

96-1-7-1

**An IJC Report
to the
Governments
of
Canada
and the
United States**

**Water Quality
in the
Saint John River Basin**



INTERNATIONAL JOINT COMMISSION

**Water Quality
in the
Saint John River Basin**

INTERNATIONAL JOINT COMMISSION

CANADA AND UNITED STATES

1977

INTERNATIONAL JOINT COMMISSION
CANADA AND UNITED STATES

COMMISSIONERS

MAXWELL COHEN, *Chairman*

HENRY P. SMITH III, *Chairman*

BERNARD BEAUPRE

CHARLES R. ROSS

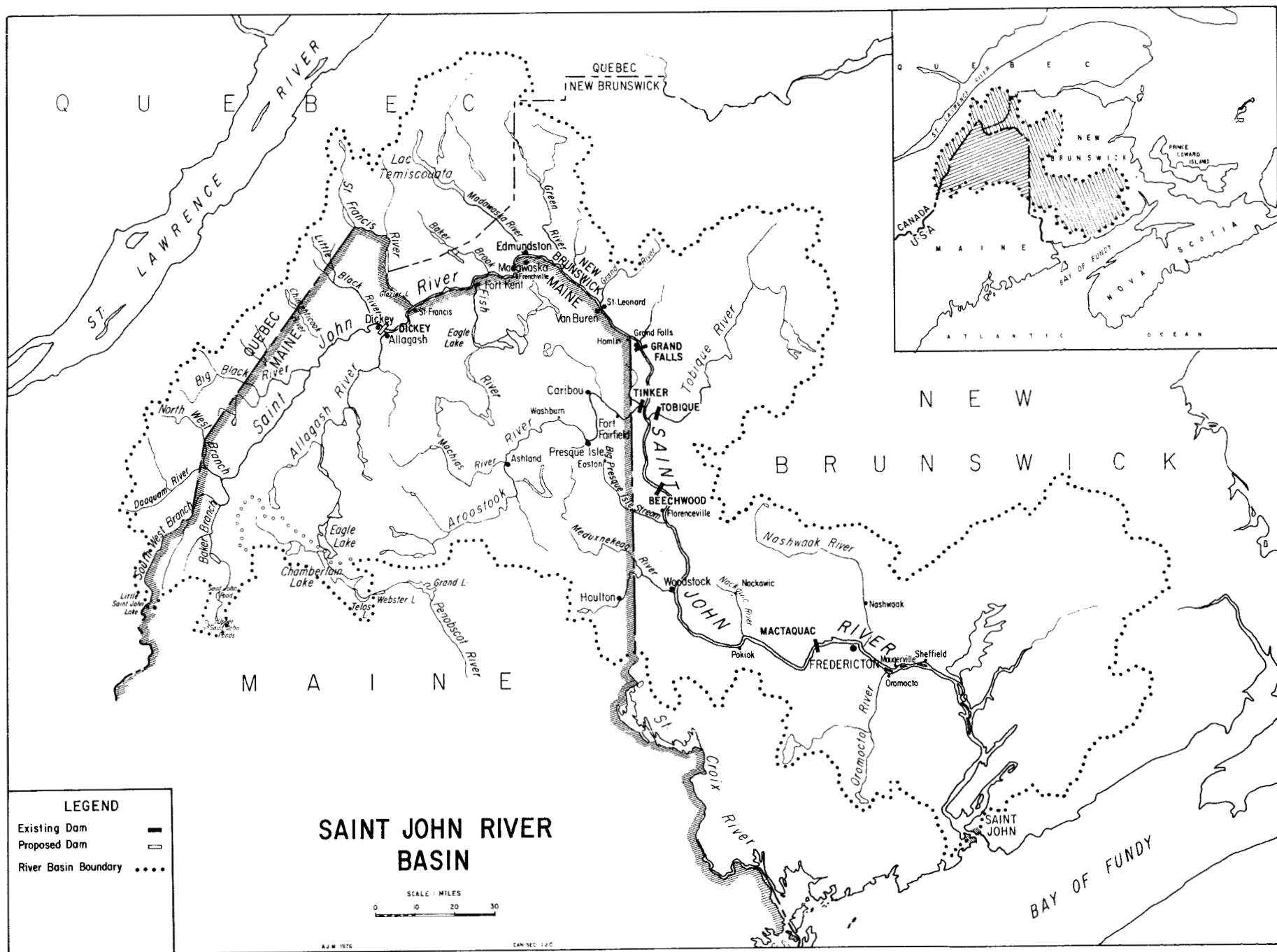
KEITH A. HENRY

VICTOR L. SMITH

SECRETARIES

DAVID G. CHANCE
Ottawa

WILLIAM A. BULLARD
Washington



LEGEND

- Existing Dam ———
- Proposed Dam □
- River Basin Boundary ·····

SAINT JOHN RIVER BASIN

SCALE : MILES
 0 10 20 30

TABLE OF CONTENTS

<u>CHAPTER</u>		<u>Page</u>
I	INTRODUCTION	9
II	THE SAINT JOHN RIVER BASIN	15
	Geographical Description	15
	Population and Economy	18
III	THE COMMITTEE'S INVESTIGATION	23
	The Committee's Work in Specific Problem Areas	23
	Review of Terms of Reference	26
	Planning and Management Activities	26
	Water Quality Objectives	28
	The Committee's Conclusions and Recommendations	29
IV	PUBLIC HEARINGS	31
V	THE COMMISSION'S CONSIDERATIONS AND CONCLUSIONS	37
	Coordinated Planning	37
	Water Quality Objectives	38
	Sampling and Testing Methodology	39
	Institutional Arrangements	39
VI	THE COMMISSION'S RECOMMENDATIONS	43
 <u>Appendices</u>		
A	Text of Reference	47
B	Exchange of Notes Creating the Canada-United States Committee on Water Quality in the Saint John River	51
C	Membership of Canada-United States Committee on Water Quality in the Saint John River	57
D	Persons Presenting Briefs or Testimony at Public Hearings	59

CHAPTER I
INTRODUCTION

The Governments of Canada and the United States have for many years been aware of, and concerned over, the quality of water in the Saint John River system, particularly in its international reaches. As early as 1918 the International Joint Commission advised the Governments that high bacterial counts had been found in the River, attributed in large measure to the potato starch factories located along its course. The report stated that "pollution exists on one side of the Boundary line which is an 'injury' within the meaning of the Boundary Waters Treaty of 1909 to health and property on the other". The report called the pollution "transboundary in its effect and extension".

In recent years both countries, independently of each other, have initiated detailed basin-wide planning studies as the first step in fully developing the resources of the area. On the United States side of the Boundary the Northern Maine Regional Planning Commission has been involved with water resources planning in the Saint John River Basin since October 1967. Its first effort was to develop a preliminary pollution control plan for the Saint John and Aroostook and Prestile River Basins, the latter two being international tributaries of the Saint John. The preliminary plan for the Saint John was published in late 1968 and recommended that a comprehensive plan for long-range water resource development in the Saint John River Basin be under-

taken jointly by the United States and Canada to determine the optimum relationship of various uses.

Recent studies on the Canadian side include the 1969 Atlantic Development Board report on the water resources of the Saint John River which drew attention to the fact that uncontrolled pollution posed a serious threat to the overall usefulness of these resources. In 1970, Canada and New Brunswick signed the Saint John River Basin Agreement and established the Saint John River Basin Board with the mandate to produce a comprehensive plan for the optimum development and utilization of the Basin's water resources.

Both the Northern Maine Regional Planning Commission and the Saint John River Basin Board placed a strong emphasis on public participation. Community participants, municipal officials and landowners played an important role in the studies conducted by the Northern Maine Regional Planning Commission. The Saint John River Basin Board had the direct support of a public participation program with the object of providing direct communication between the Board and its planning office and the people of the Basin.

In the late 1960's, the North Atlantic Treaty Organization (NATO), created the Committee on the Challenges of Modern Society (CCMS) in an effort to expand its activities to meet the threat of economic, social and technological problems faced by its member countries. The Committee on the Challenges of Modern Society undertook a number of

environmental projects including an Inland Water Pollution project which was recommended to the 1969 Plenary Session of CCMS by Canada. The United States, France and Belgium expressed interest in participating in this project. However, it was not until March 1971 that a meeting was arranged to develop the Canadian proposal into a CCMS project. A decision was taken at this meeting that the Inland Water Pollution project should demonstrate ways in which countries can cooperate in reducing water pollution and develop techniques and concepts for water quality management. Canada undertook to act as the pilot country and designated the comprehensive river basin planning and management program for the Saint John River Basin as the focus for the Canadian contribution to the overall project.

In September 1972 officials from Belgium, Canada, France, Germany, the United Kingdom and the United States met at a NATO symposium in Fish River Lake, Maine to consider alternative institutional arrangements for dealing with water pollution between countries. It was at this time that Canada and the United States, in the light of ongoing work in their respective parts of the Saint John River Basin, agreed to work together in a demonstration of international cooperation in resolving pollution problems in international streams. On September 21, 1972, the Governments, through a formal exchange of notes, created the Canada-United States Committee on Water Quality in the Saint John River. The Committee, composed of Federal,

State, Provincial and local government agencies, was requested to review progress in the conduct of water quality planning in the Saint John River Basin in both countries; to exchange information concerning plans, programs and actions which would affect water quality in the Basin; to assist in coordination and consultation among appropriate authorities; and to make appropriate recommendations to relevant authorities on both sides of the Boundary regarding the improvement of water quality in the Basin. Upon completion of the necessary bilateral studies, the Committee was to report to the two Governments and to the International Joint Commission.

Also on September 21, 1972, the Governments of Canada and the United States informed the International Joint Commission of their agreement to enter into a joint study of the water quality of the Saint John River to be carried out by a Canada-United States Committee appointed by the Governments. The Commission was, however, requested, on the basis of the Committee's report and in accordance with Article IX of the Boundary Waters Treaty of 1909, to inquire into and report to the two Governments on two questions. First, what action should the Governments take in light of the Committee's Final Report; and second, what institutional arrangements would be appropriate to assist the Governments in protecting and enhancing the water quality of the Saint John River? The reader is referred to Appendix A for the full text of this Reference.

The formation of the Canada-United States Committee on Water Quality in the Saint John River and the functioning of this Committee did not follow the established procedures for referring Boundary water problems to the Commission. The Committee was established by the two Governments and therefore worked independently of the Commission. This unusual arrangement differed from the historical procedure under which the Governments refer Boundary water problems to the Commission, which then establishes and supervises its own investigative board.

Although the announcement to establish the Committee was made in September 1972, it did not hold its first meeting until April 16, 1973. At this time the Committee reviewed its responsibilities and established a number of sub-committees to carry out these responsibilities. The Commission was kept informed of the Committee's activities primarily through progress reports, but at no time during the study did the Commission become directly involved with the work of the Committee.

Approximately two years after its formation, the Committee completed its work and on September 29, 1975 it transmitted a copy of the final report to the Commission. Because of the time required for preparation of the French translation of the Committee's Report, the

Commission was unable to hold its public hearings until the following June. Hearings were then scheduled for Presque Isle, Maine, on June 22, 1976 and for Edmundston, New Brunswick on June 23, 1976. The Commission has relied heavily on testimony received at these hearings in formulating its own views of the Report and the recommendations offered in this Report.

CHAPTER II

THE SAINT JOHN RIVER BASIN

The Saint John River Basin is one of the largest watersheds in eastern North America. From its source in Little Saint John Lake on the Quebec-Maine border to its mouth at Saint John, New Brunswick, the Saint John River follows a course of some 700 kilometres (435 miles) and drains an area of approximately 55,200 square kilometres (21,310 square miles). This drainage area is divided unequally between New Brunswick, Maine and Quebec. About 28,600 square kilometres lie in New Brunswick, 19,700 km² in Maine and 6900 km² in Quebec. The international character of the Saint John River is further emphasized by the fact that it follows the Maine-Quebec boundary before passing through Maine and then flows along the Maine-New Brunswick boundary before finally flowing through New Brunswick to the sea.

Geographical Description

Flowing northward from its source in Little Saint John Lake, the Southwest Branch of the Saint John River forms the International Boundary between Maine and Quebec for roughly 56 kilometres (35 miles). From there, the River continues northward through Maine for about 161 kilometres (100 miles) to its confluence with the St. Francis River at St. Francis, Maine. The chief tributaries to this reach of the River are the Daaquam River, the Big Black and Little Black Rivers, the Allagash River and the

St. Francis River. Of these tributaries, the Daaquam River and the Big Black and Little Black Rivers, flowing from Quebec into Maine, are transboundary rivers while the St. Francis River, flowing along the Maine-Quebec and Maine-New Brunswick borders is a Boundary river.

From St. Francis, to the town of Hamlin, Maine, a distance of about 120 kilometres (75 miles), the Saint John River forms the International Boundary between Maine and New Brunswick. Major tributaries to this portion of the River are the Madawaska, Green and Grand Rivers in New Brunswick and the Fish River in Maine.

Downstream of Hamlin, the Saint John River ceases to be a Boundary river and flows for the remaining 362 kilometres (225 miles) of its course entirely within New Brunswick. Major tributaries to this reach of the River are the Tobique, Nashwaak, Oromocto, Aroostook, and Meduxnekeag Rivers and Big Presque Isle Stream, called Prestile Stream in Maine. The latter three are transboundary, flowing from Maine into New Brunswick.

Surface runoff fluctuates widely in the Saint John River Basin, being affected by storage in lakes in the upper watershed, reservoir storage on the Tobique and Aroostook tributaries and by storage in the headponds of such hydro-electric developments as Beechwood and Mactaquac. The long-term mean annual flow of the Saint John River in the international reach at Fort Kent, Maine, is 270 cubic metres per second (9500 cubic feet per second) compared with

735m³/s (25,900 cfs) downstream in the vicinity of Pokiok, New Brunswick. Mean annual flows have ranged from a low of 170m³/s (6000 cfs) to a high of 405m³/s (14,300 cfs) at Fort Kent and from 465m³/s (16,500 cfs) to 1150m³/s (40,600 cfs) at Pokiok.

The area within the Saint John River Basin lies within the Appalachian uplands. It consists of numerous folded and faulted formations aligned generally along a northeast-southwest axis. Glacial materials are widespread with the result that soils are not well developed. Deep, mature soils are uncommon while shallow, stony soils predominate except in river valleys where sandy and silty alluvium is found.

The climate of the Saint John River Basin can best be described as humid continental, characterized by long, cold winters, cool summers and no dry season. Temperatures vary appreciably over the Basin with the mean annual temperature decreasing in a northerly direction from 5.6°C. (42°F.) at Saint John to about 2.2°C. (36°F.) in the area north of Edmundston-Madawaska. A significant rainfall gradient also exists within the Basin with the headwater areas averaging some 89 centimetres (35 inches) per year compared with 140 centimetres (55 inches) in the coastal portions near the Bay of Fundy.

Natural vegetation of the Basin is mixed with coniferous and deciduous forests covering 80 percent of the total area.

As a result of the widespread exploitation of the timber resource in the past, almost all of the present-day forest cover consists of secondary or tertiary growth.

Population and Economy

The total population of the Saint John River Basin is approximately 450,000, of which 300,000 are in New Brunswick, 100,000 in Maine and 50,000 in Quebec. Low income levels and relatively high rates of emigration and unemployment are characteristic of the Basin. The Saint John River Basin has been developed into a multi-use resource where lumber, pulp and hydro-electric power are the most important industries. Primary activities of agriculture, forestry, fisheries, and mining employ a high proportion of the labour force.

The watersheds of the United States portion of the Upper Saint John, including the Allagash River system, are sparsely populated with Fort Kent being the only centre with a population of over 1,000. Forest operations here are well organized and extensive, although there is also some agriculture. The controversial Dickey-Lincoln School hydro-electric power development, first proposed in 1952 for the Upper Saint John is under renewed consideration. This would include a power facility near the town of Dickey with a total installed capacity of 760 megawatts and an additional facility eleven miles downstream at Lincoln School with a capacity of 70 megawatts.

North of these basins within the State of Maine is the watershed of the Boundary Saint John, having a total

population of just over 13,000, including Frenchville, Madawaska, St. Francis and Van Buren. Of the industries which are located here, the Fraser Company paper mill at Madawaska, Maine is the most notable for its size and impact on water quality. Agriculture is a more significant land use along the Boundary Saint John than in the upper reaches of the River.

The watersheds of the Aroostook River, Prestile Stream and Meduxnekeag River located in Aroostook County include the major population centres and the most heavily industrialized and intensively farmed areas of the United States portion of the Basin. The total population of these basins including the centres of Caribou, Easton, Presque Isle, Fort Fairfield, Washburn and Houlton is about 70,000. The area's economy is centred almost entirely around the production and processing of a single cash crop - potatoes. The waste discharge from food processing industries which rely on large quantities of water for production, the discharge of municipal wastes from the larger urban centres, and serious soil erosion problems in the potato producing areas are principal concerns in basin-wide water quality management.

The upper part of the Saint John River Basin in Canada, extending downstream as far as Woodstock, New Brunswick, is sparsely populated. The largest urban centre is Edmundston, New Brunswick with a population of 12,300. Smaller communities include Grand Falls and Florenceville. Since more

than four-fifths of the Basin is forested, it is not surprising that forestry and forest-based industries, primarily the Fraser Companies pulp mill at Edmundston, are the major industries in this area. Agriculture, including potato and dairy farming, is of secondary importance and has resulted in the establishment of food processing industries at Grand Falls and Florenceville.

The lower part of the Basin downstream of Woodstock is one of the major economic areas of New Brunswick. Population centres include Fredericton, the capital of New Brunswick and Saint John with populations of 24,250 and 89,400 respectively. Economic activities are more varied, including agriculture in the Maugerville-Sheffield area; mining at Grand Lake; pulp production at Nackawic; and oil refining, shipping and pulp mills at Saint John.

The results of industrial waste disposal practices in Canada have also seriously degraded the water quality in the Saint John River. Heavy waste loads are discharged into the River by pulp mills at Edmundston, Nackawic and Saint John, and by the food processing industry at Florenceville. In addition, unsuitable cultivation practices in the potato-growing areas of Carleton and Victoria Counties have produced serious soil erosion problems and added to the water quality problem. Finally, untreated domestic sewage is discharged into the River all along its length and in its tributaries. At times of low flow, this results in serious oxygen deficiencies in the River, particularly in the headponds of power developments.

Between the upper reaches of the River in New Brunswick and tidehead near Fredericton, approximately three-quarters of the available head is utilized for power generation. Plants at Grand Falls, Beechwood and Mactaquac have a combined capacity of 600 megawatts. Additional, but smaller developments are located on the Tobique and Aroostook tributaries with capacities of 30 megawatts and 36 megawatts, respectively.

Other activities based upon the surface water resource include commercial and recreational fisheries, wildlife, tourism and recreation. These activities are common to a Basin population which is oriented towards outdoor recreational pursuits and have also been affected by industrial and municipal uses. For example, the River's salmon population has been virtually destroyed both by power developments blocking upstream salmon migrations, and pollution caused by other industrial developments in the Basin. All of these uses would benefit substantially from improved water resource management.

For additional information on the Saint John River Basin, the reader is referred to the "Saint John River Basin Water Quality Management Plan", prepared by the Northern Maine Regional Planning Commission, and "A Plan for Water Management in the Saint John River Basin", prepared by the Canada-New Brunswick Saint John River Basin Board.

CHAPTER III

THE COMMITTEE'S INVESTIGATION

The final Report of the Canada-United States Committee on Water Quality in the Saint John River begins with a summary of the Committee's work in specific problem areas and a review of its Terms of Reference. This is followed by a discussion of ongoing planning and management activities in the Basin and the proposal of specific water quality objectives. Conclusions and recommendations, based on the Committee's investigations, are also presented.

The Committee's Work in Specific Problem Areas

An initial task of the Committee was to examine the question of polluting discharges which affect those portions of the Basin under the Committee's mandate. The primary sources of these discharges are the forest products industry, the potato or food processing industry and municipalities.

Several sub-committees were established to report on specific problem areas, including the Fraser Companies Pulp and Paper Mills at Edmundston-Madawaska; solid waste associated with the potato industry; municipal and industrial pollution sources in the Aroostook-Prestile sub-basin; channel improvements and related activities on the Gobeil River, Quebec; municipal discharges; and the Papier Cascade (Cabano) Ltée. pulp and linerboard mill at Cabano, Quebec.

The discharge of inadequately-treated wastes at the Fraser Companies mills has, for some time, been identified as one of the most serious causes of pollution in the Saint John River. Extensive negotiations conducted with Fraser Companies by the two Federal Governments, the State of Maine and the Province of New Brunswick have secured agreement-in-principle on specifications and schedules for the implementation of pollution control measures. The Committee's Report notes that Fraser Companies have committed themselves to the most practical solution, which is to convert the Edmundston pulp mill from the present sulphite process to a chemical pulping system with waste recovery.

The present discharge of potato wastes to the Saint John River and its tributaries has a direct relationship to water quality degradation. Possible alternatives to this practice are "on site" disposal and the processing of unuseable potatoes into animal feed. However, neither has been fully demonstrated to be practical.

While recommendations by the United States Environmental Protection Agency and the Maine Department of Environmental Protection to upgrade Prestile Stream have not received the approval of the Maine legislature, as required by State law, assurances have been given by the State that the issuance of future discharge permits will be contingent on programs to maintain adequate water quality.

The Committee was also able to report that satisfactory progress is being made in municipal discharge

abatement efforts on both sides of the Boundary, and that the problem of suspended solids, entering the Big Black River from channel improvement work on the Gobeil River in 1970, has improved to the point where further action is unnecessary. Because of the potential impact of the Papier Cascade pulp and linerboard mill at Cabano on Saint John River water quality, a sub-committee was asked to monitor developments and advise the Committee regarding waste treatment plans. The mill, which began operations in late 1976, only recently implemented its \$8.2 million pollution control system. This facility provides treatment both for industrial wastes from the mill and for municipal wastes from the Town of Cabano. Because the system has only been in operation for a short time, its efficiency remains to be assessed. Tests to determine this efficiency will be made within the next few months.

Two studies being conducted by the United States Corps of Engineers, one a water resources investigation of the Saint John River, and the other a preliminary planning and environmental study for the proposed Dickey-Lincoln School project, were monitored by the Committee. At a meeting in June 1975, the Corps of Engineers and Committee members discussed these proposals and their implications on water quality.

Review of Terms of Reference

Having concentrated its attention during the first two years on specific pollution problems, the Committee decided that a review of its Terms of Reference was necessary.

To express its concern with all activities that affect or may affect water quality in the entire Saint John River Basin, the Committee agreed on this broad definition of the geographic area of its responsibility. Special attention should, however, be given to the international sections of the Saint John and St. Francis Rivers, tributaries discharging to and upstream of the international sections and to all other transboundary tributaries.

The Committee further decided that the two Basin planning exercises, referred to below, should be reviewed upon completion, for their impact on the defined geographic area. The review should also include the Committee's own course of action regarding measures needed to improve water quality and the exchange of information necessary to ensure the improvement or maintenance of present water quality.

Planning and Management Activities

During the Committee's study, two major planning studies were being carried out in Maine and New Brunswick. The Canada-New Brunswick Saint John River Basin Board reported on the New Brunswick studies in April 1975. The

Northern Maine Regional Planning Commission conducted a number of planning studies and released its report on the Saint John River Basin Water Quality Management Plan in March 1976. These studies covered the broad area of water quality, uses, goals, objectives and standards, necessary abatement measures and institutional and administrative approaches to pollution problems. A comparison of the two studies revealed that there were differences in sampling frequency, parameters measured, analytical procedures and data storage and retrieval systems. The Committee concluded that both sides could benefit from compatible data systems to allow for the exchange of such information as hydrometeorological data, flow and flood forecasting and water quality data.

The Committee found, however, that the long range water quality objectives of Maine and New Brunswick are compatible and that the goal of "fishable-swimmable" water has been mutually agreed upon. It was thus able to carry out a study of water quality criteria and objectives for the Saint John River.

Several useful mathematical models, to predict flows and water quality, have been used in both Maine and New Brunswick. Because this predictive capability is essential to keep water quality within agreed objectives, both sides could benefit from a joint or cooperative approach to modelling water quality and quantity.

In its review of the Canada-New Brunswick Saint John Basin Board Report the Committee identified several projects that could be undertaken cooperatively by the two countries. These include a study of the disposal of potato culls and solid wastes, the development of guidelines for reducing non-point source pollution and the restoration of Atlantic Salmon to the Aroostook River.

Water Quality Objectives

In January 1974, a sub-committee was established to develop specific water quality objectives for preserving, improving and maintaining water quality in the international waters of the Saint John River for all beneficial uses. It defined a water quality objective as a limit based on scientific data evaluated to derive the quality of water associated with specific uses. The beneficial uses, identified by the sub-committee were public water supply, aesthetics and recreation, aquatic life and wildlife, agriculture and industry.

In developing specific water quality objectives for the above beneficial uses, the sub-committee drew extensively on scientific literature and upon the advice of scientists specialized in various user aspects for specific water quality concerns. A thorough investigation of present methodologies for measuring each water quality objective parameter was also carried out.

The sub-committee recognized that the application of water quality objectives and the water quality programs

required to meet such objectives must be based on technical, social and economic assessments of water use in all designated international water areas of the Saint John River Basin. The task of translating these water quality objectives into pollution control measures can be undertaken once an overall assessment is made and a water use pattern established.

The reader is referred to the Report of the Canada-United States Committee on Water Quality in the Saint John River for a detailed discussion of the proposed water quality objectives.

The Committee's Conclusions and Recommendations

Based on the conclusions of the sub-committee report on water quality, the Canada-United States Committee recommended that specific water quality objectives be agreed upon and accepted by both countries for use as tools to develop pollution control programs; that water resource managers use the most stringent parameter objectives relating to the desired use, while recognizing the "natural background quality" of the River so as not to become too restrictive; that where water quality is better than specified objectives, it should be maintained at that high level rather than be allowed to degrade to "acceptable objectives"; that mixing zones be designated; that compatible methods of data sampling and analysis be adopted; and that the Water Quality Sub-Committee be made a standing committee to revise objectives as required.

The Committee further concluded that the two countries should enter into negotiations leading to a Water Quality Agreement for the international section of the Saint John River and its international and transboundary tributaries. It recommended that the agreement should include a consideration of the obligations of the Boundary Waters Treaty of 1909. Provision should also be made for timetables for the achievement of agreed water quality objectives and for abatement and surveillance programs to meet and maintain agreed water quality objectives, consistent with the provisions of the Boundary Waters Treaty and within domestic legislation and priorities. Finally, the agreement should provide for the release of reports to the public and also for close cooperation by the parties on water quality programs not specifically related to the abatement of point source pollution, including the enhancement of the fisheries resource and development of innovative programs for the control of both point and non-point sources of pollution.

The Committee also recommended that the International Joint Commission should be given the authority to establish a permanent water quality board to carry out such tasks as coordination of future research and monitoring activities, advice to Governments on the adequacy of abatement programs vis-à-vis agreed objectives as well as the adequacy of these objectives themselves.

CHAPTER IV
PUBLIC HEARINGS

The Canada-United States Committee on Water Quality in the Saint John River completed its work and forwarded a final report to the Commission on September 29, 1975. Because of the additional time required for the preparation of the French version, the Commission was forced to delay the official release of the Committee's Report until May 18, 1976, some eight months later. The release was accompanied by a statement to the press indicating highlights of the Report and announcing the Commission's intention to hold public hearings based on the Committee's Report. The first hearing was held in Presque Isle, Maine on the evening of June 22, 1976, followed by two hearings in Edmundston, New Brunswick on the afternoon and evening of June 23, 1976.

The public hearings conducted by the Commission were an integral part of its procedure in that they provided opportunity for all those concerned to express their views and comment on the Canada-United States Committee Report on Water Quality in the Saint John River, and to provide the Commission with relevant information.

In accordance with the Commission's Rules of Procedure, notice of the public hearings was published in the Canada Gazette, the United States Federal Register and local newspapers in both countries. In addition, notices were sent to individuals known to be concerned, associations,

elected representatives in the region, the mass media and governmental agencies.

At the public hearings, all those interested were given the opportunity to express their views orally and to present documentary evidence. In addition statements and letters were filed on behalf of individuals and organizations either at the public hearings or by mail.

Although attendance at the hearings was somewhat less than expected, statements were received from a fairly wide range of individuals including officials of governmental agencies, industrial representatives, local organizations and private individuals. Almost without exception the statements given by these various groups and individuals were in support of the recommended objectives and methodologies contained in the Canada-United States Committee Report on Water Quality in the Saint John River. Some witnesses said that the hearings had been scheduled too soon after official release of the Report and there was consequently insufficient time to prepare briefs.

Verbatim transcripts of the hearings and written submissions made at the hearings are on file and available for examination at the offices of the Commission in Ottawa and Washington, D.C. The essence of the testimony is summarized and paraphrased below.

Testimony presented at the hearings revealed a widespread concern about the impact of deteriorating water quality in the Saint John River and its tributaries on established beneficial uses of the water. The desire to maintain or improve water quality was apparent in the statements of many witnesses. Most witnesses commended the Canada-United States Committee for its excellent report and agreed that the adoption of the Committee's recommendations would be very beneficial to the social and economic development of the Saint John River Basin.

Several witnesses testified that the average citizen is interested in what happens to the Saint John River, and that successful implementation of the Committee's recommendations would require wider public involvement. They hoped that some mechanism would be instituted whereby all municipal, agricultural and industrial users would be able to come together to talk about common problems, and that these users would be represented on any permanent board or committee that might be established.

Although there was general acceptance of the Committee's Report by industry, concern was expressed over the economic impact of these recommendations on industry. One representative emphasized that the goals should be realistic and consonant with other geographic areas so that the region's economic development would not be burdened unfairly by self-imposed regulations. Another witness observed that the implementation of strict water quality regulations would create an imbalance in the economies of the area and noted that the area faced not only stricter and more costly pollution control regulations than other parts of the country, but also higher energy costs. Another witness said that because plants on international waters will have effluent limited to the stricter of two available sets of effluent limitations, they will be at a competitive disadvantage when compared to domestic competition. There

was also some criticism that the Committee's Report was not sufficiently specific. One witness stated that industry could not make specific comments since the effects of implementing the recommendations of the report are unknown. However, not all witnesses appearing on behalf of industry agreed that strict effluent regulations would inhibit industrial growth. A spokesman for R.T. French Company, stated that his company had recently constructed a food processing plant at Washburn, Maine in spite of the strict regulations.

A number of witnesses indicated that pollution from non-point sources, largely erosion, is a serious problem in the Basin. One witness suggested that the Commission should be very much concerned with non-point sources in the Saint John River Basin, where, because of the potato economy, erosion is one of the big polluters. According to one estimate there is an average annual loss of ten tons of soil per acre of potato land. It was further noted that because of the problem of erosion, there is a need for improved conservation practices to minimize pollution of surface water runoff and to improve declining yields on croplands. Approximately 75 percent of the 200,000 acres in Maine's portion of the Saint John River Basin have serious conservation problems. Some witnesses testified that in most cases the farmer cannot afford to do the job that needs to be done to control sedimentation and erosion and that assistance is required. The only way to achieve this conservation is through a government incentive program to support the farmer's own initiative. A number of speakers noted that many municipalities and industries are also financially unable to meet the demands of pollution control measures and require federal, state or provincial assistance.

The need for environmental assessment studies to determine the impact of such future developments as hydroelectric dams was emphasized by several witnesses. One recommendation submitted to the Commission stated that, unless

all fresh waters that are now under the influence of industrial and commercial interference, including hydro-electric reservoirs, have had a successful management program and these programs have demonstrated beyond doubt their degree of success in restoring harmful ecological effects, no more industrial and commercial interference should be considered, including the building of hydro-electric reservoirs. Additional testimony emphasized the importance of information on "natural background quality" in preconstruction planning and the need for an environmental impact assessment of such proposed projects as the Dickey-Lincoln School hydro-electric project. Because there are little or no data on the present water quality on the mainstream and tributaries above Dickey, the U.S. Army Corps of Engineers has undertaken a program of field sampling and analysis to make this data available.

Several governmental agencies offered their services in future work on the Saint John. One spokesman suggested the Maine Agricultural Stabilization Committee might be an institutional tool to ensure the maintenance of high water quality standards, through the encouragement of cultural and structural practices. Another official stated that very little long-term scientific data exist for Northern Maine to give exact water quality in terms of chemical and biological sediment characteristics, and that the Water Resources Division of the United States Geological Survey stands ready to assist in doing the necessary scientific work in the Saint John River.

Testimony given by federal, provincial and state officials indicated satisfaction with pollution control measures now being taken by Fraser Companies at Edmundston and Madawaska. Witnesses from Environment Canada and the New Brunswick Department of Environment confirmed that Fraser Companies would be able to meet the water quality requirements contained in the Committee's Report. An

official from the United States Environmental Protection Agency noted that, although EPA was satisfied with present progress by Fraser Companies in Madawaska, more stringent limitations would be required in the future and that the United States Water Pollution Control Act of 1972 would require implementation of best available control technology by 1983.

CHAPTER V

THE COMMISSION'S CONSIDERATIONS AND CONCLUSIONS

The Saint John River Basin has, over the years, been developed into a multi-use resource area providing water for domestic use, forestry, pulp and paper, agriculture and related food processing, hydro-electric power, and recreation. The Commission, after examining the Canada-United States Committee's Report, and analyzing testimony received at the public hearings, recognized that a number of significant water quality problems caused by or affecting these developments exist in the middle and lower reaches of the Saint John River Basin. This chapter presents the Commission's considerations and conclusions based on the Committee's Report and the testimony at public hearings concerning questions raised in the Reference from the Governments.

Coordinated Planning

Prior to the 1970's resource developments in the Saint John River Basin appear to have occurred independently, with limited coordinated planning, and without adequate regard to interests on the other side of the International Boundary. Since 1972, when the Canada-United States Committee was established, Governments at various levels have cooperated in a successful water quality planning effort. The Committee utilized the resources of the Northern Maine Regional Planning Commission and the Canada-New Brunswick Saint John River

Basin Board to assist in this planning effort.

It should be noted that many of the developments in the Basin occurred at the expense of the salmon fishery. Although the restoration of this natural resource has been identified by both countries as one of their major goals, the Commission believes that, based on information presently available, it is unable to comment on whether or not this goal is feasible in the light of present and possible future uses.

The Commission concludes that both countries should initiate and participate in coordinated joint programs as a continuation of the planning processes that have been underway on both sides for a number of years so as to ensure that future development of the resources of the Basin will protect or enhance the water quality of the Saint John River Basin. Any future project, such as the proposed Dickey-Lincoln School development, should not proceed until a complete environmental impact assessment of the possible effects of the project on the entire Basin has been made.

Water Quality Objectives

The Commission concurs in the Committee's recommendation that, as a first step in the initiation of a joint coordinated planning effort, specific water quality objectives, designed to preserve, improve and maintain the water quality of the Saint John River Basin be adopted as guidelines for existing beneficial uses and for the development of near-future beneficial uses.

The Commission therefore concludes that the adoption by the two Governments of the specific water quality objectives recommended by the Saint John Committee in its Report of September 1975 is urgent and essential to support present efforts being undertaken in both countries to control water pollution in the Saint John River Basin.

Sampling and Testing Methodology

The Commission endorses the methodology recommended by the Committee to ensure a standard measure for identifying quality conditions and to confirm the progress being made in both countries to achieve the objectives. The incompatibility of sampling and testing methods used by the various concerned jurisdictions in other Boundary water areas is recognized by the Commission as restricting its ability to report to Governments accurately on current water quality conditions and progress achieved by remedial actions.

The Commission concludes that the Saint John Committee's recommended sampling and testing methodology would be a significant step forward in providing a better mechanism for assessing progress in the control of pollution in Boundary waters.

Institutional Arrangements

The Commission is of the opinion that the implementation of coordinated joint programs in the Saint John River Basin can best be accomplished through a formal Saint John River Basin Water Quality Agreement, and therefore

endorses the Committee's specific recommendation that the Governments begin discussions to enter into a formal Agreement for the Saint John River Basin, similar to the one currently in effect on the Great Lakes. In the case of the Great Lakes Water Quality Agreement of 1972, a data base was available that identified existing water quality conditions, water quality problems and their causes, and programs necessary to remedy them. Although much of the information necessary as a basis for a Saint John River Basin Agreement is available, the Commission is aware that some work remains to be done. Several desirable additional studies have been identified including the resolution of the cull potato problem; continued monitoring of municipal and industrial waste treatment programs, to determine their progress and adequacy; discussion of the future possibility of restoring Atlantic Salmon to the Saint John River; and most importantly, the identification of the water uses for which each segment of the Saint John River is best suited.

The Commission therefore concludes that the Governments of Canada and the United States should enter into negotiations leading to a Water Quality Agreement for the Saint John River Basin and adopt the Committee's specific water quality objectives as a minimum. The Commission also concludes that, in the interim, it is desirable to continue the present efforts of the Canada-United States Committee on Water Quality in the Saint John River. This can best be achieved under Article IX of the Boundary Waters Treaty,

which provides for the referral of such questions to the International Joint Commission for study and recommendation, and would permit the establishment of the present Committee henceforth as a formal International Joint Commission institution with such changes as the Commission deems advisable.

CHAPTER VI
THE COMMISSION'S RECOMMENDATION

On the basis of the considerations and conclusions set forth in Chapter V, the Commission recommends to the two Governments:


1. That the Governments of Canada and the United States begin negotiations leading to a Water Quality Agreement for the Saint John River Basin.
2. That the Governments should adopt the Committee's recommended specific water quality objectives as a minimum.
3. That future developments in the Saint John River Basin, such as the proposed Dickey-Lincoln School hydro-electric development not go ahead until a complete environmental impact assessment has been made to determine the effect of such developments on the entire Basin.
4. That the two Governments adopt the sampling and testing methodology as recommended by the Canada-United States Committee.
5. That, while negotiations towards the development of a detailed agreement are underway, the Governments give a new Reference to the International Joint Commission to

- (a) provide for a continuation of present efforts to identify the water uses for which each segment of the Saint John River is best suited;
- (b) investigate the possibility of restoring Atlantic Salmon to the Saint John River Basin;
- (c) continue monitoring municipal and industrial waste treatment programs;
- (d) review steps to be taken by agriculture to improve or maintain water quality, with particular reference to the problems of soil erosion and potato waste disposal; and
- (e) to examine such other matters that the Governments may request the International Joint Commission to investigate.

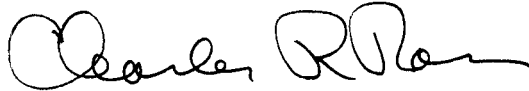
Signed this 17th day of February 1977 as the International Joint Commission's comments, with recommendations, to the Governments of Canada and the United States on the report of the Canada-United States Committee on Water Quality in the Saint John River, in accordance with the Reference of September 21, 1972.



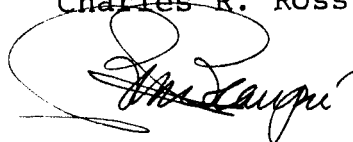
Maxwell Cohen



Henry P. Smith III



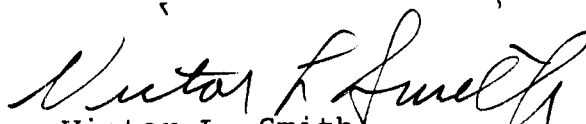
Charles R. Ross



Bernard Beaupré



Keith A. Henry



Victor L. Smith

APPENDIX A

TEXT OF REFERENCE

TEXT OF REFERENCE TO THE INTERNATIONAL JOINT COMMISSION

On September 21, 1972, the Secretary of State for External Affairs for the Government of Canada, and the Secretary of State for the Government of the United States sent the following Reference to the International Joint Commission, through identical letters addressed respectively to the Canadian and United States Sections of the Commission:

The Governments of Canada and the United States in the light of their rights and obligations under Article IV of the Boundary Waters Treaty of 1909 with respect to the avoidance of transboundary pollution, and in light of their commitment under Article 2 of the North Atlantic Treaty to contribute toward the development of peaceful and friendly international relations by strengthening their free institutions, by bringing about a better understanding of the principles upon which these institutions are founded, and by promoting conditions of stability and wellbeing, are concerned about the quality of water in the St. John River system, especially in the international section of the St. John River and its upstream tributaries and in the downstream tributaries which cross the international boundary. The Government of Canada has undertaken to act as pilot country for a project relating to inland water pollution conducted within the framework of the NATO Committee on Challenges of Modern Society. A part of this project concerns the Basin of the St. John River. The Governments of Belgium, France and the United States have associated themselves with this project and are working closely with the Government of Canada.

In conjunction with this project the Governments of Canada and the United States have agreed to the establishment of a Canada-United States Committee composed of representatives of Federal, State, Provincial and local Governmental agencies to undertake a review of progress in the conduct of water quality planning in the St. John River Basin in both countries, to exchange information concerning plans, programs and actions which could affect water quality in the Basin, to assist in coordination and consultations

among appropriate authorities, and to make appropriate recommendations to relevant authorities on both sides of the boundary regarding the improvement of water quality in the Basin. A copy of an Exchange of Notes effected in Ottawa today creating this Committee is attached to this Reference. It is therein specified that the Committee will provide the Commission with a final report of its activities, together with copies of the proceedings of its meetings and with annual interim reports as necessary.

On the basis of these reports and of such further investigation as the Commission deems appropriate, the Commission is requested, in accordance with Article IX of the Boundary Waters Treaty of 1909, to inquire into and report to the two Governments on the following questions:

1. What action should be taken by the Governments in regard to those matters examined by the Canada-United States Committee in the light of its final report?
2. What joint institutional arrangements to assist the two countries in continuing their cooperative efforts to protect and enhance the quality of the water in the St. John River system and to avoid transboundary pollution would be appropriate?

Until such time as the Commission, following receipt of the final report of the Committee, is able to make a final report and recommendations in response to this Reference, the Commission is requested to submit to the two Governments from time to time such interim reports as the Commission may consider desirable.

In the conduct of its investigation and otherwise in the performance of its duties under this Reference, the Commission may utilize the services of engineers and other specially qualified persons of the technical agencies of Canada and the United States and will so far as possible make use of information and technical data heretofore acquired or which may become available during the course of the investigation.

APPENDIX B

EXCHANGE OF NOTES

CREATING THE CANADA-UNITED STATES COMMITTEE ON
WATER QUALITY IN THE SAINT JOHN RIVER

EXCHANGE OF NOTES
CREATING THE CANADA-UNITED STATES COMMITTEE ON
WATER QUALITY IN THE SAINT JOHN RIVER

On September 21, 1972 the Secretary of State for External Affairs for Canada sent the following note to the United States Ambassador in Ottawa:

I have the honour to refer to the discussions which have taken place between representatives of our Governments regarding the preservation of the quality of water in the international section of the St. John River and to propose that our Governments establish a Canada-United States Committee on water quality in the St. John River and its tributary rivers and streams which cross the Canada-United States boundary. The composition, purposes and objectives of the Committee, which shall conduct its work in a manner which is consistent with the provisions and objectives of the Boundary Waters Treaty of 1909, are set out in the Annex to this Note.

If the foregoing proposal is acceptable to the Government of the United States of America, I have the honour to propose that this Note, together with its Annex, which are equally authentic in English and French, and Your Excellency's reply to that effect, shall constitute an agreement between our Governments which shall enter into force on the date of your reply.

Accept, Excellency, the renewed assurances of my highest consideration.

ANNEX

Whereas the Governments of Canada and the United States in the light of their rights and obligations under Article IV of the Boundary Waters Treaty of 1909 with respect to the avoidance of transboundary pollution, are concerned about the quality of water in the international section of the St. John River and in its tributary rivers and streams which cross the Canada-United States boundary;

Whereas water quality planning has been under way in the St. John River Basin in both countries for more than a year, and proper co-ordination of this planning is urgently required to assure achievement of a unified approach to the problem;

It is hereby agreed that a Canada-United States Committee on Water Quality in the St. John River and its Tributaries crossing the International Boundary (hereinafter referred to as the "Committee") be established to assist the appropriate authorities in Canada and the United States to co-operate in such water quality planning as may be necessary to devise programs which will enhance the quality of water in the St. John River. The Committee will conduct its work in a manner which is consistent with the objectives and provisions of the Boundary Waters Treaty of 1909.

I The purpose of the Committee shall be:

- (A) To review periodically progress in the conduct of such water quality planning on both sides of the Canada-United States boundary in the St. John River Basin, with a view to facilitating progress toward enhancement of water quality;
- (B) To exchange appropriate information about plans, programs and actions which could affect water quality in the Basin;
- (C) To assist in co-ordination and consultation among appropriate authorities on matters and actions affecting water quality;
- (D) To make appropriate recommendations to relevant authorities on both sides of the boundary and to the International Joint Commission (hereinafter referred to as the "Commission") regarding the improvement of water quality in the Basin.

In the conduct of its work the Committee should consider in particular the following aspects of water quality:

- (A) The condition of water quality; and the nature, extent and sources of pollution;
- (B) The need for and means of defining and achieving agreed international water quality objectives;
- (C) The identification of programs and other measures needed to obtain a significant reduction in level of pollution with timetables for accomplishment, including measures related to water quality and rate of flow, taking account of social and economic impacts.

It is understood that discussions within the Committee will serve to enhance and not to replace existing formal and informal discussions or other contacts among federal, state, provincial and local authorities.

II The Committee shall consist of an equal number of members from each country and will include appropriate officials from the Governments of Canada and the United States; the Governments of New Brunswick, Quebec and Maine, and also representatives of the St. John River Planning Board, and the Northern Maine Regional Planning Commission. The members will represent the respective authorities (who will pay such expenses as may be incurred in this respect) and provide the special skills, experience and information required to carry out the above terms of reference. The Committee should have the smallest number of members effectively to perform its functions. Advisors or observers to the Committee may be paid by Governments or serve without salary or expense allowance. The United States and Canadian sections of the Committee shall each designate a Chairman of its section. The Chairmen of the two sections shall be Joint Chairmen of the Committee and shall be responsible for providing proper liaison between the Committee and their respective authorities. The Chairmen will keep their respective section members informed of plans, activities and progress. Each Chairman after consulting the members of his own section of the Committee may appoint a Secretary of that section.

III Upon the completion of its efforts with regard to the co-ordination of water quality planning in the St. John River Basin, the Committee shall provide a report on its progress and activities for the Commission. If the Committee has not completed its work within one year of the date of this Exchange of Notes, it shall in that event provide an interim progress report for the Commission by

September 30, 1973, and to the extent necessary annually thereafter. The Committee shall also provide the Commission with copies of the proceedings of its regular meetings.

The Committee shall also provide a report on its progress and activities for the Governments of Canada and the United States as pilot and co-pilot of the Inland Water Pollution Project of the North Atlantic Treaty Organization's Committee on the Challenges of Modern Society, prior to September 30, 1973, and to the extent necessary, annually thereafter.

On September 21, 1972 the Ambassador of the United States of America in Ottawa sent the following note to the Secretary of State for External Affairs for Canada:

I have the honor to refer to your Note No. GWU-310, of September 21, 1972, with attached Annex, proposing the establishment of a Canada-United States Committee on water quality in the St. John River and its tributary rivers and streams which cross the Canada-United States boundary. The proposal meets with the approval of my Government, and I have the honor to confirm that your Note, together with its Annex, and this reply, shall constitute an agreement between our Governments which shall enter into force on the date of this reply.

Accept, Sir, the renewed assurances of my highest consideration.

APPENDIX C

MEMBERSHIP OF THE CANADA-UNITED STATES COMMITTEE
ON WATER QUALITY IN THE SAINT JOHN RIVER

MEMBERSHIP
THE CANADA-UNITED STATES COMMITTEE
ON
WATER QUALITY IN THE SAINT JOHN RIVER

The Canada-United States Committee on Water Quality in the Saint John River was established on September 21, 1972 by the Governments of Canada and the United States. When the Committee submitted its report, dated September 1975, to the International Joint Commission, the membership consisted of the following:

Canada

R.H. Millest, Environment Canada, *Co-chairman*
B.B. Barnes, New Brunswick Department of Environment
L. Chenard, New Brunswick Department of Fisheries
J.M. Henderson, Saint John River Basin Board

United States

J.A.S. McGlennon, United States Environment Protection Agency, *Co-chairman*
W. Adams, Jr., Maine Department of Environmental Protection
J.A. Barresi, Northern Maine Regional Planning Commission
J. Meek, United States Environmental Protection Agency

APPENDIX D

PERSONS PRESENTING BRIEFS OR TESTIMONY
AT PUBLIC HEARINGS

PERSONS PRESENTING BRIEFS OR TESTIMONY

AT

IJC PUBLIC HEARINGS HELD AT PRESQUE ISLE, MAINE

ON JUNE 22, 1976 AND AT EDMUNDSTON, NEW BRUNSWICK ON JUNE 23, 1976

Presque Isle, Maine, June 22, 1976 at 8:00 p.m.

Arthur J. Maraz, Fort Fairfield, Maine
Robert G. Soucy, Northern Maine Regional Planning Commission,
Fort Kent, Maine
Philip F. Petersen, Northern Maine Regional Planning Commission,
Caribou, Maine
Hudson Berce, Aroostook County Agriculture Stabilization and
Conservation Committee, Presque Isle, Maine
John Tiernan, Northern Maine Regional Planning Commission,
Presque Isle, Maine
Ezra Briggs, Natural Resources Council, Caribou, Maine
Moe L. Kimmel, Potato Service Incorporated, Presque Isle, Maine
James E. Michaud, Hydroresources Associates Inc., Grand Isle,
Maine
Lynn Sirrene, R.T. French & Co., Washburn, Maine
Thomas C. Sweetser, Cooperative Extension Service, Resource
Conservation and Development, Presque Isle, Maine
George C. Sawyer, Dunn Timberlands, Ashland, Maine
C. Russel Wagner, United States Geologic Survey, Water Resources
Division, Augusta, Maine
Richard Di Buono, U.S. Corps of Engineers, Waltham, Mass.
James A. Barresi, Northern Maine Regional Planning Commission,
Caribou, Maine
S. Von Dey, Soil Conservation Service, Saint John Arrostook
Resource Conservation and Development, Presque Isle, Maine

Edmundston, New Brunswick, June 23, 1976 at 2:00 p.m.

George D. Bouchard, Northwest Regional Development Commission,
Edmundston, New Brunswick
Larry Fyfe, Fraser Companies Ltd., Edmundston, New Brunswick

Edmundston, New Brunswick, June 23, 1976 at 8:00 p.m.

Paul L. Daigle, Association de Chasse et Pêche du Madawaska,
Edmundston, New Brunswick