the Parties have worked together through a series of Canada-Ontario Agreements Respecting the Great Lakes Basin Ecosystem that have guided their efforts to improve the environmental quality of the Basin and contributed to meeting Canada's obligations under the Canada-United States Great Lakes Water Quality Agreement;

AND WHEREAS the efforts of Basin residents, Aboriginal communities, municipalities, conservation authorities, agriculture, industrial and other business sectors, non-government organizations, academia and other members of the Great Lakes community have contributed to the restoration and protection of the Great Lakes Basin Ecosystem;

AND WHEREAS the Parties recognize that progress has been made in the Basin in reducing the release of harmful pollutants, improving and protecting fish and wildlife habitat, and fostering a sense of stewardship throughout the region;

AND WHEREAS the Parties recognize that, despite the progress made, the Great Lakes are currently exhibiting symptoms of stress due to human activities undertaken within the Basin and elsewhere in the world;

AND WHEREAS the Parties reaffirm their commitment to work together in respect of the Canada-United States Great Lakes Water Quality Agreement and in a manner consistent with the vision and purpose of this Agreement;

AND WHEREAS the Parties are committed to continuing to work together to restore, protect and conserve the environmental quality of the Basin for present and future generations;

NOW THEREFORE the Parties have agreed as follows:

ARTICLE I

DEFINITIONS

In this Agreement:

- (a) "Agreement" means the Canada-Ontario 2007 Agreement Respecting the Great Lakes Basin Ecosystem, including the Annexes.
- (b) "Basin" means the five Great Lakes and the St. Lawrence River, to the Ontario and Quebec border, and includes the lands and surrounding waters which drain into them.
- (c) "Canada-United States Great Lakes Water Quality Agreement" means the revised Canada-United States Great Lakes Water Quality Agreement of 1978 as amended by Protocol in 1987.
- (d) "Ecosystem" means the air, land, water and living organisms (including humans) and their interactions.

ARTICLE II

PURPOSE

- 1. The purpose of this Agreement is to restore, protect and conserve the Great Lakes Basin Ecosystem in order to assist in achieving the vision of a healthy, prosperous and sustainable Basin Ecosystem for present and future generations.
- 2. The Parties commit to continuing to work together in a cooperative, coordinated and integrated fashion, with each other and with others in the Basin, to achieve the vision.

3. To achieve the vision, the Agreement:
 - (a) establishes principles which will guide the actions of the Parties;
 - (b) describes the development of Annexes to respond to existing or emerging environmental issues;
 - (c) sets in place administrative arrangements for the effective and efficient management of the Agreement;
 - (d) establishes common priorities, goals, and results for the restoration, protection and conservation of the Basin Ecosystem; and
 - (e) establishes a commitment to report on the progress being made in achieving the goals and results of the Agreement.
4. By defining a vision for the Basin, specific goals and results, and the commitment to action by the Parties, this Agreement is intended to give momentum to wider efforts and to facilitate collaborative arrangements and collective action among all people and organizations with an interest in the Basin.
5. Implementation of this Agreement will contribute to meeting Canada's obligations under the Canada-United States Great Lakes Water Quality Agreement.

ARTICLE III

PRINCIPLES

1. The following principles will direct and guide the actions of the Parties under the Agreement:
 - (a) **Accountability** – remain accountable to citizens by establishing clear goals, results and commitments for this Agreement and reporting regularly on progress in relation to environmental conditions.
 - (b) **Adaptive Management** – conduct activities with openness, continuous learning, innovation, and improvement ensures effective and efficient management of the Agreement.
 - (c) **Collaboration and Cooperation** – ensure that the decision-making process incorporates consideration of public and Great Lakes community opinions and advice, and provide the Great Lakes

community with meaningful opportunities to consult, to advise and to participate directly in activities that support the Agreement.

- (d) Communication – ensure effective methods are used to inform the public of the importance of the Great Lakes, the increasingly complex environmental challenges faced by the Great Lakes and ongoing efforts to overcome the challenges, and to encourage collaborative and individual action and stewardship to protect the Great Lakes.
- (e) Conservation – promote the conservation of energy, water and other resources to sustain the physical, chemical and biological integrity of the Basin Ecosystem.
- (f) Ecosystem Approach – make decisions that recognize the interdependence of land, air, water and living organisms, including humans, and seek to maximize benefits to the entire Basin Ecosystem.
- (g) Free Exchange of Information – data will be collected once, closest to the source, in the most efficient manner possible and will be shared.
- (h) Net Gain – design human development and management actions to maximize environmental benefits rather than acting only to minimize environmental costs.
- (i) Pollution Prevention – use processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to the environment or human health.
- (j) Pollution Reduction – continue to work towards the virtual elimination of persistent toxic substances and reductions in other types of pollution.
- (k) Precautionary Principle – where there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- (l) Rehabilitation – restore environmental quality where it has been degraded by human activity.
- (m) Science-Based Management – provide advice to establish management priorities, policies and programs based on best

available science, research and knowledge including traditional ecological knowledge.

- (n) Sustainability – consider social, economic and environmental demands to balance the needs of the present without compromising the ability of future generations to meet their own needs.

ARTICLE IV

ANNEXES

1. The Parties agree to implement Annexes that focus on environmental issues that are a priority for the Parties and will benefit from co-operative and coordinated action.
2. Each Annex will specify:
 - (a) goals for the Basin Ecosystem specific to the subject of the Annex, and that, in the opinion of the Parties, are reasonable and desirable to achieve over the duration of the Annex;
 - (b) results that the Parties will pursue in order to contribute towards the achievement of the stated goals; and
 - (c) commitments each of the Parties will deliver jointly or separately over the duration of the Annex in order to contribute to the achievement of the stated goals and results.
3. Annexes may be developed at any time, and will come into force upon signing by the Parties. Annexes will remain in force until the expiry of this Agreement, unless an earlier expiry date is specified in the Annex. Annexes may be terminated by either Party giving the other at least three months written notice. If the Parties terminate the Agreement, Annexes are terminated as well. The Parties commit to conducting public consultations when developing or terminating Annexes.
4. Annexes may be amended by the Parties. The Parties commit to conducting public consultations when amending Annexes. An amendment will be confirmed by an exchange of letters by the Parties setting out the amendment and its effective date.
5. If either Party is unable to fulfill its obligations, as specified within an Annex, a minimum of six months prior, written notice must be provided to the other Party.

ARTICLE V

RESOURCES

The Parties commit to providing the resources needed to implement the Agreement and the Annexes pursuant to it, subject to there being an appropriation for such purposes in Parliament or the Legislature, as the case may be, in the relevant fiscal year. The Parties agree to create opportunities for others to contribute to achieving the vision of the Agreement.

ARTICLE VI

MANAGEMENT COMMITTEE

1. The management of the Agreement will be entrusted to a Management Committee. The Committee will consist of Regional Director General and Assistant Deputy Minister level representatives from all departments, ministries and agencies of the Parties who are participants in any one or more of the Annexes. The Committee will be co-chaired by Environment Canada and the Ontario Ministry of the Environment.
2. The Management Committee will be responsible for:
 - (a) setting priorities and establishing strategies as necessary to ensure the delivery of the goals, results and commitments of the Agreement;
 - (b) evaluating annual assessments of the Agreement against goals, results and commitments outlined in the Annexes, and recommending amendments or other action as appropriate;
 - (c) conducting ongoing evaluations of the administration and implementation of the Agreement as well as promoting any actions needed for continuous improvement;
 - (d) facilitating the free exchange of information pertaining to the Agreement between departments, ministries and agencies of the Parties to ensure the effective coordination of actions;
 - (e) addressing the implications of changes or adjustments to government policy, programs or resourcing that may affect the ability of the Parties to meet the commitments set out in the Agreement;

- (f) overseeing the development and amendment of Annexes, as necessary;
- (g) reporting to the public on progress in a manner that is meaningful, timely, reliable and in plain language;
- (h) overseeing the delivery of other communications activities in a consistent, effective and cooperative fashion.
- (i) pursuing opportunities for engagement and cooperation with the Great Lakes community; and
- (j) developing common positions and joint action plans for representing Canadian interests and engaging in cooperative initiatives with United States agencies and the International Joint Commission.

ARTICLE VII

ANNEX IMPLEMENTATION

1. The implementation of the goals, results and commitments will be entrusted to an Annex Implementation Committee. The Committee will include a co-chair from Environment Canada and co-chair from the Ontario Ministry of the Environment, the leads of each Annex, as well as Director-Managerial level representatives from all departments, ministries, and agencies of the Parties who are responsible for leading or supporting the delivery of one or more commitments in the Annexes and/or the communications strategy.
2. The Annex Implementation Committee will be responsible for:
 - (a) coordinating and managing the implementation actions of the Parties to ensure effective, efficient and timely implementation and delivery of Agreement goals, results and commitments;
 - (b) seeking out opportunities for enhanced cooperation, collaboration and integration of activity between the Parties, the Great Lakes community and the public to deliver the goals, results and commitments of the Agreement;
 - (c) recommending a course of action to the Management Committee when more authority or policy direction is required, to effectively deliver on the goals, results and commitments of the Agreement;

- (d) coordinating the internal annual assessment of the Agreement against the goals, results, and commitments and presenting it to the Management Committee for review along with any required recommendations relating to implementation; and
 - (e) developing, reviewing and ensuring the accuracy and value to the Parties, the Great Lakes community and the public of communications products.
3. To manage the implementation of each Annex, the Parties will establish federal/provincial Annex Leads and Annex Teams to:
- (a) oversee Annex-specific coordination, cooperation and integration of activities, including the establishment of issues teams as needed;
 - (b) coordinate implementation of multi-year work plans and undertake an annual assessment of work plan progress for review and approval by the Annex Implementation Committee. The work plans will describe the activities and deliverables of each contributing agency in relation to the specific results and commitments articulated within each Annex. In preparing work plans, every effort will be made to ensure a coordinated and cooperative approach by maximizing the integration of activities of contributing departments, ministries and agencies as well as those of members of the Great Lakes community such as conservation authorities, municipalities and non-government organizations;
 - (c) recommend a course of action to the Annex Implementation Committee when more authority or policy direction are required to effectively deliver the objectives of the Agreement; and
 - (d) liaise with other departments, ministries and agencies to ensure that they are aware of the goals, priorities and strategies of the Agreement, and to the maximum extent, incorporate them into agency planning.

ARTICLE VIII

COMMUNICATIONS

The Parties agree to prepare a joint communications strategy in respect of the implementation of this Agreement. The strategy will provide for effective, relevant and timely communication with the public on the goals,

results, commitments and the work undertaken pursuant to the Agreement.

ARTICLE IX

COMMITMENT TO NOTIFY

Canada will consult with Ontario regarding any changes to the Canada-United States Great Lakes Water Quality Agreement or on any other international activities that may affect this Agreement. Similarly, Ontario will consult with Canada over the initiation of programs and agreements with other provinces or states that may affect this Agreement.

ARTICLE X

REVIEWING THE AGREEMENT

1. The Parties will conduct a comprehensive review of this Agreement to be completed by November 27, 2009. The Parties will consult with the public during the review. The Parties will make public the findings and outcomes of the review prior to the expiry of the Agreement.
2. In conducting the review referred to in clause 1 above, the Parties agree to consider the recommendations and results of the Canada-United States Great Lakes Water Quality Agreement review.

ARTICLE XI

AMENDING THE AGREEMENT

1. The Agreement may be amended by the Parties at any time. The Parties commit to conducting public consultations when amending the Agreement. An amendment will be confirmed by an exchange of letters by the Parties setting out the amendment and its effective date.
2. An amendment to the Agreement may extend the term of the Agreement provided that the extended term is consistent with the requirements of section 9 of the *Canadian Environmental Protection Act, 1999*.

ARTICLE XII

DISPUTE AVOIDANCE

1. The Parties are committed to working collaboratively to avoid and resolve any dispute concerning the management of the Agreement and the performance of obligations set out in the Annexes.
2. In the event of a dispute under this Agreement, either Party may provide notice in writing of the matter in dispute together with related information and documentation. Within 60 days of a notice, the Parties will meet to discuss the dispute in a cooperative, collaborative manner. If the dispute is not resolved within 120 days of the meeting, or such longer period as the Parties may agree, the Parties may jointly retain a third party to provide fact finding advice for mediation in connection with the resolution of the dispute.

ARTICLE XIII

ENTRY INTO FORCE

This Agreement will enter into force on XXXXX X, 2007, and will remain in force until March 31, 2010. The Agreement may be terminated earlier by either Party giving the other at least six months written notice.

ARTICLE XIV

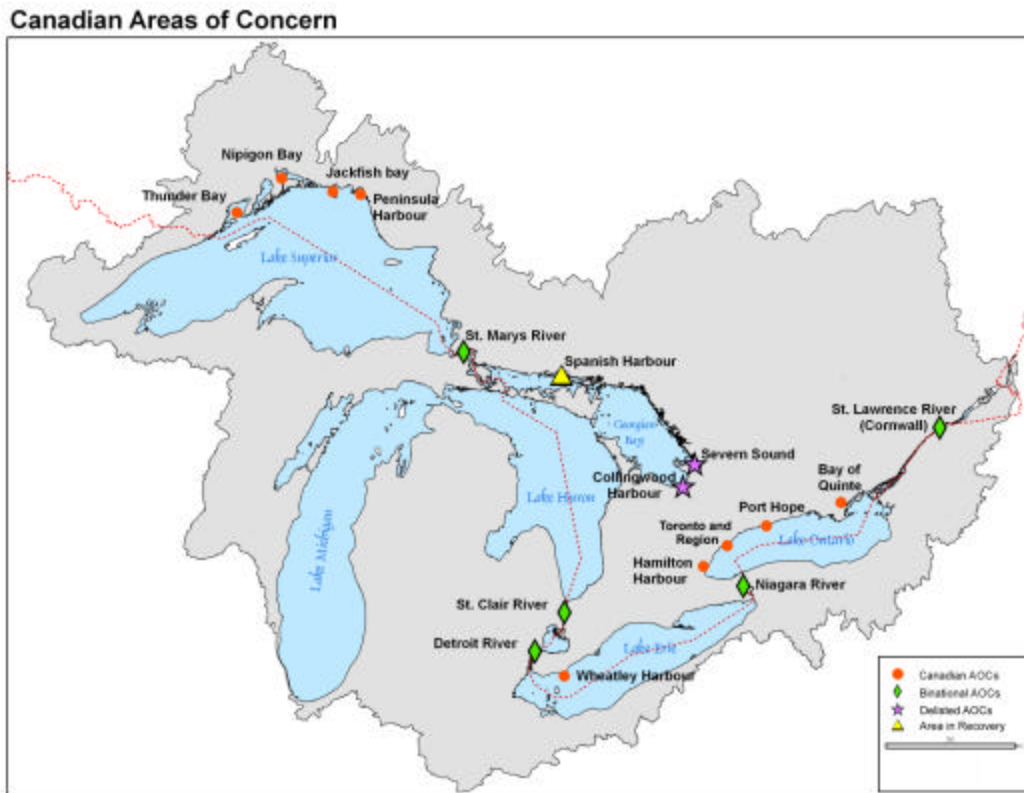
COMPLIANCE WITH LAW

1. Nothing in this Agreement alters the legislative or other authority of the Parties with respect to the exercise of their legislative or other authorities under the Constitution of Canada.
2. The Parties acknowledge that the obligations in this Agreement are subject to the applicable laws of Canada and Ontario.

ANNEX 1 AREAS OF CONCERN

I Preamble

To achieve the Agreement's vision of a healthy, prosperous and sustainable Great Lakes Basin Ecosystem, it is necessary to restore environmental quality in ten Canadian and five shared Canada-United States Areas of Concern (AOCs) which were designated by the Water Quality Board of the International Joint Commission in 1985. AOCs are locations where environmental quality has been degraded compared to other areas in the Great Lakes and beneficial uses of the aquatic ecosystem are impaired.



Considerable progress has been made to implement Remedial Action Plans (RAPs) in AOCs, and two have already been delisted (Collingwood and Severn Sound). However, in the remaining fifteen AOCs, additional effort and resources are needed to complete implementation, meet delisting targets and restore environmental quality. In some cases, following remedial actions, the

environment will take some time to recover and these areas will be recognized as being Areas in Recovery and monitoring will continue to track progress in achieving restoration goals until such time that they can be delisted. The Spanish Harbour AOC was recognized as being an Area in Recovery in 1999.

This Annex addresses initiatives that directly support the restoration and protection of environmental quality and beneficial uses in AOCs. These initiatives include:

- Reducing municipal wastewater and stormwater pollution;
- Encouraging beneficial management practices to reduce pollution from rural areas;
- Developing contaminated sediment management strategies;
- Restoring and protecting fish and wildlife habitats and populations;
- Fostering community participation;
- Increasing knowledge through research, monitoring and reporting; and
- Communicating progress.

To assist in the coordinated and cooperative delivery of the results and commitments under this Annex the Parties have agreed that:

- a) Canada and Ontario will co-lead the RAP process in Toronto and Region, St. Marys, St. Clair and Detroit River AOCs;
- b) Canada will lead the RAP process in Thunder Bay, Hamilton Harbour, Port Hope, and the St. Lawrence River AOCs; and
- c) Ontario will lead the RAP process in Nipigon Bay, Jackfish Bay, Peninsula Harbour, Spanish Harbour, Wheatley Harbour, Niagara River and the Bay of Quinte AOCs.

II Goals

The Parties are committed to the long-term goal of environmental restoration in all AOCs and will continue to work with local communities towards restoring beneficial uses and removing the remaining fifteen AOCs from the list of the most degraded areas in the Great Lakes.

Towards this long-term goal of delisting, Canada and Ontario have identified two goals to be achieved by 2010:

1. Complete priority actions for delisting in four AOCs: Nipigon Bay, Jackfish Bay, Wheatley Harbour and St. Lawrence River (Cornwall); and

2. Make significant progress towards RAP implementation, environmental recovery and restoration of beneficial uses in the remaining eleven AOCs.

III Results

Goal 1: Complete priority actions for delisting in four AOCs: Nipigon Bay, Jackfish Bay, Wheatley Harbour and St. Lawrence River (Cornwall) AOCs.

Considerable progress has been made in these four AOCs and RAP implementation is nearing completion. A number of priority actions remain to be undertaken that are specific to each AOC and directed towards achieving locally-derived delisting criteria. When these actions are completed, it will be possible to delist the AOC (if environmental conditions meet delisting criteria) or recognize it as an Area in Recovery (if the environment requires additional time to recover).

Result 1.1 – Reduced nutrients, microbial and other contaminants from industrial or municipal wastewater to achieve delisting targets in Nipigon Bay and St. Lawrence River (Cornwall) AOCs.

Canada and Ontario will:

- a) Continue to track progress as the Township of Nipigon upgrades its sewage treatment plant from primary to secondary treatment; and
- b) Identify and promote the priority actions necessary to reduce the volume and/or treat municipal wastewater in the St. Lawrence River (Cornwall) AOC to meet RAP delisting targets.

Result 1.2 – Reduced nutrients, microbial and other contaminants from rural non-point sources to meet delisting criteria in the St. Lawrence River (Cornwall) AOC.

Canada and Ontario will:

- a) Identify and ensure the implementation of rural non-point source priority actions for delisting in the St. Lawrence River (Cornwall) AOC by providing technical advice, workshops, education and outreach materials and cost-share funding for landowner contact programs, environmental stewardship projects and beneficial management practices.

Result 1.3 – Contaminated sediment management strategies developed for the Wheatley Harbour AOC and implemented in the St. Lawrence River (Cornwall) AOC.

Canada and Ontario will:

- a) Continue to implement the Cornwall sediment strategy as outlined in the Cornwall Sediment Strategy Accord and Protocol (2005);
- b) Identify and evaluate sediment management options for PCB contaminated sediment in Wheatley Harbour;
- c) Provide information and consult with representatives of the Wheatley Harbour community to seek consensus on the preferred sediment management option;
- d) Finalize the Wheatley Harbour sediment management strategy and consider it as a priority for potential future federal/provincial funding; and
- e) Implement the Wheatley Harbour sediment management strategy upon confirmation of federal and provincial funding.

Result 1.4 – Plans in place and being implemented to rehabilitate fish and wildlife habitats and populations to meet delisting targets in the Wheatley Harbour and St. Lawrence River (Cornwall) AOCs.

Canada and Ontario will:

- a) Provide enhanced fish and wildlife habitat through wetland construction in the Wheatley Harbour AOC;
- b) Continue to ensure that the fisheries habitat management plan and natural heritage strategy are integrated into municipal and regional official plans in the St. Lawrence River (Cornwall) AOC;
- c) Provide scientific/technical expertise and funding to complete the implementation of habitat priority actions for delisting in the St. Lawrence River (Cornwall) AOC through collaboration, community and citizen stewardship; and
- d) Continue to facilitate wetland protection and enhancement through land securement, restoration and stewardship of private lands in the Wheatley Harbour and St. Lawrence River (Cornwall) AOCs.

Ontario will:

- e) Continue to implement the fisheries management plan for Lake St. Francis in the St. Lawrence River (Cornwall) AOC.

Result 1.5 – Informed, effective collaboration amongst government, communities and individuals to prioritize and complete actions required for delisting and confirming environmental recovery in Nipigon Bay, Jackfish Bay, Wheatley Harbour and St. Lawrence River (Cornwall) AOCs.

Canada and Ontario will:

- a) Consult with the community and seek consensus on delisting targets, remaining priority actions for delisting, monitoring needs and the status of environmental recovery in Nipigon Bay, Jackfish Bay, Wheatley Harbour and St. Lawrence River (Cornwall) AOCs; and
- b) Support the Wheatley Harbour Implementation Team and St. Lawrence River Restoration Council activities to coordinate implementation projects and develop mechanisms to sustain long-term environmental recovery and protection.

Canada will:

- c) Identify opportunities, implement and fund mechanisms to enhance communication and collaboration with the Mohawk Community of Akwesasne in the St. Lawrence River (Cornwall) AOC during the implementation of priority actions for delisting, environmental monitoring, and reporting, and will identify mechanisms to sustain long-term environmental recovery and protection.

Result 1.6 – Environmental monitoring and reporting to document improvements and track environmental recovery.

Canada and Ontario will:

- a) Finalize and implement monitoring plans to confirm status of beneficial use impairments in the Nipigon Bay and St. Lawrence River (Cornwall) AOCs;
- b) Continue to implement the Cornwall Sediment Strategy long-term monitoring plan in the St. Lawrence River (Cornwall) AOC;
- c) Develop and implement a long-term monitoring plan as part of the sediment management strategy for Wheatley Harbour;
- d) Develop and implement Area in Recovery long-term monitoring plans for Wheatley Harbour and Jackfish Bay AOCs; and

- e) Complete status reports (Stage 3 or Area in Recovery) for Nipigon Bay, Jackfish Bay, Wheatley Harbour and St. Lawrence River (Cornwall) AOCs and formally transmit reports to the International Joint Commission.

Goal 2: Make significant progress towards Remedial Action Plan (RAP) implementation, environmental recovery and restoration of beneficial uses in the remaining eleven AOCs.

Progress in the remaining eleven AOCs has been significant and many actions have been implemented to address sources of pollutants and restore fish and wildlife habitat. However, contaminated sediment and municipal wastewater continue to be key challenges and Canada and Ontario will continue to identify these issues as priorities for achieving goals to restore all of the Great Lakes Areas of Concern.

Result 2.1 – Reduced nutrients, microbial and other contaminants from municipal sewage treatment plants, combined sewer overflows, urban stormwater and industrial wastewater towards delisting targets in St. Marys River, St. Clair River, Detroit River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs.

Canada and Ontario will:

- a) Agree that investments that support the delisting of Areas of Concern and improve the water quality of the Great Lakes will continue to be among the priorities for their infrastructure funding programs;
- b) Continue to track progress as municipalities in Thunder Bay, St. Marys, and Detroit River AOCs upgrade their primary sewage treatment plants to secondary treatment standards;
- c) Continue to identify and promote implementation of the priority actions related to sewage treatment plant upgrades in Niagara River, Hamilton Harbour and Bay of Quinte AOCs;
- d) Continue to identify and promote implementation of the priority actions to address combined sewer overflows in St. Clair River, Detroit River, Hamilton Harbour, Toronto and Region, and Niagara River AOCs;
- e) Continue to identify and promote implementation of the priority actions to address urban stormwater in St. Marys River, St. Clair River, Detroit River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs;
- f) Track decommissioning of industrial facilities in the Detroit and St. Clair

AOCs to ensure RAP delisting targets are met; and

- g) Continue to provide technical and/or financial assistance to municipalities to:
- Research, develop and demonstrate potentially cost-effective approaches and technologies such as:
 - City of Hamilton pilot evaluation of membrane technology for its main waste water treatment plant,
 - high rate combined sewer overflow treatment for Niagara River, Toronto and Region, and Detroit River AOCs,
 - stormwater treatment technology evaluation for St. Clair River, Detroit River, Niagara River, Toronto and Region, and Bay of Quinte AOCs,
 - Conduct/update combined sewer overflow and stormwater pollution prevention and control planning studies for Bay of Quinte, Niagara River, St. Clair River and Hamilton Harbour AOCs, and
 - Conduct pre-implementation studies, such as environmental study reports, sustainable asset management, environmental management plans, and integrated watershed management plans to prepare municipalities to address infrastructure funding requirements in Detroit River, St. Clair River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs.

Ontario will:

- h) Apply regulatory measures as appropriate to reduce the quantity and improve the quality of municipal and industrial wastewater in AOCs.

Result 2.2 – Reduced nutrient, microbial and other contaminants from rural non-point sources towards achieving RAP delisting criteria in St. Clair River, Detroit River, Niagara River, Hamilton Harbour, and Toronto and Region AOCs.

Canada and Ontario will:

- a) Identify and promote rural non-point source priority actions for delisting in Detroit River, St. Clair River, Niagara River, Hamilton Harbour, and Toronto and Region AOCs by:
- Working with local communities to collect and evaluate data and use tools such as models to determine and target priority areas for reductions to achieve delisting criteria,
 - Transferring technologies and information on beneficial management practices on farms and rural properties,
 - Providing technical advice and outreach materials to promote

- stewardship initiatives through education programs,
- Assisting land-owners to access funding for projects that improve farm management practices, and
 - Providing cost-share funding for land-owner contact programs, environmental stewardship projects and beneficial management practices.

Result 2.3 – Progress made in developing sediment management strategies to reduce ecological and human health risk from contaminated sediments in Thunder Bay, Peninsula Harbour, St. Marys River, St. Clair River, Detroit River, Niagara River, Hamilton Harbour, Port Hope and Bay of Quinte AOCs.

Canada and Ontario will:

- a) Use the Canada-Ontario Agreement Contaminated Sediment Assessment Decision-Making Framework to determine the need for contaminated sediment management strategies in the St. Clair River AOC and make progress in the development of contaminated sediment strategies if required;
- b) Complete the development of contaminated sediment management strategies for the Thunder Bay, Peninsula Harbour, St. Marys River, Detroit River, Niagara River (Lyons Creek East and West sites), and Bay of Quinte AOCs;
- c) Conduct additional physical, chemical and biological sediment assessments in AOCs as necessary in order to complete sediment management strategies;
- d) Provide technical support and/or financial assistance for engineering design at Hamilton Harbour (Randle Reef) AOC and other AOC sites requiring sediment remediation; and
- e) Undertake post project or long-term monitoring to confirm restoration in areas where sediment remediation has been completed (Thunder Bay NOWPARC site, St. Clair River Zone 1) or where natural recovery continues (Spanish Harbour AOC).

Canada will:

- g) Continue to lead the planning process for the implementation of a proposed project for the cleanup of historic waste and remediation of local waste sites in the Port Hope area (including sediment in the Port Hope Harbour), and the consolidation of the material in new state-of-the-art long-term licensed waste management facilities.

Ontario will:

- f) Apply regulatory measures as appropriate to advance remediation of contaminated sediment.

Result 2.4 – Long-term management plans being developed and priority actions for delisting being implemented for rehabilitation and protection of fish and wildlife habitats and populations in St. Marys River, St. Clair River, Detroit River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs.

Canada and Ontario will:

- a) Complete the fish habitat management plan in the Bay of Quinte AOC and ensure its inclusion in municipal and regional official plans;
- b) Make progress on fish and wildlife habitat protection and rehabilitation priority actions in St. Marys River, St. Clair River, Detroit River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs through collaboration and community involvement;
- c) Develop and implement actions within fisheries management plans required for delisting in Toronto and Region, and Bay of Quinte AOCs and implement the existing plan in Hamilton Harbour AOC;
- d) Undertake two technology transfer sessions on approaches and techniques for habitat rehabilitation with AOC community implementers.

Result 2.5 – Informed, effective collaboration amongst government, communities and individuals to prioritize and complete actions required for delisting and confirming environmental recovery in AOCs.

Canada and Ontario will:

- a) Support existing local community RAP implementation groups in the St. Clair River (St. Clair River Canadian RAP Implementation Committee), Detroit River (Detroit River Cleanup Committee), Hamilton Harbour (Bay Area Implementation Team), Niagara River (Niagara RAP Coordination Agreement), Toronto and Region (Toronto RAP Team), and the Bay of Quinte (Bay of Quinte Restoration Council) AOCs;
- b) Support the enhancement of local coordination in the St. Marys River and St. Clair River AOCs;
- c) Lead the coordination of activities and provide information and

opportunities for community engagement in Thunder Bay, Peninsula Harbour, and Spanish Harbour AOCs;

- d) Provide information, opportunities and support for community input, consultation and participation on RAP projects and initiatives through education, outreach, workshops, technology transfer and funding; and
- e) Publish RAP progress reports, information materials and maintain current websites.

Canada will:

- f) Identify opportunities, implement and fund mechanisms to enhance communication and collaboration with the Aboriginal communities in the St. Clair River and Bay of Quinte AOCs during the development and implementation of priority actions.

Result 2.6 – Identify monitoring needs, undertake required studies and evaluate results to assess environmental recovery and support remediation strategies in AOCs.

Canada and Ontario will:

- a) Review and revise delisting criteria as appropriate in Thunder Bay, Peninsula Harbour, St. Marys River, Spanish Harbour, St. Clair River, Detroit River, Toronto and Region, and Bay of Quinte AOCs;
- b) Develop monitoring plans to track progress towards environmental recovery and meeting delisting targets in consultation with AOC communities for Thunder Bay, Peninsula Harbour, St. Marys River, Spanish Harbour, St. Clair River, Detroit River, Niagara River, Toronto and Region, and Bay of Quinte AOCs;
- c) Implement AOC specific monitoring plans and report on progress towards environmental recovery and meeting delisting targets in Thunder Bay, Peninsula Harbour, Spanish Harbour, St. Marys River, Detroit River, St. Clair River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs through agency programs or by providing scientific, technical and funding support and collaborative arrangements with local organizations as required; and
- d) Provide a report card on the status of beneficial use impairments in all 15 AOCs by March 31, 2010.

Canada will:

- e) Monitor and report on fish and wildlife health effects in Thunder Bay, St. Marys River, St. Clair River, Niagara River, Hamilton Harbour, Toronto and Region, and Bay of Quinte AOCs.

Ontario will:

- f) Monitor contaminants and report on consumption advisories in sport fish in all AOCs through Ontario's Guide to Eating Ontario Sport Fish.

V Definitions

Area of Concern (AOC)

A degraded area in the Great Lakes that fails to meet the General or Specific Objectives of the Canada-United States Great Lakes Water Quality Agreement, where such failure has caused or is likely to cause impairment of beneficial use or of the area's ability to support aquatic life. Forty AOCs remain in the Great Lakes, 10 of which are wholly within Canada and 5 are shared with the United States.

Area in Recovery

An area, originally identified as an Area of Concern, where, based on community and government consensus, all scientifically feasible and economically reasonable actions have been implemented and additional time is required for the environment to recover. Canada and the United States have each recognized one Area in Recovery (Spanish Harbour, Ontario and Presqu'île Bay, Pennsylvania).

beneficial use

The ability of living organisms (including humans) to use the Great Lakes Basin Ecosystem without adverse consequence (includes the 14 uses identified in Annex 2 of the Canada-United States Great Lakes Water Quality Agreement).

restoration of beneficial uses

Meeting locally defined delisting criteria designed to be specific, measurable, achievable, and scientifically defensible.

delisting

Removal of an AOC from the list of Great Lakes Areas of Concern by meeting the criteria for the restoration of beneficial uses as defined by the RAP and agreed upon by the agencies and community.

fish habitat management plan

A plan that identifies objectives and priority actions to restore, protect and sustain fish habitat.

fisheries management plan

A plan that sets objectives to restore, protect and sustain fish communities.

natural heritage strategy

A plan to protect and conserve biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems for prescribed geographic areas. Strategies can include areas that have been restored and areas with the potential to be restored to a natural state.

non point source

Diffuse sources of pollution including combined sewer overflows and urban and rural runoff.

Remedial Action Plan (RAP)

A plan describing environmental problems, their causes and remedial measures required to restore beneficial uses in the Area of Concern. RAPs must also include a process for evaluating effectiveness and a description of monitoring plans to confirm environmental recovery.

sediment management strategy

A plan that describes the actions agreed to by agency and community representatives in an AOC to manage contaminated sediment. The development of the plan involves consideration of the results of scientific assessments, community and stakeholder consultations, social/economic factors and policy. The actions may range from “no further action” and monitoring recovery to full remediation projects.

ANNEX 2 HARMFUL POLLUTANTS

I Preamble

The Harmful Pollutants Annex (Annex 2) addresses both past (legacy) and on-going sources of pollution in the Great Lakes Basin, focusing on principles of pollution reduction and prevention to achieve the vision of a healthy, prosperous and sustainable Great Lakes Basin Ecosystem. Annex 2 takes a substance and/or sector approach to reduce and prevent releases throughout the Basin and seeks to virtually eliminate persistent bioaccumulative toxic substances, such as Tier 1 substances. Work in this annex is linked to activities elsewhere in the Agreement that address harmful pollutants on a local (Annex 1), lakewide or drinking water source (Annex 3) basis. Harmful pollutant issues identified in the other annexes are referred to Annex 2 if a substance- or sector-based approach is warranted.

Based on the 2005 release inventory, significant reductions in releases have been achieved for Tier 1 substances through work under the 1994 and 2002 Canada-Ontario Agreements Respecting the Great Lakes Basin Ecosystem and the Canada-U.S. Great Lakes Binational Toxics Strategy, namely:

- Benzo(a)pyrene: 52% since 1988
- Dioxins & Furans: 89% since 1988
- Hexachlorobenzene: 73% since 1988
- Mercury: 86% since 1988
- Polychlorinated Biphenyls (PCBs): 89% since 1993

Notwithstanding these significant reductions, further efforts are required to address the last remaining sources of Tier 1 substances. This can be challenging since they may be widely dispersed and/or have sources outside the Basin. Similar challenges are faced in addressing Criteria Air Pollutants (associated with smog formation). Our current emphasis is on the development of policies and programs that address these challenges.

Another challenge is how to address the many other chemical substances present in the Great Lakes Basin, such as Tier 2 substances and substances of emerging concern, which may be impacting human health or the environment. Categorization of substances under the *Canadian Environmental Protection Act, 1999*, as well as research and monitoring by federal and provincial governments, has identified many substances that require further assessment and action. This Annex brings this information together to prioritize actions with appropriate sectors in the Basin and in response to the priorities established under Annex 3. Additionally, because many substances of emerging concern are present in, or

as, consumer products, efforts will include education and outreach to Great Lakes communities to reduce exposure and releases to the environment.

Delivery of the expected results of Annex 2 will be facilitated by the continued cooperation of Canada and Ontario in initiatives to develop environmental policies, best management practices and technologies, as well as conduct scientific research. For example, Canada and Ontario have been working with other provinces and territories to reduce releases of harmful pollutants from municipal wastewater treatment facilities across the country and have committed to advance this work in the Great Lakes Basin in cooperation with municipalities. Complementing this initiative are collaborative projects to evaluate new treatment technologies and to develop best practices for the land application of biosolids. Additionally, investment in scientific research to improve understanding of the sources, fate and impacts of harmful pollutants will assist the development of reduction and risk mitigation actions that protect both human health and the environment.

II Goals

The Parties have identified three goals that will demonstrate progress toward the virtual elimination of persistent bioaccumulative toxic substances and significant reductions of other harmful pollutants. They are:

1. Continue progress toward virtual elimination of persistent bioaccumulative toxic substances;
2. Reduce other harmful pollutants and initiate a program for managing chemical substances for the Great Lakes Basin; and
3. Enhance knowledge regarding harmful pollutants for the development of policies and programs to further reduce releases and mitigate risk.

III Results

Result 1 – Reduction in releases of Tier 1 substances beyond the 2005 achievements towards the goal of virtual elimination.

Persistent bioaccumulative toxic substances, including those on the Tier 1 list, are of particular concern because they can continue to threaten fish, wildlife and human health long after releases are discontinued. Based on the most up-to-date inventory (from 2005) the Parties expect to achieve, by 2010, reductions in releases of more than 90% for dioxins & furans and mercury, 75% for hexachlorobenzene and 55% for benzo(a)pyrene (relative to a 1988 baseline),

and more than 90% for high-level polychlorinated biphenyls (PCBs) (relative to a 1993 baseline).

Canada and Ontario will:

- a) Continue education and outreach initiatives and activities to reduce releases of Tier 1 substances through the promotion of environmentally sound practices and pollution prevention measures. These include sustaining outreach activities to reduce household waste burning and to encourage sound practices for wood burning in wood stoves and outdoor wood boilers; and
- b) Undertake additional projects to achieve reductions of Tier 1 substances from both in-basin and out-of-basin sources. These include pollution prevention, voluntary agreements and best management practices.

Canada will:

- c) Amend the PCBs regulations to include timelines for PCBs use and limit their storage.

Ontario will:

- d) Continue to work with municipalities and other agencies to increase diversion of materials containing Tier 1 substances from the waste stream. This includes collecting thermostats, fluorescent lamps, and targeted pesticides as well as sharing best management practices; and
- e) Carry out commitments to Canada-wide Standards (CWS) for mercury and dioxins/furans through continued review of incinerator performance, development of compliance promotion strategies and implementation of standards and guidelines.

Result 2 – Reduction in releases of Criteria Air Pollutants.

Criteria Air Pollutants are associated with the formation of smog. Efforts under this result are directed towards reductions in releases of smog precursors within Ontario as well as working with other jurisdictions to reduce transport of smog to Ontario.

Canada and Ontario will:

- a) Continue to implement the commitments under the Canada-United States Air Quality Agreement, Anti-Smog Action Plan, and Canada-Wide Standards related to Criteria Air Pollutants; and

- b) Work with jurisdictions bordering Ontario and/or the Great Lakes to exchange information and cooperatively reduce transboundary transport of Criteria Air Pollutants.

Canada will:

- c) Continue to work with existing sector-based and small-medium enterprise (SME) agreements to reduce the releases of Criteria Air Pollutants and other harmful pollutants. This could include audit programs and development of a green supply network; and
- d) Continue to explore opportunities to implement diesel retrofits on municipal fleets, school buses and diesel engines in other sectors to reduce Criteria Air Pollutants and other harmful pollutants.

Ontario will:

- e) Continue to develop anti-smog initiatives, including codes of practice for priority sectors; and
- f) Continue to develop and implement policies that will contribute towards Ontario's emission reduction targets of 45% reduction from 1990 levels for both nitrogen oxides and volatile organic compounds, and 50% reduction from Ontario's Countdown Acid Rain limit, by 2015 or sooner. Continue to evaluate progress and consider accelerating the nitrogen oxides and volatile organic compound emission reduction target date from 2015 to 2010.

Result 3 – Coordinated activities to reduce releases from municipal wastewater.

Substances of concern to human health and the environment are discharged to sewer systems from industries, businesses and households. Many municipalities have implemented sewer use bylaws, increased capacity and/or enhanced treatment to reduce loadings of harmful pollutants to the aquatic environment from this pathway. Canada and Ontario have been working with other provinces and territories through the Canadian Council of Ministers of Environment (CCME) to develop a Canada-wide strategy for the management of municipal wastewater effluents and will work with municipalities in the Great Lakes Basin to implement programs, regulations and policies consistent with the Strategy.

Canada and Ontario will:

- a) Negotiate an agreement for the purpose of implementing the federal wastewater effluent regulations and work with other provinces and territories to finalize the CCME Canada-wide Strategy; and

- b) Investigate optimization of existing facilities and evaluate the potential of new technologies with respect to improving removal of harmful pollutants from wastewater effluents and sludges, and transfer this knowledge to municipalities and others owner/operators to assist in their efforts to reduce pollutant releases.

Canada will:

- c) Develop effluent quality instruments for wastewater systems on “federal land” and “aboriginal land”, both as defined in the *Canadian Environment Protection Act, 1999*, to support the implementation of the wastewater effluent regulations.

Ontario will:

- d) Update its policies for municipal discharges, including a harmful pollutants component, in a manner consistent with the goals of the CCME Canada-wide Strategy that is protective of the Great Lakes Basin ecosystem;
- e) Support and work with municipalities and sewer users to identify and reduce sources of harmful pollutants to sewers through promotion and implementation of sewer use best management practices and other voluntary measures; and
- f) Develop best management practices for biosolids to reduce potential offsite contamination.

Result 4 – Develop and initiate a program for the Sound Management of Chemical Substances in the Great Lakes Basin.

In addition to Tier 1 substances and Criteria Air Pollutants, Tier 2 substances and substances of emerging concern have been detected in the Great Lakes Basin. The Parties will identify substances for action and will work with sectors and Great Lakes communities to develop programs to reduce releases from the manufacture of chemical substances and from the use and disposal of agricultural and consumer products that contain these substances.

Canada and Ontario will:

- a) Develop a revised list of substances for action and associated sectors in the Great Lakes Basin;
- b) Compile an inventory of federal and provincial programs, and consult with federal and state agencies in the United States on joint reduction opportunities for the substances identified for action;

- c) Consult with sectors (i.e., industries, municipalities, agriculture) to identify opportunities and develop programs and projects for reductions in uses and/or releases;
- d) Promote and support the development of best practices for reducing or eliminating the production, use and/or release of substances identified for action. This includes support for applied scientific or technological studies as well as the demonstration of environmental technologies;
- e) Carry out education and outreach to Great Lakes communities, especially vulnerable populations, to reduce their exposure and their contribution to environmental releases and develop additional programs for the safe collection and disposal of consumer products containing substances of concern, such as pharmaceuticals; and
- f) Enhance pollutant releases profiles in the Great Lakes Basin using various available inventories, such as the National Pollutant Release Inventory (NPRI) and the US Toxics Release Inventory, and issue a report on this information.

Canada will:

- g) Implement activities to address substances identified under Canada's Chemicals Management Plan that are of concern within the Great Lakes Basin. This may include examining substances identified as high priorities, collecting information on potential releases to the Great Lakes, developing national preventive and control measures, and promoting environmental monitoring to track progress; and
- h) Continue to lead the implementation of the Great Lakes Binational Toxics Strategy and develop links with the North American Commission for Environmental Cooperation to promote reductions in releases within the Basin as well as transport of harmful pollutants to the Basin from other jurisdictions.

Ontario will:

- i) Continue to participate in the Great Lakes Binational Toxics Strategy and contribute to reduction activities;
- j) Undertake outreach initiatives to promote pollution prevention and influence further reductions in discharges from Municipal/Industrial Strategy for Abatement (MISA) sectors and facilities, and examine and implement new policies to manage aqueous industrial discharges and discharges not currently captured under MISA.

- k) Work with farm organizations and industry representatives to develop an enhanced program for the safe collection and disposal of agricultural pesticides and containers that includes expired/unused veterinary pharmaceuticals; and
- l) Enhance education and outreach within the agricultural sector regarding best management practices that reduce potential impacts of pesticide use on water quality, including the development of tools to monitor agricultural pesticide use.

Result 5 – Improved understanding of the sources, fate and impacts of harmful pollutants in the Great Lakes Basin.

Research and monitoring have been conducted by the Parties in cooperation with academia and others to understand the sources, fate and impact of harmful pollutants to human health and the environment in the Great Lakes Basin. Collaborative studies will continue to further increase understanding of harmful pollutants released to the Great Lakes environment.

Canada and Ontario will:

- a) Collect and develop more comprehensive data on pollutant releases and sources to facilitate risk assessments associated with harmful pollutants in the Great Lakes Basin;
- b) Collaboratively research the occurrence, persistence, fate, and environmental and health impacts of substances of known and emerging concern and discharges from sectors, with the support and participation of industries and other sectors;
- c) Continue to monitor and report on status and trends of substances of known and emerging concern in various media to support policy and program decision-making; and
- d) Maintain profiles of Tier 1 substances and develop and maintain inventories of substances targeted for action.

Result 6 – Human health risks from harmful pollutants are understood and addressed in the Great Lakes Basin

Environmental quality and human health are linked, with humans acting as both sources and receptors of environmental contamination. Under the Agreement, there will be a focus on human health to increase understanding of the risks from harmful pollutants and identify ways to reduce releases and/or exposure.

Canada and Ontario will:

- a) Support and facilitate the activities of environmental public health networks in the Great Lakes Basin; and
- b) Cooperate in the development of standards, guidelines and protocols for the protection of human health and the environment that may be applied in the Great Lakes Basin.

Canada will:

- c) Develop a Health Science Framework to guide and facilitate health science activities undertaken by researchers and other health scientists.
- d) Implement activities to address substances identified under Canada's Chemicals Management Plan that are of human health concern.

Ontario will:

- e) Develop and implement programs for the protection of health in Great Lakes communities through the application of national strategies for the protection of children's environmental health; and
- f) Carry out research to evaluate impacts on human health of harmful pollutants in the Great Lakes Basin to support the development of policies and programs.

IV Definitions

Criteria Air Pollutants

Nitrogen Oxides (NO_x), Volatile Organic Compounds (VOCs), Sulphur Dioxide (SO₂), particulate matter less than 10 microns (PM₁₀), particulate matter less than 2.5 microns (PM_{2.5}).

discharge

A release of a substance directly or indirectly into a water body.

emission

A release of a substance to the air.

harmful pollutants

Substances having a deleterious impact on environmental or human health. Substances on the Tier 1 and Tier 2 lists, substances of emerging concern, and Criteria Air Pollutants are examples of harmful pollutants.

loading

The amount (concentration x flow) of a substance being emitted or discharged.

pollution prevention

The use of processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants and waste and reduce the overall risk to the environment or human health.

release

An air emission or aqueous discharge, depending on the context.

Tier 1

Includes the 11 critical pollutants identified by the International Joint Commission, plus critical pollutants identified in the Niagara River and Lake Ontario Toxic Management Plans and the Lake Superior Binational Program. Tier 1 pollutants are targeted for virtual elimination. Tier 1 substances includes:

Aldrin/dieldrin*	Hexachlorobenzene	PCDD (dioxins)
Alkyl-lead*	Mercury	PCDF (furans)
Benzo(a)pyrene	Mirex*	Toxaphene*
Chlordane*	Octachlorostyrene	
DDT*	PCBs	

Note:* denotes substances that are no longer being used or released in Ontario.

Tier 2

Includes substances identified as having the potential for causing widespread impacts, or have already caused local adverse impacts on the Great Lakes Basin Ecosystem. Tier 2 substances are:

Anthracene	Dinitropyrene
Cadmium	Hexachlorocyclohexane
1,4-dichlorobenzene	4,4''-methylenebis(2-chloraniline)
3,3'-dichlorobenzidine	Pentachlorophenol
Tributyl tin	

Plus 17 PAHs as a group, including but not limited to:

Benzo(a)anthracene
Benzo(b)fluoranthene
Perylene
Phenanthrene

Benzo(g,h,i)perylene

virtual elimination

There is "no measurable release" of a substance to the environment.

ANNEX 3 LAKE AND BASIN SUSTAINABILITY

I Preamble

To achieve the Agreement's vision of a healthy, prosperous and sustainable Great Lakes Basin Ecosystem it is necessary to increase efforts to anticipate and prevent environmental problems in addition to the work being undertaken to resolve existing concerns. Therefore this Annex focuses attention on better stewardship of these aquatic resources and encourages the integration of these practices into the everyday activities of communities and citizens in the Great Lakes Basin.

Although each Lake has its own unique physical, chemical, biological, geographical and land use characteristics, the Great Lakes and the surrounding basin form an interconnected system. The goals and related initiatives within this Annex are applied at different scales - basin-wide, lake-wide or watershed - to achieve improvements to aquatic ecosystem health in the Great Lakes. Progress must be made on all goals and at all scales to maximize effectiveness and synergies within the Annex.

To achieve the long term vision, collaboration and cooperative implementation must be continually encouraged and fostered across the Great Lakes community, including federal and provincial agencies, Aboriginal communities, municipalities, conservation authorities, agriculture, industrial and other business sectors, non-government organizations, academia and residents. Binational collaboration with U.S. agencies and communities in the protection, restoration and sustainable management of this international resource is facilitated through the Canada-United States Great Lakes Water Quality Agreement and other binational Great Lakes focused collaborations such as the Great Lakes Fishery Commission.

This Annex addresses initiatives that directly promote the adoption and implementation of sustainable management practices, and enhanced stewardship efforts as well as activities required to protect important biodiversity areas and to restore conditions at priority locations with a focus on:

- Contributions to improving the social and economic well-being of humans and the health of Great Lakes aquatic ecosystems,
- Improving Great Lakes water quality,
- Conserving Great Lakes biodiversity, and
- Responding to the threats of aquatic invasive species.

This Annex also addresses two new areas of special focus:

- Climate change impacts in the Great Lakes Basin, and
- Protection of the Great Lakes Basin as a source of drinking water.

Climate change will affect the Great Lakes Basin ecosystem. This Annex looks to identify and project changes to climate and ecosystems and assess the impacts and vulnerabilities.

The Great Lakes Basin waters are the drinking water sources for most Ontarians. Drinking water source protection takes a preventative approach, working at the watershed scale to protect communities' drinking water while supporting other lake- and basin-wide environmental initiatives.

II Goals

The Parties have identified four, long-term goals with results and commitments that will demonstrate progress over the duration of the Agreement towards sustainability of the Great Lakes Basin:

1. Encourage and enhance Great Lakes sustainability to achieve social, economic and aquatic ecosystem well-being;
2. Improve water quality in each Great Lake by making progress on virtual elimination of persistent bioaccumulative toxic substances and the reduction of other harmful pollutants;
3. Conserve and protect aquatic ecosystems, species and genetic diversity of the Great Lakes Basin; and
4. Reduce the threat of aquatic invasive species to Great Lakes aquatic ecosystems and species.

The Parties have also identified goals with results and commitments that will demonstrate progress over the duration of this Agreement associated with the two areas of special focus:

5. Understand the impacts of climate change on the Great Lakes Basin Ecosystem; and
6. Make significant progress towards the development and implementation of locally-created, science-based source protection plans to identify and mitigate risks to drinking water sources in the Great Lakes Basin.

III Results

Goal 1: Encourage and enhance Great Lakes sustainability to achieve social, economic and aquatic ecosystem well-being.

Living sustainably within the Great Lakes Basin will help us achieve environmental health and social and economic well-being. Basin residents can make choices that contribute to environmental health as well as prosperity. Sustainable living means that we act with awareness of our impacts on the natural environment and do what we can to prevent further harm and create environmental, social and economic benefits.

The results and commitments for this goal support increased appreciation of the Great Lakes as a unique and valuable resource that contributes significantly to the economic and social prosperity of Ontario and Canada. They acknowledge and support the role that we can all play to protect, restore and sustain the Lakes for current and future generations.

Result 1.1 - Increased awareness and appreciation of the Great Lakes and their contributions to social, economic and environmental well-being.

Canada and Ontario will:

- a) Develop and implement a coordinated multi-year action plan to increase Basin residents' awareness and appreciation of the Great Lakes, including better understanding of the relationship between social and economic well-being and healthy aquatic ecosystems; and
- b) Report, including publicly, on the state of each Great Lake, Lake St. Clair, and the inter-connecting channels through existing forums, such as State of the Lakes Ecosystem Conference.

Result 1.2 - Increased stewardship actions that work towards a balance between human well-being and prosperity, and healthy aquatic ecosystems.

Canada and Ontario will:

- a) Implement stewardship actions and beneficial management practices with landowners, community groups and environmental and sector organizations, on urban, industrial and rural lands that are linked to aquatic habitats and water quality in Great Lakes watersheds, and near-shore, coastal and riparian areas, consistent with Great Lakes plans and priority watersheds;
- b) Work with the agricultural sector to implement environmental farm planning and beneficial land and water management practices by providing technical advice, workshops, education and outreach materials and cost share funding for land owner contact programs, environmental stewardship projects and beneficial management practices;

- c) Provide technical transfer opportunities such as workshops, extension materials and training to promote stewardship activities by communities and landowners; and
- d) Improve public awareness and access to programs that support beneficial management practices and stewardship activities.

Result 1.3 - Sustainable use of land, water and other natural resources to provide benefits from the Great Lakes now and in the future.

Canada and Ontario will:

- a) Provide leadership and participate in bi-national Great Lakes planning initiatives such as binational lakewide management and action plans;
- b) Conserve aquatic and related terrestrial ecosystems through application of relevant federal and provincial laws;
- c) Make available new and updated Great Lakes coastal and riparian wetland evaluations and provide training and extension materials to aid municipal planning;
- d) Foster sustainable water use and conservation consistent with the intent of the Great Lakes - St. Lawrence River Basin Sustainable Water Resources Agreement; and
- e) Sustain Great Lakes fisheries to ensure aquatic ecosystem health, supply wholesome fish for human consumption and provide recreational opportunities.

Canada will:

- f) Implement fisheries habitat management consistent with Great Lakes planning.

Ontario will:

- g) Develop and deliver materials, education and training programs to increase communication and raise awareness about tools for sustainable land use planning; and
- h) Work towards sustainable growth in the Great Lakes Basin through existing planning frameworks such as the Provincial Policy Statement 2005, Greenbelt Plan, Oak Ridges Moraine Conservation Plan and the Growth Plan for the Greater Golden Horseshoe.

Result 1.4 - Enhanced knowledge about beneficial and harmful impacts of human activities on Great Lakes aquatic ecosystems and resources

Canada and Ontario will:

- a) Undertake and support research and monitoring on the impacts of changing land use practices on the health of Great Lakes aquatic ecosystems;
- b) Undertake and support research and monitoring on the development and effectiveness of urban, rural, and industrial best management practices;
- c) Undertake and support research and monitoring on the status of fish communities and aquatic food webs;
- d) Undertake and support research and monitoring on surface and ground water supplies and water-takings to guide sustainable water use and conservation;
- e) Develop and implement adaptive management decision-support tools to guide sustainable land and aquatic resource use; and
- f) Implement Binational Cooperative Monitoring programs in Lake Huron in 2007, Lake Ontario in 2008 and Lake Erie in 2009.

Goal 2: Improve water quality in each Great Lake by making progress on virtual elimination of persistent bioaccumulative toxic substances and the reduction of other harmful pollutants.

Over the past three decades, Canada and Ontario have made significant progress in eliminating, reducing and preventing the release of persistent bioaccumulative toxic substances and other harmful pollutants into the Great Lakes. Continued effort is required to address both legacy and new emerging chemical threats, excessive nutrients and pathogens (i.e. viruses, bacteria or other microorganisms). This effort is needed to restore and sustain healthy ecosystems, reduce human exposure to contaminants in fish and wildlife, keep waters safe for swimming and recreation, and ensure a source of high quality drinking water is maintained. The Parties agree to continue to work together to identify and reduce the threat posed to the Great Lakes Basin Ecosystem by harmful pollutants from urban and rural sources on a lake-by-lake basis. The work conducted under this Annex complements and assists in guiding actions in Annex 2.

Result 2.1 - Reduced nutrients, microbial and other contaminants from industrial and municipal wastewater, combined sewer overflows and urban stormwater sources consistent with actions specified in binational Lakewide Management Plans (LaMPs) and binational lake action plans.

Canada and Ontario will:

- a) Identify and promote priority actions related to the development of pollution control plans, sewage treatment plant upgrades, combined sewer overflows and urban stormwater in municipalities;
- b) Promote where appropriate a voluntary approach with municipalities to achieve results beyond compliance with existing regulations for specific municipal wastewater sources that require greater measures to attain lake water quality targets; and
- c) Conduct specific watershed investigations to identify sources of harmful pollutants in lakes Superior, Huron, St. Clair, Erie, and Ontario.

Canada will:

- d) Ensure the implementation of the *Canada Shipping Act* and the Conventions of the International Maritime Organization to prevent pollution from shipping sources in the Great Lakes.

Ontario will:

- e) Use a mix of voluntary and regulatory measures to reduce the use, discharge and emission of critical pollutants by key facilities in each of the Great Lakes.

Result 2.2 - Reduced nutrient, microbial and other contaminants from rural sources by undertaking actions specified in the binational Lakewide Management Plans and binational lake action plans.

Canada and Ontario will:

- a) Identify priority watersheds in lakes Huron, St. Clair and Ontario in order to address water quality and aquatic ecosystem concerns in the near-shore zone;
- b) Evaluate potential non-point source pollutant reductions that can be achieved from the enhanced use of selected best management practices in the Great Lakes and priority watersheds; and
- c) Implement actions to reduce non-point source pollutants in priority watersheds within the Lake Huron, Lake St. Clair and Lake Erie drainage basins.

Result 2.3 - Identification of contaminated sediment and development of sediment management plans to reduce the release and impact of sediment-bound contaminants on the Great Lakes Basin Ecosystem.

Canada and Ontario will:

- a) Identify sites outside Areas of Concern (AOCs) that have contaminated sediment and apply the Canada-Ontario Agreement Contaminated Sediment Assessment Decision-Making Framework to determine potential ecological or human health risks;
- b) Where required, develop management plans to reduce the ecological and human health risks posed by contaminated sediment; and
- c) Where necessary, undertake post project monitoring to track recovery in areas where sediment remediation has been completed.

Result 2.4 - Enhanced knowledge about beneficial and harmful impacts of human activities on Great Lakes water quality.

Canada and Ontario will:

- a) Collect environmental information through lake monitoring to assist in understanding the linkages between Great Lakes sources of harmful pollutants and human health;
- b) Undertake and support research and monitoring on the sources, fate and effects of harmful pollutants and nutrients, on aquatic food webs and species;
- c) Undertake and support research and monitoring on the sources of pollutants for each Great Lake and Lake St. Clair to determine their impacts on water quality for the main lakes' open water waters, near-shore zones and beaches; and
- d) Develop and implement adaptive management decision-support tools to guide actions to improve water quality.

Goal 3: Conserve and protect aquatic ecosystems, species and genetic diversity of the Great Lakes Basin.

The Great Lakes Basin is an ecologically important region with a rich diversity of fish, wildlife and plant species. Efforts are underway to protect, restore and sustain this abundant diversity of species and the habitats that make up the aquatic ecosystems in the Basin. A balanced approach also recognizes that we use and develop biological assets sustainably to provide social and economic benefits. During the duration of the Agreement, Canada and Ontario intend to make further progress in aquatic habitat protection, restoration and in the rehabilitation of native Great Lakes species.

Result 3.1 - Great Lakes aquatic ecosystems and habitats are protected, restored and sustained consistent with binational Great Lakes planning.

Canada and Ontario will:

- a) Inventory, assess and describe linkages among aquatic ecosystems and habitats of the lakes' open waters, near-shore zones, coastal areas and rivers to identify priorities for protection and rehabilitation actions;
- b) Secure lands, as opportunities arise, to protect Great Lakes aquatic ecosystems using a variety of voluntary tools such as land acquisitions, landowner agreements and incentive programs;
- c) Plan and implement actions to support the Marine Conservation Area for Lake Superior, and determine the feasibility of other candidate sites in the Great Lakes;
- d) Protect and conserve coastal and riparian wetlands consistent with initiatives such as the Great Lakes Wetlands Conservation Action Plan and binational lake plans;
- e) Plan and implement actions to protect and rehabilitate Great Lakes waterfowl, shore and marsh birds, wetlands and associated habitats through Great Lakes plans, the North American Waterfowl Management Plan, Eastern Habitat Joint Venture and the North American Bird Conservation Initiative; and
- f) Complete and implement binational biodiversity conservation plans for lakes Superior, Huron, St. Clair, Erie and Ontario.

Result 3.2 – Progress on rehabilitation of Great Lakes native species to restore the health of aquatic ecosystems, consistent with binational Great Lakes planning.

Canada and Ontario will:

- a) Make progress on rehabilitation of Lake Superior native species such as coaster brook trout and walleye;
- b) Make progress on rehabilitation of Lake Huron native species such as lake sturgeon, lake trout and walleye;
- c) Make progress on rehabilitation of native species of lakes Erie and St. Clair such as lake sturgeon and lake herring; and
- d) Make progress on rehabilitation of Lake Ontario and St. Lawrence River native species such as Atlantic salmon, American eel, bald eagle, lake trout and lake sturgeon.

Result 3.3 - Enhanced knowledge about beneficial and harmful impacts of human activities on Great Lakes aquatic ecosystems, habitats and species.

Canada and Ontario will:

- a) Undertake and support research and monitoring on the factors affecting aquatic ecosystems, habitats and native species;
- b) Develop and implement rapid assessment and remote sensing techniques to identify aquatic ecosystem status trends and stresses for Great Lakes and St. Lawrence near-shore zones, wetlands and tributaries; and
- c) Develop and implement adaptive management decision-support tools to guide conservation of aquatic biodiversity within the Great Lakes Basin.

Goal 4: Reduce the threat of aquatic invasive species to Great Lakes aquatic ecosystems and species.

A new aquatic invasive species enters the Great Lakes approximately every six to nine months. Some of the invaders become established and change the ecology of the lakes by disrupting food webs, displacing native species, altering energy pathways, and affecting water clarity in near-shore zones. They not only lead to ecological changes and but can also alter cycling of chemical contaminants and nutrients, and impact infrastructure operational costs and beaches. Both Canada and Ontario recognize the threat of aquatic invasive species to the health of the Great Lakes and will work cooperatively to implement a national plan in the Great Lakes region.

Result 4.1 - Implementation of the “National Action Plan to Address the Threat of Aquatic Invasive Species” in the Great Lakes.

Canada and Ontario will:

- a) Coordinate implementation of the National Action Plan to Address the Threat of Aquatic Invasive Species specific to the Great Lakes;
- b) Identify allowable species associated with each pathway or sector and the application of appropriate federal and/or provincial legislation and regulations to prevent new aquatic invasive species introductions;
- c) Develop early detection and rapid response to new aquatic invasive species; and
- d) Increase public awareness and education to prevent the spread of aquatic invasive species and to report new occurrences.

Canada will:

- e) Make prevention a priority by ensuring actions such as 100 percent compliance with Ballast Water Regulations; and
- f) Implement the Great Lakes Sea Lamprey Control Program in cooperation with the United States government to reduce sea lamprey populations.

Result 4.2: Enhanced knowledge about the harmful impacts of aquatic invasive species on Great Lakes aquatic ecosystems, food webs and species.

Canada and Ontario will:

- a) Develop biological and socio-economic risk assessment tools to determine pathways and relative risks associated with aquatic invasive species;
- b) Increase understanding through research into the impacts, management and control of aquatic invasive species; and
- c) Monitor and report the status of aquatic invasive species and their impacts on Great Lakes food webs.

Canada will:

- d) Conduct research on eradication, containment and control methods for aquatic invasive species and new technologies to eliminate ballast water introductions.

Goal 5: Understand the impacts of climate change on the Great Lakes Basin Ecosystem.

According to the 2007 Intergovernmental Panel on Climate Change Fourth Assessment Report, warming of the global climate system is unequivocal. In Ontario and the Great Lakes Basin, the impacts of climate change have been illustrated in numerous studies such as the Toronto-Niagara Region Study on Atmospheric Change, the Ontario Volume of the Canada Country Study, and the bi-national Great Lakes-St. Lawrence Basin study. The Parties agree that action is needed to identify changes to climate and ecosystems and assess impacts and vulnerabilities. The Parties understand that there are limitations to the ability to predict and model local impacts on specific ecosystems and regions. The Parties also understand that discussions of mitigation efforts must be addressed in a national and international context and are outside the scope of this Agreement.

Result 5.1 - The impacts of climate change on the Great Lakes ecosystem composition, structure, and function, including biodiversity (organisms

and their habitat), water quality and quantity, human health and safety (including access to clean drinking water), social well being and economic prosperity are understood by governments and the Great Lakes community.

Canada and Ontario will:

- a) Support the development of evidence, indicators, and model projections of climate and ecosystem change in the Great Lakes Basin, to the extent feasible;
- b) Increase understanding, to the extent feasible, of the impacts on and vulnerabilities of the Great Lakes including biodiversity, natural resources, water assets, human health and safety, the economy and infrastructure; and
- c) Facilitate linkages to climate change science, impacts and policy work of international, national, provincial and municipal governments, non-governmental organizations, industry and academia.

Canada will:

- d) Provide information on atmospheric hazards and regional atmospheric change impact studies to the extent feasible to decision makers and the public.

Ontario will:

- e) Continue working with other agencies and organizations to help communities around the Great Lakes ensure that foundation work is begun on managing the impacts of climate change.

Goal 6: Make significant progress towards the development and implementation of locally-created, science-based source protection plans to identify and mitigate risks to drinking water sources in the Great Lakes Basin.

More than 70% of Ontario's population draw their water directly from the Great Lakes and connecting channels. Others draw from the underground aquifers within the Great Lakes Basin, or from the Basin's streams, rivers and other surface waters. In total, about 95% of Ontarians, or more than 12 million people, depend on the waters of the Great Lakes Basin for water supply to their homes and communities. This area of special focus addresses the protection of the Great Lakes as sources of drinking water for the millions of people who rely on them.

In Ontario, the Great Lakes and their major aquifers are generally very high quality sources of drinking water. However, additional effort and cooperation are warranted to ensure that growing populations in the Basin can continue to rely on Great Lakes water for the many generations to come. This renewed Agreement recognizes that what happens on the land affects the water, and commits to the watershed approach to protecting the sources of drinking water in the Great Lakes Basin. Source protection in the Great Lakes Basin must integrate local watershed activities with lake- and basin-wide prevention and remediation action.

The Parties have agreed to achieve progress during the duration of the Agreement on collaborative, watershed-based action to protect the waters of the Great Lakes Basin as safe, reliable and trusted sources for drinking water supply.

Result 6.1 – The potential risks to Great Lakes Basin drinking water sources are identified and assessed, and early actions to address risks are undertaken.

To protect the safety, reliability and quality of Great Lakes Basin waters for drinking water supply, we must go beyond reactive and remedial approaches to anticipate and avoid the activities that pose a risk to drinking water sources. Source protection is a science-based, locally-driven process to protect drinking water on a watershed-by-watershed basis. The Parties recognize that the Great Lakes, which integrate the impacts of pollution across the tributary watersheds of the Great Lakes Basin, require special protections. Municipalities, conservation authorities and individuals have a role to play in conducting the science assessments and then making locally-appropriate decisions to minimize risks to water supplies.

Canada and Ontario will:

- a) Provide Source Protection Committees with access to provincial and federal data sets, studies and expertise to support the identification and assessment of issues and threats to drinking water sources;
- b) Include the consideration of protecting drinking water sources from significant risks associated with wastewater, where such risks are identified, when setting priorities for Canada and Ontario infrastructure funding programs; and
- c) Collaboratively pursue strengthening of protection of the Great Lakes as sources of drinking water through existing binational mechanisms.

Canada will:

- d) Support demonstration projects and technology transfer on municipal, wastewater treatment technologies to control pathogens and chemicals of emerging concern; and

- e) Consult with agencies responsible for federal lands and facilities, to develop a framework for their participation in watershed-based source protection.

Ontario will:

- f) Establish source protection authorities and support the creation of source protection committees that include municipal, conservation authority, First Nation, industrial, business, agricultural, non-government organization and other watershed representatives and individuals, for the development of source protection plans;
- g) Provide regulations, rules and guidelines for the development of source protection workplan documents and scientific assessment reports, including the specific needs of Great Lakes drinking water systems;
- h) Provide mechanisms through regulations, rules and guidance under the *Clean Water Act, 2006* for the integration of source protection plans with Great Lakes plans and agreements;
- i) Engage with interested First Nations to develop: the framework for representatives to hold a seat on local source protection committees, and a process for Band Councils to opt in to participating in watershed-based source protection planning; and provide access to training and technical guidelines for interested First Nations to conduct source water protection assessments.
- j) Maintain a stewardship fund to provide education and outreach on the protection of drinking water sources, and to directly support action on mitigating potential threats to source waters.

Result 6.2: Develop knowledge and understanding of water quality and quantity issues of concern to the Great Lakes as drinking water sources.

Source protection planning is a science-based undertaking. It is also an inherently precautionary approach. To protect source water quality, it is necessary to understand the occurrence and significance of contaminants of existing or emerging concern on a lake-wide basis as well as on a site-specific basis. Water quantity in areas of the Basin might also be at risk, as land uses and climate change may threaten water levels or disrupt the processes that replenish underground aquifers. Canada and Ontario, working with other members of the Great Lakes community will contribute data and expertise to build a better understanding of the source water issues and concerns in the Great Lakes.

Canada and Ontario will:

- a) Support improved collaboration on Great Lakes drinking water source protection research among governments, academics, industry, watershed groups and U.S. counterparts; and
- b) Provide source protection committees with access to provincial and federal data sets, studies and expertise on environmental monitoring and science concerning source water quality and quantity, occurrence and causes of water quality impairments, and related potential health risks.

Ontario will:

- c) Ensure that watershed-based committees in the Great Lakes Basin collaborate to identify issues and threats shared by multiple watersheds in the basin, to inform the development of provincially-mandated Great Lakes source protection targets and other provincial actions as needed; and
- d) Support the engagement of conservation authorities and municipalities in the Great Lakes Basin for the assessment, restoration and protection of Great Lakes watersheds for both drinking water source protection and broader ecosystem protection purposes.

IV Definitions

Lakewide Management Plans (LaMPs) and binational lake action plans

Lake-based binational initiatives that establish aquatic ecosystem goals and identify and report on priorities for actions to protect and restore Great Lakes ecosystems. These initiatives are endorsed and overseen by the Great Lakes Binational Executive Committee and are a key program in delivering Canada's commitments under the Great Lakes Water Quality Agreement. Lakewide Management Plans are in place for lakes Superior, Erie and Ontario. Lake actions plans are in place for both lakes Huron and St. Clair and are known as the Lake Huron Binational Partnership and Lake St. Clair Management Plan.

Source Protection – or the protection of existing and future sources of drinking water, is the first barrier in a multi-barrier approach to drinking water safety. It compliments water treatment to protect human health by reducing the risk that water gets contaminated in the first place. Ontario is developing the regulatory framework that integrates locally-driven, watershed-based source protection in Great Lakes tributary watersheds with Great Lakes Basin Ecosystem protections.

ANNEX 4

COORDINATION OF MONITORING, RESEARCH AND INFORMATION

I Preamble

To achieve the Agreement's vision of a healthy, prosperous and sustainable Great Lakes Basin Ecosystem, it is necessary that the Great Lakes community has access to accurate information regarding trends in environmental quality.

Monitoring and research help to detect and characterize current and emerging issues in the Great Lakes Basin Ecosystem, and provide the understanding to guide adaptive, scientifically-supported management actions. Monitoring and research activities should be coordinated across the basin in order to ensure the comprehensive base of information is collected and captured over varying time scales and geographic coverage to improve consistency and continuity.

Binational jurisdictions, agencies, organizations and individuals routinely collect and analyze data to report on the state of the Great Lakes Basin Ecosystem. Therefore, data and information must be made readily available to resource managers, decision-makers and the public in a consistent manner, to ensure that decisions are based on the best available data. Standards for metadata (information about data) and interoperability of data must be adhered to, to improve discovery and access.

These activities are all prerequisites for sound decision-making in the Great Lakes Basin and for reporting meaningfully on the progress made in achieving environmental objectives and defining appropriate actions.

II Goals

The Parties have identified two goals that will ensure coordinated monitoring and research are conducted and that the Great Lakes community has access to accurate information regarding trends in environmental quality:

1. Undertake coordinated and efficient federal/provincial scientific monitoring and research; and
2. Continue to improve the discovery and sharing of data, information and trends in the Great Lakes Basin Ecosystem.

III Results

Result 1 – Responsive and comprehensive monitoring and research programs.

Canada and Ontario will:

- a) Coordinate monitoring and research of federal and provincial agencies as well as local communities in support of Annex 1 to track progress towards the recovery of beneficial uses and achievement of delisting targets in AOCs;
- b) Coordinate federal and provincial monitoring and research in support of Annex 2 to determine trends, impacts and sources of harmful pollutants;
- c) Coordinate federal and provincial monitoring and research in support of Annex 3 to optimize programs and address priorities in the near-shore zones, coastal areas, open waters and tributaries;
- d) Link Canadian Great Lakes research and monitoring with work being undertaken by other jurisdictions to improve efficiency and effectiveness of programs and to set priorities for future work; and
- e) Establish a Canada-Ontario water quality and aquatic ecosystem health issue team to coordinate activities.

Result 2 – Improved reporting on environmental conditions, changes and progress

Canada and Ontario will:

- a) Adopt meaningful indicators for reporting trends in ecosystem health and water quality; and
- b) Report by March 31, 2010 on the status and trends in water quality and aquatic ecosystem health in the Great Lakes Basin.

Result 3 – Increased sharing of data and information among governments, organizations and Basin residents.

Canada and Ontario will:

- a) Implement best management practices for information management of work conducted under the Agreement and commit to follow the protocols of the Canadian Geospatial Data infrastructure and the Land Information Ontario, where applicable;
- b) Establish internet-based mechanisms to facilitate access to and sharing of data and information through recognized standards and specifications, such as web mapping and web data services;

- c) Promote and maintain a web-based inventory (Binational Executive Committee Monitoring Inventory) of on-going monitoring programs and activities and track their status;
- d) Better utilize existing monitoring data to identify progress in environmental conditions, trends and emerging issues by reporting on indicators such as SOLEC and LaMP indicators using Lake Views;
- e) Ensure compatibility and interoperability with current federal and provincial information management standards and systems; and
- f) Provide targeted technical advice to the Great Lakes community to develop common geospatial applications and share federal and provincial data sets, studies and expertise in environmental monitoring and research.

IV Definitions

Binational Executive Committee (BEC) Monitoring Inventory

The BEC Monitoring Inventory is a web-based searchable inventory of Canadian and U.S. monitoring programs. The purpose of the inventory is to raise awareness of ongoing activities and to further promote collaboration and coordination of monitoring in the Great Lakes. (Available at www.binational.net)

indicators

Indicators, including physical, biological and chemical measurements, are variables selected to supply information about the presence or state of conditions or trends.

interoperability

The ability of two or more hardware devices, or two or more software routines, to work together.

geospatial

Geospatial data and applications refer to collections of information that can be mapped, or located and have relationship to time and space. Users can utilize computer applications to explore, analyze and gather details about the characteristics of a data set and reveal how it interrelates with other data sets. Geospatial data and applications can be used to plan and predict by extrapolating trends and postulating changes.

Lake Views

Lake Views is an internet based application, which dynamically retrieves information from distributed sources through the use of standardized internet mapping and web service technologies, serves as a discovery,

access, and visualization for information regarding trends in environmental quality.

metadata

Information about data. Metadata describe when and by whom a particular set of data was collected, and how the data are formatted. Metadata are essential for understanding information stored in data warehouses.

SOLEC

State of the Lakes Ecosystem Conference. The SOLEC binational conference, hosted by the U.S. Environmental Protection Agency and Environment Canada on behalf of the two Countries every two years, is intended to provide a forum for exchange of information and report on the state of the Great Lakes basin ecosystem using a suite of indicators.

standards

Standards specify a technological area with a well-defined scope by a formal standardization body and process

protocols

Protocols are established to provide guidelines for use in various circumstances, such as data collection, manipulation, storage and maintenance.

web data services

A collection of operations, accessible through one or more interfaces, is delivered by a server or multiple servers that allows users to access and retrieve data remotely

web mapping services

Web Mapping Service is a sub-set of the suite of internet-based services that allows users to display maps and/or images with a geographic component and whose raw spatial data files reside on one of more remote servers. Additional web feature and coverage services allow for advance data querying, retrieval and rendering operations.