

Canada Water Act

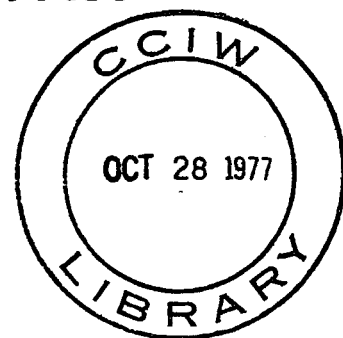


Fisheries
and Environment
Canada

Pêches
et Environnement
Canada

The Canada Water Act Annual Report

1976-1977



GB
707
C36
1976/77
c. 1



Fisheries
and Environment
Canada

Pêches
et Environnement
Canada

The Canada Water Act Annual Report

1976-1977

C. C. I. W.
LIBRARY



Minister
Fisheries and Environment Canada

Ministre
Pêches et Environnement Canada

His Excellency,
The Right Honourable Jules Léger,
Governor General and Commander-in-Chief of Canada.

May it Please Your Excellency:

I have the honour herewith, for the information of Your Excellency and the Parliament of Canada, to present the Annual Report on the Canada Water Act for the fiscal year ended March 31, 1977.

Respectfully submitted,

Roméo LeBlanc



Deputy Minister
Fisheries and Environment Canada

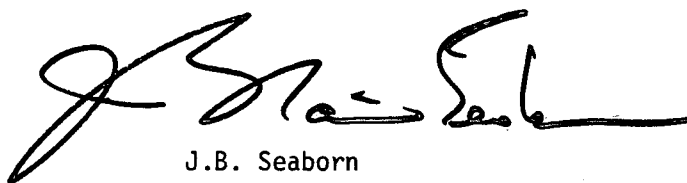
Sous-ministre
Pêches et Environnement Canada

The Honourable Roméo LeBlanc,
Minister of Fisheries and the Environment,
Ottawa, Canada.

Sir:

I have the honour to submit the Annual Report on the Canada
Water Act for the fiscal year ended March 31, 1977.

Respectfully submitted,



J.B. Seaborn

TABLE OF CONTENTS

INTRODUCTION	1
PROVISIONS OF THE CANADA WATER ACT	2
ACTIVITIES UNDER THE CANADA WATER ACT - 1976-77	3
PART I: Comprehensive Water Resource Management	3
Federal-Provincial Consultative Committees	3
Interdepartmental Committee on Water	3
Federal-Provincial Agreements	4
Progress in Water Planning and Management Programs	4
Activities Related to the Canada Water Act	13
PART II: Water Quality Management	15
PART III: Regulating Nutrient Inputs	15
PART IV: Public Information Programs	17
SPECIAL EVENTS	19
CURRENT AND PROJECTED RELEASE DATES OF FINAL REPORTS ARISING FROM CANADA WATER ACT STUDIES	20
PRINCIPAL FEDERAL-PROVINCIAL COOPERATIVE ARRANGEMENTS UNDER THE CANADA WATER ACT	21

INTRODUCTION

The Canada Water Act, proclaimed on September 30, 1970, provides the framework for joint federal-provincial management of Canada's water resources. Section 36 of the Act requires that a report on operations under the Act be laid before Parliament as soon as possible after the end of each fiscal year. This, the fifth annual report, covers operations to March 31, 1977.

During 1975-76, Treasury Board undertook to establish a ceiling for Canada Water Act cost-shared programs. For 1976-77 this ceiling was set at \$17.9 million. The same amount is to be retained for 1977-78. While this total is intended to integrate many categories of Canada Water Act financing, specific Treasury Board approval is still required for all new or amended cost-shared agreements.

Several new items have been incorporated in this edition of the Canada Water Act Annual Report. One new entry is a description of the Interdepartmental Committee on Water (ICW), whose mandate is to consider and make recommendations on policies and programs dealing with water. Another is the Flood Damage Reduction Program which, having reached new proportions in 1976-77, is now dealt with as a separate section under Progress in Water Planning and Management Programs. In a "Special Events" Section in this report, the United Nations Water Conference (March 1977) and Canada's contribution to that conference are briefly discussed. Immediately following that section is another new entry, Table 2, which indicates the current and projected release dates of final reports arising from Canada Water Act Studies.

PROVISIONS OF THE CANADA WATER ACT

Part I of the Act provides for the establishment of formal federal-provincial consultative arrangements for water resource matters (Section 3); and for cooperative agreements with the provinces for the development and implementation of comprehensive plans for the management of water resources (Sections 4 - 7). This part also enables the Minister, directly, or in cooperation with any provincial government, institution, or person, to conduct research, collect data, and establish inventories associated with the water resources.

Part II envisages federal-provincial agreements where water quality has become a matter of urgent national concern. This part permits the establishment of joint federal-provincial incorporated agencies (although existing federal and provincial corporations might alternatively be used) to plan and implement approved water quality management programs.

Part III of the Act provides for the passing of regulations banning the manufacture or import for use or sale in Canada of any cleaning agent or water conditioner that contains a prescribed nutrient in a greater concentration than that prescribed by regulations. By providing for regulations to control phosphates in detergents, the Act provides one of the principal means of reducing the rate of eutrophication of water bodies.

Under Part IV are provisions for the general administration of the Act. In addition, it provides for inspection and enforcement, and permits the Minister, either directly or in cooperation with any government, institution, or person, to undertake public information programs.

ACTIVITIES UNDER THE CANADA WATER ACT

PART I: Comprehensive Water Resource Management

Federal-Provincial Consultative Committees

To overcome the difficulties created by shared jurisdictional responsibilities for water resource planning and management in Canada, the Canada Water Act provides for the establishment of formal federal-provincial consultative arrangements on water resource matters. Specifically, these arrangements are met through federal-provincial consultative committees which are to maintain continuing consultation on water resource matters and to provide advice on priorities for research, planning, conservation, development, and utilization; and to both advise on the formulation of, and facilitate the coordination and implementation of, water policies and programs. All provinces have entered into consultative arrangements with the federal government.

During the year ending March 31, 1977, three Federal-Provincial Consultative Committees met: Canada-Manitoba (April 1976), Canada-Saskatchewan (May 1976) and Canada-Quebec (February 1977). Matters discussed included federal-provincial water monitoring, flood damage reduction, flood risk mapping, international water studies of concern to the provinces, and a number of federal-provincial agreements that were then either under way or under negotiation.

Interdepartmental Committee on Water

The Interdepartmental Committee on Water (ICW) was established before the Canada Water Act was passed to allow for the consideration and approval of all federal water programs. At that time, it was agreed that a permanent mechanism for reviewing programs and resolving interdepartmental conflicts on water programs would be set up. In 1973, Cabinet established the Interdepartmental Committee on the Environment (ICE), its mandate being to review the existing structures for interdepartmental consultation and coordination of all phases of environmental questions and related resource issues. This provided the mechanism for the formal adoption of ICW as a subcommittee of ICE, with a mandate to consider and make recommendations on any policies and programs dealing with water. Since then, ICW has actively pursued its mandate, having considered many of the more important water programs of recent years.

A total of 15 departments with an interest in water matters, are represented on this 23-man committee. Subcommittees and Working Groups are set

up as required. During the year under review, there were five such groups:

- 1) Subcommittee on the Great Lakes Water Quality Agreement
- 2) Subcommittee on Water Quality
- 3) Subcommittee on Flooding
- 4) Working Group on the U.N. Water Conference
- 5) Task Force on Droughts

Five meetings of ICW were held during the past year. Some of the topics considered were: the Great Lakes Shore Damage Survey; the Federal Policy Statement on Inland Waters; the National Flood Damage Reduction Program; Montreal Area Flooding; Saint John River Implementation; the United Nations Water Conference; Lake Winnipeg Water Quality; Assiniboine River Dyking; and Marsh Creek Flooding.

Federal-Provincial Agreements

In practice, when agreement has been reached on the need for a specific water resource program, the participating governments contribute funding, information, and expertise in agreed ratios. It is usual for the federal government to meet half the costs for planning agreements and the provincial government(s) the other half. Cost sharing for implementation is in proportion to federal and provincial responsibilities, with the federal share not exceeding half the total cost. Table 1 shows a breakdown of current agreements and other cooperative arrangements under the Canada Water Act, and indicates the stage each has reached. Further details on the current status of each of these programs are given later in this report.

Progress in Water Planning and Management Programs

Implementation Programs: Twelve implementation programs are being reported on for 1976-77, including two that were completed, six that were ongoing, one that was initiated and three others that were under negotiation.

The construction program to remedy the low water problems of the Peace-Athabasca delta was brought to completion in 1976 and monitoring studies on bison, waterfowl, furbearers, fish, and vegetation were undertaken to determine the effectiveness of the mitigating works.

The Metropolitan Toronto Flood Control Agreement and the Upper Thames Flood Control Agreement, both entered into under the Canada Water Conservation Act, were continued under the Canada Water Act to permit completion of the work to the extent possible within authorized funding. The Metropolitan Toronto Agreement expired on June 14, 1976, and a request by the Province

Table 1 Status of Principal Implementation Agreements, Planning Studies, Flood Damage Reduction Programs and Other Cooperative Arrangements Under the Canada Water Act

IMPLEMENTATION AGREEMENTS

<u>Under Negotiation</u>	<u>New during 1976-77</u>	<u>Ongoing during 1976-77</u>	<u>Completed</u>
Saint John basin Lake Winnipeg, Churchill and Nelson Rivers Flood Management - Marsh Creek, N.B.	Dykes and Flow Regulation Works, Montreal Region	Lower Fraser Valley Flood Control Program Southwestern Ontario Dyking Upper Thames Agreement (CWCAA)* Okanagan basin Qu'Appelle basin Canada-Ontario Agreement on Lower Great Lakes Water Quality	Peace-Athabasca delta(1976) Metropolitan Toronto(CWCAA)*(1976)

PLANNING STUDIES

<u>Under Negotiation</u>	<u>New during 1976-77</u>	<u>Ongoing during 1976-77</u>	<u>Completed</u>
Lake Winnipeg Water Quality Mackenzie basin		Souris basin St.Lawrence River Water Quality Northern Ontario Water Resources Shubenacadie-Stewiacke basin	Peace-Athabasca delta(1972) Qu'Appelle basin(1972) Saskatchewan-Nelson basin(1973) Okanagan basin(1974) Saint John basin(1975) Lake Winnipeg, Churchill, and Nelson Rivers(1975) Fraser River Upstream Storage(1976) Flow Regulation-Montreal Region(1976) Churchill River (Saskatchewan-Man- itoba) (1976)

FLOOD DAMAGE REDUCTION PROGRAMS

<u>Under Negotiation</u>	<u>New during 1976-77</u>	<u>Ongoing during 1976-77</u>	<u>Completed</u>
Programs with Nova Scotia, Ontario, Saskatchewan, Alberta, British Columbia, and Yukon and NWT (DINA)	Programs with Quebec and Manitoba Memorandum of Understanding on Flood Risk Mapping, NWT	Programs with New Brunswick	

OTHER COOPERATIVE ARRANGEMENTS

<u>Under Negotiation</u>	<u>New during 1976-77</u>	<u>Ongoing during 1976-77</u>	<u>Completed</u>
	Follow-up Programs - Canada- Ontario Great Lakes Shore Damage Survey	Prairie Provinces Master Agreement on Apportionment Mackenzie Basin Intergovernmental Liaison Committee Lower Saskatchewan Basin Task Force (pre-planning) Water Quantity Survey Agreements	Canada-Ontario Great Lakes Shore Damage Survey(1975)

* negotiated under the Canada Water Conservation Assistance Act

of Ontario for an extension of time for the Upper Thames Agreement was under consideration.

The Canada-Ontario Agreement on Great Lakes Water Quality, as revised in January 1976, was continued in support of the Canada-United States Agreement on Great Lakes Water Quality. Provision for completion of research efforts initiated under the prior agreement were continued under this latest agreement, cost-sharing of surveillance activities was augmented and the scope of surveillance was extended to include the upper Great Lakes. This agreement provides for commitments by Ontario and the federal government to carry out the programs needed to meet the terms of the international agreement.

The Qu'Appelle and Okanagan Implementation Programs were ongoing during the year to implement recommendations arising from comprehensive basin studies. For the Canada-Saskatchewan Qu'Appelle Implementation Program, scheduled to run from 1975 until 1985, significant progress was made in terms of flood control and sewage treatment. For the Canada-British Columbia Okanagan Implementation Program, which was signed in February 1976, a program coordinator was hired and a number of the recommendations, dealing mainly with water quality, were initiated.

Construction programs were continued to reduce damages due to floods in the lower Fraser Valley of British Columbia and in southwestern Ontario. In the Fraser Valley, work resumed at a faster pace as Canada and British Columbia each increased financial commitments from \$30.5 million to \$60 million. In addition, the agreement was extended by six years to 1984. The South-western Ontario Dyking Program, which was scheduled to expire in March 1977, also received an extension in terms of both funds and time. Treasury Board approved a one-year extension (to March 1978) and expenditure of \$2 million in federal funds (in addition to the \$5.6 million expended to March 1977).

Canada and Quebec entered into an Agreement Respecting Dykes and Flow Regulation Works in the Montreal Region, on October 4, 1976. By the year end, dykes were being constructed at Roxboro and Pierrefonds and were being planned for Pointe-Calumet and Ste-Marthe-sur-le-lac. Studies were under way to add to the storage at Quinze reservoir and to provide a control structure on the Mille Iles River.

Manitoba Hydro and various provincial agencies continued to implement some of the recommendations contained in the final report arising from the study of environmental and social effects of the regulation of Lake Winnipeg and of the Churchill River diversion to the Nelson River. Federal agencies

are continuing water quality and water quantity monitoring, and are undertaking a major fisheries research project on South Indian Lake, where diversion from the Churchill River begins. Discussions continued with Manitoba with a view to implementing recommendations requiring joint action.

An implementation agreement for the Saint John River basin was discussed with New Brunswick. A federal-provincial task force was formed to review the recommendations of the Saint John Basin Board Study for the purposes of assessing those recommendations which have already been implemented and recommending to the Governments of Canada and New Brunswick an implementation program.

A flood management study of the Marsh Creek Watershed (near Saint John, N.B.), carried out under the Studies For Flood Damage Reduction Agreement of March, 1976, was completed and reviewed by the three levels of government concerned (Federal, Provincial and Municipal). Based on this and subsequent investigations, discussions were held on federal-provincial-municipal cost-sharing of a \$2.01 million flood control project for the Marsh Creek Watershed. Agreement in principle was reached on the need for this project and a submission was made to the federal Treasury Board for funding.

Planning Studies: The number of planning studies under way or under negotiation in fiscal year 1976-77 fell to six as three studies were brought to completion; there were no new planning studies undertaken during the year as much effort was concentrated on the flood damage reduction program.

The Churchill River Agreement (Canada, Saskatchewan and Manitoba) to determine the possible effects of the proposed Wintego dam on the natural environment of the area and on its inhabitants was brought to a close with the release of a study report on May 28, 1976. Public hearings by the Province of Saskatchewan relating to the report's findings are scheduled for 1977.

The Flow Regulation Study, Montreal Region, was brought to completion with the release of the Flow Regulation Committee's Final Report. As a result of the recommendations in that report, Canada and Quebec, on October 4, 1976, entered into an Agreement Respecting Flood Risk Mapping Applied to Flood Damage Reduction. This agreement is briefly discussed in a Section on the Flood Damage Reduction Program which follows.

The Fraser River Upstream Storage Study, an important part of the Canada-British Columbia Lower Fraser Valley Flood Control Program, was completed and a report released in February 1977. The study revealed that the McGregor River is an economically effective project for flood control but could cause damage to the environment and fisheries.

Two planning studies that continued throughout fiscal year 1976-77 are designed to develop framework plans for the management of the water and related resources in the Souris River basin and in the Shubenacadie-Stewiacke River basin. The program of study assignments for the Souris basin under this Canada-Saskatchewan-Manitoba Study Agreement has been developed to meet both the objective of the agreement and the reporting deadline of December 31, 1977. The Canada-Nova Scotia Shubenacadie-Stewiacke Agreement experienced delays during the year because of difficulties in recruiting a study director but key personnel have since been recruited, a detailed study plan has been approved, and work has been initiated under the technical direction of four subcommittees.

An Interim Report was released in 1976 on the Canada-Quebec St. Lawrence River Water Quality study which has as its goal a comprehensive water quality plan of the St. Lawrence River from the end of the international section near Cornwall, to the Gulf of St. Lawrence. After completion of this study in March 1978, it is expected that implementation programs and a continuing water quality monitoring program will be needed.

Canada's share of the Northern Ontario Water Resources Studies was completed and reported on in the early 1970's. Ontario's share of the studies is now scheduled for completion in 1977.

An agreement between Canada and Manitoba to carry out a water quality study of the Lake Winnipeg basin remained under negotiation.

Negotiations were also under way between Canada, Alberta, British Columbia and Saskatchewan for a Mackenzie Basin Memorandum of Understanding and subsequent studies which have arisen from the deliberations of the Mackenzie Basin Intergovernmental Liaison Committee. The Memorandum of Understanding, which formalizes intergovernmental cooperation in the Mackenzie River basin, is expected to be signed in May 1977.

Flood Damage Reduction Programs: During the year under review, this program was actively supported throughout most of Canada. Progress by Province and Territory is given below:

OBJECTIVE: The Flood Damage Reduction Program follows the cooperative federal-provincial approach of the Canada Water Act. It envisages a General Agreement with each province to outline the basic approach in reducing potential flood damage, and a Flood Risk Mapping Agreement to permit joint funding of mapping and designation of floodplain lands. Other subsidiary agreements relative to specific programs may also follow.

Under the General Agreements, the respective governments commit themselves to (i) an agreement to carry out a flood risk mapping program whereby lands subject to flooding would be clearly defined and (ii) a number of policies to restrict government undertakings and programs on lands subject to flooding. The governments agree not to engage in or provide financial assistance to undertakings in areas designated as flood risk areas. Application of the disaster assistance program will also be restricted in designated flood risk areas. Only existing structures and, under certain circumstances, structures which are flood-proofed would be eligible for assistance. Information linked with designated flood risk areas will be made available to governments, agencies, zoning authorities, and the public. Zoning on the basis of flood risk will be encouraged.

Subsidiary agreements may also be developed to deal with existing developments in floodplains, area flood studies, flood forecasting and flood warning systems, flood proofing techniques, land use planning in flood areas, works to control flows and levels, and the acquisition of property or easements to reduce flood damage potential.

DURATION: 1976 to 1986
ENTITIES AND FUNDING: CANADA
THE PROVINCES

The mapping and studies portion of the program, as originally approved, was to cost \$20 million, to be divided between the federal and provincial governments. Most of the \$20 million was to be spent on flood risk mapping.

RELATED AGREEMENTS: Several studies and implementation agreements dealing with separate flood prone areas in Canada were in force when the flood damage reduction program was launched. These include five flood risk pilot projects which are dealt with below and several agreements described elsewhere in this report under the titles: Lower Fraser Valley Flood Control Program; Southwestern Ontario Dyking; Canada Water Conservation Assistance Act; Qu'Appelle basin; Souris basin; Fraser River Upstream Storage Study; Dyking and Flow Regulation-Montreal Region; Canada-Ontario Great Lakes Shore Damage Survey, and Flood Management-Marsh Creek.

STATUS:

New Brunswick: Canada and New Brunswick entered into a General Agreement and sub-agreements on Flood Risk Mapping, and Studies for Flood Damage

Reduction, on March 31, 1976. These agreements extend over five years, with up to \$1 million to be spent mapping 24 flood-prone areas and up to \$0.2 million studying three problem areas. These costs will be shared equally between Canada and New Brunswick. Steering and Technical Committees have been established to implement these agreements. During fiscal year 1976-77, priorities for the flood risk mapping program were established based on detailed field reconnaissance and discussions with local officials; a regional flood frequency analysis was undertaken and various phases of the hydrotechnical and mapping components of the program in the Fredericton, Maugerville/Sheffield/Lincoln, Sussex, Campbellton, Woodstock/Hartland, and Perth/Andover areas were initiated.

A federal-provincial agreement on flood forecasting was under negotiation. In the interim, an Ad Hoc Technical Sub-Committee on Flood Forecasting was established, mainly to provide the framework for flood forecasting operations in spring 1977.

A Fredericton flood risk pilot project, which predated the above agreements, has been completed and two maps, with accompanying bilingual technical booklets, are available. A general brochure, "Flood Damage in Fredericton", has also been produced in both official languages.

Nova Scotia: Prior to signing any agreements, Nova Scotia has suggested a pilot flood risk mapping project be undertaken for the Truro area. This project has commenced on a work-shared basis and is scheduled for completion by March 1978.

Prince Edward Island and Newfoundland: Flooding problems in these provinces are not of high priority with the result that there are no discussions leading to flood damage reduction agreements with either Prince Edward Island or Newfoundland.

Quebec: Canada and Quebec entered into an Agreement Respecting Flood Risk Mapping Applied to Flood Damage Reduction on October 4, 1976.

A Flood Risk Mapping Committee has been set up to administer the "Flood Risk Mapping" Agreement, which calls for equal sharing of costs of up to \$5 million for the mapping of 183 flood-prone areas over a five-year period. The pilot flood risk mapping project in the Montreal Region, consisting of 22 map sheets, is being completed under the terms of this agreement. Flood risk mapping for the Gatineau, Chaudière, and Richelieu Rivers is scheduled for fiscal year 1977-78.

Ontario: Discussions leading to flood damage reduction agreements with Ontario are under way. Four flood risk map sheets have been produced for the Oshawa pilot project and an accompanying technical booklet and a general brochure on flood damage in Oshawa are being prepared. Drafting of six flood risk maps for the Sault Ste. Marie pilot project has begun.

Manitoba: Canada and Manitoba entered into a General Agreement and sub-agreements on Flood Risk Mapping and Studies for Flood Damage Reduction on December 20, 1976. Up to \$700,000 will be spent mapping 45 flood-prone areas and up to \$310,000 studying 14 problem areas. These amounts will be shared equally over the five-year life of each agreement. Steering and Technical Committees have been established to implement these agreements.

A flood risk map has been produced for the Carman pilot project, which predated the agreements, and an accompanying technical booklet and a general brochure on flood damage in Carman are under preparation.

Saskatchewan: Canada and Saskatchewan were negotiating a General Agreement and a Flood Hazard Mapping and Studies Agreement at year's end. Up to \$1.3 million is expected to be spent on the mapping of 30 flood-prone areas and up to \$480,000 on the study of 14 areas. These costs will be shared equally by the two governments.

The Moose Jaw pilot project has been completed and a brochure "Flooding in Moose Jaw, Saskatchewan 1969 & 1974", which includes a flood risk map, is available in English and French.

Alberta and British Columbia: Discussions leading to flood damage reduction agreements with both provinces, are continuing.

Yukon and Northwest Territories: Current activities in the Yukon and Northwest Territories are being carried out under a Memorandum of Understanding and subsequent correspondence between the Minister of Fisheries and Environment Canada and the Minister of Indian and Northern Affairs. The Ministers agreed that Hay River N.W.T. was to be mapped immediately. A Committee has been established to oversee completion of the mapping by March 1978. The costs of the mapping, to be shared equally by the two departments, are not to exceed \$185,000. The Ministers also agreed that formal agreements are to be developed with Yukon Territory and the Northwest Territories, similar to those negotiated with the provinces.

Indian Lands: Discussions are under way with the Department of Indian and Northern Affairs regarding the application of principles of the Flood Damage Reduction Program on Indian lands.

Other Cooperative Arrangements: This category includes programs which cannot be characterized entirely as implementation programs or planning studies. These programs are often of a continuous or long-term nature.

During the year under review, a Canada-Ontario Task Force was formed to implement programs arising from the Great Lakes Shore Damage Survey. The major programs to be implemented are hazard land mapping, shoreline monitoring, and public awareness.

The shared-cost water quantity surveys, formally implemented with all provinces effective April 1, 1975, were continued. Coordinating Committees established for each province plan the hydrometric survey networks and determine cost sharing.

The Prairie Provinces Water Board, which administers the Prairie Provinces Master Agreement on Apportionment, continued to provide recommendations to Canada, Alberta, Saskatchewan, and Manitoba concerning the equitable apportionment of interprovincial prairie rivers flowing eastward. During the year, the Board's Committee on Hydrology recommended methods and networks for the determination of natural flow for five major basins on the prairies. That Committee is also studying apportionment possibilities concerning westward flowing streams, and mechanisms necessary to administer an agreement for such apportionment.

The Mackenzie Basin Intergovernmental Liaison Committee was formed in 1973 to gather information on the Mackenzie River basin, with the intent of determining what further studies should be undertaken. During 1976-77, the Liaison Committee was preparing a draft Memorandum of Understanding to be considered at a Ministerial meeting in the spring of 1977. The Memorandum of Understanding will reaffirm cooperation of the entities involved (Canada, Alberta, British Columbia and Saskatchewan) and strengthen the role of the Liaison Committee. During the meeting, the Liaison Committee will also seek direction from the Ministers as to the level of study effort desired over the next few years.

A pre-planning study by Canada, Saskatchewan, and the Lower Saskatchewan Basin Association has been under way since September 1974 to identify water management concerns needing further study in the lower Saskatchewan River basin. The target date for completion of this assignment has had to be extended to the end of September 1977.

Activities Related to the Canada Water Act

Not to be overlooked in the review of operations under the Canada Water Act are various activities such as socio-economic studies, water research, data collection, and data management systems, seldom objectives in themselves but indispensable tools in effective water planning and management.

Socio-Economic Studies: Within the philosophy of the Canada Water Act, there lies the responsibility to develop the socio-economic techniques necessary to carry out studies and to provide technical advice in support of water management in Canada. During the year, efforts were continued to define planning and research techniques and to collect essential background data on water uses in Canada. Ongoing river basin planning studies and implementation programs, and the development of a national flood damage reduction program, provided a number of opportunities to apply these techniques during the year.

Water Research: The department, on the recommendation of the Water Resources Research Support Program Review Group, provided 21 Canadian universities with a total of \$1,000,000 for water-related research during 1976-77. These contracts were for such purposes as studies of contamination of ground water, river and coastal management, techniques for environmental impact assessment, hydrologic forecasting, urban water management, and climatic change. Research by departmental agencies included studies of pollutants to the Great Lakes basin, the design of storm water management systems in cities and towns, the precipitation-runoff process, hydrologic implications of resource development including pipeline and highway construction in the north, and the assessment of water quality trends across Canada. Plans for the near future call for a National Hydrologic Research Institute to be established in western Canada, close to many of the major hydrologic problems confronting Canada at the present time.

Water Data: Programs for the systematic collection and compilation of data on streamflow, water levels, sediment transport, ground water, water quality, and related information on glaciers, snow and ice predated the

Canada Water Act but have continued to operate in support of water management basin studies and implementation programs. A relatively new innovation is the collection of background data on water use in Canada.

Data Management Systems: Numerous data and reference systems have been developed in support of water resource activities. WATDOC, the water resource document reference centre, gives direct access nationwide to a variety of water related data bases through a publicly available on-line interactive storage and retrieval system. GOWN, the ground water data storage, processing, and retrieval system, was developed to enlarge the scope and flexibility of the retrieval functions and to develop capability to deal with interconnected ground water and surface water systems. NAQUADAT, the national water quality data bank, was designed to accept chemical, physical, bacteriological, biological and hydrometric data relevant to water quality for surface waters, ground waters, wastewaters and sediments. STAR, a data storage and retrieval system, was developed to handle limnological data from Great Lakes monitoring cruises. WATENIS, the water effluent national information system, provides an inventory of industrial and municipal water pollution sources including data on physical, chemical, and toxicological characteristics of effluents and information on water effluent regulations and guidelines. MUNDAT, a data base covering municipal waterworks and wastewater systems from coast to coast, was developed in close cooperation with the provincial governments and the Federation of Associations on the Canadian Environment (FACE). A Surface Water Data System has been developed to contain streamflow, water levels, and sediment transport information, and a Glacier Data and Information System has been designed to contain a compilation of physical dimensions of Canadian glaciers and a bibliography of Canadian glacier documents.

PART II: Water Quality Management

No water quality management areas, as defined under Part II of the Canada Water Act, have been set up. However, there are a number of implementation programs by federal-provincial agreements under the Act, where water quality management programs are being implemented. These include programs in the Great Lakes basin and in the Okanagan and Qu'Appelle basins. While these agreements do not provide for the establishment of water quality management agencies under Part II of the Act, they nevertheless have the same objectives of maintaining and improving water quality and are managed by joint federal-provincial Boards. The federal government, in concert with provincial governments, is in the process of completing the development of comprehensive water resources management plans, including water quality management strategies, for several major Canadian river systems including the St. Lawrence (Quebec), the Souris (Manitoba-Saskatchewan) and the Shubenacadie-Stewiacke (Nova Scotia).

PART III: Regulating Nutrient Inputs

In the late 1960's, when phosphates from laundry detergents were identified as significant contributors to the degradation of Canada's water resources, the federal government launched its phosphorus concentration control program for these products.

By 1970, regulations to control the amount of phosphorus in laundry detergents were written under the nutrient control provisions of the Canada Water Act. The initial regulations limited the maximum phosphorus content of laundry detergents to 8.7% elemental phosphorus by weight, expressed as 20% phosphorus pentoxide (P_2O_5) and an inspection program began under which product samples were collected from manufacturers and importers for government analysis. It is estimated that these first regulations resulted in a 22% reduction in the amount of phosphate discharged from all detergent sources (from 57,200,000 pounds to 44,000,000 pounds) per annum.

On January 1, 1973, a further reduction in the maximum permissible phosphorus content of laundry detergents came into effect. The revised regulations permitted a maximum of only 2.2% elemental phosphorus by weight, expressed as 5% P_2O_5 . This further limitation is estimated to have reduced the pre-regulation levels of detergent phosphates discharged by 80% (from 57,200,000 pounds to 11,000,000 pounds) per annum.

In 1973 the inventory of detergent manufacturers and importers was updated and a new round of sample collection began. At that time, the inspection and sample collection program was reorganized through the formation of a network of regionally-based Canada Water Act Inspectors. The new network was designed not only to improve the national collection of samples and update the inventory of manufacturers and importers but also to provide more direct day-to-day contact with regional manufacturers, importers and the public. Under the new regional system, a complete national sampling round has been carried out annually since 1973.

When the revised regulations and the new sampling system were first introduced, a number of violations were detected. These initial violations were committed by small manufacturers who were unaware of, or had misinterpreted, some aspects of the revised regulations. In some instances Canada Water Act Inspectors formally seized quantities of suspected products. In all instances, whether seizures were made or not, the companies concerned quickly rectified their errors and remained in compliance thereafter. Consequently, no formal prosecutions were recommended or undertaken as a result of these initial violations.

Since that time the indicated violations which have occurred have generally been classified as "technical" violations where improper mixing, clean-up or analytical procedures have resulted in small batches of product exceeding the 2.2% limit by fractional amounts. Once discovered, all such occurrences have been quickly corrected. It should be noted that none of the larger Canadian manufacturers of nationally advertized laundry detergent brands, which make up the bulk of Canadian retail sales, have been involved in these incidents.

During 1975, the decentralization of laboratory analysis was begun with a view to significantly improving the speed with which the official analysis is performed and the results become available to inspectors, manufacturers and importers. In 1976 all analyses were conducted by newly designated regional analysts in regional laboratories and a significant time improvement resulted.

In addition to the required sampling and analysis of laundry detergents, other cleaning agents which are not regulated at present are analysed for informational purposes from time to time, improved methods of analysis are developed and the development of acceptable new low and non phosphate products by industry is monitored. During 1976, the results of the previous years automatic dishwasher detergent survey were analysed and an improved

automated method of analysis was published.

Reformulation of laundry detergents to comply with the phosphorus limit has resulted in the use of large quantities of alternative builders. By far the most common substitute is nitrilotriacetic acid (NTA). The resulting presence of this synthetic substance in the Canadian environment, and more specifically in drinking water, is the subject of a continuing nationwide monitoring program to ensure that NTA concentrations in the environment stay as low as predicted.

Rapid biodegradation of NTA in the environment has been demonstrated by the many samples taken from drinking water supplies and from lake, river, marine and ground waters. To date 2,200 samples have been analysed. In most samples, NTA concentrations were below the normal detection level of 10 parts per billion (ppb), though a few groundwater samples, also highly contaminated by other substances, produced readings up to 50 ppb. The latter level is still several orders of magnitude less than concentrations which had earlier raised concerns for public health though the evident contamination of these groundwater wells with untreated sewage raises other public health concerns.

The search for acceptable substitutes for phosphates is continuing, with the object of finding clean and effective materials which are readily biodegradable. Several promising substances are undergoing appraisal.

PART IV: Public Information Programs

During the 1976-1977 fiscal year, an important public information project was directed at informing the public about the new flood damage reduction program, under which agreements have been signed by the federal government and the governments of New Brunswick, Quebec and Manitoba.

A series of public information brochures entitled WHAT DO YOU KNOW ABOUT WATER? was published. The series briefly discusses Canada's water resources under the following headings: 1) Water -- Nature's Most Versatile Substance; 2) Water -- Where and in What Form? 3) Water Use in Canada; 4) Water -- Too Little or Too Much? 5) Water Resource Development and Conservation; 6) Water -- Cleaning Up Pollution.

Publication of the final report of the "Comité sur la régularisation des eaux, Région de Montréal", release of the "Fraser River Upstream Storage Review Report", and distribution of the 1976 edition of the "Canada Water

Year Book" were also occasions for public information programs.

Another important public information program was undertaken to prepare the Canadian press for reports coming from the Mar del Plata (Argentina) United Nations' Water Conference. A full day of intense information exchange between water experts and specialised journalists took place in cooperation with External Affairs, CIDA and other federal agencies. On this occasion, a new mailing list was prepared, identifying both the written and the electronic press representatives across Canada interested in environmental topics.

Public information services were provided for the Canadian delegation to the U.N. Water Conference. Twelve releases were made to the press, five press conferences were held along with five film showings, and considerable media relations work was done to acquaint the media, and through them the Canadian and international publics, with Canada's position on numerous matters concerning water, oil spills and aid to developing countries.

Liaison with the National Film Board was provided during the production of two films completed during the year: "The Great Cleanup" and "River Planet Earth".

Among the recommendations of the Canada-Ontario Great Lakes Shore Damage Survey Report was a program of public information to widely disseminate the survey's findings. Consequently, in 1976, the two governments collaborated to produce a folder summarizing the report entitled, "Coping With the Great Lakes". This was subsequently mailed to all property owners along the entire surveyed shoreline. At the same time, conservation authorities in the affected areas were consulted about a possible further program of public information on the subject. Several workshops were organized in order to discuss with municipal engineers and planners the findings of the survey.

The Review Board of the Canada-Ontario Agreement on Great Lakes Water Quality, recognizing that the story of the substantial progress made under the Agreement had not been publicly told, called for a joint program of public information as a remedy. Planning for this was well in hand by the end of the fiscal year.

SPECIAL EVENTS

United Nations Water Conference (March 1977)

Water supplies and water problems throughout the world were the topic of this U.N. conference held near the end of the 1976-77 fiscal year. The conference was attended by delegates from 116 countries and a large number of intergovernmental and international organizations; the 25 member Canadian delegation was headed by Senator R.J. Perrault. An additional number of observers and participants in technical sessions accompanied the delegation and several Canadians represented international organizations, such as the World Meteorological Organization and the World Health Organization.

At the national level, a large number of recommendations to improve the management and conservation of water resources were approved at the conference. Canadian experiences, written into a number of sections, are expected to be valuable to other countries, while Canada should benefit from other countries' experiences on topics such as drought loss reduction.

At the regional level, some of the strongest concerns were raised with regard to the use and abuse of shared water resources. Two significant results were achieved. One was an agreement to ask the United Nations to convene a conference of the various boundary water commissions to review experiences and make recommendations to the United Nations on procedures for dispute resolution. It is understood that the UN Centre on National Resources has already budgeted for a conference this year. The other was to urge a strengthening of the work of Regional Economic Commissions in the water field. Each region was asked to set up a small secretariat and intergovernmental committee on water. ECE (Europe) now has this, but ECLA (Latin America), to which Canada also belongs, will need to develop such arrangements.

At the international level, the main debates were on organizational and funding matters. It was agreed that, intergovernmentally, ECOSOC and its Committee on Natural Resources should lead in ensuring that conference recommendations are followed up. On funding, it was agreed that 1980-90 should be designated as the International Water Supply Decade, during which increased technical assistance for water projects would be provided, but African pressure for a special fund was rejected. A feasibility study by the United Nations was called for to find the most effective way of increasing funding for water resource development during the decade.

Table 2 CURRENT AND PROJECTED RELEASE DATES OF FINAL REPORTS
ARISING FROM CANADA WATER ACT STUDIES

<u>Name of Study</u>	<u>1976-77 *</u>	<u>1977-78</u>	<u>1978-79</u>	<u>After 1978-79</u>
Churchill River (Saskatchewan)	May 1976			
Flow Regulation, Montreal Region	Oct.1976			
Fraser River Upstream Storage	Feb.1977			
Lower Saskatchewan Basin Task Force		Sept.1977		
Souris Basin		March 1978		
St.Lawrence River Water Quality		March 1978		
Shubenacadie-Stewiacke Basin			Jan.1979	

* Available upon request from: Director
Water Planning and Management Branch
Inland Waters Directorate
Ottawa, K1A 0E7

PRINCIPAL FEDERAL-PROVINCIAL COOPERATIVE ARRANGEMENTS UNDER THE CANADA WATER ACT

IMPLEMENTATION AGREEMENTS

1. Saint John Basin(proposed)	22
2. Flood Management - Marsh Creek, N.B. (proposed)	22
3. Dykes and Flow Regulation Works - Montreal Region	22
4. Canada Water Conservation Assistance Act	23
5. Canada-Ontario Agreement on Great Lakes Water Quality	23
6. Southwestern Ontario Dyking	25
7. Lake Winnipeg, Churchill and Nelson Rivers(proposed).....	25
8. Qu'Appelle Basin	26
9. Peace-Athabasca Delta	27
10. Okanagan Basin	27
11. Lower Fraser Valley Flood Control Program	28

PLANNING STUDIES

1. Shubenacadie-Stewiacke Basin	29
2. St. Lawrence River Water Quality	29
3. Northern Ontario Water Resources Studies	30
4. Lake Winnipeg Water Quality (Proposed)	30
5. Souris Basin	30
6. Churchill River (Saskatchewan-Manitoba)	31
7. Fraser River Upstream Storage Study	31

OTHER COOPERATIVE ARRANGEMENTS

1. Canada-Ontario Great Lakes Shore Damage Survey Follow-Up Programs	32
2. Prairie Provinces Master Agreement on Apportionment	32
3. Mackenzie Basin Intergovernmental Liaison Committee	33
4. Water Quantity Survey Agreements	34
5. Lower Saskatchewan Basin Task Force (pre-planning)	35

PRINCIPAL FEDERAL-PROVINCIAL COOPERATIVE
ARRANGEMENTS UNDER THE CANADA WATER ACT

IMPLEMENTATION AGREEMENTS

1. SAINT JOHN BASIN (proposed)

Objective: To implement recommendations arising from the 1970-74 Saint John River Basin Study.

Entities: CANADA
NEW BRUNSWICK

Status: A Federal-Provincial Task Force has been formed to review the recommendations of the Saint John River Basin Board with a view towards (1) assessing those recommendations which have already been implemented and (2) recommending to the Governments of Canada and New Brunswick an implementation program.

2. FLOOD MANAGEMENT - MARSH CREEK, N.B. (proposed)

Objective: To reduce the damage from floods in the Marsh Creek Watershed through acquisition of lands, construction of flood control reservoirs, channel improvements, excavations and changes in structures.

Duration: 1977 to March 1980

Entities and Funding: CANADA.....\$670,000
NEW BRUNSWICK.....\$670,000
CITY OF SAINT JOHN\$670,000

Prior Action: Studies conducted under the Canada-New Brunswick General Agreement Respecting Flood Damage Reduction contained recommendations for appropriate measures to reduce flood damages in the watershed.

Status: The three entities agreed in principle on the need for this project, and a submission was made to the federal Treasury Board for funding.

3. DYKES AND FLOW REGULATION WORKS - MONTREAL REGION

Objective: To plan and construct dykes to prevent flood damage in the municipalities of Pointe-Calumet, Ste-Marthe-sur-le-lac, Roxboro and Pierrefonds; and to determine the feasibility of enlarging the storage capacity of the Quinze Reservoir, and of reducing the maximum flow of the Mille Iles River to approximately 25,000 cfs by means of a control structure.

Duration: October 1976 to March 1978

Entities and Funding: CANADA\$2,250,000
QUEBEC.....\$2,750,000

Prior Action: Between June 1974 and October 1976, a study was conducted to determine the means of reducing the frequency of both flooding and extreme low water levels in the Montreal Region water bodies. The Committee on Flow Regulation which conducted the study, submitted an interim report in 1975 and its final report in October 1976. This new implementation agreement was signed in October 1976 on the basis of the recommendations in the interim report, because the extensive damage caused by floods in 1974 and 1976 in the Montreal Region made it important that these recommendations be implemented immediately. A Flood Risk Mapping Agreement signed at the same time as this Flow Regulation Agreement is discussed in the section headed Flood Damage Reduction Programs.

Status: Dykes are being constructed at Roxboro and Pierrefonds and are being planned for Pointe-Calumet and Ste-Marthe-sur-le-lac. Studies are under way to add to the storage at Quinze Reservoir and to provide a control structure on the Mille Iles River.

4. CANADA WATER CONSERVATION ASSISTANCE ACT - CWCAA (Repealed)

Pursuant to the CWCAA agreements, Canada has contributed financially towards the construction of major flood control and water conservation projects. The Metropolitan Toronto Agreement expired on June 14, 1976, but a request by the Province of Ontario for an extension of time for the Upper Thames Agreement is under consideration.

5. CANADA-ONTARIO AGREEMENT ON GREAT LAKES WATER QUALITY

Objective: To provide a basis for implementing the Canada-U.S. Agreement on Great Lakes Water Quality in the Great Lakes basin by reaching agreement on water quality objectives, by accelerating investment in sewage treatment and by conducting research into treatment technology.

Duration: January 1976 to March 31, 1980

Entities and Funding: CANADA
ONTARIO

The entities will each pay half the costs associated with the research and surveillance programs; the federal share of research over the two fiscal years 1976-77 and 1977-78 is not to exceed \$500,000; the federal share of surveillance was \$762,500 for fiscal year 1976-77. For each fiscal year, the total amount payable by Canada shall not exceed an amount to be agreed upon between Canada and Ontario, taking into account:

- (a) the recommendations made by the International Joint Commission respecting surveillance of the whole of the boundary waters;
- (b) the decisions taken, as a result of such recommendations, by the parties to the Canada-U.S. Agreement with respect to such surveillance;
- (c) the recommendations of the Board of Review.

Prior Action: An initial agreement from August 1971 to December 1975 authorized \$3 million for feasibility studies and joint sewage treatment technology research. Loans totalling \$250 million for sewage treatment facilities from CMHC and the Ontario Government were also called for in the initial agreement. (Funding for municipal sewage treatment is now the subject of a separate agreement with CMHC under the National Housing Act.)

Status: Increased attention has been focused on the importance of water quality trend information in warning of developing problems and assessing the effectiveness of ongoing abatement programs. To this end, surveillance design and data analysis under the Agreement were strengthened during 1976.

Because, as already noted, the Canada-Ontario Agreement is being undertaken to provide a basis for implementing the Canada-U.S. Agreement on Great Lakes Water Quality, a brief outline of activities under the latter agreement is also provided.

CANADA-U.S. AGREEMENT ON GREAT LAKES WATER QUALITY

Objective: To improve the quality of the water in the areas of the Great Lakes now suffering from pollution and to ensure that Great Lakes water quality will be protected in the future.

Duration: continuous since April 1972

Entities: CANADA
UNITED STATES

Commitment: Approximately 95 per cent of the sewered population on the Canadian side of the basin now has adequate municipal wastewater treatment facilities. Thunder Bay is the only major municipality in which construction of municipal wastewater treatment facilities is still under way and it is expected to be completed in 1977.

Arrangement: The International Joint Commission was given primary responsibility for overseeing implementation of this international water quality agreement. The Commission has established a number of Boards, Committees and Reference Groups to carry out the various provisions of the agreement. Activities are carried out under four programs: Pollution From Land Use Activities Study, Water Quality Objectives, Regulatory Activities, and Surveillance.

Status: Considerable progress was made in the containment of toxic pollutants and in the development of a strategy to deal with toxic substances in the Great Lakes. Under the surveillance program, 12 surveillance cruises on Lake Ontario and 3 on Lake Erie were conducted. The reduction of phosphorus loadings from municipal point sources in Lakes Erie and Ontario in 1976 shows the success of the phosphorus removal program. Progress was also made in developing new and re-vising existing water quality objectives to ensure protection of the most sensitive and beneficial uses in the boundary waters of the Great Lakes.

The PLUARG 1974 Detailed Study Plan was updated and a supplement prepared; all field studies have been completed or are in their final stages and drafting of the final report has commenced.

6. SOUTHWESTERN ONTARIO DYKING

Objective: To provide for the construction and reconstruction of dykes and associated control works for protection of agricultural lands in the southwestern Ontario Counties of Essex and Kent, and the Regional Municipality of Niagara.

Duration of Program: March 1974 to March 1978 (extended)

<u>Entities and Funding:</u>	CANADA Department of the Environment	45%
	Department of Agriculture	
	ONTARIO	45%
	Municipalities and/or	
	Conservation Authorities	10%

(Federal expenditures to March 1977 totalled \$5.6 million. During 1976-77, Treasury Board approved a one-year extension and expenditure of a further \$2 million in federal funds to make effective any major construction under way.)

Prior Commitment: For purposes of this agreement, the program shall include the cost of completing the work in excess of \$2,700,000 undertaken pursuant to the Agreement made on 30 May 1973 between Canada (Minister of Regional Economic Expansion) and Ontario for the repair and construction of dykes protecting agricultural land in the Townships of Harwick, Pelee and Mersea.

Status: Work was completed in Pelee, Mersea and Harwick Townships and in the Regional Municipality of Niagara. Work in East Tilbury and Dover Townships was partially completed.

7. LAKE WINNIPEG, CHURCHILL AND NELSON RIVERS (proposed)

Objective: To implement recommendations arising from the Lake Winnipeg, Churchill and Nelson Rivers Study carried out under the Canada Water Act.

Entities: CANADA
MANITOBA

Prior Action: The Lake Winnipeg, Churchill and Nelson Rivers Study Board concluded the three-year, \$2,000,000 joint study with the release of the Summary Report (and eight Technical Appendices) on June 2, 1975. Thirteen of the 47 recommendations are of direct federal interest, ranging from water, fisheries, and wildlife to Indian affairs and navigable waters.

Status: Manitoba Hydro and various Manitoba Departments are implementing some of the Study Board's recommendations which are a provincial responsibility. Fisheries and Environment (Canada) is continuing its water quality and water quantity monitoring, and has undertaken a major research project on the fisheries of South Indian Lake.

Discussions continued with Manitoba to promote joint implementation of recommendations, including establishment of an implementation board. A long-term ecological monitoring program was prepared for possible joint implementation under such an agreement.

8. QU'APPELLE BASIN

Objective: To implement recommendations from the 1970-72 Qu'Appelle Basin Study.

Duration of Program: October 1975 to 1985

Entities and Funding: CANADA\$18,000,000
SASKATCHEWAN\$15,700,000

(An additional \$10,400,000 will be available on a loan basis, \$8,400,000 through CMHC and \$2,000,000 from Saskatchewan)

Status: The Department of Regional Economic Expansion is acting as this project's coordinator. The Management Board established by the agreement ratified a number of implementation programs (which had been undertaken on an interim basis) for retro-active cost sharing.

Projects essentially completed include flood control works for Regina, Lumsden and Tantallon, and Phase I of the Regina tertiary sewage treatment plant. Implementation plans to increase channel capacity in the Qu'Appelle River, and to provide a livestock pollution control program and a Moose Jaw flood protection program, are nearing completion.

Plans for developing the recreation and tourism potential in the Valley are being prepared.

9. PEACE-ATHABASCA DELTA

Objective: To remedy the low water problems of the Peace-Athabasca delta by constructing a submerged rock weir on the Rivière des Rochers, and an earth dam on Revillon Coupé and by removing the temporary structure on Chenal des Quatre Fourches.

Duration of Program: January 1971 to 1976

Entities: CANADA
ALBERTA
SASKATCHEWAN

Prior Action: During the period January 1971-July 1972, a study group was established to investigate and report on the extent of low water levels in Lake Athabasca, the causes of the low water conditions, and the resulting effect on the delta and the local inhabitants. The study group completed its investigation in eighteen months. A summary report was published in 1972 and a technical report was published in 1973. As a result of the study, remedial action for preservation of the delta was taken in 1971 with the construction of a temporary rock-fill dam on the western arm of the Quatre Fourches to improve water levels in the park portion of the delta. Further remedial action, consisting of a short diversion of the Athabasca River to prevent it from joining the Embarras River and thus flowing directly into the delta during floods, was undertaken in 1972. A more permanent remedy to the problems of the delta, a submerged rock weir on the Rivière des Rochers and a permanent earth plug in the Revillon Coupé, were recommended in the technical report. During 1975-76, construction of the Rivière des Rochers weir was completed and the temporary plug in the Quatre Fourches Channel was removed. A design for a modified Revillon Coupé structure was approved and construction was completed in 1976.

Status: Monitoring studies on bison, waterfowl, furbearers, fish, vegetation and hydrology to determine the effectiveness of the mitigating works are under way. These studies are being carried out and financed under regular programs by various agencies of the federal and provincial governments. Financing of an accelerated program, including water quality monitoring, is under discussion.

10. OKANAGAN BASIN

Objective: To implement recommendations arising from the 1969-74 Okanagan Basin Study.

Duration of Program: February 1976 to 1981

Entities and Funding: CANADA\$2,500,000
BRITISH COLUMBIA\$2,500,000

(CMHC has agreed to provide \$17,000,000 in loans and grants for sewage treatment projects)

Status: A number of the recommendations of the Implementation Agreement, signed by the federal and provincial governments in February 1976, were initiated during the year. Three phases of the water quality monitoring program - waste treatment, lake response, and basin loading - designed to provide a base for documenting existing water quality conditions, were commenced during the year. A number of water quantity stations to provide hydrometric data to assist in the development of models for future water management of the basin were established. Water intakes along Okanagan River and Lake were surveyed during the year. Examination of the modifications required for the Kelowna Floating Bridge was started. Plans were initiated to study the multi-purpose management of water of the Mission Creek basin. Design commenced for Okanagan River control improvement.

A coordinator for the program was hired in February, 1977.

11. LOWER FRASER VALLEY FLOOD CONTROL PROGRAM

Objective: To provide protection from flooding of land in the lower reaches of the Fraser River Valley and other areas upstream by rehabilitating existing dykes, constructing new dykes, increasing river bank protection, and improving internal drainage facilities.

Duration of Program: 1968 to 1984 (extended)

Entities and Funding: CANADA.....50%
BRITISH COLUMBIA50%

(Study costs and construction costs)

In 1974, the federal government increased its contribution to the Flood Control Program and Storage Studies from \$18,000,000 to \$30,500,000 and British Columbia agreed to increase its share by the same amount. In fiscal year 1976-77, both parties agreed to a further increase in funding and to extend the expiry date. The new funding level is \$60,000,000 for each party, and the agreement has been extended to March 31, 1984.

Status: Construction of dykes and floodboxes continued in Delta, Richmond and Chilliwack. Construction of dykes and floodboxes commenced in New Westminster and Pitt Meadows. Design for construction of dykes in Coquitlam, Surrey and Abbotsford was well advanced.

PLANNING STUDIES

1. SHUBENACADIE-STEWIACKE BASIN

Objective: To examine critical problems affecting the water resources and the interrelationships of these problems; to develop proposals for interim measures to control critical problems and to maintain options for future action; and to develop a comprehensive framework plan focusing on water quality and quantity objectives and complementary development and resource-use strategies.

Duration of Study: 30 months

Entities and Funding: CANADA.....50%
NOVA SCOTIA50%

Funding proposed \$730,000

Status: The Study Director and an assistant were recruited. A study plan has been developed to satisfy the objectives and work is currently in progress under the technical direction of four sub-committees. Because of the delay in recruiting a study director, a formal request has been made to change the starting date of this program from April 31, 1975 to August 1, 1976.

2. ST. LAWRENCE RIVER WATER QUALITY

Objective: To prepare a comprehensive water quality plan of the St. Lawrence River from the end of the international section near Cornwall, down to the Gulf of St. Lawrence.

Duration of Study: May 1972 to March 1978 (extended)

Entities and Funding: CANADA50%
QUEBEC50%

(The Statement of Intent called for a total expenditure of \$400,000 in 1972-73, while a further \$3,500,000 has been authorized under the formal agreement)

Arrangement: The program was initiated in 1972 on the basis of a Statement of Intent, pending a formal agreement. In subsequent years, it has been authorized under the formal agreement.

Status: The study program undertaken in the Cornwall-Varennnes reach in 1972-73 was extended to cover the Varennnes-Montmagny reach in 1973-74, with some overlapping in the Cornwall-Varennnes reach; in 1974-75, the program was extended to cover the Montmagny-Saguenay River reach, with overlapping in the Cornwall-Montmagny reach; since 1975-76, a major change in study emphasis was brought about - biological data were collected including content of toxic material in fish; fish spawning grounds and bird nesting sites were

identified; and vegetative studies were advanced, including studies of algae and aquatic weeds.

An Interim Report on this study was released in 1976. After completion of the study in March 1978, it is expected that implementation programs and a continuing water quality monitoring program will be needed.

3. NORTHERN ONTARIO WATER RESOURCES STUDIES

Objective: To study the quantity and quality of water resources draining into James Bay and Hudson Bay in Ontario and to assess the possibilities for their future development.

Duration of Study: 1966 to 1977 (extended)

Entities and Funding: CANADA.....(Approx. \$3,000,000)
ONTARIO(funding unknown)

Arrangement: Ontario was given responsibility for hydrologic and water quality studies, while Canada was made responsible for engineering feasibility and cost studies required for an assessment of alternative possibilities for utilizing the waters concerned. Socio-economic studies were shared.

Status: The federal responsibility for field and office studies was met and reported upon in a series of reports. Ontario has indicated that its part of the study will be completed in 1977.

4. LAKE WINNIPEG WATER QUALITY (Proposed)

Objective: A study of the Lake Winnipeg basin for the purpose of identifying beneficial uses of Lake Winnipeg, water quality criteria needed for such uses, and the need for more data on tributary inflows; identifying present and future contaminants and methods of controlling contaminant inflows; and developing a predictive model and determining alternative approaches to managing the water's quality.

Status: A Task Force has been established to negotiate and develop a draft agreement.

5. SOURIS BASIN

Objective: To formulate a framework plan for the management of the water and related resources of the basin.

Duration of Study: 1974-1977

Entities and Funding: CANADA\$415,000
 SASKATCHEWAN\$240,700
 MANITOBA\$174,300

The federal government has committed another \$220,000 for studies on international aspects, raising the total funding to \$1,050,000.

Status: A program of study assignments has been developed to meet the objective of the Souris River Basin Study Agreement and the reporting deadline of December 31, 1977.

The work assignments were grouped into nine study sectors and contractual arrangements have been made for each assignment. The nine sectors are: Public Involvement, Flood Damage Reduction, Water Supply, Water Quality, Agriculture, Water-Related Resources, Economic Studies, Evaluation, and Program Management and Coordination.

All work requirements in the study program have been assigned with the exception of the drafting, layout and printing of the final report. Approximately 75 percent of the work has been completed. Expenditures to March 31 totalled \$805,000.

6. CHURCHILL RIVER (Saskatchewan-Manitoba)

Objective: To determine the possible effects of the proposed Wintego dam on the natural environment of the area and on its inhabitants.

Duration of Study: February 1973 to May 1976

Entities and Funding: CANADA\$1,250,000
 SASKATCHEWAN.....\$1,075,000
 MANITOBA\$ 175,000

Status: The Study Report was released on May 28, 1976. Public hearings by the Province of Saskatchewan are scheduled for 1977.

7. FRASER RIVER UPSTREAM STORAGE STUDY

Objective: To develop an integrated plan for further flood protection, utilization and control of the water resources of the basin, with particular emphasis on flood protection for the lower reaches of the Fraser River Valley, through use of dykes, upstream storage reservoirs and diversions.

Duration of Study: February 1971 to February 1977 (extended)

Entities and Funding: CANADA\$600,000
 BRITISH COLUMBIA.....\$600,000

Included in funds for the LOWER FRASER VALLEY FLOOD CONTROL PROGRAM

Status: Field investigations and studies of hydrology, flood benefits, project costs, sedimentation, navigation, ecological and environmental considerations, and reservoir regulation studies were completed. The final report was released in February, 1977.

OTHER COOPERATIVE ARRANGEMENTS

1. CANADA-ONTARIO GREAT LAKES SHORE DAMAGE SURVEY FOLLOW-UP PROGRAMS

Objective: To implement recommendations arising from the Canada-Ontario Great Lakes Shore Damage Survey.

Duration of Program: 1976-1981

Entities and Funding: CANADA.....50%
ONTARIO.....50%

Programs are carried out by the province and DFE or both on work-shared and cost-shared bases.

Total federal and provincial expenditures in 1976-77 were approximately \$200,000. Half of this cost was met from regular programs while the remainder was funded under a formal agreement: the Canada-Ontario Great Lakes Shore Monitoring Agreement.

Status: During 1976-77 a Canada-Ontario Task Force was formed to implement programs arising from the Great Lakes Shore Damage Survey. The major programs to be implemented are:

- hazard land mapping
- shoreline monitoring
- public awareness

Considerable progress was made in the production of maps delineating flood and erosion hazard areas on the Great Lakes. These 1:20,000 scale maps are intended to provide a preliminary indication of hazardous areas to local municipalities and conservation authorities for their planning purposes. The first year of a five-year shoreline monitoring program was also completed.

2. PRAIRIE PROVINCES MASTER AGREEMENT ON APPORTIONMENT

Objective: The equitable apportionment of interprovincial prairie waters flowing eastward. The agreement and subsidiary agreements ensure one half the natural eastward flow of waters arising in or flowing through Alberta for Saskatchewan, and one half the eastward flow arising in or flowing through Saskatchewan for Manitoba.

Duration : Continuing -- Agreement signed October 30, 1969.

Entities and Funding: CANADA
ALBERTA
MANITOBA
SASKATCHEWAN

(Funding to be borne one half by Canada and one sixth by each of the provinces)

Arrangement: Schedule C provides for the reconstitution of the Prairie Provinces Water Board, whose responsibility is to oversee and report on apportionment of waters flowing from one province into another province; to take under consideration comprehensive planning, water quality management and other management problems referred to it by the entities concerned; to recommend appropriate action to investigate such matters; and to submit recommendations for resolution of the problems.

Status: The Board's standing Committee on Hydrology recommended methods and networks for the determination of natural flow for five major basins in the area. These were approved by the Board and are now in the process of implementation. The companion study on streamflow forecasting for the same five basins is being finalized for consideration by the Board. In addition, the Committee on Hydrology is studying apportionment possibilities concerning westward flowing streams, and mechanisms necessary to administer the agreement. The Board has initiated action through its standing Committee on Water Quality on a thorough review and update of the existing PPWB Water Quality Objectives. The Board has proposed to the four governments that a Water Demand Study of the area be conducted as a necessary companion to a completed water supply study to aid in the planning of the water resources of the prairies. A Board Committee is studying the effect of apportionment on water rights issued on the southern prairies.

3. MACKENZIE BASIN INTERGOVERNMENTAL LIAISON COMMITTEE

Objective: To exchange information on potential water-related developments in the basin and to formulate a program to gather data on the basin's water and related resources, with the intent of determining what further studies are required.

Duration : Continuous since 1973

Entities: CANADA.....Dept. of the the Environment,
Ministry of Transport, and Dept. of Indian
and Northern Affairs representing the
Yukon and NWT
ALBERTA
BRITISH COLUMBIA
SASKATCHEWAN

Prior Action: Following detailed examination of interjurisdictional water resource issues by an Ad Hoc Task Force, the Mackenzie Basin Intergovernmental Liaison Committee agreed to submit a formal agreement to the Ministers of the participating governments, for signing, and to seek endorsement of a study program.

Status: The Mackenzie Basin Intergovernmental Liaison Committee (MBILC) met in Victoria, B.C. on January 18 and 19, mainly to discuss a draft Memorandum of Understanding between the three provincial governments and the three federal departments.

A Ministerial meeting is scheduled for spring 1977 to brief the Ministers (all of whom have been appointed since 1972) on potential developments in the Mackenzie basin which may cause environmental problems and on the formation and work of the present MBILC. At that time, too, the MBILC will seek to have the Ministers sign a Memorandum of Understanding to reaffirm cooperation, and strengthen the role of the MBILC. Moreover, the MBILC will seek to obtain direction from the Ministers as to the level of effort desired over the next few years, and will hold a press conference to reaffirm publicly the cooperative approach to the problems of the basin.

The MBILC is expected to recommend a three-year program costing \$1,300,000.

4. WATER QUANTITY SURVEY AGREEMENTS

Objective: To maintain a viable and efficient national water quantity survey network and to give recognition to joint federal and provincial responsibilities in this activity.

Duration of Agreements: Agreements between Canada and each province were signed in 1975 and implementation was effective April 1, 1975. The programs are continuous but there is a provision in each agreement that provides for termination on 18 months' written notice.

Entities: CANADA
ALL PROVINCES

Arrangement: This is a shared-cost program, with the federal government carrying out the operations and invoicing the provinces quarterly. An exception is Quebec which operates its own program (except for that part involving international and navigable waters, and waters crossing federal land) and which invoices the federal government quarterly. Canada operates and finances the program for the Territories.

<u>Funding:</u>	1976-77	Canada's Share	7,940,000
		Provinces' Share	2,120,000
			<hr/>
		Total Program Cost	\$10,060,000

The Total Program Cost reflects the survey costs to the federal government and to all provinces except Quebec. Incorporated in the Total Program Cost is a federal payment of \$593,000 to Quebec, but not Quebec's own costs.

Status: Coordinating Committees, established for each province, plan the water quantity survey networks and determine annual cost sharing.

5. LOWER SASKATCHEWAN BASIN TASK FORCE (pre-planning)

Objective: To prepare an overview report on the Lower Saskatchewan River basin which would identify water management concerns needing further study.

Duration: September 1974 to 1977 (extended)

Entities: CANADA
SASKATCHEWAN
LOWER SASKATCHEWAN BASIN ASSOCIATION

Status: The target date for completion of this Task Force assignment has been extended to 1977.