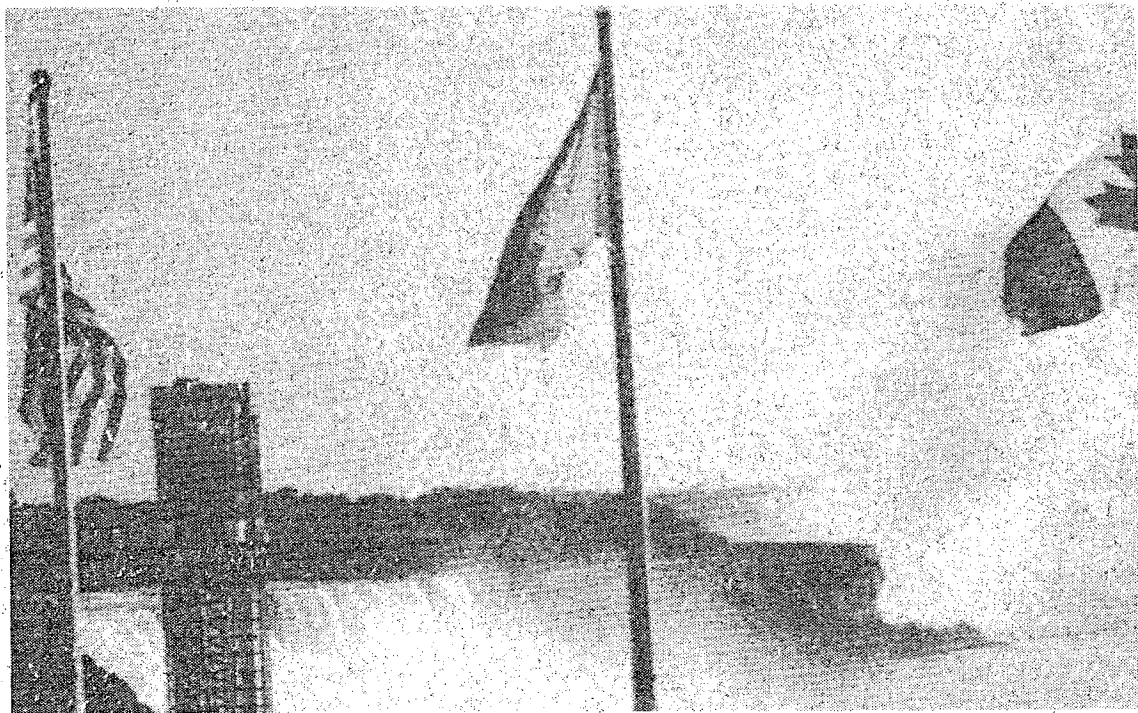


**A CITIZENS' GUIDE
TO THE
GREAT LAKES WATER QUALITY
AGREEMENT**



**GREAT
LAKES
UNITED**

SARAH MILLER

**A CITIZENS' GUIDE
TO THE
GREAT LAKES WATER QUALITY
AGREEMENT**



By Tim Eder and John Jackson
December, 1988

GREAT LAKES UNITED
State University College at Buffalo,
Cassety Hall, 1300 Elmwood Avenue
Buffalo, New York 14222
(716) 886-0142

GREAT LAKES UNITED

Great Lakes United is a coalition of more than 200 member groups of environmentalists, sportsmen and women, labor, and civic organizations from the eight Great Lakes States and two Canadian Provinces. We are dedicated to promoting the protection and restoration of the Great Lakes Basin Ecosystem.

Great Lakes United gratefully acknowledges funding for this publication from the C.S. Mott Foundation, the International Joint Commission and the Great Lakes Environment Office of Environment Canada.

Second Printing

August, 1989

PREFACE

The Great Lakes are bodies of water that we all cherish. The vision that we have for their future is reflected in that remarkable document -- the Great Lakes Water Quality Agreement. The Water Quality Agreement provides an inspiring vision of what the Great Lakes could be like in the future:

- *"the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem" is restored and maintained,*
- *"the discharge of toxic substances in toxic amounts [is] prohibited,"*
- *"the discharge of any or all persistent toxic substances [is] virtually eliminated," and*
- *"the waters are free from substances produced by humans that would "produce conditions that are toxic or harmful to human, animal, or aquatic life."*

In November 1987, the Canadian and U.S. Governments reaffirmed "their determination to restore and enhance water quality in the Great Lakes" when they signed amendments to the Great Lakes Water Quality Agreement. The Governments had made similar commitments in 1972 and 1978.

Unfortunately, contamination problems still abound in all parts of the Great Lakes Basin. Therefore, citizens throughout the Basin have concluded that many of the promises of the 1972 and 1978 Agreements are as yet unfulfilled. Though pleased with the new and renewed commitments of the two governments in 1987, many of the Basin's residents fear that these will simply be more unfulfilled promises.

PREFACE

The citizens of the Great Lakes Basin played an unprecedented role in the development of the 1987 changes to the Water Quality Agreement. Through citizens' hearings conducted by Great Lakes United, public meetings held by the Canadian and U.S. governments, ongoing discussion with officials developing the amendments, and participation on the negotiating teams, the citizens of the Basin affected the content of the Agreement. The public succeeded in making the Agreement reflect their hopes and expectations.

The success of the Agreement will depend upon the public's determination to ensure that the Governments follow through on their commitments. Without the continued diligence of the residents of the Great Lakes Basin, the Governments will not move as aggressively as they could to achieve the Agreement's goals and objectives.

This booklet is intended to help you understand the potential of the Agreement and the ways that you can use the Agreement in your efforts to clean up the Great Lakes.

We hope that you will find this citizens' guide useful in a variety of ways. With this in mind, we have organized this booklet under headings that you can use for easy reference to the topic of most concern to you at a particular time. We urge everyone to review Chapter 3, "The Agreement's Guiding Principles." The points in the other chapters must be read in the context of the central tenets described in Chapter 3.

PREFACE

The citizens of the Great Lakes Basin played an unprecedented role in the development of the 1987 changes to the Water Quality Agreement. Through citizens' hearings conducted by Great Lakes United, public meetings held by the Canadian and U.S. governments, ongoing discussion with officials developing the amendments, and participation on the negotiating teams, the citizens of the Basin affected the content of the Agreement. The public succeeded in making the Agreement reflect their hopes and expectations.

The success of the Agreement will depend upon the public's determination to ensure that the Governments follow through on their commitments. Without the continued diligence of the residents of the Great Lakes Basin, the Governments will not move as aggressively as they could to achieve the Agreement's goals and objectives.

This booklet is intended to help you understand the potential of the Agreement and the ways that you can use the Agreement in your efforts to clean up the Great Lakes.

We hope that you will find this citizens' guide useful in a variety of ways. With this in mind, we have organized this booklet under headings that you can use for easy reference to the topic of most concern to you at a particular time. We urge everyone to review Chapter 3, "The Agreement's Guiding Principles." The points in the other chapters must be read in the context of the central tenets described in Chapter 3.

A CITIZENS' GUIDE TO THE GREAT LAKES WATER QUALITY AGREEMENT

TABLE OF CONTENTS

	<u>Page</u>
Preface	i
Table of Contents	iii
CHAPTER 1:	
THE GREAT LAKES WATER QUALITY AGREEMENT	
<u>History of the Agreement</u>	1
The 1972 Agreement	1
The 1978 Agreement	2
The 1987 Amendments	3
<u>Jurisdiction of the Agreement</u>	5
<u>Format of the Agreement</u>	5
<u>The Agreement and the Public</u>	6
CHAPTER 2:	
ROLES AND RESPONSIBILITIES	
<u>The Federal Governments</u>	9
Implementing Agencies	9
Reporting Responsibilities	10
The Federal Governments, the Agreement and the Public	12
<u>The State and Provincial Governments</u>	12
Cooperation Between the Federal Governments and the State and Provincial Governments	14
The State and Provincial Governments, the Agreement and the Public	15

	<u>Page</u>
<u>The International Joint Commission</u>	15
Role of the IJC	16
The IJC as Implementor	17
The IJC as Evaluator	17
Structure of the IJC	19
The Commission	19
The Great Lakes Water Quality Board	19
The Great Lakes Science Advisory Board	20
Great Lakes Regional Office	21
The IJC, the Agreement and the Public	21
<u>The Polluters</u>	23
<u>The Great Lakes Basin's Residents</u>	23
CHAPTER 3:	
THE AGREEMENT'S GUIDING PRINCIPLES	
<u>The Ecosystem Approach</u>	25
The Geographic Boundaries	26
The Connections of Air, Land, Water and All Life	27
<u>Virtual Elimination and Zero Discharge of</u>	
<u>Persistent Toxic Substances</u>	28
The Importance of Zero Discharge	29
<u>Implementing the Guiding Principles</u>	30
CHAPTER 4:	
THE AGREEMENT AND WATER QUALITY ISSUES	
4.1 <u>General and Specific Objectives</u>	31
General Objectives	32
Specific Objectives	33
The List of Specific Objectives	34
Review of Specific Objectives	36

	<u>Page</u>
4.2 <u>Water Quality Standards</u>	37
Principles for Judging Water Quality Standards	38
4.3 <u>Industrial Discharges</u>	46
Discharge Permits	46
Reducing Industrial Wastes	47
4.4 <u>Remedial Action Plans</u>	50
Designation of Areas of Concern	51
Development of RAPs	53
The Public's Role	53
The Basic Principles of RAPs	53
Implementation of RAPs	55
4.5 <u>Lakewide Management Plans</u>	56
Critical Pollutants	56
Lakewide Goals and Objectives	57
A Toxics Freeze	58
Beyond the Freeze	59
4.6 <u>Air</u>	61
4.7 <u>Non-Point Source Pollution and</u>	
<u>Land Use Activities</u>	63
Pest Control	64
Animal Husbandry	64
Road Salt	64
Urban and Rural Runoff	65
Watershed and Land Use Management	65
Wetlands	66
Contaminated Groundwater	67

	<u>Page</u>
4.8: <u>Contaminated Sediments and Dredging</u>	69
Measuring Contaminant Levels	70
Demonstration Programmes	71
Existing Disposal Facilities	72
4.9 <u>Human, Fish and Wildlife Health</u>	73
CONCLUSION	77
APPENDIX: SOURCES OF INFORMATION ON GREAT LAKES WATER QUALITY	79

Chapter 1:

THE GREAT LAKES WATER QUALITY AGREEMENT

The residents of the Great Lakes Basin own the Great Lakes Water Quality Agreement. But few of us know about and understand the potential of that Agreement to protect the Lakes and all those who depend upon them for their well-being.

HISTORY OF THE AGREEMENT

The Great Lakes Water Quality Agreement arose out of the Boundary Waters Treaty signed by Great Britain and the United States in 1909. This Treaty stated that "boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." The Treaty created the International Joint Commission to assist the Governments in carrying out their promises under the Treaty.

THE 1972 AGREEMENT

When the Canadian and United States Governments became very concerned about pollution problems in the Great Lakes, they decided that this area of their border required special attention. This led to the signing of the Great Lakes Water Quality Agreement in 1972 by the two Federal Governments.

The signing of the 1972 Great Lakes Water Quality Agreement was a dramatic step rarely taken by two sovereign governments. In it the Canadian and U.S. Governments promised to work together to clean up the Great Lakes and to commit substantial resources to that effort.

THE AGREEMENT

The 1972 Agreement focussed on the problems being created by excess phosphorus and other nutrients being released into the Great Lakes. This caused rampant growth of algae, which resulted in beaches awash with smelly, sticky, unsightly seaweed. The algae consumed the oxygen dissolved in the waters, leaving the fish to suffocate; dead fish washed up on the shores of the Lakes. Many people declared Lake Erie "dead".



Massive dieoffs of alewife were common in the Great Lakes in the early 1970's.

To address these problems, the Governments signed the 1972 Water Quality Agreement. The central promise in this Agreement was the reduction of phosphorus loadings to the Great Lakes by building sewage treatment plants, reducing phosphates in detergents and controlling runoff from rural and urban areas.

THE 1978 AGREEMENT

Substantial progress was made under the 1972 Agreement. Lake Erie came back to life and the other Lakes were much less affected by excess algae growth. But the Lakes were now increasingly confronted by an even greater threat -- toxic contaminants. Fish, wildlife, and humans all were having their health endangered by

toxic substances -- those silent and usually invisible contaminants permeating the environment. Increased concern about contamination by toxic substances led the Canadian and U.S. Governments to renegotiate the 1972 Agreement and sign a new Great Lakes Water Quality Agreement in 1978.

The 1978 Water Quality Agreement is an outstanding, precedent-setting document. It pledges the two countries to work together using an ecosystem approach to rid the Great Lakes of toxic contamination problems. It espouses a philosophy that the only rational approach to managing the worst pollutants is zero discharge and virtual elimination. It is the first time that such leading-edge concepts as ecosystem and zero discharge were incorporated into a document signed by governments.

THE 1987 AMENDMENTS

Between 1985 and 1987, the Water Quality Agreement was scrutinized by several bodies. Great Lakes United held 19 hearings around the Great Lakes basin at which almost 400 people talked about the environmental problems they were encountering, their hopes for the future and their ideas for cleaning up and protecting the Great Lakes. The citizens strongly expressed their frustrations with the failure of the Governments to live up to the fine language in the Agreement. These concerns and recommendations are reported in Great Lakes United's publication *Unfulfilled Promises*.

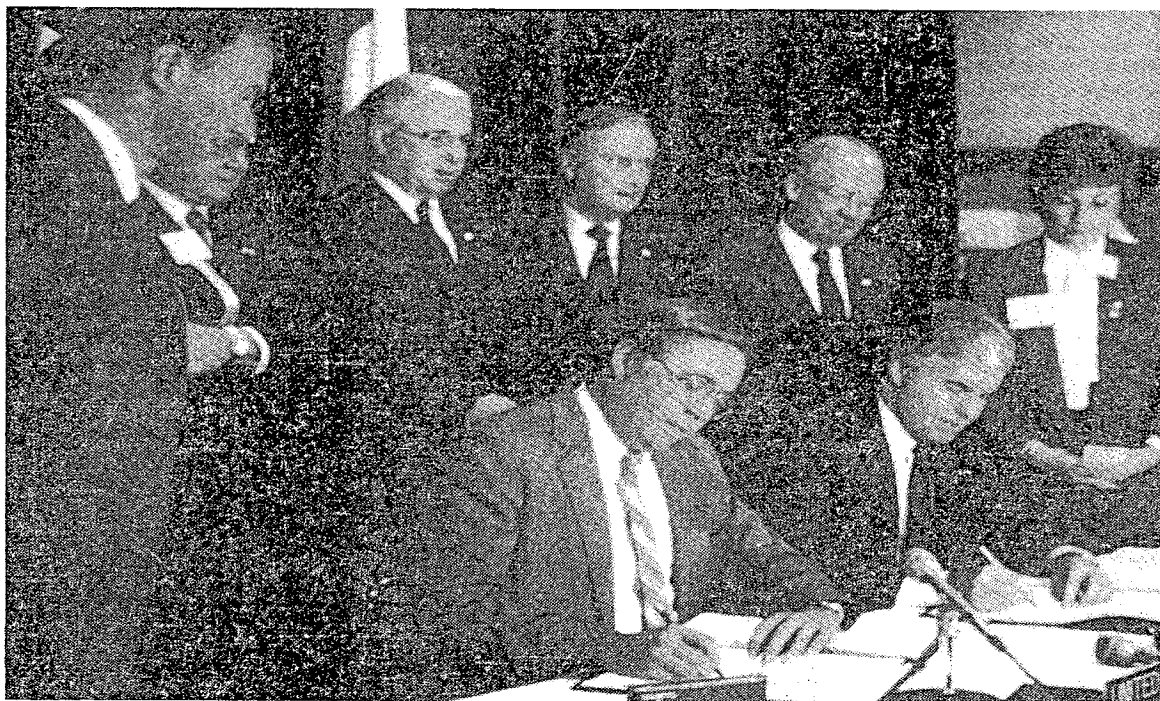
The Royal Society of Canada and the U.S. National Academy of Sciences, and the International Joint Commission conducted reviews at approximately the same time. They also concluded that much more had to be done to reach the goals of the 1978 Water Quality Agreement.

As a result of this input, the Canadian and U.S. Governments decided to retain the Agreement with some adjustments to update it to recent issues. Citizens throughout the Basin had a substantial impact upon the amendments that were eventually passed. The citizens' report *Unfulfilled Promises* helped set the agenda for the beginning of the negotiation process. Citizens on both sides of the

THE AGREEMENT

border reviewed and commented on government proposals for changes. In addition, five representatives of environmental groups (three from Great Lakes United, one from the National Wildlife Federation and one from the Sierra Club) participated in the negotiations between Canada and the U.S.

The amendments to the 1978 Great Lakes Water Quality Agreement were signed in Toledo in 1987. The preamble added to the Agreement at that time clearly stated the reasons for the Governments' affirmation of commitment and the addition of amendments:



U. S. and Canada signed new Amendments to Great Lakes Water Quality Agreement in 1987.

Recognizing the need for strengthened efforts to address the continuing contamination of the Great Lakes Basin Ecosystem, particularly from persistent toxic substances, ...

The amendments added new annexes on pollution from non-point sources, contaminated sediments, airborne toxic substances, pollution from contaminated groundwater, and research and

development. In addition, the annex on limited use zones was replaced with one on Remedial Action Plans, Lakewide Management Plans and Point Source Impact Zones.

JURISDICTION OF THE AGREEMENT

The Great Lakes Water Quality Agreement applies to the five Great Lakes, the connecting channels (St. Mary's River, the St. Clair River and the Niagara River) and the St. Lawrence River up to the point where the St. Lawrence River ceases to form the international boundary between Canada and the U.S. (near Cornwall, Ontario, and Massena, New York). Quebec and the St. Lawrence River beyond Cornwall/Massena are not included in the Agreement.

The Great Lakes System refers to all the streams, rivers, lakes, tributaries and other bodies of water that drain into the Great Lakes. The Ecosystem is defined to include "the interacting components of air, land, water and living organisms, including humans" [Article I, (g)].

The Canadian and U.S. Federal Governments signed the Agreement and are, therefore, referred to as the Parties throughout the Agreement; they bear primary responsibility for implementing the Agreement.

FORMAT OF THE AGREEMENT

The body of the Great Lakes Water Quality Agreement contains a series of articles outlining the purposes, objectives, requirements, and programmes that the Governments are committing themselves to. The articles also define the responsibilities of the International Joint Commission and set up special institutions to help the IJC carry out its duties. These institutions include the Water Quality Board, the Science Advisory Board and a Regional Office located in Windsor, Ontario.

Attached to the Agreement are seventeen annexes. These give more details on the programmes that the Parties have committed themselves to in the body of the Agreement. The Annexes include:

Specific Objectives, Remedial Action Plans and Lakewide Management Plans, Control of Phosphorus, Discharges of Oil and Hazardous Polluting Substances from Vessels, Discharges of Vessel Wastes, Review of Pollution from Shipping Sources, Dredging, Discharges from Onshore and Offshore Facilities, A Joint Contingency Plan (for responding to spills), Hazardous Polluting Substances, Surveillance and Monitoring, Persistent Toxic Substances, Pollution from Non-Point Sources, Contaminated Sediments, Airborne Toxic Substances, Pollution from Contaminated Groundwater, and Research and Development.

References throughout this booklet in square brackets refer to the Articles and Annexes of the Water Quality Agreement.

THE AGREEMENT AND THE PUBLIC

The 1987 amendments to the Water Quality Agreement added a public role to the Agreement for the first time. Provisions for public input were formally written into the Agreement in two places:

The Parties, in cooperation with the State and Provincial Governments, shall ensure that the public is consulted in the development and adoption of the Specific Objectives [Supplement to Annex 1, 2. (a)], and

The Parties, in cooperation with State and Provincial Governments, shall ensure that the public is consulted in all actions undertaken pursuant to this Annex [Annex 2, 2. (e) Annex on Remedial Action Plans and Lakewide Management Plans].

These insertions also imply a general commitment from the Governments to consult with the public on all aspects of the Agreement.

This formal recognition of the public role was a result of the initiatives that citizens' groups took in the review and renegotiation of the Water Quality Agreement. In effect, the residents of the Basin have claimed the Agreement as our own.

This public ownership and commitment to the Agreement is the most hopeful sign for the Agreement's success; this is the only way the potential of the Agreement will be realized.

The laws and water quality programmes of the Federal, Provincial and State Governments are far weaker than the strong, clear language in the Water Quality Agreement. Citizens will have to continuously push for strong programmes to achieve the Agreement's goals.



CREDITS: TORONTO CROSS & HALL

Chapter 2:

ROLES AND RESPONSIBILITIES

The Agreement depends on people to fulfil its promises. All sectors -- government, the International Joint Commission, dischargers and the region's residents -- are failing to carry out their responsibilities. Governments do not have strong enough laws and do not adequately enforce the legislation they do have. The International Joint Commission too seldom speaks out as an aggressive advocate for the Great Lakes. Polluters still discharge massive quantities of toxic substances into the Great Lakes. The public are often oblivious to the environmental consequences of their lifestyles.

THE FEDERAL GOVERNMENTS

Many people mistakenly believe that the International Joint Commission has the primary responsibility for implementing the Great Lakes Water Quality Agreement. But this responsibility really lies with the Canadian and U.S. Federal Governments.

These two Governments are the Parties who signed the Agreement; therefore, they bear the responsibility for carrying out the commitments they made.

IMPLEMENTING AGENCIES

Because the Agreement is between two sovereign countries, the formal responsibility for negotiating and implementing the Agreement rests with their departments responsible for foreign affairs: Canada's Department of External Affairs and the U.S. State Department. While these departments have the "official" responsibility, Environment Canada and the U.S. Environmental Protection Agency play the lead roles.

RESPONSIBILITIES

In the U.S., the 1987 Great Lakes Amendment to the Clean Water Act (Section 118) declares that it is "the purpose of this section to achieve the goals embodied in the Great Lakes Water Quality Agreement of 1978 ..." The Clean Water Act has been amended again to ensure that Section 118 also applies to the 1987 Great Lakes Water Quality Agreement.

The Clean Water Act puts EPA's Great Lakes National Program Office (GLNPO) in Chicago in charge of overseeing the implementation of most of the Federal Government's responsibilities under the Agreement.

A Work Group on the Great Lakes Water Quality Agreement was set up in May 1988 to act as a coordinating mechanism within the U.S. to assist the EPA in organizing the various reports needed under the amended Agreement and the annual Great Lakes report to Congress called for in the Clean Water Act. This Work Group is made up of representatives from the various Federal and State agencies, the Council of Great Lakes Governors, Great Lakes United and the Lake Michigan Federation.

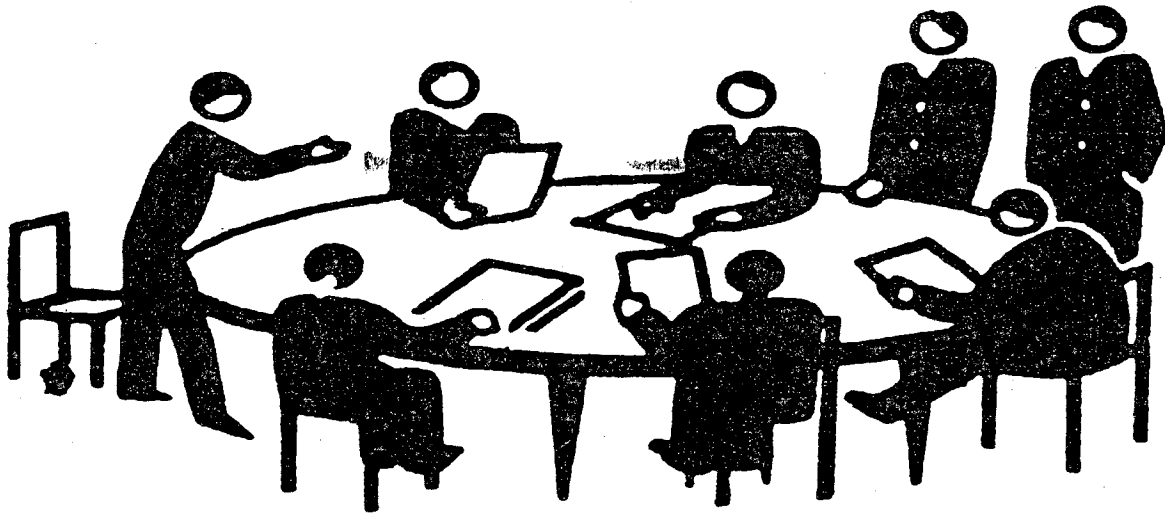
In Canada, Environment Canada has given primary responsibility for overseeing the implementation of the Agreement to its Great Lakes Environment Office located in Toronto.

REPORTING RESPONSIBILITIES

The two Federal Governments are required to report to the International Joint Commission on their progress in implementing the Agreement. The 1978 Agreement required two recurring reports:

- annual reports on the municipal and industrial discharges to the Great Lakes System [Article VI, 1. (c)], and
- annual reports on phosphorus load reduction plans [1983 Supplement to Annex 3, 4. (b)].

This reporting responsibility was substantially expanded in the 1987 amendments to the Agreement. Additional reporting requirements include:



- biennial reports on the size and effects of Point Source Impact Zones [Annex 2, 7. (a)],
- biennial reports on development of Remedial Action Plans and Lakewide Management Plans [Annex 2, 7. (b)],
- biennial reports on progress in reducing the generation of contaminants [Annex 12, 8.],
- biennial reports on the development of watershed management plans and programmes to control non-point sources of pollution [Annex 13, 5.],
- biennial reports on progress in understanding transfer of contaminated sediments and developments in technologies for management of contaminated sediments [Annex 14, 2. (b) (i)],
- biennial reports on research and control programmes on airborne toxic substances [Annex 15, 6.], and
- biennial reports on progress in understanding and controlling pollution from contaminated groundwater [Annex 16, (v)].

RESPONSIBILITIES

With one exception, the biennial reports are due by the end of 1988 and every two years after that. The exception is the reports on Point Source Impact Zones; the first one is due by September 30, 1989, and every two years thereafter.

These reporting requirements will make it easier to hold the Parties accountable for their promises.

THE FEDERAL GOVERNMENTS, THE AGREEMENT AND THE PUBLIC

If the Water Quality Agreement fails to reach its goals, the Federal Governments, as the signers of the Agreement, must assume primary responsibility. We must hold the Federal Governments, the Parties to the Agreement, accountable.

Some ways in which we can hold them accountable are:

- reminding them at every opportunity of their commitments under the Agreement and our expectations,
- judging their water quality programmes by the principles of the Agreement and pushing for improvements,
- lobbying them for budget allocations adequate to carry out their commitments in the Agreement, and
- reviewing and critiquing the reports the Federal Governments submit according to the requirements of the Agreement.

Past experience shows that the success of the Agreement relies heavily upon the public's diligence in pushing the Federal Governments for action.

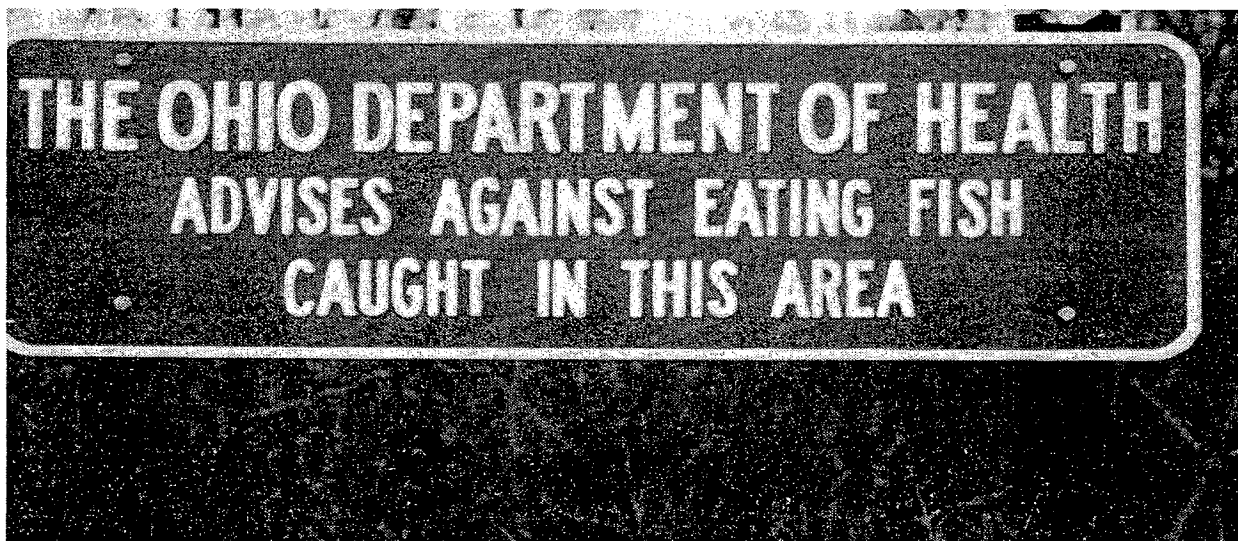
THE STATE AND PROVINCIAL GOVERNMENTS

Most of the day-to-day management of Great Lakes water quality is handled by the State and Provincial Governments. The States and Provinces have their own water quality laws and standards and issue permits to dischargers. The State and Provincial

Governments also are taking a lead role in carrying out many Agreement programmes, including the development of Remedial Action Plans.

The Federal Governments recognize that they cannot do the job without the assistance of the State and Provincial Governments. As a result, throughout the Agreement, when the Parties are referred to, it is frequently followed by the phrase "in cooperation with the State and Provincial Governments" or "in consultation with the State and Provincial Governments."

The State and Provincial Governments referred to in the Great Lakes Water Quality Agreement are Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin and Ontario. The Province of Quebec is not included, because, even though from an ecological sense the entire St. Lawrence is part of the Great Lakes ecosystem, the Agreement ends its jurisdiction at Cornwall-Massena before the River reaches the boundaries of Quebec.



COOPERATION BETWEEN THE FEDERAL GOVERNMENTS AND THE STATE AND PROVINCIAL GOVERNMENTS

Under the U.S. Clean Water Act, the States are delegated the responsibility for carrying out clean water programmes. EPA negotiates each State's annual work programme and provides grants to carry out the work. It also comments on and approves States' water quality standards.

EPA's Water Division, not the Great Lakes National Program Office, is charged with approving the States' programmes. While EPA has made arrangements to make sure that GLNPO is involved in this process, the Water Division has the final say. As a result, the Great Lakes Water Quality Agreement is not as important a factor as it should be in these decisions.

Unlike in the U.S., the Canadian constitution does not provide the Federal Government a role in approving Provincial programmes like water quality regulations. Therefore, the Canadian Federal Government was put into a very awkward position when it signed the Great Lakes Water Quality Agreement. It had signed an Agreement committing itself to ensure that certain programmes were carried out but did not have the legal power to make sure that many of the items were done.

To get around this situation, the Federal and Ontario Governments developed the "Canada-Ontario Agreement Respecting Great Lakes Water Quality." The purpose of the Canada-Ontario Agreement (COA) is to ensure cooperation between Canada and Ontario in meeting the Federal Government's obligations under the Great Lakes Water Quality Agreement. To ensure ongoing cooperation and joint development of programmes related to Great Lakes water quality, a COA Board of Review was set up. This Board is co-chaired by one representative each from the Federal and Provincial Governments.

The necessarily substantial role for the States and Ontario in working for the goals of the Great Lakes Water Quality Agreement creates some serious problems. It is the Federal Governments -- not the State and Provincial Governments -- that signed the Agreement. Therefore, the commitment of the States and Ontario to the Agreement is not as definite as for the Federal Governments. In recognition of this problem, the two Federal Governments consulted with the States and Ontario during the renegotiation of the Water Quality Agreement in 1987. They even included representatives of the State and Provincial Governments on their negotiating teams. Canada included representatives of both Ontario and Quebec on its team.

THE STATE AND PROVINCIAL GOVERNMENTS, THE AGREEMENT AND THE PUBLIC

Citizens must recognize the central importance of the State and Provincial Governments in implementing the Water Quality Agreement. This means that we should judge the actions of these governments by the standards set by the Agreement, even though they are not signatories to the Agreement.

If we do not push the States and Ontario to fulfil the goals of the Agreement, there is no possibility of reaching those goals that are so central to the well-being of the Great Lakes Ecosystem.

THE INTERNATIONAL JOINT COMMISSION

The International Joint Commission is made up of three U.S. and three Canadian Commissioners who are appointed by the U.S. President and the Canadian Prime Minister to oversee the Boundary Waters Treaty of 1909. One of the Commissioners' most important duties is their oversight of the Great Lakes Water Quality Agreement. In conjunction with their staffs in their Washington, Ottawa and Windsor offices, the Commission plays a vital role in seeing that the Agreement is implemented.

RESPONSIBILITIES

Many people look to the IJC as the protector and saviour of the Great Lakes. It was evident during Great Lakes United's hearings around the Great Lakes during the summer and fall of 1986 that many people are disappointed that the IJC has not been a more aggressive advocate for the Great Lakes and its residents.

The IJC's main role under the Agreement is to evaluate the Parties' performance. This distinction between the Federal Governments as implementors of the Agreement and the IJC as evaluator or auditor was made clearer by the 1987 amendments.

Even though the IJC does not actually have the responsibility for implementing the Agreement, their role is no less important. In fact, because of the unique nature of the Agreement -- it is not quite as powerful as a treaty or domestic law -- the IJC's role is even more crucial. The Agreement and the Boundary Waters Treaty give the IJC enormous potential to ensure that the Governments live up to their commitments. Unfortunately, much of this potential is unrealized.

ROLE OF THE IJC

Article VII of the Great Lakes Water Quality Agreement spells out the IJC's powers and responsibilities under the Agreement:

- collection, analysis and distribution of information on Great Lakes water quality and effectiveness of programmes carried out by the Parties under the Agreement,
- provision of advice and recommendations to the Federal, State and Provincial Governments on water quality matters, including legislation, standards, and other regulatory programmes, and matters covered in the Annexes to the Agreement,
- assistance in coordination of joint activities to carry out the intent of the Agreement, and
- advice on research needs.

Citizens involved in water quality issues often express frustration with the role of the IJC. This frustration is based on two factors:

- 1) the expectation that the IJC would take a greater role in implementation of the Agreement, and
- 2) the expectation that the IJC would be a more aggressive critic of the Governments' failures to implement the Agreement more fully.

The IJC As Implementor:

The first frustration is based on a common misunderstanding of the respective responsibilities of the IJC and the Federal Governments under the Agreement. It is the Federal, State and Provincial Governments -- not the IJC -- who are responsible for cleaning up the Great Lakes. The IJC is supposed to be an evaluator and auditor of the Governments as they implement the Agreement.

The 1987 amendments to the Agreement attempted to make the distinction in these roles clearer. The amendments require the Federal Governments to prepare more reports -- rather than the IJC. This frees up the IJC to serve more of a critical, evaluative role.

The IJC As Evaluator:

The main role defined for the IJC is as evaluator of the Governments' progress in carrying out the Agreement. During Great Lakes United's hearings in 1986, numerous speakers criticized the IJC for failing to be more outspoken in calling upon the Governments to carry out their promises under the Agreement.

Many members of the public feel that the IJC's biennial reports should be more aggressive in criticizing the Governments and not so heavily couched in diplomatic language. They also believe the IJC should speak out publicly more frequently than every two years.

The public also has sometimes called upon the IJC to speak out on their behalf on specific issues. For example, in 1986 residents of Windsor and Detroit asked the IJC to comment on the potential impacts of the Detroit incinerator then under construction. In 1988,

RESPONSIBILITIES

ten citizens' groups asked the IJC's Water Quality Board to comment on Wisconsin's proposed water quality standards. They also asked the IJC to routinely review all proposals for major changes in water quality standards in the Great Lakes Basin. The IJC has studiously declined such requests unless formally petitioned to do so by the two Federal Governments.

The IJC gives several reasons for not speaking out more aggressively and for declining requests to comment on specific issues:

- 1) they believe they are most effective as an aggressive critic at closed door meetings with government administrators -- a role that would be weakened if they were more aggressive in public,
- 2) they refrain from taking positions that might be seen as favouring one or another political party,
- 3) they maintain that the IJC should take an overview perspective and perform after-the-event assessments as an outside critic rather than being involved in the development of programmes, and
- 4) they do not have the staff and other resources to carry out more work.

It is clear that the public wants the IJC to play a more public and activist role. The IJC is perceived as a prestigious organization whose greatest power is in "moral suasion" -- the ability to influence through high public status. Such power functions best through its ability to publicly embarrass those who are not living up to their commitments.

Article VII gives the IJC the authority to do much more than it is currently doing. However, just like so much of the rest of the Agreement, citizen involvement is needed to persuade them to live up to their potential. An understanding of how the Commission is structured and how it operates is essential to this effort.

STRUCTURE OF THE IJC

The Commission:

The IJC is made up of six people -- three appointed by the Prime Minister of Canada and three appointed by the President of the United States. These Commissioners are political appointees and serve at the pleasure of the Prime Minister or President. This situation creates the potential for the Commissioners to be hesitant about being vocal public critics of the actions of the Governments that appointed them.

The IJC generally make decisions by unanimous agreement. Its reports on Great Lakes water quality, for example, do not contain minority reports. The Boundary Waters Treaty, which set up the IJC, contains provisions for majority decisions, but these provisions have not been used in actions under the Great Lakes Water Quality Agreement.

In carrying out its functions under the Water Quality Agreement, the IJC is assisted by the Great Lakes Water Quality Board, the Great Lakes Science Advisory Board and a Great Lakes Regional Office.

Several other bodies operate under the jurisdiction of the IJC. Some of these, such as Boards of Control, which regulate water flows at several places in the Great Lakes, have an impact on Great Lakes water quality. Their primary role, however, is not protection of water quality.

The Great Lakes Water Quality Board:

The Water Quality Board is composed of an equal number of members from Canada and the U.S. It is composed solely of representatives of the Federal, Provincial and State Governments, although the Agreement does not limit it to government members. The members are formally appointed by the IJC. When sitting as Water Quality Board members, they are not supposed to be representing the governments they work for. They are asked to switch hats, and act as individual professionals.

The Water Quality Board is the principal advisor to the IJC on Great Lakes water quality matters. Since the IJC's main role is to assess the Parties' progress under the Agreement, an awkward and unsatisfactory situation exists because the IJC is relying on Water Quality Board members who run their respective governments' water quality programmes to help the IJC critique those same water quality programmes. The Water Quality Board members are in effect asked to report on their own shortcomings.

The IJC's dependence on the Water Quality Board is increased by the IJC's limited budget. It does not have the financial resources to hire the staff needed to generate its own independent information and must rely on the Governments to supply all its water quality data.

The Water Quality Board presents a report to the Commissioners every two years. The last few editions of this biennial report have been excellent compendiums of information on the status and trends in Great Lakes water quality.

Some members of the "IJC Family", the community of people from both government and non-government Great Lakes institutions, believe that the increased emphasis upon the IJC's evaluative role in the 1987 amendments to the Agreement will make the incestuous nature of the Water Quality Board's role even more blatant. They think that this will lead to the lessening of the IJC's dependence upon this Board for advice and increase the power of the Regional Office.

The meetings of the Water Quality Board are open to the public and are held in different locations around the Basin. If you wish to attend, contact the IJC's Regional Office in Windsor for information on location, time and agenda. If you wish to make a presentation to the Board, contact one of the Board's co-chairs.

The Great Lakes Science Advisory Board:

The Science Advisory Board is the advisor on scientific matters to the Commission and the Water Quality Board. Its primary roles are to assess the significance and adequacy of the scientific information

on the Great Lakes, identify emerging issues, encourage cooperation among all those carrying out research on Great Lakes matters and advise on needs for further research.

The Science Advisory Board is made up of managers of Great Lakes research programmes and a broad range of experts on Great Lakes water quality problems and related fields. Its members are appointed by the IJC.

Science Advisory Board meetings are open to the public. They are held in a variety of locations around the Basin. For information, contact the IJC's Regional Office.

Great Lakes Regional Office:

To assist the IJC in carrying out its functions under the Water Quality Agreement, a Great Lakes Regional Office has been set up in Windsor, Ontario. The members of this office are the primary contact point for the public with the IJC. The staff of the Ottawa and Washington, D.C., offices of the IJC do, however, still play a major role in Water Quality Agreement matters and should not be ignored when working with the IJC.

The Regional Office provides technical and administrative support to the IJC, the Water Quality Board and the Science Advisory Board. It is also responsible for providing a public information service, including the quarterly publication *Focus*.

THE IJC, THE AGREEMENT AND THE PUBLIC

The IJC's main values for the public are as a source of information and as a critic and advocate for improved Great Lakes water quality programmes.

The biennial reports of the IJC, the Water Quality Board and the Science Advisory Board are prime sources of information on the state of the Lakes. The quarterly publication *Focus* is a valuable way to be updated on events in the Great Lakes. Many other



Citizen Water Quality Hearing in Sarnia, Ontario, one of 19 held throughout the Basin in 1986 by Great Lakes United to review the Water Quality Agreement.

documents are published that contain information unavailable elsewhere. These documents can be obtained through the IJC's Regional Office in Windsor. All publications are free of charge.

Another way to obtain information and meet people involved in Great Lakes issues is by attending Water Quality Board and Science Advisory Board meetings and the IJC's biennial meeting. You can quickly get to know the "IJC Family" in this way.

Your efforts to encourage the IJC to be a more effective critic and advocate for the Great Lakes will not be as easy nor as immediately gratifying as the search for information. Nevertheless, it is worth pursuing. The IJC has tremendous potential to be a more effective advocate for improved Great Lakes water quality. That potential will only be achieved if the public persistently makes its expectations known to the IJC.

THE POLLUTERS

Our visions for the Great Lakes cannot be achieved unless existing polluters operate according to the basic tenets of the Great Lakes Water Quality Agreement: zero discharge and the ecosystem approach.

We must make it clear to polluters that, even though they have not signed the Agreement, they are expected to live up to the Agreement's provisions. The Agreement is a clear, strong expression of the public's demand for polluters to change their behaviour. The Agreement is backed by the Canadian and U.S. Governments' commitment. We must remind polluters that this means the Agreement is the basis upon which they must make decisions.

THE GREAT LAKES BASIN'S RESIDENTS

If the Agreement's goals are to be achieved, it is imperative that the public take a lead role in its implementation.

We should become familiar with the Agreement. Whenever Federal, State or Provincial legislation is being considered, we should refer to the Agreement and remind legislators of its requirements. One important way for this to be accomplished is for all water quality legislation to explicitly recognize the Agreement and its goals. We should use every opportunity to ask our government representatives how they plan to carry out specific Agreement requirements. The States and Provinces should be asked to prepare reports on their progress at implementing the Agreement.

We should also judge polluters' actions by the Water Quality Agreement and make input to them on that basis.

In addition, we must assess our lifestyles and make the necessary adjustments to ensure that we are not contributing to the environmental problems of the Great Lakes.

RESPONSIBILITIES

Chapter 3:

THE AGREEMENT'S GUIDING PRINCIPLES

The 1978 Great Lakes Water Quality Agreement was a remarkably prescient document. It was based on two guiding principles that are revolutionary solutions to water quality problems:

- the ecosystem approach, and
- virtual elimination and zero discharge of persistent toxic substances.

These themes are reflected throughout the document and should be the basis upon which all actions under the Agreement are judged.

Citizens need to understand these central themes so they can push the Governments to act according to the guiding principles of the Agreement -- not just according to the specific words of the Annexes.



THE ECOSYSTEM APPROACH

The Great Lakes Water Quality Agreement was one of the first government documents anywhere in the world to commit itself to the ecosystem approach.

The Great Lakes Basin Ecosystem is defined as:

the interacting components of air, land, water and living organisms, including humans, within the drainage basin of the St. Lawrence River at or upstream from the point at which this river becomes the international boundary between Canada and the United States [Article I (g)].

The ecosystem approach has two important implications for actions to clean up and protect Great Lakes water quality. The first is that political boundaries are meaningless. The second is that land, air, water and all life in or on any of these are inextricably intertwined.

THE GEOGRAPHIC BOUNDARIES

The drainage basin of the Great Lakes System is the significant dividing line -- not artificial political borders such as those drawn through the middle of the Lakes separating political boundaries. Pollutants do not have to stop at the border to be accepted by immigration officers before being admitted to the other side.

Also, the Lakes, rivers and streams from the western extreme of the Lake Superior drainage basin, all the way through the St. Lawrence and the Atlantic, are connected by one system. There is always a downstream. Someone who ignores this and pollutes even the smallest portion of the Great Lakes will harm some other part of the Great Lakes System. The Agreement recognizes this aspect of the ecosystem approach by including the entire Great Lakes drainage basin.

One of the 1987 amendments even recognizes that the Great Lakes Basin Ecosystem is not isolated from the areas beyond its edges. The Annex on airborne toxic substances talks about the need to look at sources of contamination beyond the Great Lakes. The presence of toxaphene from the southern United States in Lake Superior has proven the need to expand the understanding of the Great Lakes ecosystem.

Ironically, while basing itself on the ecosystem approach, the Water Quality Agreement ends its jurisdiction with the most artificial of boundaries -- the U.S.-Canadian border in the St. Lawrence River. This means that two-thirds of the St. Lawrence River -- the Great Lakes' sewer -- is left out of the Agreement.

The Agreement sets up basin-wide institutions to help overcome the barriers created by political boundaries. The IJC's Water Quality Board, for example, is made up of representatives from all eight Great Lakes States, Ontario and Quebec, and the two Federal Governments. Other Great Lakes organizations, such as Great Lakes United and the Great Lakes Fishery Commission, define their missions by ecological objectives that transcend political borders.

THE CONNECTIONS OF AIR, LAND, WATER AND ALL LIFE

The air, land, water and all life in and on them are inextricably intertwined. What happens in the air or on land inevitably affects water quality. And the well-being of one form of life affects the well-being of other forms of life.

This understanding of the ecosystem is reflected in the Water Quality Agreement by the inclusion of provisions on air quality and land use. Beneficial uses are defined in the Agreement to include not just human uses, but protection of fish, wildlife and benthos from harm by contamination and destruction of habitat.

Some people point out that the Great Lakes Water Quality Agreement contradicts this aspect of the ecosystem approach in its very title. They say it should be called a "Great Lakes Ecosystem Agreement" instead of the "Great Lakes Water Quality Agreement."

One reason the Great Lakes are still plagued with toxic chemicals is that most environmental agencies are structured with separate divisions in charge of air, water and land. Decisions made by these agencies to protect water quality by preventing discharges into the water may not take into account that instead, potential water polluters may burn their wastes creating air pollution.

VIRTUAL ELIMINATION AND ZERO DISCHARGE OF PERSISTENT TOXIC SUBSTANCES

When viewed from an ecosystem perspective, the only rational approach for managing the worst toxic substances is virtual elimination or zero discharge.

This policy is clearly stated in the Agreement. In the purpose of the Agreement, the Parties commit themselves "to eliminate or reduce to the maximum extent practicable the discharge of pollutants into the Great Lakes System" [Article II]. The purpose goes on to say that it is the policy of the Parties that "the discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated" [Article II (a)].

This policy is repeated later:

The intent of programs specified in this Annex is to virtually eliminate the input of persistent toxic substances in order to protect human health and to ensure the continued health and productivity of living aquatic resources and human use thereof [Annex 12. 2. (a) (i)].

The philosophy adopted for the control of inputs of persistent toxic substances shall be zero discharge [Annex 12. 2. (a) (ii)].

After making an overall commitment "to eliminate or reduce to the maximum extent practicable" all discharges, the Agreement makes special provisions for persistent and non-persistent toxic substances. For persistent toxic substances the Parties commit themselves to virtual elimination or zero discharge. For toxic substances that are not persistent, the Parties commit themselves to stop discharging them in toxic amounts.

Persistent toxic substances are defined as those that have a half-life in water of greater than eight weeks. "Half-life" means the time required for the concentration of a substance to diminish to one-half of its original value in a lake or water body [Annex 12, 1. (a) & (b)].

THE IMPORTANCE OF ZERO DISCHARGE

Very small quantities of persistent toxic substances in water can have significant negative effects. For example, quantities of PCBs, DDT or other fat soluble toxic substances that are so low that they can not even be measured in water will be stored in the fatty tissue and organs of fish at much higher levels. The concentrations of toxic chemicals in the fish can be as much as one million times higher than in the water where the fish lived. This process is called bioconcentration.

When larger fish, birds or humans eat the fish, the contaminants move up the food chain in higher and higher concentrations. This process is called biomagnification.

The combined processes of bioconcentration and biomagnification result in dramatic increases in concentration of contaminants. For example, PCBs increase in concentration 25 million times as they pass from water through the food chain to the eggs a herring gull lays. This is why a person who eats just one meal of Lake Michigan trout will receive a higher dose of PCBs than through a lifetime of drinking Lake Michigan water.

Scientists have only limited knowledge about the effects of toxic substances. We have very little information on the health effects of exposure over a long period of time to low concentrations of contaminants. Our knowledge of the combined effects of more than one toxic compound is even more limited. All life is exposed to a multiplicity of toxic substances at once -- not just the single ones that tests are conducted with in laboratories.

GUIDING PRINCIPLES

The enormous increases in concentrations of toxic substances in humans, fish and birds from extremely minute quantities in water, combined with the unknowns about the effects of toxic substances, underscores why it is essential to eliminate the discharge of persistent toxic substances.

The need to avoid all contamination from persistent toxic substances is even more essential in the Great Lakes because of one of the Lakes' unique characteristics: the long period of time during which water stays in the Lakes before being flushed out -- the retention time. The largest and deepest of the Great Lakes -- Lake Superior -- has a retention time of approximately 200 years. This means that once contaminants are released into the Lakes they remain in the system for a very long time. If these substances settle out in the sediments and are recirculated later from the sediments into the water, the contaminants could remain in the system for an even longer period of time.

IMPLEMENTING THE GUIDING PRINCIPLES

We must keep the guiding principles of the Great Lakes Water Quality Agreement at the forefront of our minds as we work with the Agreement. The ecosystem approach and zero discharge are the basis upon which we should judge all actions. This will take substantial effort and time. For example, no one expects us to achieve zero discharge over night. Virtual elimination and zero discharge are targets that we must constantly focus on. We must steadily improve our control of toxic substances, striving for the ultimate goal of zero discharge.

The Agreement sets out lofty goals that we will have to strive mightily to reach, but we must continuously make the effort. If we do not, we are doomed to fail in our efforts to clean up and protect the Great Lakes.

Chapter 4:

THE AGREEMENT AND WATER QUALITY ISSUES

The Great Lakes Water Quality Agreement describes programmes that the Federal, State and Provincial Governments are responsible for carrying out. These more specific goals and undertakings are described in this chapter.

Sometimes the programmes described here may appear to fall short of the guiding principles already described. These programmes should be viewed as steps in moving us towards the ultimate goals. They should be judged on the basis of their effectiveness in moving us towards the goals of the Agreement.

Chapter 4.1

GENERAL AND SPECIFIC OBJECTIVES

In the Great Lakes Water Quality Agreement, the two Federal Governments agreed to a set of objectives that are to be the yardstick used within the Great Lakes Basin for determining the suitability of conditions in the Lakes. These commitments should be used by citizens' groups as one basis for judging the adequacy of Governments' performance under the Agreement. These objectives can also help you evaluate government and industry proposals for water quality standards, regulations and discharge permits.

GENERAL OBJECTIVES

The General Objectives state that the Great Lakes waters should be:

- free from substances resulting from human activity that will settle to form "putrescent or otherwise objectionable sludge deposits or that will adversely affect aquatic life or waterfowl";
- free from floating substances caused by human actions that are "unsightly or deleterious";
- free from materials and heat generated by human activity that "alone, or in combination with other materials, will produce colour, odour, taste, or other conditions in such a degree as to interfere with beneficial uses";
- free from materials and heat caused by human actions that "alone, or in combination with other materials, will produce conditions that are toxic or harmful to human, animal, or aquatic life"; and

GENERAL AND SPECIFIC OBJECTIVES

- free from nutrients such as phosphorus and nitrogen caused by human activity "in amounts that create growths of aquatic life that interfere with beneficial uses" [Article III].



SPECIFIC OBJECTIVES

The Specific Objectives are a list of criteria to be used in judging whether particular pollutants are present at excessive levels and whether desirable substances like oxygen are present at sufficient levels. These are listed in Annex 1 of the Agreement.

The Specific Objectives of Annex 1 seem to contradict the general objectives and a basic overall purpose of the Agreement -- the virtual elimination of persistent toxic substances and the prohibition of the discharge of toxic substances in toxic amounts. By contrast, Annex 1 lists levels of contamination that are considered "acceptable".

In recognition of this apparent contradiction, the Agreement lays down certain provisions that are to be used as limitations in the application of the Specific Objectives. These provisions are:

- These levels are "minimum levels" only and are "not intended to preclude the establishment of more stringent requirements" [Article IV, 1. (a)].

WATER QUALITY ISSUES

- If water quality is now better than the Specific Objectives, that water quality should be maintained or improved. Water quality should not be allowed to be degraded to the inferior level in the Specific Objectives [Article IV, 1. (c)].
- The Specific Objectives are "interim" objectives only. They are to be accepted only as one step along the route to virtual elimination of the discharge of all persistent toxic substances [Supplement to Annex 1, 1. (a)].

Unfortunately, Governments tend to forget these modifying provisions during their day-to-day activities when the real decisions are being made that affect Great Lakes water quality. Citizens' groups must take the initiative in reminding Government and industry about the need to move beyond the Specific Objectives.

Citizens must guard against the danger of Governments using the Specific Objectives as the goals of their water quality programmes. Their real targets should be the public's goals and the Agreement's guiding principles. If we continue to view goals like virtual elimination as being impossible or in the far distant future, programmes and actions will only reinforce the Specific Objectives. The public has to ensure that Governments' goals aim for the Agreement's guiding principles.

THE LIST OF SPECIFIC OBJECTIVES

Annex 1 of the Agreement lists substances and states what level of these can be considered acceptable. Acceptability is measured in several different ways:

THE LIST OF SPECIFIC OBJECTIVES

- 1) Amount of substance that should not be exceeded in water or in edible portions of fish: aldrin/dieldrin, chlordane, DDT and metabolites, endrin, heptachlor/heptachlor epoxide, lindane, methoxychlor, toxaphene, phthalic acid esters, PCBs, arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, zinc, fluoride, total dissolved solids, diazinon, guthion, parathion, ammonia, hydrogen sulfide, phenolic compounds in public water supplies;
- 2) Substances that should not be present in the water or aquatic organisms: mirex, organic compounds (other than those specifically listed elsewhere in the Annex) that can be "demonstrated to be persistent and are likely to be toxic";
- 3) Amount of the substance that produces a particular effect:
 - a) no more than amount that would exceed 0.05 of the median lethal concentration in a 96-hour test: pesticides not listed elsewhere in the Annex, unspecified non-persistent toxic substances and complex effluents.
 - b) concentration that causes odour, smells, tainting, or is visible: oil and petrochemicals.
 - c) concentration that is injurious to aquatic life or human life or any beneficial water use: phosphorus, asbestos, temperature, settleable and suspended solids, light transmission, bacteria, fungi and viruses.
 - d) amount desirable in water: dissolved oxygen, pH value.
 - e) dose received by human from drinking water: radioactivity.

REVIEW OF SPECIFIC OBJECTIVES

Because these Specific Objectives are supposed to be of an interim nature, the Canadian and U.S. Governments agreed to review the objectives at least once every two years [Supplement to Annex 1, 2.]. Proposals for revisions are supposed to come from the Federal, State or Provincial Governments or from the IJC. The Parties are required to consult the public in "the development and adoption of Specific Objectives".

Concerned citizens should play a lead role in pushing for upgrading the Specific Objectives. It should be stressed that these Specific Objectives are interim only and that the public expects rapid progress towards the overall goals of the Agreement. The provision for a public role in reviewing the objectives is a prime opportunity for us to make these points.

Chapter 4.2

WATER QUALITY STANDARDS

Water quality standards are the foundation of water pollution control efforts in the Great Lakes States and Ontario.

When we refer to water quality standards in this booklet, we are including both the objectives for water quality and the procedures regulatory agencies apply when issuing discharge permits and administering other water quality programmes.

Under the U.S. Clean Water Act, the States are responsible for developing water quality standards, reviewing them every three years, and if necessary, modifying them. U.S. EPA is responsible for approving the States' proposed water quality standards. The public should ask to be involved in both the States' development and review process and the Federal approval process.

Several States are in the process of reforming their water quality programmes. Environment Ontario is currently developing its Municipal-Industrial Strategy for Abatement (MISA), a sweeping reform of its water quality programme.

Water quality standards represent maximum accepted levels of pollution in a body of water. They are the worst water quality conditions that are to be allowed. These standards are used by governments to determine discharge limits for industries and municipal sewage treatment plants. The standards determine how much the dischargers have to treat their wastes before discharging them. They also should be used in developing control programmes for non-point sources of pollution to water bodies such as runoff from agricultural and urban land.

A major difficulty in setting water quality standards is the lack of definitive information on impacts of contamination in water. This lack of data is often used as an excuse by industry and government for not applying strict standards. They argue that if you cannot

prove harm, you cannot justify the expenditures involved in the plant modifications required to prevent that extra bit of pollution. Such arguments are not acceptable. The evidence of devastating impacts of contamination are so substantial and the degree of contamination in our environment is already so high that we can not risk adding more contaminants. In the absence of data proving there is no harm, we must assume harm and apply very strict water quality standards.

Because water quality standards are so central to all water quality programmes, citizens should get involved in reviewing proposed changes. The Agreement can be a very useful tool in these debates.

PRINCIPLES IN THE AGREEMENT FOR JUDGING WATER QUALITY STANDARDS.

1. Are The Proposed Water Quality Standards Equal To Or More Stringent Than The Agreement's Specific Objectives?

Standards proposed by the States or Ontario for minimum acceptable water quality should be at least as strict as the Agreement. Article V of the Agreement requires the following:

Water quality standards and other regulatory requirements of the Parties shall be consistent with the achievement of the General and Specific Objectives. The Parties shall use their best efforts to ensure that water quality standards and other regulatory requirements of the State and Provincial Governments shall similarly be consistent with the achievement of these Objectives [Article V, 1.]

The intent of the Agreement is to encourage standards at least as strict as those in the Agreement:

The Specific Objectives adopted pursuant to this Article represent the minimum levels of water quality desired in the boundary waters of the Great Lakes System and are not intended to preclude the establishment of more stringent requirements [Article IV, 1.(a)].

Proposed water quality standards should include all substances listed in Annexes 1 and 10. For as many as possible of these, the standard should be set at "zero" or "absent".

2. Do the Standards Promote the Agreement's Goal of Zero Discharge and Virtual Elimination of Persistent Toxic Substances?

Most laws and regulations have a preamble or purpose section. This preamble should include language recognizing that the intent of the regulation is to carry out the goals and objectives of the Great Lakes Water Quality Agreement, including the goal that the discharge of persistent toxic substances be virtually eliminated.

When working with governments to develop and review proposed water discharge standards, citizens should question how the new standards will help move us closer to the Agreement's goal of zero discharge and virtual elimination of persistent toxic substances. It is not enough for governments and industry to simply say that zero discharge is unrealistic. Nor is it enough for governments to replace their current programmes with more complicated, highly technical formulae and procedures which look good because they are more complicated, but which really don't remove any pollutants from the system.

The Agreement's goal of zero discharge means that governments must use their water quality standards to keep moving us closer to our shared goal. Citizens should ask governments to provide information on how much pollution will be eliminated in the new programme compared to current procedures.

Industry frequently says that zero is impossible to measure and that, therefore, there is no point in pretending to strive for it. The Agreement addresses this problem:

As used in this Annex, "absent" means that the substances are not detectable when analyzed using the best available technology, which may include the use of biological indicators. Detection levels will be subject to change as technology improves and new levels are adopted [Annex 1, 1.(b)].

The use of biological indicators is essential. Downstream from Dow Chemical's Midland, Michigan plant, the State of Michigan requires the use of fish held in cages to detect the company's discharge of dioxin. Citizens should oppose water quality standards being set at zero if zero is defined as the level of detection in the water or waste stream; biological indicators should also be used.

There is no reason why water quality standards cannot be set below the detection level using the best existing technologies. Setting standards below the detection levels sends a clear message to polluters that they are required to continue working to decrease their discharges even if they are not detecting contaminants.

3. Are Standards For Discharge of Persistent Toxic Substances Interim Only?

The Agreement says that standards for persistent toxic substances should be interim only:

Consistent with the policy stated in paragraph (a) of Article II and Paragraph 2 of Annex 12 that the discharge of any or all persistent toxic substances be virtually eliminated, the Specific Objectives set out in Annex 1 for such substances are adopted as interim objectives [Supplement to Annex 1, 1. (a)].

Citizens should use this principle when reviewing proposed water quality standards. The standards should state that consistent with the Great Lakes Water Quality Agreement's overall goal of eliminating persistent toxic substances, the standards are only temporary and will be continuously revised to make them more

strict. This is also consistent with the underlying intent of both Ontario's Municipal-Industrial Strategy for Abatement and the U.S.'s Clean Water Act.

Since the standards are to be interim only, the programmes should state how and when the standards will be strengthened in the future. In the U.S., for example, the water quality standards of each State must be reviewed every three years. Similar requirements should be set up in Canada. Citizens should make sure that they are involved in these reviews in order to push for stricter standards. Such provisions will show that governments are serious about achieving the Agreement's goals and intend to pass even stricter standards next time.

Our goal is to rid the Great Lakes of persistent toxic substances. This means that standards are a moving target. As we get close to them, they must be made ever more strict until we reach that ultimate goal.

4. Do the Standards Prevent Degradation of High Quality Waters?

Concerned citizens can use the Agreement to urge their government regulatory agencies to adopt procedures to prevent the discharge of pollutants to waters that are already cleaner than the proposed State or Provincial standards. These "anti-degradation" procedures should say that it is not permissible to add more pollution to the system, even if, according to the standards, more could be added without violating the standards.

The Water Quality Agreement requires such provisions:

Notwithstanding the adoption of Specific Objectives, all reasonable and practicable measures shall be taken to maintain or improve the existing water quality in those areas of the boundary waters of the Great Lakes System where such water quality is better than that prescribed by the Specific Objectives, and in those areas having outstanding natural resource value [Article IV, 1. (c)].

WATER QUALITY ISSUES

In support of this principle, water discharge permits should include anti-backsliding provisions. Backsliding occurs when a discharger says that their level of pollution controls is greater than that required by their discharge permit and that, therefore, they are going to cut back on their control systems. This is contrary to the Agreement, which calls for the use of "the best available technology" [Annex 2, 2. (d)].

5. Do the Standards Prevent or Minimize the Use of Dilution as a Solution to Pollution?

The Great Lakes Water Quality Agreement forbids use of dilution as a solution to pollution:

The responsible regulatory agencies shall not consider flow augmentation as a substitute for adequate treatment to meet the Specific Objectives [Article IV, 1.(d)].

The U.S. Clean Water Act has similar provisions.

Nevertheless, almost every State and Province accepts dilution as a means of meeting water quality standards. One of the typical places where the issue of dilution comes up is in provisions on the "design flow of streams." Governments state what volume of water in a stream to use in calculating how concentrated with toxics a company's discharge can be and still meet water quality standards.

This practice is unacceptable when applied to persistent toxic substances because the Great Lakes act as a sink for whatever is discharged to them. For these substances, no dilution should be allowed for discharges ending up in the Great Lakes. Standards should be met at the end of the discharge pipe.

For non-persistent toxic substances, two limitations on the use of "the design flow of streams" concept should be applied. No discharge at levels that are toxic should be allowed. The Agreement prohibits such conditions [Annex 2, 1. (d)]. In addition, calculations should be made on the basis of the time of lowest stream flow in order to provide maximum protection.

6. How Do the Standards Deal With Mixing Zones?

Mixing zones are areas around point sources where water quality standards do not apply, or where less stringent standards apply than elsewhere in the water body. Polluters argue that it is hard to meet water quality standards right at the end of the pipe. They are, in effect, saying that dilution should be allowed.

Mixing zones should not be allowed for discharges of persistent toxic substances going into the Great Lakes or their tributaries. The Great Lakes are a basin where these persistent toxic substances will accumulate and build up over time causing serious contamination problems.

The Agreement recognizes the existence of "Point Source Impact Zones," which are akin to mixing zones [Annex 2]. They are defined as areas adjacent to point source discharges where water quality does not comply with the General and Specific Objectives. The Agreement states that Point Source Impact Zones.....

...shall not be acutely toxic to aquatic species, nor shall their recognition be considered a substitute for adequate treatment or control of discharges at their sources [Annex 2. 1. (d)].

For non-persistent toxic substances, this test of whether the quantities are acutely toxic should be the basis for determining the acceptance of the mixing zone on a temporary basis. The discharge also should not be so great in volume as to interfere with the ability of fish to swim through it to go upstream.

In the Agreement, the Governments promise to report all Point Source Impact Zones and work towards their elimination [Article IV, 1.(f)]. Water quality programmes should be specific about the methods that will be used to eliminate Point Source Impact Zones and provide timetables for achieving this goal.

7. How do the Standards Deal With Risk Assessment?

Governments are increasingly relying on risk assessment to set environmental standards. Risk assessment involves using scientific models to predict the degree of health effects from exposure to various amounts of toxic chemicals. Standards based on risk assessment typically assume that a certain emission of a toxic substance is "o.k." because it will cause only a limited number of additional deaths from cancer.

Risk assessment is simply a complicated method for setting allowable concentrations of environmental contaminants. Standards for persistent toxic substances based on risk assessment are, therefore, contrary to the Great Lakes Water Quality Agreement's call for zero discharge of those substances, except on an interim basis.

8. Do the Proposed Standards Recognize Cumulative Effects?

A major shortcoming in most environmental standards is their inability to account for the simultaneous exposure to a mixture of toxic substances. Fish in the Great Lakes are never exposed to just PCBs but a whole range of substances known to be present in the Great Lakes. Similarly, people who eat PCB-contaminated Great Lakes fish are likely also consuming dioxin, DDT and a whole range of other pollutants. Also, people are exposed to these contaminants in the air we breathe, the water we drink, the food we eat and the materials we handle at work, not just the fish we get from the Great Lakes.

The 1987 amendments to the Water Quality Agreement recognize the significance of the combined effects of contaminants. In several places in Annex 1 the following language appears:

...substances known or believed, singly or in synergistic or additive combination with another substance, to have acute or chronic toxic effects on aquatic, animal or human life.

Similar language appears in other Annexes.

Citizens should urge their government to reflect the Agreement's intent in their water quality standards in a number of ways:

- Permits to an individual company to discharge toxic chemicals should take into account the existing pollution load in the water body.
- Permits should take into account not just individual contaminants being discharged by the polluter but all chemicals being discharged and their interactive and cumulative effects.
- Standards should take into account all routes of exposure to contaminants. For example, human intake of dioxin from food and from the air should be taken into account when setting standards for the level of dioxin allowed in water.

Research is usually not adequate to say whether the combined effects of pollutants are additive, synergistic or cancel each other out. In the absence of information to the contrary, citizens should argue for added protection levels that assume toxic effects from different chemicals are at least additive.

Citizens should also push for the use of biological indicators as one way to assess cumulative effects. The Agreement calls for this in Annexes 1 and 12.

9. Do the Proposed Standards apply to Non-Point Discharges?

Usually water quality standards are used as the basis for determining control programmes that will be placed on industrial and municipal dischargers of pollutants through pipes. But, if we are to achieve our goal of cleaning up the waters of the Great Lakes system, we will have to place a much greater focus on controlling non-point sources of pollution such as agricultural and urban runoff. The Agreement makes numerous commitments to address the problems of non-point contamination sources such as these.

Citizens should ensure that water quality standards and programmes specifically include provisions to address non-point sources.

chapter 4.3

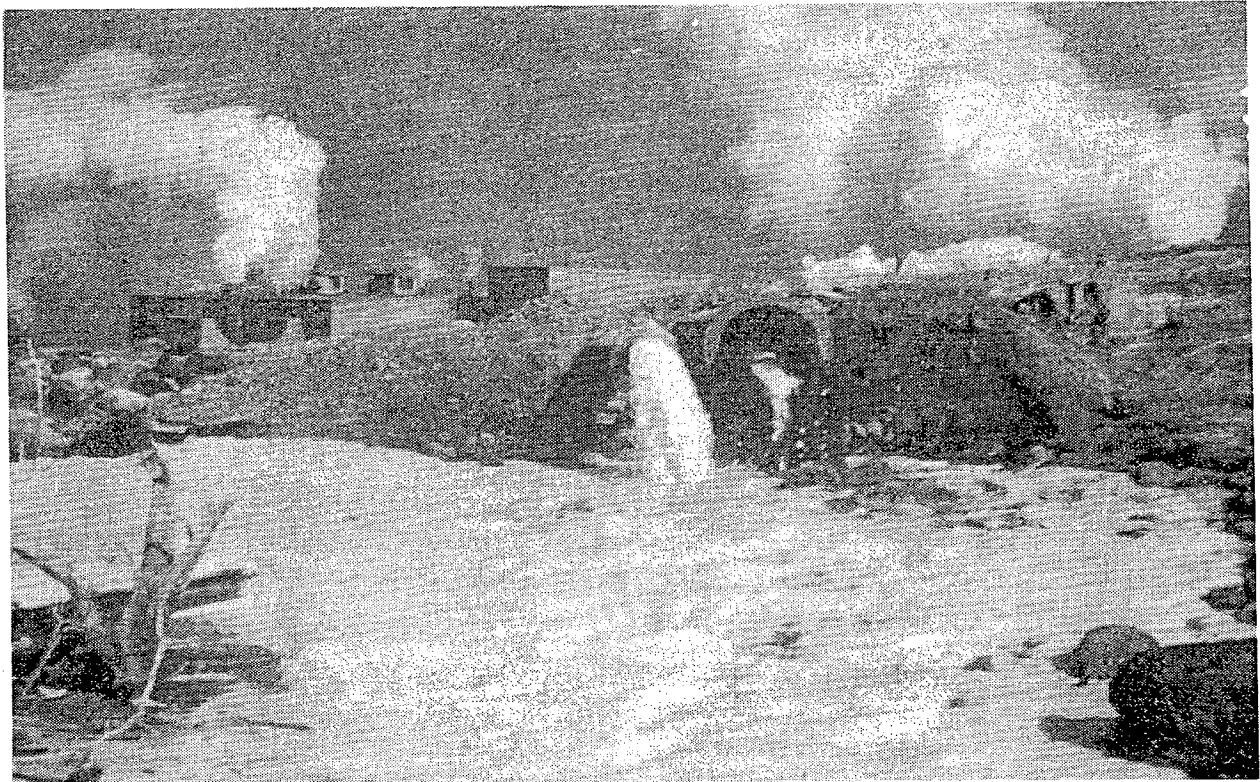
INDUSTRIAL DISCHARGES

DISCHARGE PERMITS

When they negotiated the 1978 Water Quality Agreement, the Governments realized that one of the most important sources of toxic substances to be controlled was from industrial sources.

Article VI describes what should be included in industrial pollution control programmes, but this must be interpreted in the Agreement's broader context:

The philosophy adopted for control of inputs of persistent toxic substances shall be zero discharge [Annex 12, 2. (a) (ii)].



Pulp/paper mill outfall on the north shore of Lake Superior

To move towards this goal, the section on industrial discharges pledged that by the end of 1983 the Governments would set up "requirements for the substantial elimination of discharges into the Great Lakes System of persistent toxic substances" [Article VI, 1. (b) (ii)]. Even though much progress has been made, this commitment has not been carried out; Governments continue to issue permits and control orders to industry that allow the dumping of massive quantities of persistent toxic substances.

The 1987 amendments to the Agreement talk about areas of water that exceed the water quality objectives because they are near point sources of contamination. The Governments committed themselves to "work toward the elimination" of these "Point Source Impact Zones" [Article IV, 1. (f)]. To achieve this goal, the "best available technology" is to be used [Annex 2, 2. (d)].

If the goals of zero discharge and elimination of point source impact zones are to be achieved, it is essential that the public play a strong role in assessing existing discharge permits, calling for revisions and making input into the development of new discharge permits for polluters.

The Water Quality Agreement can lend considerable guidance to citizens' groups in reviewing and evaluating discharge permits. The commitments just described and the principles outlined in the "Water Quality Standards" section of this booklet can be used as a basis for pressing for stronger discharge permits for individual polluters. Make sure that each of these principles is being used to the maximum extent possible.

REDUCING INDUSTRIAL WASTES

The Agreement presents two important guidelines for the methods to be used by potential polluters to control their discharges: best available technology and waste reduction.

Frequently, government programmes do not require polluters to use the best available technology to control discharges. Government legislation is strewn with phrases such as "best practicable control technology", "best conventional pollution

control technology" and "best available technology economically achievable". In each instance, the government programme is allowing weakening of the requirements because of economic considerations. The Agreement is clear, however, that when dealing with persistent toxic substances the best available technology should be used to control discharges [Annex 2, 2. (d)]. Economic considerations are not supposed to divert attention away from cleaning up and protecting the Great Lakes.

The 1987 amendments to the Water Quality Agreement emphasize waste reduction as the means to control pollutants:

The reduction in the generation of contaminants, particularly persistent toxic substances, either through the reduction of the total volume or quantity of waste or through the reduction of the toxicity of waste, or both, shall, wherever possible, be encouraged [Annex 12, 2. (a) (iii)].

Increasingly, waste reduction methods rather than treatment technology or the construction of waste destruction facilities are being recognized as the best way to deal with the hazardous wastes produced in our society. The primary methods of waste reduction are:

- change products so they are less hazardous,
- reduce the amounts of hazardous raw materials used by changing the raw materials to less hazardous ones or changing production technology to reduce the amounts of hazardous materials used,
- improve housekeeping practices within the plant to lessen spills and waste, and
- recycle and reuse waste.

Citizens' groups should push polluters to use these methods when discharge permits are being discussed. The Agreement endorses this approach.

Waste reduction techniques represent our greatest hope for achieving significant reductions in the loadings of toxic substances into the Great Lakes. Concentrations of many toxic pollutants in the Great Lakes decreased in the 1970's and early 1980's because of improvements in pollution treatment and control technologies. In the last few years, declines in concentrations of many pollutants have levelled off. Further reductions will have to come from controlling other sources, like atmospheric deposition and land runoff, and through waste reduction techniques.

In 1986, the U.S. Office of Technology Assessment reported that there were no practical or technical barriers to the achievement of the zero discharge goal, if we shift our focus from pollution management to waste reduction. The same Office of Technology Assessment report stated that less than one percent of the U.S.'s environmental budget was devoted to pollution prevention and source reduction. The situation is much the same in Canada.

The Government's 1987 pledge in Annex 12 to reduce the generation of contaminants is a step in the right direction. In Annex 12 the Governments also promised to issue biennial reports on their progress at promoting source reduction. Citizens should review these reports carefully and should use every opportunity to urge more emphasis on source reduction.

Chapter 4.4

REMEDIAL ACTION PLANS

As of 1988, forty-two areas in the Great Lakes have been identified by the IJC's Water Quality Board as Areas of Concern. These are places where water pollution over the years has severely affected the quality of life for humans, wildlife and aquatic life. In recent years the Federal, Provincial and State Governments in the Great Lakes Basin committed themselves to develop Remedial Action Plans (RAPs) aimed at cleaning up each of these Areas of Concern.

RAPs are a source of hope for many of the people living in the Great Lakes Basin. They potentially mean that enough resources will be focussed on cleaning up the Great Lakes' most severely contaminated areas.

Probably the most significant addition to the Agreement in the 1987 amendments was its provision for RAPs. In the new Annex 2, the Canadian and U.S. Governments, in cooperation with the Provincial and State Governments, committed themselves to clean up Areas of Concern through the RAP process.

In this Annex, the two Parties also committed themselves to include the public in all aspects of the development and implementation of RAPs:

The Parties, in cooperation with State and Provincial Governments, shall ensure that the public is consulted in all actions undertaken pursuant to this Annex [Annex 2.2.(e)].



The IJC's Science Advisory Board, GLU and citizens of Erie, PA held a 1988 conference on designating Erie, PA as an Area of Concern

DESIGNATION OF AREAS OF CONCERN

The two Federal Governments are responsible for designating Areas of Concern. They are directed to do this in cooperation with the State and Provincial Governments and the IJC. The IJC is also directed to "recommend additional Areas of Concern for designation by each Party" [Annex 2, 3.].

If you wish to have an area formally designated as an Area of Concern so that a Remedial Action Plan would be prepared for the area, you should begin by making a formal request for designation to the two Federal Governments. This request should refer to the criteria listed in Annex 2 of the Agreement defining "impairment of beneficial uses" [Annex 2, 1. (c)]. This list of 14 impairments is extremely important to the RAP process because it defines what qualifies an area to be listed as an Area of Concern, and in turn, what must be cleaned up to remove it from the list of Areas of Concern. You should rely heavily on this list when making the case to designate an Area of Concern. The criteria include:

- Impacts on human use of the area (e.g., restrictions on fish and wildlife consumption, problems with drinking water quality, waters unfit to swim in and unfit to be used for agricultural and industrial purposes without the cost of pretreatment);
- Negative impacts on wildlife and species living in the water (e.g., loss of benthos [organisms living in river or lake beds], reproductive problems in birds or animals, tumors and other deformities in birds, fish and wildlife, and loss of habitat), and
- Eutrophication or undesirable algae.

If the Federal Governments do not immediately agree to your request to designate an Area of Concern, you can use other provisions of the Agreement to try to create added pressure. Try to get the support of your Provincial or State Government for the designation. If there is a downstream government jurisdiction that is affected by pollution from your proposed Area of Concern, get them involved in making the request. The Agreement directs the IJC to make recommendations to the Parties for additional Areas of Concern; urge the IJC to make a recommendation that supports your request. You could initiate this by convincing the Science Advisory and Water Quality Boards of the merits of your case.

The most important way to stimulate support for your request for designation as an Area of Concern is by developing public support for your request. You could use the provision of Annex 2 requiring public consultation to ask the Government to hold a public hearing on your request. If they refuse such a request, you might hold such a hearing yourself to show the extent of public concern and support for your request.

DEVELOPMENT OF RAPs

The Public's Role:

As a member of the public, you should be involved in all stages of the development of the RAP. This is one of the requirements of Annex 2.

The Governments developing the RAP are also required to include governments that are not immediately within the RAP planning area (or covered under the Agreement) in the development of RAPs if their territory is affected by the problems in the Area of Concern [Annex 2, 4 (b)]. For example, under this provision, Quebec should be included in RAPs in the St. Lawrence River area. This provision can be useful in helping you to ensure that all people affected are included, not just those living within the Area of Concern.

The Basic Principles of RAPs:

RAPs often get bogged down in discussions of the limitations upon what can be done. As a result, the vital principles behind RAPs and the Great Lakes Water Quality Agreement are forgotten. You can use the Agreement to keep bringing these discussions back to basics. Three principles in the Agreement are particularly relevant in the development of RAPs:

- 1) The Ecosystem Approach: Annex 2 specifies that the plans "shall embody a systematic and comprehensive ecosystem approach" [Annex 2, 2 (a)]. Some of the implications of this for RAPs include:
 - * Cleaning up a body of water should not involve increased contamination of another body of water (e.g., simply making a longer pipe that moves contaminants further out into the Lake beyond the boundaries of the Area of Concern) or contamination of the air or land (e.g., burning contaminated sediments and thus contaminating the air).

- * The RAP cannot simply focus on the water. The Water Quality Agreement defines the Great Lakes Basin Ecosystem as "the interacting components of air, land, water and living organisms, including humans" [Article I (g)]. This means that issues such as land use are legitimate topics for discussion. Annex 13 can also be used to bolster your arguments to include land use as part of RAPs. A key provision requires that the Governments "develop and implement watershed management plans, consistent with the objectives and schedules for individual Remedial Action Plans" [Annex 13, 2. (b)].
- 2) Virtual Elimination of Persistent Toxic Substances: According to the Agreement, one of the goals of the RAP must be the "virtual elimination of persistent toxic substances" [Annex 2, 2 (b)]. This means going for a total cleanup. Half way measures should be challenged by referring to the commitments made by the Federal Governments when they signed the Agreement.
- 3) Restoring the Ecosystem: The Agreement says that the Area of Concern should be restored. This means that "the chemical, physical and biological integrity" of the Area of Concern should be restored so as to remove the existing "impairment of beneficial uses" for humans, birds, fish and wildlife. This means that all human and non-human uses should be restored.

This is where the list of 14 "impairments to beneficial uses" will prove to be important [Annex 2,1 (c)]. (This list is described above in the section on designating Areas of Concern.) Much of the discussion in the early stages of writing the RAPs will focus on defining the problem using these 14 indicators. Since this will form the basis of what clean-up actions are needed to solve the problems, it is essential that citizens urge the Governments to use a broad interpretation of what constitutes impaired uses.

The Government responsible for preparing and implementing the RAP may want to limit the description of impaired use so as to limit what remedial measures are needed to restore the area. For example, governments and industry sometimes say the goal is to restore certain "designated uses" instead of restoring all "impaired beneficial uses." Citizens groups in several areas have already been through these debates and can be a useful source of information for you. The best way to contact these groups is through Great Lakes United at the address in the back of this booklet.

IMPLEMENTATION OF RAPs

The RAP must include details on how the Plan will be implemented. This is the critical component of the RAP. Otherwise it will just be another plan gathering dust on the shelf.

According to the Agreement, in addition to stating what measures should be taken to clean up the Area of Concern, the RAP should give timetables for implementation of the measures, state who is responsible for each of the clean-up actions, develop a process for evaluating the effectiveness of the Plan as it is implemented and specify how it will be determined if the area should be removed from the list of Areas of Concern [Annex 2, 4 (a)]. Make sure that the RAP is very specific in detailing each of these items. This is the basis for turning the RAP into a meaningful document that you can use in the future as you work for a cleanup.

The success of RAPs depends upon public support for them and participation in their implementation. Make sure that the Plan includes provisions to include the public in the monitoring and modification of the Plan as it is implemented. Such public involvement is consistent with the requirements of the Agreement.

Chapter 4.5

LAKEWIDE MANAGEMENT PLANS

One of the most innovative changes in the 1987 Water Quality Agreement is the requirement for the Parties to prepare Lakewide Management Plans.

Lakewide Management Plans are to serve...

... as an important step toward virtual elimination of persistent toxic substances and toward restoring and maintaining the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem [Annex 2, 2. (b)].

Lakewide Management Plans are an important step forward, but like so much of the rest of the Agreement, achieving their full potential will require active citizen involvement. The Agreement requires the Federal, State and Provincial Governments to "ensure that the public is consulted in all actions undertaken pursuant to this Annex" [Annex 2, 2(e)]. You should take full advantage of this commitment.

CRITICAL POLLUTANTS

The Plans are to focus on reducing and ultimately eliminating Critical Pollutants in the Great Lakes [Article IV, 1.(f)]. Critical Pollutants are the worst pollutants in the Great Lakes. According to the definitions in Annex 2:

"Critical Pollutants" means substances that persist at levels that, singly or in synergistic or additive combination, are causing, or are likely to cause, impairment of beneficial uses despite past application of regulatory controls due to their:

- (i) Presence in open lake waters;*

(ii) Ability to cause or contribute to a failure to meet Agreement Objectives through their recognized threat to human health and aquatic life; or

(iii) Ability to bioaccumulate.

The two Federal Governments are responsible for designating Critical Pollutants [Annex 2, 5.]. In their 1987 report, the IJC's Water Quality Board listed 11 Critical Pollutants on their "Primary Track." These include: total PCBs, DDT and metabolites, Dieldrin, Toxaphene, 2,3,7,8 TCDD dioxin, 2,3,7,8, TCDF furan, Mirex, Mercury, Alkylated lead, Benzo(a)pyrene, and Hexachlorobenzene.

Most of these 11 pollutants are the pollutants of most concern in all five Great Lakes. Efforts to control and eliminate these pollutants will also reduce others not on the list. Therefore, there is no need for the Governments to spend considerable time developing new lists of Critical Pollutants. They could just adopt the Water Quality Board's list with modifications suited to specific circumstances.

LAKEWIDE GOALS AND OBJECTIVES

Citizens should play an active role in determining each Plan's goals, as these will spell out how clean the Lakes will be after the Plans have been implemented.

Great Lakes United has participated in early efforts to develop Lakewide Management Plans for Lakes Ontario and Michigan. We have advocated that the goals for the Plans should be biologically-based. For example the goals should be to clean up the Lakes to the point where all species can safely reproduce in the ecosystem. Many species have been harmed or eliminated from the Great Lakes, including bald eagles, ospreys, terns, gulls, mink and otters. Often, these species are our best indicators of the effects of toxic contamination. The advantages of lakewide goals based on restoring indigenous species include being easy to monitor and tremendous popular appeal. The interim short-range goals could be to reduce contaminants in fish and other aquatic food sources to a level safe for unlimited human consumption.

One of the 1987 amendments to the Agreement calls for the establishment of "Lake Ecosystem Objectives", which are similar to these biological indicators. According to Annex 11, these ecosystem health indicators are to "assist in evaluating the achievement of the specific objectives for the ecosystem." This Annex sets ecosystem objectives for Lake Superior. As an indicator of the well-being of the Lake, the ecosystem health indicators include Lake Trout productivity greater than 0.38 kilograms/hectare. These Trout are to be free from contaminants at concentrations that affect their health or their usefulness as food. Ecosystem Objectives for the other four Great Lakes are to be developed later.

The Agreement does not specify that the ecosystem objectives called for in the Agreement are to be the same as the goals for the Lakewide Management Plans. It is likely that the two sets of goals will be closely related.

A TOXICS FREEZE

The starting point to reducing and eliminating Critical Pollutants is to not let any new sources enter the system. The concept of a Toxics Freeze has been advocated by citizens working on new water quality rules in the State of Wisconsin. The Toxics Freeze would prohibit new or increased discharges into the Great Lakes or any of their tributaries of any substance on the 1986 Inventory of Chemicals in the Great Lakes basin prepared by the Great Lakes Water Quality Board.

The guiding principles and general intent of the Agreement strongly support the concept of a Toxics Freeze. The Agreement makes it clear that this also covers cases where existing water quality is cleaner than required by the Agreement's Specific Objectives:

Lakewide Management Plans shall not allow increases in pollutant loadings in areas where Specific Objectives are not exceeded [Annex 2, 6.(a)].

BEYOND THE FREEZE

Such Plans [Lakewide Management Plans] shall be designed to reduce loadings of Critical Pollutants in order to restore beneficial uses [Annex 2. 6.(a)].

The prime focus of the Lakewide Management Plans, after the adoption of the Toxics Freeze, should be to develop timetables for achieving reductions in the total mass loadings of Critical Pollutants in the Lakes. Virtual elimination of persistent toxic substances should be at the end of the timetable.

The interim steps on the timetable should state the amount of reduction in total loadings that will be achieved by specific dates. These reductions should be based on achieving biologically based goals, such as fish being safe for unlimited human consumption by a certain year.

Because of the persistent and cumulative nature of the Critical Pollutants, maximum pressure should be exerted to minimize the addition of further contamination. The Toxics Freeze must be followed by a review of existing discharge permits and the development and implementation of plans with timetables to eliminate the discharge of Critical Pollutants.

Reduction of loadings of Critical Pollutants in the Lakes also requires plans for eliminating contamination from the air, from runoff and from re-suspension of contaminated sediments. All of these plans should be integrated into the strategy for reducing the loadings of pollutants in the Lakes.

The responsibility for achieving these reduction goals should be divided among the States and Provinces surrounding the Lakes. The jurisdictions would be required to reduce all sources of contamination to achieve the reduction goals. Setting reduction goals high enough will create the incentive for controls on all pollution sources -- not just discharge pipes.

In the 1970's, a similar approach was successfully used to reduce the loadings of phosphorus into the Great Lakes.

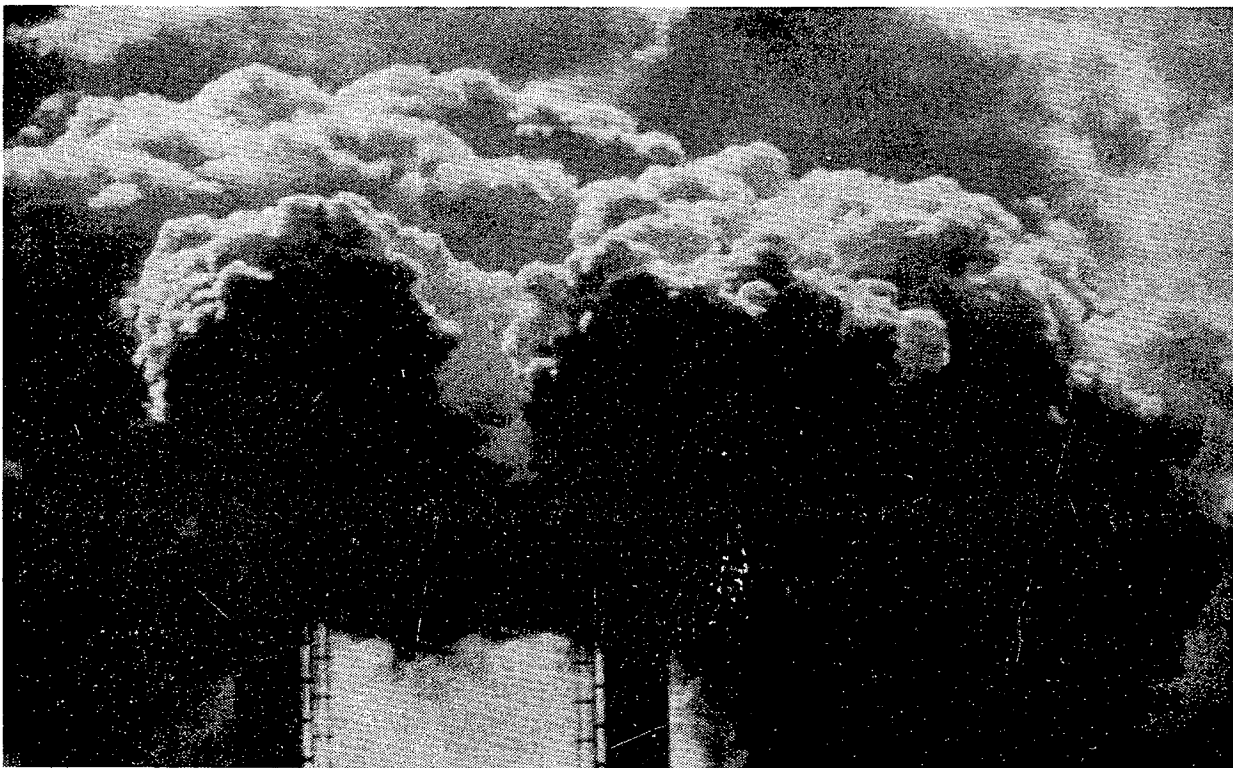
WATER QUALITY ISSUES

Lakewide Management Plans are an innovative ecosystem approach to cleaning up the Great Lakes. The full determination and creative abilities of the public, government and industry will be required to fulfil the potential this planning process provides.

Chapter 4.6

AIR

Toxic substances falling from the air into the Lakes are a major source of contamination in the Great Lakes. For example, most of the PCBs in Lakes Superior, Huron and Michigan come from the air. In Lake Superior ninety percent come from atmospheric deposition.



The 1987 amendments to the Agreement added a new Annex 15 titled "Airborne Toxic Substances" to address this problem. The Parties committed themselves to conduct research, develop a sophisticated new monitoring system and implement measures to reduce and control atmospheric deposition of persistent toxic substances.

This Annex was carefully worded so polluters or others opposed to regulations could not argue that it is essential to show that a specific smokestack is polluting the Great Lakes. The language in the

Agreement ends the need to prove this often unprovable link. It requires controls on atmospheric sources as long as it can be shown that atmospheric deposition of these substances from any atmospheric source contributes to pollution of the Great Lakes System [Annex 15, 5 (a)].

Many of the sources of the contamination from the air into the Great Lakes are outside of the Great Lakes Basin. The Agreement commits the Parties to identify contamination sources outside of the Great Lakes and to "notify the responsible jurisdiction and the Commission of the problem and seek a suitable response" [Annex 15, 5.(a)].

Annex 15 also requires the Parties to develop new technologies to reduce atmospheric pollution, including technologies that find substitutes for products that generate air pollution:

The Parties shall also assess and encourage the development of pollution control technologies and alternative products to reduce the effects of airborne toxic substances on the Great Lakes System [Annex 15, 5. (b)].

The Agreement can be useful to citizens who are concerned about a proposed incinerator or other new source of atmospheric pollution in their area, and when new air pollution programmes are being developed.

The focus of the entire Agreement is on reducing and ultimately eliminating sources of toxic substances to the Great Lakes. Citizens can point out that Annex 15 recognizes the problem of contamination in the air and requires the Governments to institute controls on atmospheric sources of pollutants. Citizens should ask Government officials how their pledge in the Agreement to achieve the virtual elimination of persistent toxic substances will be furthered by their air pollution control programmes and how this commitment is being taken into account when they decide to permit the proposed new source of atmospheric pollution.

Chapter 4.7

NON-POINT SOURCE POLLUTION AND LAND USE ACTIVITIES

Central to the ecosystem understanding of the Great Lakes Basin is recognition that activities on the land have profound impacts upon Great Lakes water quality. Thus far, most government and public attention in controlling pollution sources has focussed on direct discharges through pipes from industrial and municipal polluters. Substantial progress has been made in these efforts, but it will be impossible to achieve the Agreement's goals of virtual elimination of persistent toxic substances without looking at what are usually referred to as non-point pollution sources. These include run off from farms, run off from urban areas, and leaking waste disposal sites.

The Great Lakes Water Quality Agreement recognizes the significance of non-point source pollution control measures by specifically referring to them in Article VI (e) in the Agreement. This concern, which originally was referred to in the 1978 Agreement, was reinforced in 1987 by the addition of Annex 13 on pollution from non-point sources.

Unfortunately, the specific provisions of the Agreement for addressing non-point pollution are weak. They lack detail and in many instances do not lay down principles as strong as are found in most of the rest of the Agreement. For example, references to agricultural non-point source management programmes are qualified by the phrases "where feasible" and "where necessary." This means that citizens may be pushed into debating feasibility and necessity.

Nevertheless, in your work to control pollution from non-point sources, reference to the overall guiding principles of the Agreement and to the limited specific references to these topics can help lend credence and support to your arguments.

WATER QUALITY ISSUES

PEST CONTROL

The Agreement calls for:

- measures to ensure that pest control products are "used only as authorized by the responsible regulatory agency,"
- inventories of pest control products used in the Basin, and
- strengthening of research and educational programmes aimed at facilitating "integration of cultural, biological and chemical pest control techniques" [Article VI, I (e) (i)].

These provisions are generally weak. In uAgreement for leverage on pest control, it is necessary to return to the basic goals of the Agreement -- virtual elimination of persistent toxic substances. Since many pesticides are persistent, this becomes a very powerful argument.

ANIMAL HUSBANDRY

The Agreement calls for control of pollution resulting from raising animals. It calls for development of methods to use animal wastes and development of techniques for disposing of animal wastes rather than letting them contaminate nearby streams [Article VI, 1. (e) (ii)].

ROAD SALT

Concern is raised in the Agreement about road salting practices. The Agreement calls for review and supervision of road salting practices and salt storage "to ensure optimum use of salt and all-weather protection of salt stores in consideration of long-term environmental impact" [Article VI (e) (iv)].

URBAN AND RURAL RUNOFF

Much of the Agreement's focus on runoff is aimed at reducing loadings of phosphorus. Through investments in sewage treatment plants and limits on phosphates in detergents, the governments have substantially reduced the problems with eutrophication in the Great Lakes. It is now recognized, however, that further progress depends upon addressing other sources of phosphorus; the main area is runoff.

Measures recommended in the Agreement to control runoff of phosphorus include conservation tillage, no-till, winter cover crops, crop rotation, strip cropping, vegetation buffer zones along waterways, contour plowing, artificial detention and sedimentation of stormwater and reduction of phosphorus in combined sewer overflows [Supplement to Annex 3].

WATERSHED AND LAND USE MANAGEMENT

The Agreement recognizes the impacts of land use upon water quality. It calls for "measures to encourage and facilitate improvements in land use planning and management programs to take account of impacts on Great Lakes water quality" [Article VI (e) (vi)].

Annex 13, which was added in 1987, commits the governments to "develop and implement watershed management plans, consistent with the objectives and schedules for individual Remedial Action Plans or Lakewide Management Plans" [Annex 13, 2. (b)]. This provision lays down an important principle: land use affects water quality and is, therefore, a legitimate area for control actions under the Agreement. Governments sometimes try to strictly interpret the Agreement to apply only to water quality and, therefore, to keep out of land use planning matters. This arises, for example, when developing Remedial Action Plans. Citizens can use this provision in the Agreement to argue for land use controls along the shores of lakes and rivers and throughout the entire watershed. The arguments would have to be made on the basis of the potential negative impacts of the land use on water quality.

Most governments have fairly weak non-point control programs; virtually none of them regulate non-point runoff from agricultural and urban land in the same way as discharges from industrial and municipal point sources are regulated. In the past, Governments have tried to encourage and promote measures to reduce non-point runoff but they have shied away from regulations. Annex 13 now makes it clear that regulations should be used to control runoff, especially in areas with high amounts of runoff. It says that watershed management plans "shall include provisions for the regulation of non-point sources of pollution" [Annex 13, 2. (b)].

WETLANDS

Wetlands provide essential habitat for wildlife as well as playing an important role in many natural processes such as modifying water level fluctuations and trapping and detoxifying hazardous contaminants. But human activities in the Great Lakes have led to large scale destruction of wetlands. Wetland losses range between 50 and 100 per cent for many parts of the Great Lakes Basin.

The Agreement recognizes the importance of wetlands and calls upon the Governments to identify and preserve wetlands that are "threatened by dredging and disposal activities" [Annex 7, 3.], or "by urban and agricultural development and waste disposal activities" [Annex 13, 3.]. Annex 13 also calls for rehabilitation of wetlands.

Unfortunately these provisions are weakened by important modifiers. "Significant" is used to describe which wetlands should be protected. When calling for rehabilitation, the phrase "where necessary" is thrown in. Despite these limitations, the Governments' commitment in the Agreement to protect and rehabilitate wetlands can be used by the public as a leverage point for those working on wetlands preservation.

CONTAMINATED GROUNDWATER:

The linkages between groundwater and the surface waters of the Great Lakes are poorly understood. There is definite evidence, however, that contaminated groundwater is moving through the soils and fouling streams, rivers and lakes.

Waste disposal sites are a major source of groundwater contamination that contributes to contamination of the Great Lakes. In the Niagara River, for example, the latest estimates indicate that contaminants migrating through the groundwater from hazardous waste sites are causing more contamination of the River than discharges from industry and municipalities and all other non-point sources combined. Similar situations exist in many other parts of the Great Lakes.

In 1987, the two Federal Governments added Annex 16 to the Agreement to address pollution of the Great Lakes from contaminated groundwater. The Governments committed themselves to:

- "identify existing and potential sources of contaminated groundwater affecting the Great Lakes",
- map hydrogeological conditions in the areas of contaminated groundwater,
- develop standard procedures for sampling and analyzing contaminants in groundwater, and
- control the sources of contamination of groundwater and the contaminated groundwater itself, when the problem has been identified".

These provisions obviously lack the detail to adequately deal with the enormous problems created by leaking landfills in the Great Lakes Basin, even though the Governments do pledge to control sources of contaminated groundwater. Nonetheless, citizens'

WATER QUALITY ISSUES

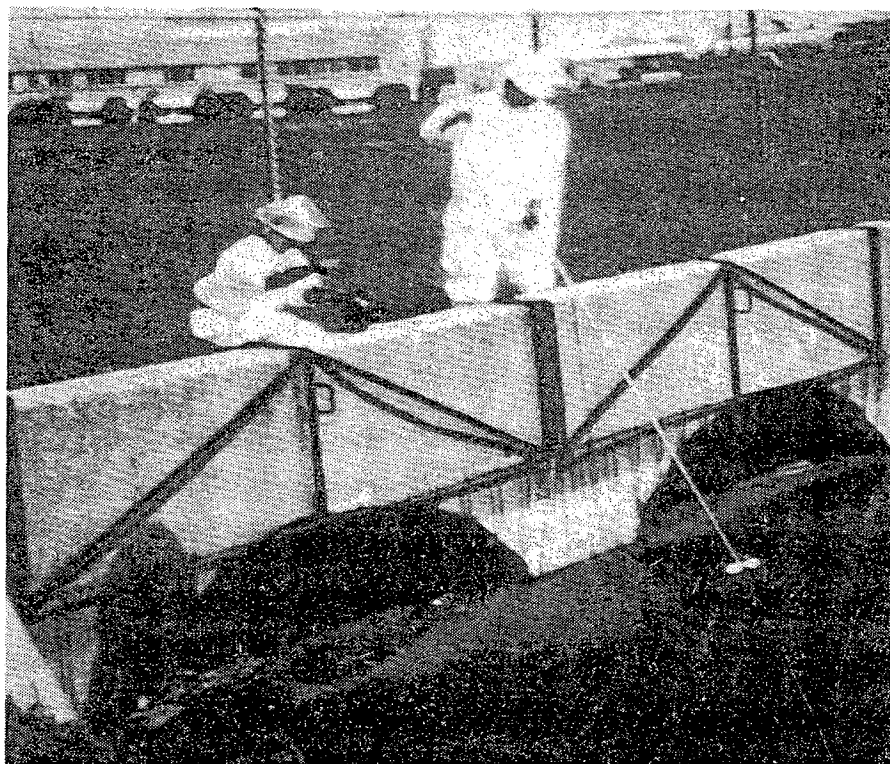
groups should use the commitments in these sections to press the Governments to clean up leaking dumps and other sources of groundwater contamination.

Chapter 4.8

CONTAMINATED SEDIMENTS AND DREDGING

In 41 of the Great Lakes' 42 Areas of Concern, contaminated sediments are one of the major causes of impaired uses. Finding ways to clean up contaminated sediments or prevent contamination from them is one of the biggest problems threatening the success of the Remedial Action Plan programme.

Contaminated sediments are largely the result of past discharges of toxic chemicals. Most of the Great Lakes' major industrialized rivers and harbours contain huge reservoirs of toxic sludge. The contaminated sediments in the Grand Calumet River/Indiana Harbor Canal are up to 10 feet deep in spots. PCB contamination in the harbour at Waukegan, Illinois, have been measured at concentrations as high as 500,000 parts per million -- half PCBs!



*U. S. EPA testing contaminated sediments at Fields Brook, Ohio
(Credit: CH2M Hill)*

WATER QUALITY ISSUES

These sediments do not rest harmlessly on the bottom. Through a variety of processes they become resuspended causing serious contamination problems. They can be stirred up by storms, dredging or large ships turning in the harbour. Worms and microorganisms living in the sediments can burrow around in the mud and pass the pollutants through their bodies into the aquatic ecosystem.

These contaminants can be a major source of pollutants to the environment. The sediments in the Kalamazoo River send an estimated 240 pounds of PCBs to Lake Michigan every year. This pollution can cause serious contamination of fish and waterfowl.

The 1987 amendments to the Agreement recognize the importance of controlling contaminated sediment, by the addition of a special Annex on this topic -- Annex 14. This is in addition to Annex 7 of the 1978 Agreement, which covers dredging. This structure suggests an attempt to separate the issues of dredging for navigation purposes from dealing with contaminated sediments. But, as all citizens who have attempted to address these issues know, the two issues cannot be dealt with separately.

MEASURING CONTAMINANT LEVELS

Both Annex 7 and Annex 14 require the Governments to develop uniform methods to evaluate the extent of sediment contamination. Annex 14 also requires the Governments to devise means of evaluating the transfer of contaminants from sediment to the ecosystem. Biological indicators are to be developed "to determine accumulation rates in biota from polluted bottom sediments" [Annex 14, 2. (b) (iii)].

New thorough evaluation procedures are essential because the results of these evaluations are the basis for such critical decisions as whether to dredge, how to dredge, and where to dispose of the dredged material. For example, if the sediments are judged not to be severely polluted, they may be disposed of in open-water without special precautions.

Many environmentalists criticize the criteria currently used because they are not based on the impacts the materials may have on the ecosystem. The Agreement clearly directs that impacts on the ecosystem should be the basis for such decisions.

Citizens who are reviewing proposals to dredge a river or harbour in their area should object to decisions to dump dredge spoil in open water if those decisions are made using criteria that do not take into account ecosystem impact.

DEMONSTRATION PROGRAMMES

Citizens working on Remedial Action Plans and other people attempting to find ways to clean up contaminated sediments are searching for answers to the best way to handle polluted sediments in their area. Researchers throughout North America are attempting to find ways to safely treat contaminated sediments. Allowing them to be covered with clean sediments, using microorganisms to neutralize them, and digging them up to be burned or treated are some of the methods under consideration. The answers to the problem are still far from being definitive.

The Governments have pledged themselves to design demonstration projects to test new technologies to treat contaminated sediments [Annex 14, 2. (c)]. This commitment parallels a programme in the 1987 amendments to the U.S. Clean Water Act that pledges the U.S. Government to conduct demonstration programmes in five Great Lakes polluted waterways. Under Annex 14, the Parties were to design a demonstration programme and implementation schedule by June 30, 1988, and are to report biennially after that on their progress.

Citizens should evaluate the Governments' progress reports on this Annex closely and should pressure them to immediately commence these demonstration programmes.

EXISTING DISPOSAL FACILITIES

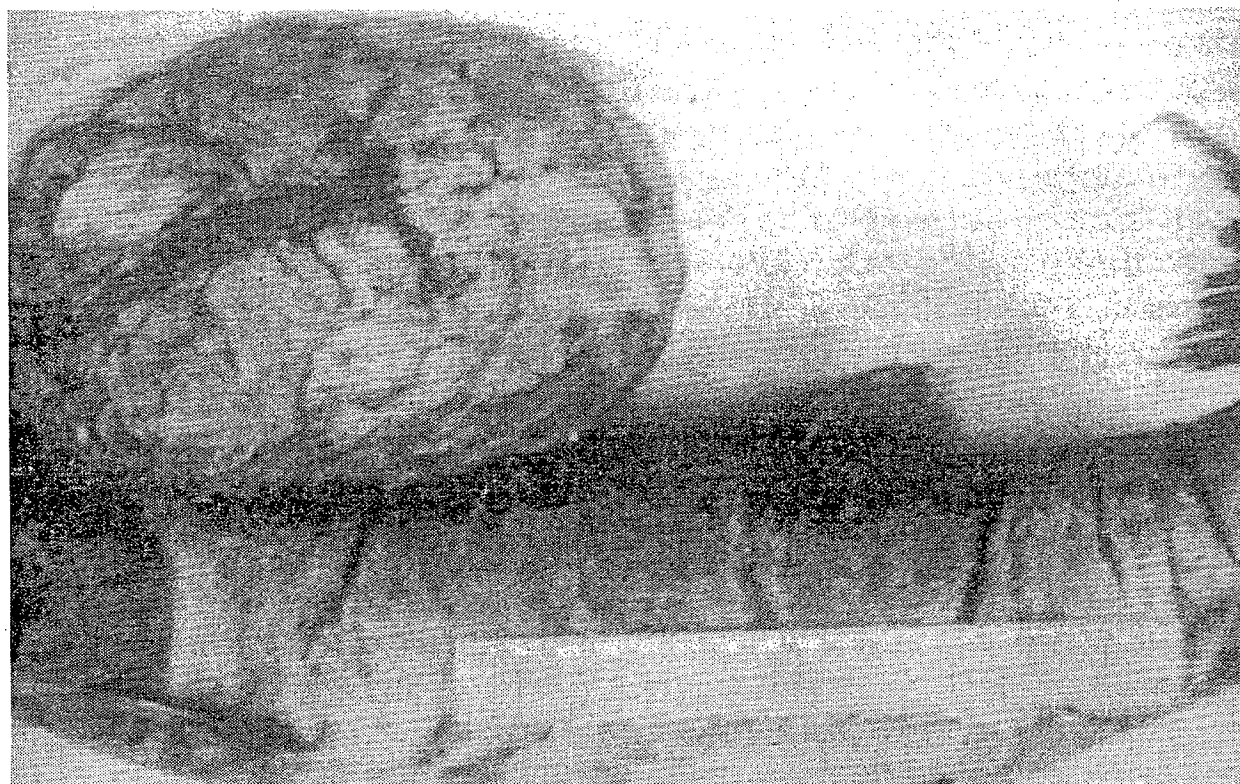
During Great Lakes United's hearings on the 1978 Water Quality Agreement in 1986, citizens expressed considerable concern about the way dredge spoils are currently being handled. In many areas of the Great Lakes, "confined disposal facilities" have been constructed to contain spoils once they are dredged. These facilities are usually constructed of rock rubble within a bay or harbour. The sediment is pumped into the facility and the polluted materials settle out. Many citizens have complained that these facilities leak and are a source of pollution to the ecosystem. In some areas, contaminated dredged material are used to create new land. Some dredging methods, such as overflow dredging, resuspend contaminated sediments. These practices are unacceptable.

The 1987 amendments to the Agreement include a commitment by the Governments to investigate these problems [Annex 14, 3.].

Chapter 4.9

HUMAN, FISH AND WILDLIFE HEALTH

Citizens are extremely concerned over the health impacts of long-term exposure to low levels of toxic chemicals in the Great Lakes basin. This concern was in part sparked by a report on the Agreement by the Royal Society of Canada and the U.S. National Academy of Sciences published in 1985. The report found "substantial evidence that the human population living in the Great Lakes basin is exposed to and accumulates appreciably more toxic chemical burden than people in other large regions of North America for which data are available."



Tumor growth on Great Lakes fish likely due to toxic contamination.

WATER QUALITY ISSUES

The concern about human health impacts of toxic chemicals is also caused by seeing fish with cancerous tumors, wildlife with birth defects such as crossed beaks and hearing of research studies on human health impacts. For example, a study by researchers at Wayne State University in Michigan found that babies born to mothers who ate Great Lakes fish have shorter gestational ages, weigh less, have smaller head sizes and have slower emotional responses than babies whose mothers ate little or no contaminated fish.

When faced with this evidence, people conclude that the Lakes are sick. Since they know the health of the Lakes determines the health of the people, they fear for their own well-being.

Government is finding it hard to provide answers to the public's questions about human health. There is a basic lack of clear data. It is extremely difficult to determine human health effects of low-level exposure to toxic chemicals and the cumulative effects of exposure to a wide-range of chemicals. In addition, the science of epidemiology is geared toward looking at "gross" effects, like death, not the more subtle effects like suppressed ability to fight diseases. Also, these types of problems may take decades to show up in humans, making linking the disease or problem to exposure that occurred many years ago very difficult. Also, not enough attention is paid to the health effects of exposure in high risk groups such as people who ate large quantities of Great Lakes fish, native people and others who depend on Great Lakes fish and wildlife for a large portion of their diet.

Citizens must continue to pressure the Governments to overcome these problems and undertake more serious human health research. The Agreement gives citizens ammunition to push the two Federal Governments for more and better research on human health effects of contaminants in the Great Lakes ecosystem.

The Agreement calls for several kinds of research on health effects:

- research "to determine the pathways, fate and effects of toxic substances aimed at the protection of human health, fishery resources and wildlife in the Great Lakes Basin Ecosystem" [Annex 12, 7.];
- research on the "interactive effects of residues of toxic substances on aquatic life, wildlife, and human health" [Annex 12, 7. (b)];
- research to "develop action levels for contamination that incorporate multi-media exposures and the interactive effects of chemicals" [Annex 17, 2. (k)]; and
- research to "develop approaches to population-based studies to determine the long-term, low-level effects of toxic substances on human health" [Annex 17, 2. (1)].

Another important provision in the Agreement is that...

The Parties shall establish action levels to protect human health based on multi-media exposure and the interactive effects of toxic substances [Annex 12, 6.].

This provision takes into account all sources of contaminants, and cumulative and synergistic effects.

Many States and Ontario are in the process of revising their water quality standards and regulations. Some of these regulations contain proposed action levels that will be used to issue discharge permits to industry and municipalities. Citizens should point out the above pledge and insist that action levels take into account the interactive effects of more than one toxic compound.

Most of these pledges for research and action on human, fish and wildlife effects of toxics were in the 1978 Agreement. But very little progress has been made in these areas in the past ten years. It will take an outspoken citizenry, continuing to pressure government, to ensure these pledges are carried out.



*Dead Fish near Muskegon, Michigan
(Credit: John and Ann Mahan)*

CONCLUSION

The Great Lakes Water Quality Agreement is a remarkable tool for citizens to use when working to clean up the Great Lakes.

In unequivocal terms the Agreement lays down the principles which Governments must use to manage and protect the Great Lakes. They must use an ecosystem approach recognizing the interconnections between the land, air, water and all living things on both sides of the U.S.-Canada border within the Great Lakes drainage basin. And they must virtually eliminate persistent toxic substances from the Great Lakes starting by using a philosophy of zero discharge of these pollutants.

These strong guiding principles coupled with the specific provisions of the Agreement, provide citizens with valuable information on how to evaluate legislation and other Government proposals for water quality programmes. We must demand that all of the divisions within Federal, Provincial and State Governments use the Agreement as the law of the land, not just the Great Lakes environmental sections. The Agreement is also a source of guidance and inspiration for citizens' groups to propose or even conduct their own water quality programmes.

Despite the Agreement's clear and strong directives, much of its potential has yet to be realized. Industry continues to discharge tons of persistent toxic substances into waterways with the approval of the Governments. Governments continue to propose water quality standards that are far weaker or even contradictory to the Agreement's requirements.

A well informed and vocal citizenry is the best hope for achieving the Agreement's full potential. If you haven't done so already, you should obtain a copy of the Agreement. Once you are familiar with it, there are several ways you can help encourage Governments to implement it: by constantly referring to the Agreement when

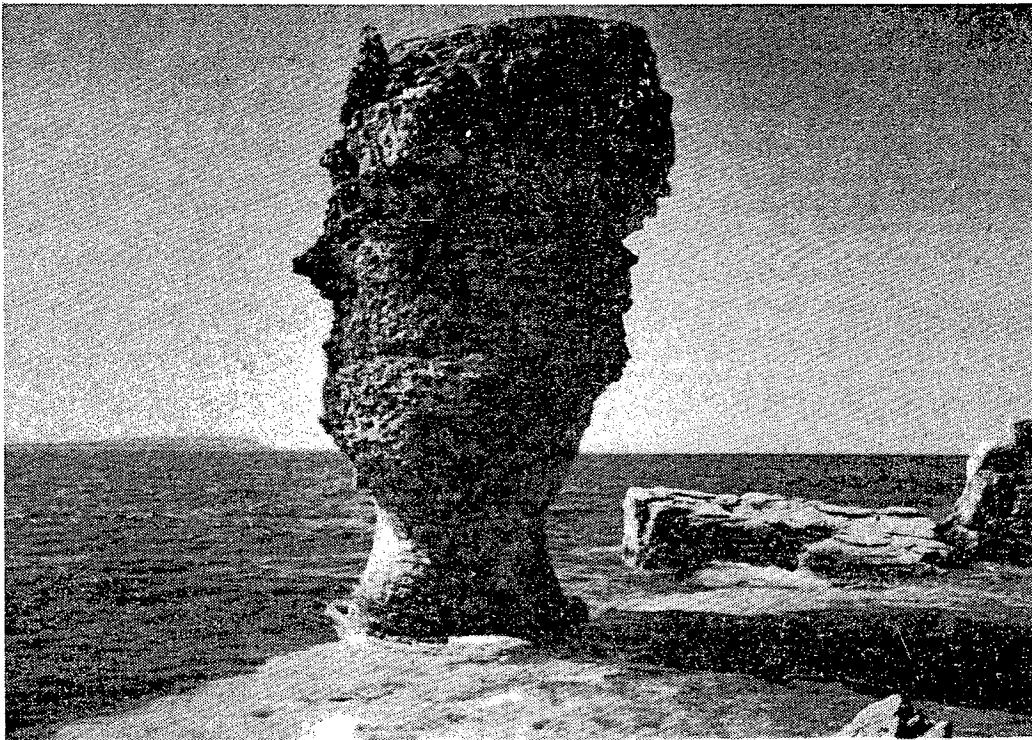
CONCLUSION

working on water quality issues, by using the Agreement as the yardstick to measure and evaluate Government proposals, by reminding the Governments of their commitments when they signed the Agreement, and by persistently asking Governments how they intend to honour those commitments.

These actions can make a dramatic difference.

One other important step is to join and support citizens' organizations that work on Agreement-related issues. Great Lakes environmentalists have several options to pressure the Governments for better implementation of the Agreement. We can press for requiring that funding from the Federal Governments to the State and Provincial Governments for water quality work be closely tied to carrying out Agreement requirements. We can consider pressing for ratification of the Agreement by Congress and Parliament or for passage of enabling domestic legislation and regulations. And we can consider litigation.

Whatever options are chosen, citizens' vigilance and involvement are the keys to unlocking the Agreement's potential.



Flowerpot Island in a national park on Lake Huron, one of the Great Lakes' scenic treasures.

APPENDIX

**SOME SOURCES OF INFORMATION ON
GREAT LAKES WATER QUALITY**

ORGANIZATIONS:

**CANADIAN ENVIRONMENTAL LAW ASSOCIATION AND
CANADIAN INSTITUTE FOR ENVIRONMENTAL LAW AND POLICY:**

243 Queen Street West, 4th Floor
Toronto, Ontario M5V 1Z4
(416) 977-2410

CENTER FOR THE GREAT LAKES:

U.S. Office:

435 North Michigan Avenue, Suite 1408
Chicago, Illinois 6061
(312) 645-0901

Canadian Office:

39 Spadina Road, 3rd Floor
Toronto, Ontario M5R 2S9
(416) 921-7662

GREAT LAKES UNITED:

State University College at Buffalo, Cassety Hall
1300 Elmwood Avenue
Buffalo, New York 14222
(716) 886-0142

LAKE MICHIGAN FEDERATION:

59 East Van Buren, Suite 2215
Chicago, Illinois 60605
(312) 939-0838

**NATIONAL WILDLIFE FEDERATION,
Great Lakes Natural Resource Center:**

802 Monroe
Ann Arbor, Michigan 48104
(313) 769-3351

POLLUTION PROBE:

12 Madison Avenue
Toronto, Ontario M5R 2S1
(416) 926-9876

THE IJC:

**INTERNATIONAL JOINT COMMISSION,
GREAT LAKES REGIONAL OFFICE**

100 Ouellette Avenue
Windsor, Ontario N9A 6T3
(519) 256-7821,

or,

Box 32869
Detroit, Michigan 48232
(313) 226-2170

THE PARTIES:

**ENVIRONMENT CANADA,
GREAT LAKES ENVIRONMENT OFFICE**

25 St. Clair Avenue East
Toronto, Ontario M4T 1M2
(416) 973-1104

**U.S. ENVIRONMENTAL PROTECTION AGENCY,
GREAT LAKES NATIONAL PROGRAM OFFICE**

111 West Jackson, 10th Floor
Chicago, Illinois 60604
(312) 353-2117

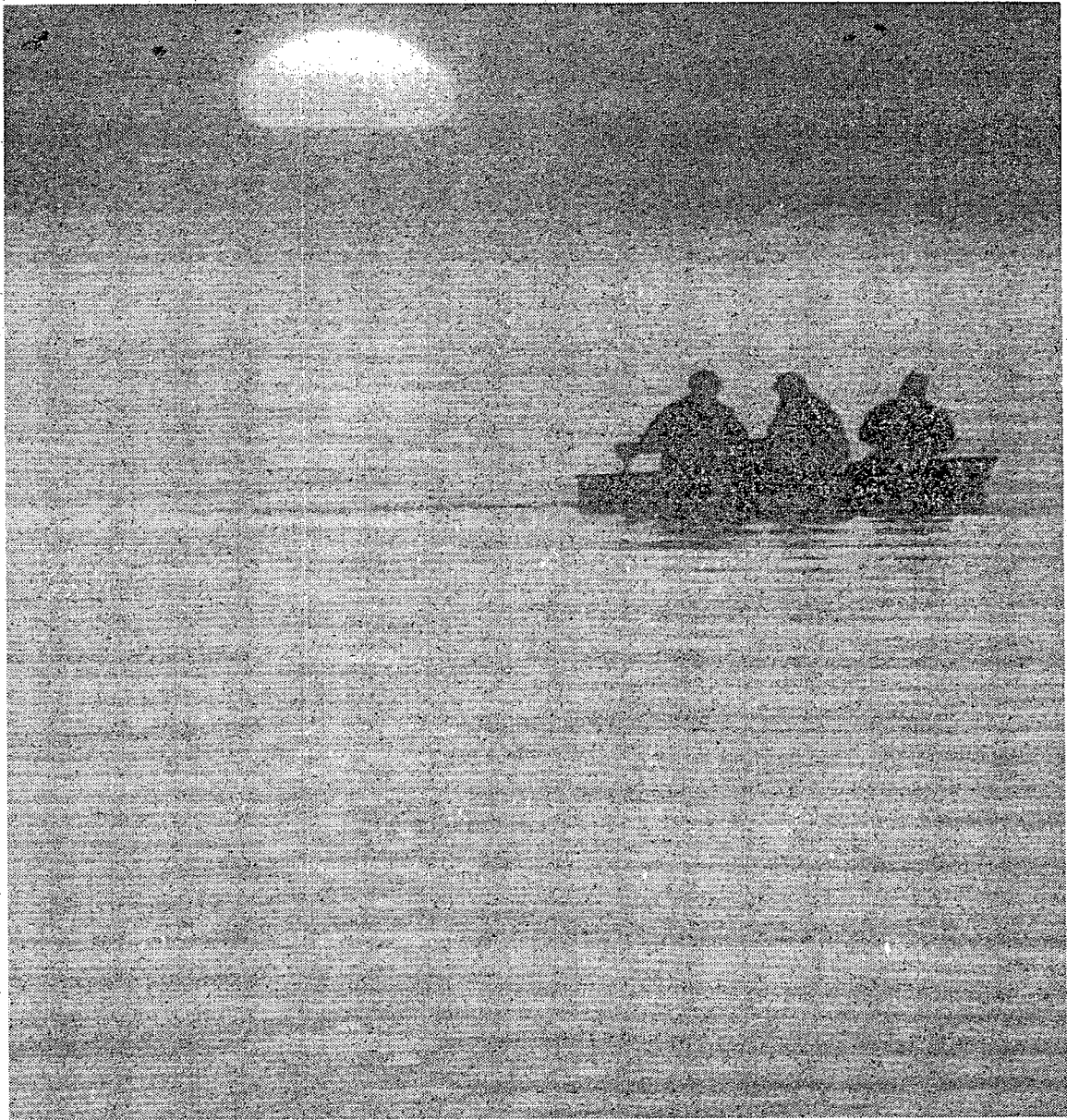
PUBLICATIONS:

The Great Lakes Reporter: a bimonthly publication of the Center for the Great Lakes. Available free.

The Great Lakes United: quarterly update on Great Lakes issues and citizens' activities. Available with Great Lakes United membership of \$15/year.

Great Lakes Washington Report: a newsletter published by the Sierra Club on developments in U.S. legislation and Federal Government programs relating to the Great Lakes. Available for \$10/year from the Sierra Club, 214 N. Henry Street, Suite 203, Madison, Wisconsin 53703.

The Great Lakes Water Quality Agreement, Focus (a quarterly update on IJC happenings), *Water Quality Board Reports* and *Science Advisory Board Reports*. All these publications are available free from the IJC's Regional Office.



**GREAT
LAKES
UNITED**



GREAT LAKES UNITED, INC.

State University College at Buffalo, Cassety Hall

1300 Elmwood Avenue

Buffalo, New York 14222

(716) 886-0142