



MILESTONES IN WATER POLLUTION ABATEMENT IN CANADA

W. S. TAIT

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by W. S. Tait

1. Introduction

When European explorers visited Canada some four and a half centuries ago, history records their awe at the vastness of this new country with its seemingly limitless expanses of fresh water. If they could return today to see what succeeding generations have done to the almost untouched land that challenged their skills, perhaps they would observe the wonders of our present civilization with the same awe, tempered somewhat by despair at the impairment to many of the large bodies of water they once knew in their near virgin state. One can only speculate whether pollution would, in fact, be a matter of concern to these adventurers of yesterday, or whether they would consider it an unavoidable result of man's ceaseless endeavour to master his environment.

Despite the vastness of her fresh water resources, Canadians have managed to despoil many of their streams and lakes through uncontrolled discharges of industrial and domestic wastes. The philosophy that waste was an inevitable product of progress and the life of man was a deterrent to public support of pollution abatement programs in Canada until visual evidence of the degradation of our water resources brought home to all Canadians the consequences of allowing such wastes to be discharged unchecked into our rivers and streams.. As a result, anti-pollution legislation, organizational structures, and financial assistance to provide the pollution control systems necessary have had their greatest growth in Canada only in the past decade. This paper attempts to trace in broad fashion the development of our Canadian system at the various levels of government - Federal, Provincial and Municipal. In general, research organizations in this field and the financial assistance available to them are not included in this presentation.

2. Organizations and Legislation

2.1 International Joint Commission

As its name implies, the Commission is not a purely Canadian institution but was established by the Boundary Waters Treaty with the United States in 1909. One of the major contributions resulting from the work of the Commission was the stimulus it provided to the development of pollution control organizations in Canada.

A major purpose of the Treaty was to prevent disputes regarding the use of boundary waters between the two countries and to make provision for the resolution of all questions arising in future between Canada and the United States along their common frontier, which involve the rights, obligations or interests of either in relation to the other or to the inhabitants of the other. The Treaty also defined the scope of the International Joint Commission, which was to be composed of three members from Canada and three members from the United States. Specific reference was made to the pollution of waters in the following fashion "Boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health and property on the other".

It is not the purpose of this paper to delve into all the ramifications of this Treaty and the various aspects with which the International Commission concerns itself, but the following factors are worthy of note: ⁽¹⁾

- (a) The Treaty recognized that the primary responsibility for pollution control and water resource management rested with the provinces in Canada and the states in the United States.
- (b) This responsibility is in no way qualified by the Treaty or by the existence of the International Joint Commission.

- (c) The governments agreed to refer to the I.J.C. any questions or matters of difference arising between them along the common frontier involving the rights, obligations and interests of either.
- (d) Although this reference could be initiated by either side, in practice both governments first agree to the terms of reference, then forward these as a joint reference.
- (e) The Commission's findings in such cases include conclusions and recommendations that are not decisions on either the facts or the law.
- (f) The Commission conducts its investigations through technical boards selected by the Commission from qualified experts in both countries. Like the Commission, the International Boards operate as single units.

The first reference on water pollution to the Commission was put forward in 1913. It was asked to determine to what extent, by what causes and in what localities were the boundary waters extending from the Lake of the Woods through the Great Lakes to the Sain John River polluted so as to be injurious to public health and unfit for domestic and other uses. The subsequent study involved the most extensive bacteriological examination of waters in the world up to that time. The survey, therefore, was confined basically to the health aspects of pollution resulting from the discharge of human or domestic wastes, although the control of industrial wastes was also recommended.

The next reference to the Commission was not made until 1946 when it was requested to investigate the pollution problems of the Connecting Channels of the Great Lakes from Sault Ste. Marie to the Niagara River. This study included physical, bacteriological and chemical analysis of samples to gauge water quality as well as an evaluation of municipal and industrial contributors to the pollution load in this stretch of waters. As a result of this study in depth, general and specific objectives concerning

water and effluent quality were proposed by the Commission on the advice of its Advisory Board on Water Pollution. Since the Board was composed of technical experts from both sides of the border, there was a fruitful exchange of ideas and techniques as well as the joint development of new methodology to meet new problems.

The objectives set by the Commission were only mandatory to the extent that provincial and state agencies enforce their implementation. However, they were adopted by many provincial water resource management agencies in Canada as a basis for operation when these groups were organized in the mid-fifties and early sixties. In addition, the experience that the various Canadian experts gained in evaluation techniques, methods of analysis, and procedures related to water pollution studies was of immense help to their particular federal and provincial organizations when these were called upon to carry out similar work.

Through its public hearings and the publicity gained as a result of its investigations, a considerable amount of attention was focused on water pollution as a whole which contributed to the public support required in Canada to underwrite the resources needed to function in the field of water pollution control and abatement.

2.2 Federal Government ⁽²⁾

Canada, this year, celebrates the 100th anniversary of the signing of the British North America Act, under which, in 1867, the provinces of Ontario, Quebec, New Brunswick and Nova Scotia joined together by mutual agreement to form the Dominion of Canada. From this date to 1905, the provinces of Manitoba, British Columbia, Prince Edward Island, Alberta and Saskatchewan also became partners in Confederation while Newfoundland took this step in 1949.

In general, water as a resource was assigned to the provinces but exclusive legislative authority was vested in the Parliament of Canada regarding all matters coming within the following classes, which reflect water use and pollution control

responsibilities:

- (i) Navigation and Shipping
- (ii) Seacoast and Inland Fisheries,

From 1867 to 1930 the work associated with these functions was carried out under the Minister of Marine and Fisheries, who was also Minister of Naval Service during World War I. Separate departments were then formed to carry out related programs as noted hereafter.

2.2.1 Department of Fisheries

The Department of Fisheries was first organized under a Minister of Fisheries on July 1, 1930, pursuant to the Department of Fisheries Act - now the Department of Fisheries Act RSE 1952.

The Department has responsibility for the control of water pollution affecting fish, mainly in two general areas;

- (a) Under the Fisheries Act, which makes illegal the placing of any substance deleterious to fish in waters frequented by fish, in tributaries to such waters or on the ice above them. Fish, as particularly defined here include shellfish, crustaceans, and marine animals.
- (b) Under the Fish Inspection Act, which is designed to guarantee the purity and safety of fish for food. This involves such matters as sanitation, purity of water supplies, etc.

The authority under the Fisheries Act is unique amongst all others in federal resources management, since it gives legislative jurisdiction for coastal and inland fisheries to the Federal Government. Since 1867, management of the Fisheries has been transferred in some cases to provinces in varying degrees but always to be

implemented under the Fisheries Act and the Regulations made thereunder. Thus, the control of pollution as it affects the fish population in all Canada lies in one Act.

The pertinent paragraph of the Act reads as follows: "No person shall cause or knowingly permit to pass into, or put or knowingly to permit to be put, lime, chemical substances, or drugs, poisonous matter, dead or decaying fish, or remnants thereof, mill rubbish or sawdust or any other deleterious substance or thing, whether the same is of like character to the substance named in this Section or not, in any water frequented by fish, or that flows into such water, nor on ice over either such waters".

In 1960-61, this Section was strengthened by increasing the penalties and adding a subsection which permitted the Governor-in-Council to name substances deleterious to fish.

The Department is basically concerned with maintaining water as a suitable environment for fish, not only for commercial purposes, but in support of sport fishing which ranks as one of the major recreational uses of water.

2.2.1.1 Fisheries Research Board

This Board was established under the control of the Minister of Fisheries by the Fisheries Research Board Act, 1937 - now the Fisheries Research Board Act, 1952, to serve as the scientific branch of the Department of Fisheries. The Board is charged with the improvement and expansion of Canadian fisheries through scientific research. It conducts fundamental and scientific research, applicable to both marine and fresh water fisheries at stations located across Canada.

Through its oceanographic research, the Board was able to establish the mixing characteristics of fresh water when discharged into a body of salt water. The discovery defined the conditions for effluent disposal in estuarial harbours and inlets. It is also involved in problems associated with the effect of waste on fish and their control;

eutrophication, especially the mechanics of the process and means whereby it can be interrupted or inhibited economically; the swimming speed of salmon, and how high they can jump so that successful fishways can be designed, The Board is interested in all matters pertaining to the health and welfare of fish, including the protection of their environment.

2.2.2 Department of Transport

The Department of Transport was established in 1936 by the Department of Transport Act, 1936 - now the Department of Transport Act, 1952, when the functions of the Department of Railways and Canals, Department of Marine and the Civil Aviation Branch of the Department of National Health were amalgamated.

Amongst other functions, the Department administers the Canada Shipping Act. The Marine Regulations Branch of the Department has promulgated the Oil Pollution Prevention Regulations, pursuant to Section 495(a) of the Canada Shipping Act. These regulations are in accordance with the terms of the 1962 International Oil Pollution Prevention Conference.

The Branch investigates cases of oil pollution by ships and prosecutes the owner whenever a clear case is presented. It is at present seeking authority under the same Canada Shipping Act to make regulations to prevent the pollution of rivers and lakes by sewage and garbage discharged by vessels operating in Canadian waters. A draft of the proposed regulations has been made and it is under joint study with the Department of National Health and Welfare. It is interesting to note that the International Joint Commission in its report to the Canadian-American governments in 1918 recommended amongst other things that sewage from vessels operating on the Great Lakes be disinfected.

2.2.3 Department of National Health and Welfare

The present Department of National Health and Welfare was established by the Department of Health and Welfare Act of 1944 and was originally formed as the Department of Health in 1919. The Public Health Engineering Division of the Department was first organized in 1923. It was created initially to investigate and control the outbreaks of typhoid fever on vessels plying the Great Lakes, but it has since evolved into an organization concerned primarily with the health aspects of water pollution as a whole.

This Division underwent a reorganization in 1963 to allow its personnel to concentrate on -

- (a) Consulting and advisory services
 - (b) Research and development work,
- especially in the field of water pollution as it relates to health.

The Department has been closely associated with water quality studies in a number of areas. Staff has been provided for several investigations of boundary water pollution, carried out under the jurisdiction of the International Joint Commission. A Board of technical advisors to the Commission is formed in each case from members of provincial, state and federal agencies on both sides of the border, with a representative from the Department of National Health and Welfare acting as chairman of the Canadian Section.

Members from the Department not only act as Board members but also provide engineering and analytical assistance for the studies and evaluation programs associated with the work of the Commission. One of the powers and functions of the Minister of National Health and Welfare is the enforcement of any rules or regulations made by the International Joint Commission, promulgated pursuant to the Treaty between the U.S.A. and Canada, so far as the same relate to public health. No such rules or regulations have been made by the Commission so far.

This Division of the Department has also participated in studies relating to provincial water or interprovincial boundary water pollution. In addition, water quality studies of shellfish growing areas are carried out on a continuing basis in accordance with the requirements established in an agreement reached with the United States Public Health Service regarding a cooperative shellfish control program. The Department is actively engaged in the evaluation of waste treatment systems operated by or for various Federal departments or agencies, and also approves plans for new treatment systems or modifications of existing plants.

A new Environmental Health Centre at Tunney's Pasture in Ottawa was completed in 1966 for the Department. It provides all the services in the terms of laboratories and pilot plant to ensure a full capability for the basic disciplines in the environmental health field. The research arm of the Engineering Division of the Department is now being established and plans are being developed to carry out research in the field of domestic and industrial waste treatment. Other health aspects of water pollution are to be examined when the resources are available.

2.2.4 Department of Indian Affairs and Northern Development

This Department was reconstituted under its present name in 1966. The Canadian Wildlife Service of the Department administers the migratory bird regulations which are issued under the authority of the Migratory Birds Convention Act of 1952. This Act derives from the Migratory Birds Treaty of 1916 between the United States and Great Britain who acted for Canada.

The anti-pollution legislation of the Act is designed to safeguard birds. It stipulates that no person shall place, cause to be placed or in any manner permit the flow or entrance of oil, oil wastes or substances harmful to migratory birds, into or upon waters frequented by migratory birds or waters flowing into such waters or upon the ice covering such waters. The deleterious nature of pollutants must be demonstrated before the Service can make a charge under this section of the Act.

2.2.5 Department of Energy, Mines and Resources

In 1966 Canada carried out the most extensive reorganization in responsibilities of Federal Government departments ever undertaken in peacetime. This was done in all cases in order to bring together in the most logical manner those groups that have common objectives and functions. Many scientific and technical units whose work relates particularly to the field of water were consolidated within the Department of Energy, Mines and Resources.

Towards this end, and within the Department which was then known as the Department of Mines and Technical Surveys, five separate units were brought together late in 1965 to form the Water Research Branch. These units deal with ground water, water quality, glaciology, water levels and Great Lakes studies. In addition, two branches from the Department of Northern Affairs and National Resources; namely, the Water Resources Branch and the Resource Development Branch, were moved to the Department of Energy, Mines and Resources. The activities of the former involved the field of water resource engineering; the latter had a major interest in planning and coordination in the area of water and water pollution.

Various processes of coordination and assimilation have been in progress since that time. In bringing these three branches together, a new focus was given to the importance of their activities and every encouragement extended for expansion and increase in the scope of their programs.

In addition, the Minister of Energy, Mines and Resources was given further directives early in March 1966 and was charged with the responsibility of coordinating federal government activities in the field of water and water pollution. He was given the responsibility of assuming the primary and coordinating role in this respect.

2.3 Provincial Governments

The water pollution control agencies in Canada today developed essentially from health departments, particularly the engineering divisions of these departments. In the provinces, these were first created in the late nineteenth and early twentieth centuries, and the public health acts of the time contained much from the laws of England. Stress was laid on water used for domestic purposes, and the need to prevent the spread of diseases, such as typhoid fever, through water treatment and environmental control of drinking water sources. With industrial and population growth came other factors which had to be assessed in terms of pollution control and abatement, and the fair use of water for many purposes.

2.3.1 Central Provinces

As the largest geographically and the most heavily populated, problems associated with water pollution were perhaps felt more urgently in the provinces of Ontario and Quebec than in other areas of Canada. In Ontario ⁽³⁾ the Public Health Act was initially passed in 1884 and legislation under this Act was administered by a provincial board of health which eventually became the Ontario Department of Health. A Sanitary Engineering Division was formed in 1912 and emphasis was placed on the control of all drinking supplies and on the treatment of sewage and other waste waters.

In 1956 the Ontario Water Resources Commission Act ⁽⁴⁾ was passed and the major responsibility for pollution control was transferred to that agency, along with much of the staff of the Sanitary Engineering Division which formerly had been engaged in this activity. While most of the legislation now in water pollution is administered by the Water Resources Commission, the Department of Health has some obligations through the Public Health Act.

Both the Commission and its predecessor, the Sanitary Engineering Division, provided technical staff for boundary water pollution studies under the jurisdiction of

the International Joint Commission. In addition, personnel are members of the advisory boards which were formed to aid the Commission in formulating the work programs required to undertake these studies.

Although the Ontario Water Resources Commission has not set forth regulations dealing with pollution, it has adopted a comprehensive set of objectives for water quality throughout Ontario. These objectives are based in many cases on those recommended by the International Joint Commission, modified where necessary to suit the regions involved. In addition, model bylaws regulating industrial discharges into municipal storm and sanitary sewers have been framed.

These have been drawn up by the Ontario Water Resources Commission and made available to the various municipalities in the province with the suggestion that they be enacted by the municipalities under the authority of the Municipal Act. The Commission has power under its Act to control industrial waste pollution in the same manner that it does with domestic waste pollutants. It may compel an industry to provide the necessary facilities, if none already exist, and new industries will be required to have the plans for the waste treatment facilities approved before the works are installed.

The pressing need for pollution control was a major factor in the creation of the Commission in 1956. Under the Commission's guidance, construction of water pollution control facilities, serving both industries and municipalities was accelerated.

The Ontario Water Resources Commission is made up of six commissioners; one of whom is appointed chairman and one vice-chairman. The Commission staff is headed by a General Manager, who is responsible for the direct administration of the Commission, including its programs and all staff activities. He is directly assisted in this by four assistant general managers, each of whom is in charge of a specific division.

These divisions are -

1. Project development, construction plant operations
2. Laboratories and research
3. Sanitary engineering, industrial wastes
4. Water resources.

Quebec followed much the same pattern as Ontario, although it established a division of sanitary engineering as early as 1908 under the Provincial Bureau of Health. Control over water, sewage and environmental conditions was placed under this division.

In 1965 ⁽⁵⁾ the Quebec Water Board Act was proclaimed in force which established the Quebec Water Board. In establishing the Board, a great deal of information was gained from the experience of the Ontario Water Resources Commission.

The Board is composed of five controllers including a chairman and a vice-chairman, who devote their time exclusively to the Board and the duties of their office. The Board may make such rules of procedures and practice as it deems necessary. In exercising its powers, the Board, any member of, or any person appointed by it, shall have the powers and immunities of Commissioners appointed under the Public Enquiry Act.

The Board is charged with the supervision and control of the purity of surface and subterranean water. It may examine the waters to ascertain their degree of pollution and determine the causes thereof. The Board may make regulations pertaining to all operations entailing the pollution of water. Regulations under this Act have not been published as yet.

2.3.2 Atlantic Provinces

The Atlantic Provinces are made up of New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland. The formation of health departments and sanitary engineering divisions occurred roughly during the same period as those in the Central Provinces. Although population and industrial growth was not as great as that in the Central Provinces, problems with pollution still existed, and the necessity of forming groups to manage water resources as a whole was evident.

The New Brunswick Water Authority ⁽⁶⁾ was established in 1958 and was given its present form by the Water Act in 1960-61. This Act authorized the Lieutenant-Governor-in-Council to appoint a New Brunswick Water Authority consisting of three to five members who will be responsible to the Minister of Municipal Affairs. The Lieutenant-Governor-in-Council may also appoint an Advisory Board to the Authority consisting of ten to fifteen members. One member each from particular departments or agencies was specified.

The Department of Health, which is represented on the Board, still has a part to play in pollution abatement under the Health Act This has to do with the suppression of disease and conservation of human health.

The Waters Act assigns to the New Brunswick Water Authority control over -

1. The use of all surface, ground and shore waters.
2. The allocation of the use of water.
3. Pollution originating within the jurisdiction of the province.
4. The alteration of the natural features of any watercourse or lake, and the natural movement of the water therein.

The discharge of solid wastes into water resources is prohibited and adequate treatment of wastes containing effluents is required.

The Waters Act also requires that the Water Authority and the Department of Health both approve all new sewage and water works. It also requires approval from the Authority for any project which alters water levels or water flows, and it permits the Authority to define and prescribe areas for public water supply for protection by municipalities.

In 1963, the Nova Scotia Water Authority ⁽⁷⁾ was formed, which was modeled after the one in New Brunswick. By an amendment to the Water Act in 1965, the Governor-in-Council may create a body or bodies to acquire, establish, enlarge, maintain or operate any water works or sewage works. Subsequently, the Governor-in-Council appointed an authority of five members, designated the chairman, and appointed an advisory board of 13 representing specific provincial agencies and major water user groups.

The Authority has control over the same areas as those assigned to the New Brunswick Water Authority. As in New Brunswick, the Authority must approve with the Department of Health new water and sewage works; it must approve plans for any project which will alter lake, water flow or water course; it may define and prescribe areas for public water supply for protection by municipalities; and it may operate water supply and sewage treatment facilities as public utilities.

In 1965, the Prince Edward Island Water Authority ⁽⁸⁾ was created under the Water Authority Act. This authority was organized along the same lines as that for Nova Scotia and New Brunswick, and its areas of jurisdiction are the same.

Both Nova Scotia and New Brunswick adopted the objectives of the International Joint Commission as modified by the Ontario Water Resources Commission and it is expected that Prince Edward Island will do the same.

The primary responsibility for pollution control in the province of Newfoundland and Labrador ⁽⁹⁾ is invested in the Minister of Health by means of the Water Protection

Act of 1964. Legislation to protect fresh waters from pollution has been in effect in this province for at least half a century.

As in the other Atlantic Provinces, the necessity for coordinating the work of all pollution control agencies within the province is realized and, to this end, a bill entitled "The Water Resources Conservation Act" has been prepared for legislative action.

2.3.3 Western Provinces

The provinces of British Columbia, Alberta, Saskatchewan and Manitoba have followed a similar pattern where the development of pollution control agencies are concerned, although many of the primary control functions still remain with the engineering divisions of their respective departments of health. It has been recognized, however, that all facets of pollution control and abatement, for which several departments are responsible, must be coordinated in some fashion.

In the Province of British Columbia ⁽¹⁰⁾ water pollution is the concern of three separate administrative agencies. A Pollution Control Board administers the Pollution Control Act, which was proclaimed initially in 1956 and amended in 1965. This amendment transferred responsibility for administration of the Act to the Minister of Lands, Forests and Water Resources, the chairman of the Board being the Deputy Minister of Water Resources. Under this current legislation, the structures and procedures of the Pollution Control Board and its staff are prescribed. The Board is able to retain its own specific staff comprising of engineers, technicians and secretarial help.

The present Board is composed of 7 members, five of whom are government officials with backgrounds or associations in pertinent fields. It has the power to -

- (a) Determine what qualities and properties of water shall constitute a polluted condition.

- (b) Prescribe standards regarding the quality and character of the effluent which may be discharged into any of the waters within the area or areas under the jurisdiction of the Board.

At present 40 percent of the area of the province containing approximately 95 percent of the population comes under the Board's jurisdiction.

- (c) Conduct tests and surveys to determine the extent of pollution of any waters within the area or areas under the jurisdiction of the Board.
- (d) Determine all matters relating to the examination of plans for the pollution control works and their approval, and the compliance required to meet certain effluent standards where such are considered necessary and desirable.

The Board has not prescribed any set standards for use on a uniform basis. Each application is considered on its merits and any permit to discharge effluent contains standards for that particular installation.

The Water Act, administered by the Department of Lands and Forests, prohibits the deposition of materials such as sawdust, timber, tailings, gravel, or refuse into any stream, lake, river or creek. Under the sanitary regulations pursuant to the Health Act, there is authority to deal with any waste discharges within the province which endangers public health, the main waste of concern being domestic sewage.

The agency dealing with water pollution in the Province of Alberta ⁽¹¹⁾ is the Provincial Board of Health. This Board consists of the provincial Medical Officer of Health (the chairman), the provincial Sanitary Engineer and the Provincial Bacteriologist. The Board administers the Public Health Act.

The Act confers fairly broad powers to the Board to supervise and control the water resources of the province, to conduct hearings when required on matters relating to water pollution and water use, to make appropriate recommendations, to make regulations concerning provincial pollution and approve waste control systems. The Board has proposed objectives for water quality in Alberta that outline the factors which are considered to require approval in regard to the discharge of waste to rivers, particularly industrial wastes.

The work of the various groups concerned with pollution as a whole; i.e., Departments of Public Health, Lands and Forests, Agriculture, Alberta Research Council and the Oil and Gas Conservation Board, is coordinated through direct staff liaison, joint conferences and, at the Ministerial level, by a Cabinet Committee composed of the Ministers of Health (Chairman), Lands and Forests, Agriculture, Industries and Development, and the Provincial Treasurer.

In Saskatchewan⁽¹²⁾ the Saskatchewan Water Resources Commission established in 1964 has the overall responsibility for the investigation, planning, management and administration of the water resources of the province, and the general supervision of all matters concerning the pollution of water.

The Commission may, upon the advice and with the approval of the Minister of Public Health through the Minister of Natural Resources, make regulations establishing general standards for water quality, governing issue of permits for the discharge of effluent, respecting the cancellation, operation or renewal of such permits; and may require the alteration or improvement of existing works where existing practices cause serious danger to the public.

Responsibilities relating to pollution control are also found in the Public Health Act of 1953, which provides for the approval by the Minister of Health of all public sewage systems and sewage treatment facilities, and approval of the alteration or renewal of same in the control of the operation of these facilities. Further regulations

have been passed respecting sewers and systems for sewage disposal, the prevention of pollution of natural water bodies and the cutting and storing of ice.

The Pollution of Water Prevention Act of 1962, administered by the Department of Natural Resources, applies in a more general way to the control of pollution throughout this province. This Act was enforced prior to the Saskatchewan Water Resources Commission Act and was intended to provide for a system of permits for the disposal of any form of pollutant on or near designated bodies of water. In the absence of regulations under the S.W.R.C. Act, this Act may be enforced.

The Commission is composed of the Deputy Ministers of the Departments of Public Health, Natural Resources, Agriculture, the General Manager of the Power Corp., and the Secretary of the Economic Development Board. Provision is made for one public member and for legal, financial, research and engineering advisors.

Organizations controlling pollution in the Province of Manitoba ⁽¹³⁾ may be said to be first the Department of Health for Manitoba and secondly the Provincial Sanitary Control Commission, which, while responsible to the Minister of Health, has general supervision over all matters concerning the discharge or drainage of sewage or waste into any body of water.

The Public Health Act as revised in 1965 provides that the Minister of Health shall have supervision of all matters relating to the preservation of life and health of the people of the province. Regulations may be made concerning the prevention of insanitary conditions - one of which by definition is a condition or circumstance that may pollute or contaminate water or that may render water injurious to the health of any person.

The Pollution of Waters Prevention Act was enacted in 1935. Its four parts refer respectively to the offence of polluting any body of water, the composition of a provincial sanitary control commission, the creation of sewage disposal districts and

the powers of said districts once created.

The regulations pursuant to the Public Health Act deal with the protection of water sources. Under the Pollution of Waters Prevention Act the Commission may make regulations concerning the treatment of sewage or waste, but to date none have been made.

The Commission consists of three members appointed by the Lieutenant-Governor-in-Council. At present these are the Chairman of the Municipal Board, the Chief of the Planning Division of Water Control and Conservation, and the Chief Public Health Engineer. A significant part of the Commission's function is the issuance of subsisting licences which in effect allow the discharge of sewage or waste effluents under certain specified conditions. A written policy was prepared and adopted by the Commission in 1953 which included such factors as pollution indices, grading of major water courses, the categorization of types of sewage and waste treatment processes, and future planning.

Although the Pollution of Waters Prevention Act has been amended since its enactment in 1935, it is probably the first of its kind in Canada that delineated pollution in this fashion rather than associating it only with a Public Health Act.

2.4 Municipal Governments

The task of providing pollution control systems has historically rested with the municipalities in Canada., Problems associated with the treatment of domestic wastes were often compounded by industrial waste inclusions from small plants. Large industrial concerns of course were expected to treat their own wastes.

Since the Second World War, the practice of grouping or amalgamating individual municipal units together to form larger areas, either through annexation or the formation of metropolitan areas, has been widespread in Canada. This has

permitted better planning where pollution control systems are concerned as well as providing the economy of scale, Although several examples of such transitions exist, the experience of the City of Winnipeg may serve as a useful example in this regard, since it has a fairly lengthy history in pollution control where several municipalities are concerned.

In 1935 the Greater Winnipeg Sanitary District was formed under the Greater Winnipeg Sanitary District Act. The district was composed of the City of Winnipeg and eight surrounding municipalities plus any additional areas that might from time to time be added. The broad objective of the Act was to promote the public health and welfare by providing an adequate and efficient system and means of regulating, collecting, conveying, pumping, treating and disposing of all domestic sewage and industrial wastes and their products within the district. Bylaws controlling the discharge of industrial and domestic wastes to sewers or rivers within or entering the district were enacted.

The metropolitan form of government was established in 1961, and the District became a branch of the Metropolitan Corporation. The former Sanitary District Act became a part or was incorporated into the Metro Winnipeg Act. As a result, this Act provides the Corporation with substantially the same powers within the Metro area as the Manitoba Sanitary Control Commission has elsewhere in the province.

3. Financial Assistance

Before World War II, the financial burden imposed by the construction of waste treatment works fell on individual municipalities. The problem of providing the financial capital required was considered to be an isolated one, resting with the community or municipality alone, even though the benefits, or otherwise, derived from treatment or non-treatment, had wider ramifications in most cases money bylaws requiring the consent of the majority of the people of the community were required before action on sewerage systems could be taken. During the depression such projects had a low

priority as far as most of the people were concerned with the result that few major works were built. To stimulate works programs in general during this period financial assistance was available from the federal government.

It is notable that the City of Winnipeg took advantage of such assistance in constructing its primary treatment plant in 1935, Following World War II, difficulties associated with pollution became more acute due to Industrial and population growth. The realization that pollution was more than an isolated problem and must be attacked on a wider basis spurred the installation of pollution control and abatement systems in Canada, The need for financial assistance to implement construction programs of this nature was evident and various plans have been developed for this purpose.

3.1 Federal Financial Assistance

- (A) The Central Mortgage and Housing Corp., a Crown Corporation, administers the National Housing Act, Part VI(b) of which relates to the loaning of money to municipalities in Canada for the construction of sewage treatment plants, the main trunk or collector sewers to the plant, and the outfall sewers, Not included are costs relating to the remainder of the sewage system or to the maintenance and operation of the systems.

Up to two-thirds of the total cost of the work as defined in the previous paragraph may be borrowed in this fashion. The current interest rate is 6- $\frac{1}{8}$ percent, calculated semi-annually and not in advance. As long as fifty years may be taken to repay the loan, although this is subject to provincial limitations. The fund is limited to a total of 200 million dollars at the present time.

This arrangement terminates as of March 31, 1970, unless an extension is granted, Three such extensions have been made since this part of the Act first came into force in 1961. The Corporation will write off up to one-quarter of the total loan, depending on the amount of construction completed on the date the

arrangement terminates. If the project is completed, then a full 25 percent of the construction loan is cancelled as far as repayment is concerned.

- (B) The Atlantic Development Board was formed as an agency under the federal government to stimulate industrial development in the Maritime Provinces (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland).. Certain monies have been provided for this purpose with a portion set aside to assist industrial firms with the installation of pollution abatement systems.

Only firms in production as of July 15, 1965 are eligible for payments under this program and it relates only to those concerns that discharge industrial wastes into fresh water stretches of Atlantic Province rivers, except in the case of Prince Edward Island where the firm will be eligible if it is discharging wastes into fresh or estuarial waters.. Payments are made on the basis of pollution abated, with 5 day B.O.D. used as the parameter. The fund is limited to a total of 2 million dollars.

- (C) In addition, winter works subsidies have been available to municipalities for capital works programs undertaken during the period November 1 to April 30: The subsidy payable is 75 percent of the labour costs incurred, and this cost is shared by the federal and provincial governments. There is also provision for fast write-off of capital investments in industrial waste treatment plants under the income tax regulations.

3.2 Provincial Assistance

In Ontario the Ontario Water Resources Commission is prepared to lend money to municipalities to assist them in financing pollution control systems. Generally, the loans are limited to a maximum term of thirty years and are made at a current rate of interest. If the municipality wishes, the sewage works can be fully financed by the province as a provincial project and title is then vested in the Commission. In this case,

the municipality is charged a service rate for use of the facilities.

Similarly, the Alberta Municipal and Finance Corp., established by the Alberta Finance Corp. Act in 1956, loans money to various communities for approved municipal projects at a slightly higher interest rate than that obtained by this government agency in the open market.

In New Brunswick, the province will pay one-half of the first year's interest on the capital cost of collection and treatment facilities for a period of thirty years. This is approximately equivalent to 35 percent of the carrying and refunding charges. In addition, the Water Authority undertakes the financing of preliminary surveys of requirements for water and sewage systems. These funds are to be refunded by municipalities upon completion of works. During 1966 the New Brunswick Electric Power Commission adopted a policy of contributing towards the capital costs of waste treatment facilities of industries located along portions of the Saint John River. Industries installing facilities towards the end of 1967 can receive 20 percent of capital costs up to a maximum of 150 thousand dollars for any one industry.

In the Province of Nova Scotia, the government grants 20 percent of the capital cost of sewage treatment works, including trunk collectors and pumping stations. No assistance is given on maintenance or operation.

Other provinces also provide assistance in the form of grants, subsidies or loans, based on various formulae, which recognize the need to aid municipalities in the construction of necessary waste treatment systems. The financial assistance being provided at the working level is a major milestone in the control and abatement of pollution in Canada.

4. National Pollution Conference ⁽¹⁴⁾

One of the most significant milestones to date in pollution abatement in Canada was the Conference on "Pollution and our Environment", sponsored by the Canadian Council of Resource Ministers at Montreal from October 31 to November 4, 1966. The Conference in many ways summed up the state of the art on all aspects of pollution at this point in time. Its aim was to bring together Canadians who by training and experience are in a position to influence the decisions that must be made in Canada, both in the public and private sectors, to improve the quality of our environment. The objective of the Conference was the formulation of practical guidelines to support these decisions. It dealt in particular with the problems associated with air, water and soil pollution.

The Council of Resource Ministers is a voluntary group representing each of the governments of Canada. Members are the Resource Ministers of each provincial government plus the federal Minister of Energy, Mines and Resources. The Ministers discuss the various aspects of resource problems with a view to cooperative solution, but it should be stressed that any decisions made by the Council or its members are not binding on the governments they represent; the Ministers report back to their Legislative Assemblies on the recommendations made and the matter is then discussed to see if it can be translated into legislation or administrative action.

The Conference was unique in that papers were prepared on every facet of pollution in Canada and were distributed to delegates before the Conference took place as background information only. It was organized primarily to discuss and debate the issues, rather than to provide a forum for the reading of papers.

The working session of the Conference consisted of two sets of small groups; the first set termed the discussion groups examined the problems in depth, while the second set - the guideline groups - formulated the guidelines. It was hoped that realistic recommendations for specific issues would be made. It should be noted that

the Conference was not intended to be the crux or climax of the Council's efforts, but only a part of a continuing sequence of events and developments.

The results of the Conference will be published and there is reason to believe that the need for cooperation and coordination amongst existing agencies dealing with pollution will be stressed in order to gain the common goal of a successful pollution control and abatement system in Canada. The structures required to achieve this purpose, the use of national standards or objectives to foster a coordinated approach, the determination of financial aid, and the role of research are all factors that are expected to be considered.

The Conference has been successful in further focussing the attention of the public on the need for pollution abatement programs. Public support has been essential in securing the resources required to provide Canada with her present status in pollution control. It is hoped that the guidelines and recommendations emanating from the Conference will establish future milestones that preserve and restore Canada's water resources for the benefit of all.

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