THE

ONTARIO WATER RESOURCES

COMMISSION

WATER QUALITY SURVEY

of the

OTTAWA RIVER

1967

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Report on a

WATER QUALITY SURVEY

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Division of Sanitary Engineering

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INTRODUCTION

Water quality surveys of the Ottawa River have been performed on a routine basis during the years 1961 through 1965, inclusive. These surveys are part of a continuing program to assess the water quality of the river.

This report presents a correlation of the results of samples collected from the river from Point Fortune at the Quebec-Ontario Border to Deux Rivieres. Pertinent sampling locations have been selected on the river, upstream and downstream from various municipalities and industries and at the mouths of significant tributary watercourses.

In 1965, more comprehensive water quality monitoring of the tributaries and selected points on the river involving a program of regular year round collection of samples for detailed analyses was initiated to supplement the routine yearly water quality surveys. For the purpose of this report, the pertinent results available from this program are included. In addition to the results of samples collected by Commission staff, this report also includes laboratory raw water quality results of samples collected by personnel at specific water works.

The laboratory results of the samples as discussed in the body of the report are tabulated in the appended Tables I, II and III. The results are listed in Table I in terms of bacteriological and chemical qualities, which are of primary importance in water pollution control programs; in Table II in terms of nitrogen and phosphorus values, which are of significance in nutritional and fertility studies of surface water; and in Table III in terms of chemical analyses relevant to drinking water quality.

The significance of the laboratory analyses employed to assess the various parameters of pollution and water quality are given in the appendix.

In addition to general information on the Ottawa River in the body of the report, information related to stream flows during the period covered as well as water and sewage works data of significance to the Ottawa River are included in the appended Tables IV, V and VI, respectively.

A map showing the approximate sampling locations and relevant mileages is attached to the report.

OTTAWA RIVER WATERSHED

General

The Ottawa River forms the boundary between the Provinces of Ontario and Quebec from the Carillon Rapids near Point Fortune to the head of Lake Timiskaming, approximately 360 miles upstream. The watercourse drains an area of 56,000 square miles in Ontario and Quebec. The major tributaries to the Ottawa River within this drainage area include:

Ontario	-	Mattawa River
	-	Petawawa River
	-	Muskrat River
	-	Bonnechere River
	-	Madawaska River
	-	Mississippi River
	-	Carp River
	-	Rideau River
	-	Green Creek
	-	South Nation River
	-	Hawkesbury Creek
Quebec	-	Kipawa Creek
	-	Gatineau River
	-	Lievre River

The Ottawa River, like many rivers in glaciated territory, appears to consist of a series of lake-like expanses connected by sections of steeper gradient often with rapids and waterfalls. A change of some 520 feet in surface water elevation occurs between Timiskaming and Point Fortune. Consequently, considerable use is made of the river for the production of hydro-electric power and dams have been constructed at several locations.

Climate

The pertinent drainage area of the Ottawa River lies along the path of many low pressure areas which sweep across the northern part of North America from west to east. This results in stormy changeable weather with mild variation in temperature. The average annual temperature is approximately 45° Fahrenheit.

Hydrology

The appended Table IV provides Ottawa River monthly flow data as recorded at the Chats Falls power dam from 1962 to 1965 and at the Grenville-Carillon area from 1961 to 1965. The average monthly and the maximum and minimum daily flows are also included.

LABORATORY RESULTS

Water Pollution Control Aspects

As previously indicated, the commonly used parameters for determining levels of pollution are bacteriological coliform examinations and chemical analyses, which include biochemical oxygen demand, solids content or turbidity and occasional specific determinations such as phenols.

With reference to Table I, intermittent or consistant pollution patterns are indicated at the following sample point locations. Explanatory comments are provided for the respective sampling locations.

0-56.0 The high phenol concentrations at Point Fortune can be attributed to upstream industrial waste discharges.

0-67.5 The high coliform counts, 5-day BOD and phenol concentrations downstream from the Town of Hawkesbury sanitary sewer outfall is a direct result of untreated and/or inadequately treated sanitary and industrial waste flows from Hawkesbury.

0-68.0 Although there appears to be some improvement in recent years, the intermittently high coliform counts and 5-day BOD reflect the influence of sanitary and industrial waste flows from the Town of Hawkesbury. The consistently high phenol concentrations are attributed to the industrial discharges from the Canadian International Paper Company Limited. Recently the paper mill has improved its waste disposal system by extending the outfall sewer from its lagoons into an area of greater dilution in the river.

0-71.7 The intermittent high coliform counts at this point are attributed to local inadequately treated sewage discharges from the Village of L'Orignal and have posed a hazard to a swimming beach in the area.

0-82.0 The one high coliform count indicated in this area was not confirmed by subsequent sampling results. The influence of upstream industrial waste discharges may be observed in the high phenol concentrations.

0-90.0 The high coliform count recorded at this point on one occasion was not confirmed by subsequent sampling results.

0-102.3 The pattern of bacteriological samples show higher coliform counts on the Quebec side of the river during the respective sampling periods. The phenol concentrations in this area can be attributed to upstream industrial activity.

0-106.0 The intermittent pattern of high coliform counts at the Rockland water works indicates that inadequately treated sanitary waste flows from the upstream urban areas of Orleans, Cumberland and from a subdivision in the Township of Cumberland, is still apparent at this point. The proposed Gloucester-Cumberland sewage treatment plant will help to remedy this problem. It is noted that small clumps of waste material periodically drift into shore near the water works intake and has interfered with the suitability of the area for swimming. The source of the material is not certain. It could be bottom accumulations of inadequately treated domestic or industrial wastes which during the breakdown process, produce enough gas to float the material to the surface. It could also be intermittent discharges of inadequately treated materials from upstream industries. This matter requires further investigation.

0-107.0 The one high coliform count recorded at this point may be attributed to the sources noted for 0-106.0.

0-112.0 The pattern of high coliform counts in this area show a recent improvement near the Ontario shore while those near the Quebec shore tended to fluctuate. The high 5-day BOD level noted in 1961 was not substantiated by subsequent sampling results, however, the phenol concentrations are consistently high. Evidence of pollution in this area may be attributed to domestic and industrial waste discharges from both provinces upstream from the sampling range. The high phenol concentrations at this point reflect the lack of adequate treatment of industrial waste discharges from the Ottawa and Hull area.

0-118.0 The recent improvement in the bacteriological quality of the water in this area, i.e., 0-112.0 to 0-118.0, indicates that the Ottawa sewage treatment plant has had a beneficial effect on the river.

0-120.3 The high coliform counts at this point in the river reflect the conditions prior to the operation of the Ottawa sewage treatment plant.

OGR-120.5 The high coliform count at this point resulted from the lack of treatment of sanitary wastes from the City of Ottawa prior to municipal sewage treatment.

0-121.0 The initial high coliform count recorded in this area was not confirmed by subsequent sampling results. The high phenol concentrations in this area reflects the presence of industrial wastes from the Ottawa and Hull area.

0-123.4 to 0-129.0

In this area, i.e., 0-123.4 the downstream end of Kettle Island to 0-129.0, the Interprovincial Bridge the coliform counts have in general been high. As noted the start up of the City of Ottawa sewage treatment plant in the summer of 1963 has had a beneficial effect on this part of the river. However, sources of bacterial pollution which remain would be untreated sewage from the Hull area and intermittent overflows from the City of Ottawa combined sewers.

The high levels of 5-day BOD at O-123.4 and OQ-124.4 are attributed to the domestic and industrial waste, such as the paper mill, in the Gatineau Point area.

High phenol concentrations on both the Ontario and Quebec sides of the river can be attributed to industrial waste discharges in this area.

O-130.2 The intermittent high coliform and phenol concentrations indicate the presence of some domestic and industrial wastes. There is a marked improvement in the water quality in this area from that noted at the Interprovincial Bridge.

O-132.6 It is interesting to note the recent high coliform counts near both the Ontario and Quebec sides of the river whereas, the central portion is still of good quality. The pollution on the Ontario side could be due to recent extensive development and the overloading of sewage treatment facilities in the Township of Nepean. The reason for the deterioration in quality on the Quebec side is also likely due to increased development in the Aylmer area.

The phenol concentration was high across the full width of the river in 1964, however, this was considerably reduced in 1965. The source of this is unknown, however, its presence is intermittent.

O-134.0 These samples are obtained from the Britannia Water Works' intake. All of the samples noted were taken by the Commission staff and analyzed at the Commission laboratory. Since the beginning of 1965 raw water samples have been obtained on a daily basis by the water works staff and analyzed at the local provincial laboratory. A review of these results for 1965 indicates a maximum coliform concentration of 11,000+/100 ml. and a minimum of zero. Seventeen of the 365 samples for 1965 equalled or exceeded a coliform concentration of 2,400/100 ml. However, most of the samples had coliform counts less than 500/100 ml.

OW-139.2 The high 5-day BOD at the mouth of Watts Creek which was noted on two occasions could be due to the condition discussed for point O-132.6.

0-141.0 The reason for the high coliform count at this point is not known. It could be due to the lack of sewage treatment at Arnprior and some of the small municipalities which drain into the Mississippi and Carp Rivers. However, the samples obtained at the Chats Falls Generating Station, which is between this point and Arnprior, are all low. The samples obtained at Chats Falls (0-163.6) were from an inlet at the station and therefore represent the water quality at depth. Therefore future sampling at this station should be of the surface water. This will help to determine if the effect of discharges at Arnprior are noticeable on the river quality in the area.

0-151.0 The high coliform count at this point noted in 1964, is not representative.

0-160.6 See 0-141.0

0-162.0 See 0-141.0

0-169.4 The intermittent pattern of high coliform counts below the mouth of the Madawaska River at Arnprior may be attributed to the fact that no treatment is provided for municipal sanitary wastes. The Town of Arnprior is proceeding with the installation of a municipal sewage system.

0-169.6 The high coliform count recorded at this point in 1964 was not confirmed by subsequent sample results. This could be caused by variable wind induced water currents.

0-237.3 The sample results obtained downstream from the Town of Pembroke have not in general indicated the adverse condition presumed to exist in this part of the river due to the discharge of untreated sanitary sewage from the municipality. This may be due to natural factors, such as, river depth, thermal stratification and currents. The results obtained in 1965 indicate higher coliform concentrations which may be due to natural conditions which prevail for short periods of time, however, in general these results indicate the need to alter this sampling point if an accurate assessment of the condition of the river is to be made.

<u>OMU-241.8</u> The initial high coliform count could be attributed to local sources of pollution, in the Pembroke area, however, it was not confirmed in subsequent sampling results.

<u>O-269.6</u> The early high coliform count below the Town of Deep River was not confirmed by subsequent sampling results.

<u>O-283.6</u> The reason for the high coliform count at this point is not known.

NUTRITIONAL AND RELATED PROBLEMS

Overfertilization and Biological Productivity

The nutrients which contribute to biological productivity in surface waters originate from domestic and industrial waste as well as from farmland. The most striking evidience of over-enrichment is prolific algae growth, which can clog water intakes and filters, pile up on beaches, create unsightly conditions and upon death and decay cause unpleasant odours. Research has shown that nitrogen and phosphorus are both essential for the growth of algae and that limitations in amounts of these elements is usually the factor that controls their rate of growth.

Laboratory Results

The nitrogen and phosphorus data is included in Table II of this report. Nitrogen is reported in terms of Free Ammonia, Total Kjeldahl, Nitrite Nitrogen, Nitrate Nitrogen, and the Phosphorus in terms of total and soluble forms. The significance of the various forms of nitrogen and phosphorus is outlined in the appendix.

Comments

The following comments on the nutrient data are based on a limited number of samples and therefore do not necessarily represent the general trend and seasonal fluctuations but only the concentrations found at the time of sampling.

Downstream of Arnprior phosphorus data is not available, however, the nitrogen levels in the Ottawa River are not critical or unusual for rivers receiving agricultural drainage. Increased nutrient concentration in the Ottawa area reflect the influence of domestic and industrial wastes. Total Kjeldahl, Free Ammonia, and soluble phosphorus contents occur at concentrations which under favourable conditions could promote nuisance algae growth. The nutrient data showed a further increase in the nitrogen and phosphorus levels at Hawkesbury.

CHEMICAL ANALYSES AND PHYSICAL DETERMINATIONS

With respect to the Chemical Analyses and Physical Determinations reference should be made to Table III and the appended significance of Laboratory Analyses. The results of samples collected from the Hawkesbury, Ottawa and Pembroke water works have been utilized.

Hardness

From the collected data it may be seen that the waters of the Ottawa River are reasonably soft. There is no appreciable difference in the hardness of the water between Pembroke and Hawkesbury.

Alkalinity

There is little change in the level of alkalinity over the recorded sampling period.

Iron

The iron content of the river appears to be decreasing slightly during recent years. The OWRC objectives were not generally exceeded in the Pembroke and Ottawa areas, and although intermittent excessive concentrations have occurred at Pembroke the levels of concentration are generally acceptable.

Chloride

The level of chlorides is generally consistent over the sampling period and is well within the OWRC objective of 250 ppm.

pH

The waters of the Ottawa River at Hawkesbury, Ottawa and Pembroke generally meet the objectives set by the OWRC for surface waters for the period of this survey.

Colour

The colour of the waters of the Ottawa River are generally in excess of OWRC objectives. The presence of higher colour concentrations is not uncommon in northern watercourses.

Turbidity

The turbidity of the Ottawa River generally does not exceed the OWRC objectives for the period encompassed by this survey.

SUMMARY AND CONCLUSIONS

This report deals with the results of water quality surveys performed on the Ottawa River from the Quebec boundary at Point Fortune to Deux Rivieres during the period of 1961-2-3-4-5. Reference has also been made to a more comprehensive water quality monitoring of specific areas of the river and tributaries within the watershed, initiated in 1965.

The surface water quality objectives of the Commission were not met in many areas of the Ottawa River. Although fluctuating in nature, the laboratory analyses results reveal areas of pollution in the vicinity of and downstream from several municipalities. The adverse influence of sanitary and industrial wastes emanating from these municipalities is reflected in these sampling results. Although sewage treatment is provided by a number of the major municipalities, several municipalities provide inadequate or no treatment at all. Similarily, in some instances, industrial wastes are discharged directly or indirectly to receiving waters without the benefit of adequate treatment.

In order to maintain the sanitary chemical and bacteriological qualities of the water of the Ottawa River to acceptable limits, and to maintain a satisfactory standard of water quality therein, adequate treatment of all sanitary and industrial wastes discharged to the river and its tributaries should be provided.

Results in excess of the OWRC objectives for water quality were revealed during individual water pollution surveys of the following centres of population:

Town of Hawkesbury
Village of L'Orignal
Town of Arnprior
Town of Pembroke
Town of Rockland

In addition to these municipalities the Commission's objectives for water quality are exceeded in the City of Ottawa area, which includes the Townships of Nepean, Gloucester and Cumberland.

Subsequent to these surveys the Town of Rockland has put into service sewage treatment facilities. Plans are progressing for the installation or extension of existing sewage works in the remainder of the municipalities with the exception of the Town of Hawkesbury. In regard to the industries a time schedule has been established for the institution of satisfactory waste treatment. The pulp and paper industry have until 1970 for the installation of satisfactory secondary treatment.

The sanitary quality of the river from Deux Rivieres to the upstream side of Arnprior, with the exception of the Pembroke area, is good. Downstream of Arnprior to the upstream end of the Ottawa-Hull section there is intermittent pollution. From this point to the Community of Treadwell, a distance of some 40 miles, the quality of the river water is in various stages of deterioration or pollution. This is due to both untreated or inadequately treated domestic and industrial wastes from the Ontario and Quebec sides of the river. The recent start up of the City of Ottawa and Town of Rockland sewage treatment plants has served to reduce the pollution load to the river. The proposed expansion of the Township of Nepean sewage treatment plant should also benefit the water quality at the upstream end of Ottawa.

Taste and odour problems were reported in the water supply for the operating staff located at the Province of Quebec hydro development, Carillon Dam. These can be attributed in part to the river pollution noted in the Hawkesbury area. Similar problems of a more limited and intermittent nature have been reported at the City of Ottawa water filtration plant. The problem here is due in part to the effect on the river of storm flows in the nearby small tributary streams, but is undoubtedly influenced by the secondary effects of upstream pollution.

The effect of the industrial wastes is measured in part by the phenol concentration. Objectionable levels of this are noted in many areas of the river. This and other similar industrial wastes are mainly responsible for the tainting of fish flesh in the more developed section of the Ottawa River.

A previous biological study of the Ottawa River has indicated significant deposits of wood fibre on the bottom of the river in the Ottawa-Hull area. This material is noticeable in suspension in the river for many miles below the City of Ottawa. Such material has been noted in floating clumps as far downstream as the Town of Rockland. This has interfered with the domestic and recreational use of the river and is certainly aesthetically undesirable.

The study of nutritional and related problems in the Ottawa River and its resultant data compiled to date does not show unusual nitrogen levels upstream from Ottawa, while notable increased nutrient concentrations were observed in the Ottawa and Hawkesbury areas.

The chemical analyses and physical determinations of samples collected at Hawkesbury, Ottawa and Pembroke revealed favourable levels of concentration for hardness, alkalinity, chloride, pH and turbidity throughout the area under study. The slightly excessive colour and intermittently excessive iron concentrations are not unusual for rivers such as the Ottawa River.

The need has been demonstrated by this review for close co-operation between the Province of Quebec and the Province of Ontario if adequate protection of the quality of the Ottawa River is desired.

RECOMMENDATIONS

1. In the future the Provinces of Quebec and Ontario should carry out joint surveys and pollution control programs on this river.

2. The Town of Hawkesbury should install adequate sewage treatment facilities.

3. The noted municipalities and concerned industries should ensure early completion of their plans to install satisfactory waste treatment facilities.

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SIGNIFICANCE OF LABORATORY ANALYSES

TABLE I ANALYSES

Bacteriological Examination

The membrane filter technique is employed to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres. The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. A membrane filter coliform count in excess of the desirable upper limit of 2,400 organisms is considered to render waters undesireable for bathing purposes.

Chemical Analysis

Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is reported in parts per million (ppm), and is an indication of the amount of oxygen required for the stabilization of decomposable organic matter in the water. The completion of the laboratory test requires five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

Solids

The value for total solids, expressed in parts per million (ppm), is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses in regards to surface water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, depositions in streams and injury to the habitat of fish. Where suspended solids values are less than 20 ppm, laboratory difficulties are experienced and the turbidity is determined instead.

Turbidity

Turbidity is caused by the presence of suspended matter, such as clay, silt, finely divided organic matter, plankton and other microscopic organisms in water. It is an expression of the optical property of a sample and results are reported in "turbidity units".

Phenols

The presence of phenol or phenolic equivalents is generally associated with the waste discharges from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenol or phenolic equivalents in waste discharges does not exceed 20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

TABLE II ANALYSES

Nitrogen

Ammonia Nitrogen or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogeneous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

Nitrite Nitrogen

Nitrite is usually an intermediate oxidation product of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the sample, notably the relative magnitude of ammonia and nitrate present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen

Nitrate is the end product of aerobic decompostion of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide. Low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

Phosphorus

Total Phosphorus is a measure of both the organic and inorganic forms of phosphorus present.

Soluble Phosphorus is a measure of the orthophosphate only and when subtracted from the total phosphorus gives an indication of the concentration of organic phosphorus present. That is, the soluble phosphorus is a measure of the inorganic phosphorus present except the phosphorus in the form of poly phosphate, which, however in surface waters is usually insignificant. Inorganic phosphorus in concentration in excess of 0.01 ppm may cause nuisance conditions.

TABLE III ANALYSES

Chemical Analyses

Hardness

The hardness of water reflects the nature of the geological formations with which it has been in contact. Hard waters are as satisfactory for human consumption as soft waters. Waters with a hardness of 75-100 ppm are considered moderately hard and waters with a hardness of 150-300 ppm are classified as hard.

Alkalinity

The alkalinity of natural waters is caused by three major classes of materials which may be ranked in order of their effect on pH as follows (1) hydroxides (2) carbonates and (3) bicarbonates and other salts of weak acids. The alkalinity of a water has little sanitary significance but is of importance in water, sewage and industrial waste treatment practices.

Iron

The OWRC 1964 Drinking Water Objectives set a limit of 0.3 ppm for iron. This limitation is based on consideration of appearance rather than health.

Chlorides

Chlorides in reasonable concentrations are not harmful to humans. At concentrations above 250 ppm they give a salty taste to the water which is objectionable to many people. For this reason, the OWRC 1964 Drinking Water Objectives recommends that chlorides be limited to 250 ppm in supplies intended for public use.

pH

The pH value, for practical purposes, refers to acidity or alkalinity, and is a measure of intensity rather than quantity. The pH scale extends from zero (very acidic) to 14 (very alkaline), with the middle value of 7 corresponding to neutrality at 25^{o} Centigrade. The pH of surface water should be in the range of 6.7 to 8.5.

Physical Determination

Colour and Turbidity

Although these tests do not directly measure the safety of the water, they are related to consumer acceptance of the water. At levels in excess of 15 units of colour and 5 units of turbidity in the raw water consumer acceptance may be conditional upon treatment of the water.

TABLE I

OTTAWA RIVER

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-56.0	POINT FORTUNE								
	(A) AT ONTARIO SHORE	JULY 26/62	---	1.1	70	--	--	3.3	--
		JULY 29/63	3,700	---	--	--	--	---	--
	(B) $\frac{1}{4}$ OF DISTANCE ACROSS RIVER	NOV. 8/61	344	3.2	84	--	--	2.9	--
		AUG. 11/65	310	0.8	70	7	63	---	8
	(C) $\frac{1}{2}$ OF DISTANCE ACROSS RIVER	NOV. 8/61	314	2.4	82	--	--	2.3	--
		AUG. 11/65	230	---	--	--	--	---	--
	(D) 3/4 OF DISTANCE ACROSS RIVER	NOV. 8/61	228	2.8	86	--	--	3.6	10
		AUG. 11/65	410	0.8	38	7	31	---	--
0-67.5	DOWNSTREAM FROM HAWKESBURY SANITARY SEWER OUTFALL								
	(A) 200 FT. FROM SHORE	AUG. 22/63	146,000	---	--	--	--	---	--
		JULY 15/65	24,000	3.7	104	8	96	---	20
	(B) 400 FT. FROM SHORE	AUG. 22/63	32,000	7.4	82	3	79	---	--
		MAY 7/64	77,000	26.0	176	16	160	---	95
		JULY 15/65	1,040	5.2	94	11	83	---	15
	(C) 600 FT. FROM SHORE	MAY 7/64	89,000	21.0	162	19	143	---	100
		JULY 15/65	16,000	2.0	84	12	72	---	15
	(D) 800 FT. FROM SHORE	AUG. 22/63	114,000	22.0	142	7	135	---	12
		JULY 15/65	124,000	1.8	70	12	58	---	10
	(E) 1000 FT. FROM SHORE	AUG. 22/63	1,700	4.1	60	--	--	---	12
		MAY 7/64	250	1.8	88	11	77	---	20
		JULY 15/65	920	2.4	118	11	107	---	20
0-68.0	HAWKESBURY - INTERPROVINCIAL BRIDGE								
	(A) FIRST CHANNEL NEAR SOUTH BANK	NOV. 8/61	0	3.4	124	--	--	7.0	--
		JULY 24/63	70,000	8.0	158	--	--	6.5	60
		AUG. 22/63	33,000	78.0	458	30	428	---	--
		MAY 7/64	100,000	46.0	242	45	197	---	25
		JULY 15/65	920	2.1	128	14	114	---	15
		SEPT.30/65	490	3.0	134	52	--	---	10
		NOV. 3/65	290	0.8	102	18	84	---	--

TABLE I-I (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-68.0	(B) SECOND CHANNEL FROM SOUTH BANK	NOV. 8/61	930	76.0	280	---	---	10.0	---
		JULY 24/63	122,000	24.0	180	---	---	8.5	60
		JULY 8/65	---	0.7	80	7	---	2.6	---
		JULY 15/65	1,600	3.0	74	11	63	---	6
		SEPT.30/65	770	1.6	80	2	---	---	8
	(C) ¼ DISTANCE ACROSS MAIN CHANNEL	NOV. 8/61	370	25.0	130	---	---	7.0	---
		AUG. 22/63	900	1.1	60	---	---	---	---
		MAY 7/64	60	0.8	88	10	78	---	10
		JULY 8/65	---	---	120	5	---	3.6	---
		JULY 8/65	---	0.2	82	6	---	---	---
		JULY 15/65	1,300	0.8	74	12	62	---	10
		JULY 15/65	4,200	11.0	106	11	95	---	40
		JULY 15/65	88	1.0	72	5	67	---	6
		SEPT.30/65	650	3.2	104	26	---	---	15
	(D) ½ DISTANCE ACROSS MAIN CHANNEL	NOV. 8/61	306	10.0	76	---	---	4.0	---
		JULY 24/63	14,000	0.6	100	---	---	1.7	12
		JULY 8/65	---	1.8	118	5	---	3.6	---
		JULY 8/65	---	0.4	76	24	---	2.5	---
		SEPT.30/65	810	0.6	48	2	---	---	6
	(E) 3/4 OF DISTANCE ACROSS MAIN CHANNELL	NOV. 8/61	332	2.4	82	---	---	4.5	---
		JULY 8/65	---	0.6	84	8	---	2.5	---
		JULY 8/65	---	0.7	96	7	---	3.1	---
		SEPT.30/65	790	1.0	78	18	---	---	4
0-69.1	HAWKESBURY - UPSTREAM FROM WATER WORKS	NOV. 3/65	2,200	0.6	116	18	98	----	---
0-71.7	L'ORIGNAL PARK - SWIMMING AREA	JULY 28/65	107	1.1	126	---	---	10	---
		AUG. 12/65	290,000	---	---	---	---	---	---
		AUG. 12/65	6,000	---	---	---	---	---	---

TABLE I-11 (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-73.2	L'ORIGNAL								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	0	2.2	78	---	---	2.9	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 8/61	0	2.6	76	---	---	2.3	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	0	2.6	42	---	---	1.8	---
0-82.0	LEFAIVRE - FASSET FERRY								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	900	2.3	72	---	---	2.1	---
		JULY 26/62	830	---	---	---	---	---	---
		JULY 29/63	1,000	---	---	---	---	---	---
		AUG. 11/65	100	1.6	114	5	109	---	10
	(B) ½ DISTANCE ACROSS RIVER	NOV. 8/61	5,400	2.8	74	---	---	2.3	---
		JULY 29/63	390	---	---	---	---	---	---
		AUG. 11/65	140	0.4	77	9	68	---	10
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	58	2.1	82	---	---	3.5	---
		JULY 26/62	570	---	---	---	---	---	---
		JULY 29/63	280	---	---	---	---	---	---
		AUG. 11/65	76	1.8	102	4	98	---	15
0-90.0	TREADWELL	JULY 26/62	17,000	---	---	---	---	---	---
		JULY 25/63	---	2.0	---	---	---	---	1.7
		JULY 30/63	42	---	---	---	---	---	---
OSN-95.4	SOUTH NATION RIVER - AT MOUTH	NOV. 7/61	76	2.6	322	---	---	9.5	---
0-102.3	FERRY TO THURSO, P.Q. - DOWNSTREAM FROM MOUTH OF BLANCHE RIVER								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	240	2.8	80	---	---	2.8	---
		JULY 26/62	7,000	1.4	54	---	---	5.5	---
		JULY 30/63	400	1.6	---	----	---	1.7	---
		AUG. 27/64	230	0.7	---	---	---	3.8	10
		AUG. 11/65	1,300	1.2	90	5	85	---	10

TABLE I - III (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-102.3	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/61	290	1.9	62	---	---	2.5	---
		AUG. 27/64	170	1.2	---	---	---	2.3	10
		AUG. 11/65	3,100	1.4	66	3	63	---	10
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	1,100	3.3	68	---	---	2.6	---
		JULY 26/62	32,000	2.7	74	---	---	3.5	---
		JULY 30/63	3,000	---	---	---	---	---	---
		AUG. 27/64	330	1.3	---	---	---	3.6	10
		AUG. 11/65	19,000	12.0	436	14	422	---	50
0-106.0	ROCKLAND WATER WORKS	DEC. 4/62	8,500	---	---	---	---	---	---
		AUG. 1/63	3,000	---	---	---	---	---	---
		SEPT. 2/64	23,000	---	---	---	---	---	---
		MAR. 12/65	10,800	---	---	---	---	---	---
		MAR. 15/65	16,300	---	---	---	---	---	---
		NOV. 15/65	6,000 (9:00 A.M.)	---	---	---	---	---	---
		NOV. 15/65	330 (3:00 P.M.)	---	---	---	---	---	---
		NOV. 22/65	256 (9:00 A.M.)	---	---	---	---	---	---
		NOV. 22/65	124 (3:00 P.M.)	---	---	---	---	---	---
		NOV. 23/65	1,380 (9:00 A.M.)	---	---	---	---	---	---
		NOV. 23/65	870 (3:00 P.M.)	---	---	---	---	---	---
		NOV. 24/65	108 (9:00 A.M.)	---	---	---	---	---	---
		NOV. 24/65	78 (3:00 P.M.)	---	---	---	---	---	---
		NOV. 29/65	56,000 (9:00 A.M.)	---	---	---	---	---	---
		NOV. 29/65	25,000 (3:00 P.M.)	---	---	---	---	---	---
		NOV. 30/65	9,800 (3:00 P.M.)	---	---	---	---	---	---
		DEC. 1/65	7,200 (3:00 P.M.)	---	---	---	---	---	---
		DEC. 13/65	37,000 (9:00 A.M.)	---	---	---	---	---	---
		DEC. 13/65	25,000 (3:00 P.M.)	---	---	---	---	---	---
		DEC. 18/65	53,000 (3:00 P.M.)	---	---	---	---	---	---
0-107.0	ONE MILE UPSTREAM FROM ROCKLAND WATER WORKS	JUNE 18/63	2,600	---	---	---	---	---	---
		SEPT. 2/64	310	---	---	---	---	---	---

TABLE I - IV (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-112.0	CUMBERLAND - MASSON FERRY								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	8,600	2.4	70	---	---	2.6	---
		JULY 26/62	4,800	1.6	56	---	---	4.0	---
		JULY 30/63	2,700	---	---	---	---	---	---
		SEPT. 2/64	590	1.0	---	---	---	1.8	10
		AUG. 12/65	900	1.4	90	4	86	---	6
	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/61	242	6.2	84	---	---	2.6	---
		SEPT. 2/64	410	---	---	---	---	---	---
		AUG. 12/65	700	0.6	109	3	106	---	8
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	4,000	7.0	76	---	---	2.3	---
		JULY 26/62	2,600	1.4	54	---	---	4.5	---
		JULY 30/63	2,500	---	---	---	---	---	---
		SEPT. 2/64	370	0.9	---	---	---	3.1	6
		AUG. 12/65	2,800	1.0	76	12	64	---	15
OL-113.2	LIEVRE RIVER								
	- AT WEST MOUTH	NOV. 7/61	1,200	3.6	58	---	---	2.5	---
	- AT EAST MOUTH	NOV. 7/61	196	3.8	46	---	---	2.5	---
0-118.0	HIAWATHA PARK	JULY 25/63	---	2.4	---	---	---	11.5	---
		JULY 30/63	12,000	---	---	---	---	---	---
		AUG. 27/64	340	1.7	---	---	---	18.0	6
	(A) ¼ DISTANCE ACROSS RIVER	MAY 29/63	---	1.9	98	---	---	3.3	13
		AUG. 26/65	420	0.8	52	8	44	---	6
	(B) ½ DISTANCE ACROSS RIVER	MAY 29/63	---	2.0	102	---	---	3.5	11
		AUG. 26/65	910	0.7	48	1	47	---	6
	(C) 3/4 DISTANCE ACROSS RIVER	MAY 29/63	---	2.1	86	---	---	3.5	12
		AUG. 26/65	940	2.8	82	5	77	---	15
0-120.3	BELOW MOUTH OF GREEN CREEK								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	18,600	7.2	64	---	---	5.5	---
		MAY 29/63	---	2.3	---	---	---	3.5	

TABLE I - V (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-120.3	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/61	20,400	3.1	56	---	---	2.6	---
		MAY 29/63	---	2.3	---	---	---	3.3	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	17,100	12.0	92	---	---	3.5	---
		JULY 26/62	9,100	2.3	72	---	---	6.0	---
		MAY 29/63	---	2.2	---	---	---	1.1	---
OGR-120.5	GREEN CREEK - AT MOUTH	JULY 22/62	6,500	1.2	56	---	---	1.4	---
0-121.0	UPSTREAM FROM LOWER DUCK ISLAND								
	(A) ¼ DISTANCE ACROSS RIVER	MAY 29/63	3,900	2.4	102	---	---	3.5	---
		AUG. 12/64	---	0.3	74	6	68	---	10
		AUG. 27/64	0	0.9	---	---	---	3.3	12
		AUG. 26/65	530	0.5	58	1	57	---	8
	(B) ½ DISTANCE ACROSS RIVER	MAY 29/63	---	1.9	88	---	---	3.5	---
		AUG. 26/65	450	0.9	58	1	57	---	6
	(C) 3/4 DISTANCE ACROSS RIVER	MAY 29/63	---	1.7	96	---	---	3.3	---
		AUG. 26/65	690	0.8	48	1	47	---	6
0-123.4	DOWNSTREAM FROM KETTLE ISLAND								
	(A) AT ONTARIO SHORE	NOV. 7/61	6,800	2.8	60	---	---	2.6	---
		MAY 29/63	17,200	2.0	84	---	---	2.9	---
	(B) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	6,100	2.7	68	---	---	2.8	---
		JULY 26/62	6,800	2.2	58	---	---	5.0	---
		MAY 29/63	---	2.8	80	---	---	3.3	---
	(C) ½ DISTANCE ACROSS RIVER	NOV. 7/61	9,800	2.7	60	---	---	2.3	---
		MAY 29/63	20,800	2.1	86	---	---	3.3	---
	(D) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	3,700	2.8	70	---	---	2.6	---
		JULY 26/62	10,400	1.3	52	---	---	5.0	---
		MAY 29/63	---	1.4	74	---	---	3.5	---
	(E) AT QUEBEC SHORE	NOV. 7/61	15,400	37.0	148	---	---	9.5	---
		MAY 29/63	182,000	15.0	166	---	---	4.0	---

TABLE I - VI (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-127.1	AT GATINEAU POINT								
	(A) ¼ DISTANCE FROM SHORE	NOV. 6/61	900	3.5	64	---	---	2.8	---
		MAY 29/63	95,000	2.2	88	---	---	2.6	6
	(B) ½ DISTANCE FROM SHORE	NOV. 6/61	2,000	3.6	48	---	---	2.3	---
		MAY 29/63	570	1.6	88	---	---	2.6	5
	(C) 3/4 DISTANCE FROM SHORE	NOV. 6/61	1,400	3.0	70	---	---	2.5	---
		MAY 29/63	115,000	1.6	96	---	---	2.6	4
0Q-124.4	QUEBEC CHANNEL - BELOW PAPER MILL OUTFALL AT GATINEAU, P.Q.								
	(A) 1/5 DISTANCE ACROSS CHANNEL	NOV. 7/61	4,900	3.1	70	---	---	2.5	---
	(B) 2/5 DISTANCE ACROSS CHANNEL	NOV. 7/61	12,900	2.6	70	---	---	2.6	---
	(C) 3/5 DISTANCE ACROSS CHANNEL	NOV. 7/61	11,300	3.8	70	---	---	2.9	---
	(D) 4/5 DISTANCE ACROSS CHANNEL	NOV. 7/61	770	25.0	372	---	---	24.0	---
0-125.7	UPSTREAM FROM KETTLE ISLAND								
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 26/64	17,000	1.4	---	---	---	2.3	45
	(B) ½ DISTANCE ACROSS RIVER	AUG. 26/64	23,000	1.3	---	---	---	2.5	18
	(C) 3/4 DISTANCE ACROSS RIVER	AUG. 26/64	19,000	1.6	---	---	---	2.5	15
0-129.0	OTTAWA- INTERPROVINCIAL BRIDGE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 6/61	13,900	3.1	68	---	---	2.6	---
		NOV. 6/61	8,900	3.8	76	---	---	2.6	---
		JULY 26/62	6,500	1.3	56	---	---	1.5	---
		MAY 29/63	9,700	1.8	108	---	---	2.6	---
		AUG. 26/64	17,000	0.9	---	---	---	2.1	2
		JULY 7/65	9,800	2.6	84	2	---	2.9	---
		AUG. 26/65	890	0.7	44	1	43	---	2

TABLE I - VII (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-129.0	(B) ½ DISTANCE ACROSS RIVER	NOV. 6/61	14,400	3.6	78	---	---	2.8	---
		JULY 26/62	250,000	1.2	60	---	---	1.3	---
		MAY 29/63	19,000	2.3	80	---	---	2.6	---
		AUG. 26/64	16,000	2.7	---	---	---	1.7	20
		JULY 7/65	6,100	2.0	90	2	---	2.5	---
		AUG. 26/65	14,000	1.8	84	2	82	---	8
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 6/61	8,400	4.1	78	---	---	2.6	---
		NOV. 6/61	7,100	4.5	82	---	---	2.9	---
		NOV. 26/62	---	1.8	60	---	---	1.1	---
		MAY 29/63	10,300	3.0	104	---	---	2.6	---
		AUG. 26/64	690	3.0	---	---	---	1.4	30
		JULY 7/65	2,400	1.5	110	2	---	2.5	---
		AUG. 26/65	30,000	1.4	96	1	95	---	8
0-130.2	OTTAWA - CHAUDIERE BRIDGE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	110	1.2	89	---	---	3.2	---
		MAY 29/63	---	1.2	78	---	---	2.6	---
		JULY 7/65	3,900	0.1	---	2	---	2.3	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 8/61	128	1.1	88	---	---	3.6	---
		MAY 29/63	---	1.2	96	---	---	2.6	---
		JULY 7/65	240	---	66	3	---	2.9	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	3,451	1.9	80	---	---	3.4	---
		MAY 29/63	---	1.4	90	---	---	2.6	---
		MAY 7/65	2,300	0.3	72	2	---	2.1	---
0-132.6	OTTAWA - CHAMPLAIN BRIDGE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	14	1.2	80	---	---	3.0	---
		AUG. 26/64	430	0.8	---	---	---	1.7	15
		AUG. 25/65	9,000	0.4	---	7	---	---	2
		SEPT. 29/65	---	0.8	---	11	---	2.7	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 8/61	12	2.0	84	---	---	3.3	---
		AUG. 26/64	100	0.4	---	---	---	0.8	7
		AUG. 25/65	160	0.8	86	4	82	---	2
		SEPT. 29/65	---	0.4	---	4	---	2.6	---

TABLE I - VIII (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-132.6	(c) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	331	1.5	85	---	---	3.6	---
		AUG. 26/64	180	0.5	---	---	---	1.1	7
		AUG. 25/65	16,000	0.5	76	34	42	---	2
		SEPT.29/65	---	0.5	60	3	---	4.4	---
0-134.0	OTTAWA - BRITANNIA - WATER WORKS	JULY 27/62	9,000	---	---	---	---	---	---
		DEC. 12/63	84	---	---	---	---	---	---
		MAR. 4/64	57	---	---	---	---	---	---
		AUG. 26/64	60	0.4	---	---	---	1.8	---
		AUG. 25/65	1,200	0.6	76	19	57	---	---
OW-139.2	WATT'S CREEK - AT MOUTH	NOV. 7/61	0	7.6	360	---	---	3.5	---
		JULY 23/62	1,100	1.2	---	---	---	3.6	---
		JULY 24/63	70	---	---	---	---	---	---
		AUG. 26/64	240	3.0	---	---	---	5.0	---
		AUG. 25/65	160	1.4	100	10	90	---	---
0-141.0	NEPEAN - MARCH, TOWNSHIP'S BOUNDARY	AUG. 26/64	310	---	---	---	---	---	---
		AUG. 25/65	11,000	1.4	102	12	90	---	---
0-150.0	TORBOLTON TOWNSHIP - BASKIN MARINA	AUG. 25/65	100	---	---	---	---	---	---
0-151.0	BASKIN BEACH	JULY 25/62	42	---	---	---	---	---	---
		JULY 24/63	18	---	---	---	---	---	---
		AUG. 26/64	90,000	---	---	---	---	---	---
		AUG. 25/65	190	---	---	---	---	---	---
0-160.6	AT MOORE LANDING - QUYON FERRY	NOV. 7/61	0	2.2	68	---	---	3.3	---
		JULY 25/62	0	---	---	---	---	---	---
		JULY 24/63	36	---	---	---	---	---	---
		AUG. 26/64	2,500	---	---	---	---	---	---
0-162.6	FITZROY PARK - BELOW CARP RIVER	NOV. 7/61	0	2.5	258	---	---	2.0	---
		JULY 23/62	12,000	3.6	---	---	---	29.0	---
		JULY 24/63	8	1.2	108	---	---	2.3	---
		AUG. 26/64	3,700	---	---	---	---	---	---
		AUG. 25/65	270	0.8	72	13	59	---	---

TABLE I - IX (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-163.6	CHATS FALLS GENERATING STATION	NOV. 7/61	0	2.2	66	---	---	2.3	---
		AUG. 26/64	2	0.4	---	---	---	4.2	---
		JULY 6/65	14	0.9	110	6	104	---	---
		AUG. 24/65	0	0.5	56	4	52	---	---
		SEPT.28/65	20	0.7	66	2	64	---	---
OMI-169.2	MISSISSIPPI RIVER AT MOUTH	NOV. 7/61	0	2.4	128	---	---	2.3	---
		JULY 23/62	30	0.4	---	---	---	2.8	---
		JULY 23/63	1,800	0.6	88	---	---	2.3	---
0-169.4	ARNPRIOR - BELL MEMORIAL PARK (MOUTH OF MADAWASKA RIVER)	NOV. 7/61	0	1.2	62	---	---	1.5	---
		JULY 23/62	840	0.4	---	---	---	3.3	---
		JULY 23/63	2	1.1	108	---	---	2.3	---
		AUG. 24/64	7,000	0.8	---	---	---	1.3	---
		SEPT. 8/64	40,000	1.6	86	4	82	---	---
		AUG. 24/65	2,000	0.9	86	7	79	---	---
0-169.6	ARNPRIOR PARK	AUG. 24/64	1,400	---	---	---	---	---	---
		SEPT. 8/64	12,000	1.2	80	4	76	---	---
		AUG. 24/65	700	1.1	78	3	75	---	---
0-174.2	SAND-POINT TO NORWAY BAY FERRY								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	0	2.2	64	---	---	2.3	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/61	0	2.1	68	---	---	2.8	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	0	2.1	54	---	---	2.9	---
0-181.6	BELOW BONNECHERE RIVER MOUTH AT TOWEY'S BEACH	NOV. 6/61	0	3.1	86	---	---	2.9	---
		JULY 23/62	670	0.3	---	---	---	3.3	---
		JULY 23/63	700	0.8	72	---	---	5.5	---
		AUG. 25/64	22	0.8	---	---	---	2.9	---
		AUG. 24/65	1,300	0.8	60	4	56	---	---

TABLE I - X (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-188.6	CHENAUX GENERATING STATION								
	(A) 1/6 DISTANCE ACROSS RIVER	NOV. 6/61	0	2.4	84	---	---	2.3	---
	(B) 1/3 DISTANCE ACROSS RIVER	NOV. 6/61	0	2.3	86	---	---	2.3	---
	(C) ½ DISTANCE ACROSS RIVER	NOV. 6/61	0	2.3	70	---	---	2.8	---
	(D) 2/3 DISTANCE ACROSS RIVER	NOV. 6/61	0	2.3	68	---	---	2.8	---
	(E) 5/6 DISTANCE ACROSS RIVER	NOV. 6/61	0	2.6	64	---	---	2.6	---
Oc-197.1	CALUMET FALLS DAM								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 6/61	0	2.2	76	---	---	1.8	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 6/61	0	1.6	80	---	---	2.3	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 6/61	0	2.3	76	---	---	2.1	---
Oc-198.9	BRYSON BRIDGE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 6/61	0	2.1	70	---	---	1.8	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 6/61	0	2.4	62	---	---	1.8	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 6/61	0	1.8	62	---	---	1.7	---
0-209.9	LA PASSE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 6/61	78	3.6	76	---	---	1.8	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 6/61	24	2.2	62	---	---	1.5	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 6/61	0	2.0	60	---	---	1.5	---
0-222.1	WALTHAM STATION								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 6/61	54	1.9	76	---	---	1.4	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 6/61	32	1.7	68	---	---	2.0	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 6/61	14	2.2	58	---	---	2.3	---

TABLE I - XI (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-237.3	INTERPROVINCIAL BRIDGE BELOW PEMBROKE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 6/61	214	2.2	62	---	---	1.9	---
		JULY 23/62	830	---	---	---	---	---	---
		AUG. 25/64	380	0.7	2.0	---	---	---	---
		AUG. 24/65	2,200	0.4	50	5	45	---	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 6/61	134	2.2	72	---	---	1.5	---
		JULY 23/62	880	0.3	---	---	---	4.0	---
		JULY 23/63	4,900	0.9	94	---	---	2.3	---
		AUG. 25/64	380	1.3	---	---	---	2.6	---
		AUG. 24/65	9,300	0.5	66	3	63	---	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 6/61	130	2.4	66	---	---	1.7	---
		AUG. 25/64	230	0.5	---	---	---	4.0	---
		AUG. 24/65	1,800	0.6	66	5	61	---	---
0-239.0	CEDAR BEACH - DOWNSTREAM FROM PEMBROKE	JULY 24/63	2,000	---	---	---	---	---	---
		AUG. 25/64	200	1.9	---	---	---	2.6	---
		AUG. 24/65	1,900	0.8	42	7	35	---	5
OMU-241.8	MUSKRAT RIVER AT MOUTH	NOV. 8/61	200	1.8	134	---	---	3.3	---
		JULY 23/62	57,000	0.7	---	---	---	3.1	---
		JULY 24/63	14	1.8	88	---	---	2.6	---
0-242.9	PEMBROKE AT WATER WORKS								
	(A) AT ONTARIO SIDE	NOV. 8/61	0	1.6	76	---	---	2.3	---
		JULY 23/62	680	---	---	---	---	---	---
		JULY 30/63	100	---	---	---	---	---	---
		JUNE 24/64	40	0.7	82	8	74	---	---
		AUG. 25/64	860	---	---	---	---	---	---
		AUG. 24/65	900	0.4	84	1	83	---	---

TABLE I - XII (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
	(B) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.6	66	---	---	2.5	---
	(C) ½ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.8	72	---	---	1.8	---
	(D) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	4	1.5	70	---	---	2.1	---
	(E) AT QUEBEC SIDE	NOV. 8/61	4	4.8	70	---	---	2.0	---
0-248.5	BELOW PETAWAWA SEWAGE TREATMENT PLANT								
	(A) AT ONTARIO SIDE	NOV. 8/61	0	1.7	72	---	---	1.7	---
		JULY 23/62	1,150	---	---	---	---	---	---
		JULY 25/63	400	---	---	---	---	---	---
		AUG. 25/64	60	1.0	---	---	---	2.6	---
		AUG. 24/65	230	0.5	78	7	71	---	---
	(B) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.3	66	---	---	2.1	---
	(C) ½ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.6	70	---	---	1.8	---
	(D) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	0	1.7	70	---	---	2.0	---
	(E) AT QUEBEC RIVER	NOV. 8/61	0	1.6	74	---	---	2.0	---
OP-251.2	PETAWAWA RIVER AT MOUTH	NOV. 8/61	10	2.3	44	---	---	1.5	---
		JULY 25/63	400	---	---	---	---	---	---
		AUG. 25/64	70	---	---	---	---	---	---
0-252.0	ABOVE PETAWAWA AT PINK ISLAND								
	(A) AT ONTARIO SIDE	NOV. 8/61	2	1.2	54	---	---	2.0	---
		JULY 23/62	1,600	---	---	---	---	---	---
		JULY 23/63	8	---	---	---	---	---	---
		AUG. 31/64	100	---	---	---	---	---	---
		AUG. 24/65	310	0.5	88	2	86	---	---
	(B) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	4	1.0	52	---	---	2.3	---
	(C) ½ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.4	54	---	---	1.8	---

TABLE I - XIII (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-252.0	(D) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	0	1.2	68	---	---	1.7	---
	(E) AT QUEBEC SIDE	NOV. 8/61	0	1.2	70	---	---	2.0	---
0-269.6	BELOW TOWN OF DEEP RIVER								
	(A) AT ONTARIO SIDE OF RIVER	NOV. 8/61	28	1.8	60	---	---	2.1	---
		AUG. 27/62	60	---	---	---	---	---	---
		JULY 23/63	5,800	---	---	---	---	---	---
		AUG. 25/64	580	1.2	---	---	---	3.5	---
		AUG. 24/65	500	0.8	76	5	71	---	---
	(B) ¼ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.6	68	---	---	1.8	---
	(C) ½ DISTANCE ACROSS RIVER	NOV. 8/61	0	1.1	74	---	---	2.0	---
	(D) 3/4 DISTANCE ACROSS RIVER	NOV. 8/61	0	1.4	68	---	---	2.3	---
	(E) AT QUEBEC SIDE	NOV. 8/61	0	1.8	64	---	---	2.0	---
0-269.8	DEEP RIVER AT BEACH	JULY 23/63	42	---	---	---	---	---	---
		AUG. 25/64	1,740	---	---	---	---	---	---
		AUG. 24/65	120	0.3	94	7	87	---	---
0-283.6	DES JOACHIMS GENERATING STATION								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	0	1.2	64	---	---	2.5	---
		AUG. 25/65	2,800	0.1	88	2	86	---	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/65	4	1.3	68	---	---	2.0	---
	(C) 3/4 DISTANCE ACROSS RIVER	NOV. 7/65	0	1.1	70	---	---	2.5	---
0-292.0	DRIFTWOOD PROVINCIAL PARK	JULY 24/63	16	---	---	---	---	---	---
		AUG. 25/64	120	---	---	---	---	---	---
		AUG. 24/65	270	0.8	76	18	58	---	---
0-292.8	STONECLIFFE								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	6	1.6	68	---	---	2.6	---
	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/61	0	0.9	68	---	---	2.9	---

TABLE I - XIV (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	COLIFORMS PER 100 ML.	5-DAY BOD	SOLIDS TOTAL	SOLIDS SUSP.	SOLIDS DISS.	TURBIDITY	PHENOLS
0-292.8	(c) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	0	0.9	70	---	---	2.5	---
0-313.8	BELOW DEUX RIVIERES								
	(A) ¼ DISTANCE ACROSS RIVER	NOV. 7/61	4	1.5	56	---	---	3.5	---
		JULY 23/62	667	0.6	---	---	---	3.1	---
		JULY 23/63	6	0.6	70	---	---	2.1	---
		AUG. 25/64	150	0.5	---	---	---	3.3	---
		AUG. 24/65	34	0.5	122	5	117	---	4
	(B) ½ DISTANCE ACROSS RIVER	NOV. 7/61	18	1.5	66	---	---	3.6	---
	(c) 3/4 DISTANCE ACROSS RIVER	NOV. 7/61	28	1.6	64	---	---	3.6	---

TABLE II

OTTAWA RIVER

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	NITROGEN AS N: FREE AMMONIA	NITROGEN AS N: TOTAL KJELDAHL	NITROGEN AS N: NITRITE	NITROGEN AS N: NITRATE	PHOSPHORUS AS PO_4: TOTAL	PHOSPHORUS AS PO_4: SOLUBLES
0-56.0	POINT FORTUNE							
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 11/65	0.10	0.33	TR	TR	---	---
	(B) ¾ DISTANCE ACROSS RIVER	AUG. 11/65	0.12	0.33	TR	---	---	---
0-67.5	DOWNSTREAM FROM HAWKESBURY SANITARY SEWER OUTFALL							
	(A) ¼ DISTANCE ACROSS RIVER	JULY 8/65	0.22	0.84	TR	TR	0.36	0.14
		AUG. 11/65	0.36	0.58	TR	TR	---	---
		SEPT.30/65	0.20	0.71	TR	TR	0.20	0.12
	(B) ½ DISTANCE ACROSS RIVER	AUG. 11/65	0.20	0.39	TR	0.00	---	---
	(C) ¾ DISTANCE ACROSS RIVER	AUG. 11/65	0.20	0.33	TR	---	---	---
0-67.8	UPSTREAM FROM HAWKESBURY SANITARY SEWER OUTFALL	JULY 8/65	0.66	1.40	TR	TR	0.44	0.14
		SEPT.30/65	0.33	0.84	TR	TR	0.20	0.08
0-68.0	HAWKESBURY - INTERPROVINCIAL BRIDGE							
	(A) FIRST CHANNEL AT ONTARIO SHORE	SEPT.30/65	0.20	0.71	TR	TR	---	---
	(B) SECOND CHANNEL FROM ONTARIO SHORE	JULY 8/65	0.29	0.39	TR	TR	0.18	0.14
		SEPT.30/65	0.33	0.71	TR	TR	0.24	0.08
		SEPT.30/65	0.20	0.40	TR	TR	---	---
	(C) ¼ POINT ON MAIN CHANNEL FROM ONTARIO SHORE	JULY 8/65	0.38	0.46	TR	TR	0.20	0.10
		JULY 8/65	0.35	0.43	TR	TR	0.22	0.14
		SEPT.30/65	0.57	1.20	TR	TR	---	---
	(D) MID-POINT ON MAIN CHANNEL	JULY 8/65	0.96	1.50	0.0	TR	0.10	0.04
		JULY 8/65	0.58	0.66	TR	TR	0.12	---
		SEPT.30/65	0.13	0.40	TR	TR	---	---
	(E) ¾ POINT ON MAIN CHANNEL FROM ONTARIO SHORE	JULY 8/65	0.22	0.71	TR	TR	0.08	---
		JULY 8/65	0.19	0.43	TR	TR	0.10	---
		SEPT.30/65	0.16	0.52	TR	TR	---	---
0-68.1	AT FORMER OLD MILL DAM BETWEEN HAMILTON ISLAND AND INTERNATIONAL BRIDGE	SEPT.30/65	0.08	0.33	TR	TR	0.16	0.12
0-68.4	(A) 30 FEET FROM ONTARIO SHORE ABOVE OUTFALL SEWER FROM CANADIAN INTERNATIONAL PAPER-INDUSTRIAL WASTE LAGOON	JULY 8/65	0.82	9.90	TR	0.08	0.36	0.08
		SEPT.30/65	1.24	2.50	TR	TR	---	---
	(B) OTTAWA RIVER AT C.I.P. SUBMERGED OUTLET	JULY 8/65	0.32	0.43	TR	TR	0.20	0.16
		SEPT.30/65	0.20	0.26	TR	TR	---	---

TABLE II- I (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	NITROGEN AS N: FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	PHOSPHORUS AS PO_4: TOTAL	SOLUBLES
0-68.8	MIDWAY BETWEEN HAMILTON ISLAND AND C.I.P. PUMPHOUSE	JULY 8/65	0.26	0.33	TR	TR	0.16	0.12
		SEPT.30/65	0.06	0.26	TR	TR	0.24	0.12
0-69.0	STREAM RECEIVING EFFLUENT FROM UPPER LAGOON BESIDE C.I.P. PUMPHOUSE	SEPT.30/65	59.00	81.00	0.00	0.00	---	---
0-102.3	FERRY TO THURSO, P.Q. - DOWNSTREAM FROM MOUTH OF BLANCHE RIVER							
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 11/65	0.13	0.39	TR	---	---	---
	(B) ½ DISTANCE ACROSS RIVER	AUG. 11/65	0.16	0.26	TR	---	---	---
	(C) ¾ DISTANCE ACROSS RIVER	AUG. 11/65	0.30	5.00	TR	0.00	---	---
0-112.0	CUMBERLAND-MASSON FERRY							
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 12/65	0.15	0.33	TR	0.00	---	---
	(B) ½ DISTANCE ACROSS RIVER	AUG. 12/65	0.16	0.33	TR	0.00	---	---
	(C) ¾ DISTANCE ACROSS RIVER	AUG. 12/65	0.22	0.26	TR	0.00	---	---
0-118.0	HIAWATHA PARK							
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 26/65	0.06	0.26	0.00	0.00	---	---
	(B) ½ DISTANCE ACROSS RIVER	AUG. 26/65	0.03	0.33	0.00	0.00	---	---
	(C) ¾ DISTANCE ACROSS RIVER	AUG. 26/65	0.33	0.52	0.00	0.00	---	---
0-121.0	UPSTREAM FROM LOWER DUCK ISLAND							
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 26/65	TR	0.40	0.00	0.00	---	---
	(B) ½ DISTANCE ACROSS RIVER	AUG. 26/65	TR	0.33	0.00	0.00	---	---
	(C) ¾ DISTANCE ACROSS RIVER	AUG. 26/65	0.05	0.33	0.00	0.00	---	---
0-125.7	UPSTREAM FROM KETTLE ISLAND							
	(A) ¼ DISTANCE ACROSS RIVER	AUG. 26/64	0.16	0.46	0.00	0.00	---	---
	(B) ½ DISTANCE ACROSS RIVER	AUG. 26/64	0.10	0.46	0.00	0.00	---	---
	(C) ¾ DISTANCE ACROSS RIVER	AUG. 26/64	0.20	0.46	0.00	0.00	---	---
OR-128.2 E	RIDEAU RIVER AT MOUTH - EAST SIDE	SEPT.29/65	0.20	1.00	0.01	TR	0.36	0.24
OR-128.2 W	- WEST SIDE	JULY 7/65	0.20	1.15	TR	TR	0.36	0.36
		SEPT.29/65	0.16	0.84	0.01	TR	0.40	0.24
0-129.0	OTTAWA - INTERPROVINCIAL BRIDGE							
	(A) 1/6 DISTANCE ACROSS RIVER FROM QUEBEC SHORE	JULY 7/65	0.26	0.26	0.01	---	0.08	0.04
		SEPT.29/65	0.12	0.26	TR	TR	0.16	0.04

TABLE II - II (CONT'D)

SAMPLE POINT NO.	DESCRIPTION OF SAMPLING POINT	DATE	NITROGEN AS N: FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	PHOSPHORUS AS PO_4: TOTAL	SOLUBLES
0-129.0	(B) 1/3 DISTANCE ACROSS RIVER FROM QUEBEC SHORE	AUG. 26/64	0.13	0.46	0.00	0.00	---	---
		JULY 7/65	0.30	0.30	TR	---	0.08	0.06
		AUG. 26/65	0.06	0.26	0.00	0.00	---	---
		SEPT.29/65	0.12	0.33	TR	TR	0.28	0.20
	(C) ½ DISTANCE ACROSS RIVER FROM QUEBEC SHORE	AUG. 26/64	0.11	0.46	0.00	0.00	---	---
		JULY 7/65	0.22	0.33	TR	---	0.10	0.10
		AUG. 26/65	TR	0.13	0.00	0.00	---	---
		SEPT.29/65	0.12	0.33	TR	TR	0.08	0.04
	(D) 2/3 DISTANCE ACROSS RIVER FROM QUEBEC SHORE	AUG. 26/64	0.06	0.59	0.00	0.00	---	---
		JULY 7/65	0.16	0.43	TR	0.00	0.10	0.10
		AUG. 26/65	0.05	0.20	0.01	0.00	---	---
		SEPT.29/65	0.12	0.33	TR	TR	0.24	0.08
	(E) 5/6 DISTANCE ACROSS RIVER FROM QUEBEC SHORE	JULY 7/65	0.11	0.55	TR	0.00	0.10	0.04
		SEPT.29/65	0.12	0.33	TR	TR	0.12	0.04
0-130.2	OTTAWA - CHAUDIERE BRIDGE							
	(A) BEWEEN HULL AND PHILEMON ISLAND	JULY 7/65	0.10	0.40	0.00	0.00	0.08	0.08
	(B) ¼ POINT ON MAIN BRIDGE FROM PHILEMON ISLAND TO CHAUDIERE ISLAND	JULY 7/65	0.11	0.26	0.00	0.00	0.08	0.06
	(C) MID POINT ON MAIN BRIDGE FROM PHILEMON ISLAND TO CHAUDIERE	JULY 7/65	0.11	0.33	0.00	0.00	0.08	0.08
	(D) 3/4 POINT ON MAIN BRIDGE FROM PHILEMON ISLAND TO CHAUDIERE ISLAND	JULY 7/65	0.10	0.40	0.00	0.00	0.08	0.08
	(E) BRIDGE BETWEEN CHAUDIERE ISLAND AND VICTORIA ISLAND	JULY 7/65	0.10	0.26	0.00	0.00	0.06	0.06
	(F) BRIDGE BETWEEN VICTORIA ISLAND AND OTTAWA	JULY 7/65	0.10	0.33	0.00	0.00	0.08	0.06
0-132.6	OTTAWA - CHAMPLAIN BRIDGE							
	(A) 1/6 DISTANCE FROM QUEBEC SIDE	SEPT.29/65	0.20	0.26	TR	TR	0.20	0.08
	(B) 1/3 DISTANCE FROM QUEBEC SIDE	AUG. 26/64	0.10	0.26	0.00	0.00	---	---
		AUG. 25/65	0.08	0.10	0.00	0.00	---	---
		SEPT.29/65	0.20	0.33	TR	TR	0.08	0.04

TABLE II - III (CONT'D)

SAMPLE POINT NO.	DESCRPTION OF SAMPLING POINT	DATE	NITROGEN AS N FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	PHOSPHORUS AS PO_4 TOTAL	SOLUBLES
0-132.6	(C) ½ DISTANCE FROM QUEBEC SIDE	AUG. 26/64	0.08	0.13	0.00	0.00	---	---
		AUG. 25/65	0.06	0.13	0.00	0.00	---	---
		SEPT.29/65	0.16	0.26	TR	---	0.12	0.00
	(D) 2/3 DISTANCE FROM QUEBEC SIDE	AUG. 26/64	0.06	0.20	0.00	0.00	---	---
		AUG. 25/65	0.06	0.10	0.00	0.00	---	---
		SEPT.29/65	0.20	0.46	TR	TR	0.20	0.08
	(E) 5/6 DISTANCE FROM QUEBEC SIDE	SEPT.29/65	0.16	0.26	TR	TR	0.12	0.08
0-134.0	OTTAWA - BRITTANIA WATER WORKS	AUG. 26/64	0.10	0.26	---	---	---	---
		AUG. 25/65	0.06	0.10	0.00	0.00	---	---
OW-139.2	WATT'S CREEK AT MOUTH	AUG. 26/64	0.10	0.26	---	---	---	---
		AUG. 25/65	0.05	0.39	---	---	---	---
0-141.0	NEPEAN - MARCH TOWNSHIPS BOUNDARY	AUG. 25/65	0.06	0.46	0.00	0.00	---	---
0-162.6	FITZROY PARK - BELOW CARP RIVER	JULY 23/62	0.06	0.26	0.00	TR	---	---
0-163.6	CHATS FALLS GENERATING STATION							
	(A) FIRST SLUICE GATE FROM QUEBEC SHORE	SEPT.28/65	0.08	0.33	---	---	---	---
	(B) SECOND SLUICE GATE FROM QUEBEC SHORE	SEPT.28/65	0.10	0.13	---	---	---	---
	(C) MAIN SLUICE GATE	SEPT.28/65	0.08	0.20	---	---	---	---
	(D) FOURTH SLUICE GATE FROM QUEBEC SHORE	SEPT.28/65	0.10	0.26	---	---	---	---
OMI-169.0	MISSISSIPPI RIVER AT ROAD NORTH-EAST OF GALETTA	SEPT.28/65	0.10	0.84	---	---	---	---
OMS-169.9	MADAWASKA RIVER AT HIGHWAY NO. 17	SEPT.28/65	TR	0.71				
0-313.8	BELOW DEUX RIVIERES	JULY 23/63	0.11	0.13	0.00	TR	---	---
		AUG. 25/64	0.16	0.26	0.00	TR	---	---
		AUG. 24/65	0.10	0.13	0.00	TR	---	---

TABLE III

MUNICIPAL WATER WORKS - RAW WATER

HAWKESBURY - 1962

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Jan. 21	48	16	0.10	4	7.2	--	--
Feb. 20	38	18	0.96	2	8.0	--	--
Mar. 21	34	22	0.96	4	7.6	--	--
Apr. 18	54	36	1.96	2	7.8	--	--
May 21	38	26	1.35	trace	7.2	--	--
June 7	36	24	0.52	1	7.2	40	5.0
Nov. 12	42	30	1.30	11	7.2	55	2.3
Average	41	24	1.02	4	---	48	3.7
Minimum	34	16	0.10	1	---	40	2.3
Maximum	54	30	1.96	11	---	55	5.0

1963

An insufficient number of sample results are available.

1964

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Feb. 3	59	32	0.55	5	7.7	35	1.8
Mar. 2	40	32	0.85	3	6.7	35	1.8
Apr. 6	54	38	0.38	2	7.6	30	4.5
May 11	38	28	1.00	1	7.3	70	1.8
June 1	38	24	0.42	4	7.3	30	4.0
July 6	28	20	0.51	3	7.6	25	6.5
Aug. 3	30	22	0.49	2	7.4	40	4.0
Nov. 2	40	22	0.55	4	7.4	25	3.8
Dec. 7	56	50	0.53	10	6.8	--	4.0
Average	42	30	0.59	4	---	36	3.6
Minimum	28	20	0.38	1	---	25	1.8
Maximum	59	50	1.00	10	---	70	6.5

TABLE III (cont'd)

HAWKESBURY - 1965

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Jan. 4	48	28	0.42	4	7.4	35	2.8
Feb. 2	32	24	0.54	7	7.0	40	1.8
Mar. 1	46	28	0.25	6	7.7	35	1.7
Apr. 6	36	23	0.88	4	7.4	--	2.6
May 3	44	32	0.36	9	7.4	35	2.3
June 7	34	20	0.39	3	7.2	40	1.8
Aug. 2	36	16	0.57	4	7.0	30	3.5
Sept. 7	34	22	0.52	4	7.3	45	5.0
Oct. 6	48	27	0.71	5	8.1	--	---
Nov. 3	34	29	1.50	3	7.9	--	---
Dec. 13	42	31	0.60	4	7.2	--	---
Average	39	25	0.61	5	---	37	2.7
Minimum	32	16	0.25	3	---	30	1.7
Maximum	48	32	1.50	9	---	45	5.0

OTTAWA - LEMIEUX ISLAND WATER WORKS - 1962

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Jan. 15	26	22	0.22	trace	7.2	30	3.3
Feb. 15	38	30	0.38	1	7.3	20	2.9
Mar. 15	32	26	0.86	3	7.6	40	3.6
Apr. 14	46	30	1.20	2	8.2	40	6.0
May 15	36	20	0.43	trace	7.2	40	3.1
June 15	42	16	0.27	2	7.4	20	3.3
July 17	36	22	0.20	0	7.3	30	2.9
Aug. 15	32	26	0.28	2	7.5	20	1.4
Sept. 17	34	26	0.38	8	7.6	40	2.6
Oct. 15	42	24	0.67	5	8.2	35	3.5
Nov. 16	42	28	0.87	11	7.8	45	5.0
Dec. 18	44	32	0.48	3	8.0	30	6.0
Average	38	25	0.52	4	---	33	3.6
Minimum	26	16	0.20	0	---	20	1.4
Maximum	46	32	1.20	11	---	45	6.0

TABLE III (cont'd)

OTTAWA - LEMIEUX ISLAND - 1963

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Jan. 15	42	30	0.32	trace	8.0	25	2.3
Feb. 15	40	28	0.45	2	7.5	25	3.5
Mar. 18	42	26	0.32	3	7.4	25	2.3
Apr. 16	44	34	0.52	6	7.5	35	4.0
May 23	38	32	0.51	6	7.7	35	2.6
June 17	32	24	0.38	14	7.5	35	3.1
July 16	34	20	0.52	2	8.0	45	2.6
Aug. 15	44	26	0.48	2	7.2	35	3.5
Sept. 19	34	26	0.25	2	7.8	30	2.0
Oct. 15	30	24	0.36	3	7.9	35	2.6
Nov. 18	40	26	0.38	2	7.9	25	4.0
Dec. 16	42	30	0.44	4	7.9	30	2.8
Average	39	27	0.41	4	---	32	2.9
Minimum	30	20	0.25	2	---	25	2.0
Maximum	44	34	0.52	14	---	45	4.0

1964

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Jan. 15	48	32	0.50	4	7.4	30	1.8
Feb. 17	40	30	0.60	4	7.8	25	1.8
Mar. 16	46	36	0.55	6	7.5	30	5.5
Apr. 17	48	36	0.40	4	7.3	40	4.0
May 20	36	28	0.93	3	7.7	35	9.0
June 24	28	20	0.44	1	7.6	25	3.3
July 16	48	22	0.45	1	7.8	15	2.0
Aug. 17	36	24	0.30	1	7.4	15	1.7
Sept. 16	38	28	0.52	2	7.9	20	1.5
Oct. 19	50	26	0.30	3	7.8	20	2.3
Nov. 16	44	24	0.41	6	8.1	20	3.5
Dec. 15	46	30	0.48	6	7.5	<5	3.1
Average	42	28	0.49	3	---	23	3.3
Minimum	28	20	0.30	1	---	<5	1.5
Maximum	50	36	0.93	6	---	40	9.0

TABLE III (cont'd)

OTTAWA - LEMIEUX ISLAND - 1965

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Feb. 15	38	26	0.28	3	7.8	35	1.1
Mar. 16	36	24	0.45	trace	6.7	25	1.5
Apr. 27	42	33	0.41	3	8.0	35	2.6
May 17	40	24	0.30	5	7.9	25	1.7
June 16	72	18	0.22	3	7.5	20	1.0
July 7	38	18	0.37	18	7.6	20	2.0
Aug. 16	32	20	0.24	2	8.4	25	2.1
Sept. 15	30	20	0.24	22	7.9	35	2.1
Oct. 20	36	19	0.31	2	7.5	30	2.5
Nov. 18	34	23	0.53	2	7.7	25	5.5
Dec. 15	36	26	0.95	4	7.3	20	3.6
Average	39	23	0.39	6	---	27	2.3
Minimum	30	18	0.22	2	---	20	1.0
Maximum	72	33	0.95	22	---	35	5.5

PEMBROKE MUNICIPAL WATER WORKS - 1962

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Mar. 9	34	22	0.86	6	7.5	--	---
Apr. 16	24	18	0.60	4	7.1	35	4.0
June 4	26	16	0.82	0	7.1	30	2.1
July 24	40	18	0.43	trace	7.4	--	---
Dec. 17	32	20	0.48	1	7.8	40	5.5
Average	31	19	0.64	3	---	35	3.9
Minimum	24	16	0.43	0	---	30	2.1
Maximum	40	22	0.86	6	---	40	5.5

TABLE III (cont'd)

PEMBROKE - 1963

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Feb. 20	100	128	0.16	4	8.2	--	---
Sept. 4	38	28	0.36	12	8.0	30	1.8
Oct. 23	36	24	0.36	3	7.6	40	0.8
Nov. 25	48	22	0.44	4	7.5	40	1.1
Dec. 20	48	22	0.44	6	7.7	30	1.4
Average	54	45	0.35	6	---	35	1.3
Minimum	36	22	0.16	3	---	30	0.8
Maximum	100	128	0.44	12	---	40	1.8

1964

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Feb. 6	36	20	0.58	2	7.2	40	2.0
Mar. 6	52	26	0.42	4	8.1	35	2.5
Apr. 10	34	20	0.35	2	6.9	30	4.0
May 8	26	16	0.29	2	7.0	25	2.8
June 4	28	16	0.32	1	7.6	20	2.3
July 10	30	20	0.31	2	7.8	25	4.0
Aug. 7	40	22	0.25	1	7.8	35	2.0
Sept. 4	38	22	0.30	2	7.1	40	2.0
Oct. 9	54	22	0.36	2	8.0	30	2.8
Nov. 6	36	22	0.43	10	7.4	30	1.8
Dec. 1	40	26	0.38	6	7.6	40	1.5
Average	38	21	0.36	3	---	32	2.5
Minimum	26	16	0.25	1	---	20	1.5
Maximum	54	26	0.58	10	---	40	4.0

TABLE III (cont'd)

PEMBROKE - 1965

Date Sampled	Hardness as $CaCO_3$	Alkalinity as $CaCO_3$	Iron as Fe	Chloride as Cl	pH at Lab.	Colour in Hazen Units	Turbidity Units
Jan. 4	34	22	0.28	5	7.3	35	1.8
Feb. 3	48	22	0.25	3	7.4	35	1.4
Mar. 1	42	24	0.31	6	7.1	35	2.6
Apr. 7	36	21	0.36	4	6.9	30	1.8
May 4	22	16	0.27	3	7.1	35	1.3
June 2	22	16	0.28	2	7.5	25	1.8
July 7	26	17	0.40	2	7.5	30	1.8
Aug. 4	80	17	0.18	5	8.0	25	2.0
Oct. 6	30	19	0.30	trace	7.5	25	2.3
Nov. 3	50	18	0.28	2	7.6	30	2.6
Dec. 1	30	15	0.33	3	7.3	25	3.5
Average	38	19	0.29	4	---	30	2.1
Minimum	22	15	0.18	2	---	25	1.3
Maximum	[illegible]	24	0.40	6	---	35	3.5

TABLE IV

OTTAWA RIVER FLOW AT CHATS FALLS

(Reported by HEPC in 1000's of cfs)

Month	1962	1963	1964	1965
January	1,123.2	561.3	1,008.3	827.6
February	1,081.1	560.7	908.7	764.5
March	994.4	710.1	1,106.7	913.8
April	1,789.3	1,699.3	1,536.6	1,236.5
May	2,273.5	1,420.6	1,589.2	2,279.1
June	1,044.8	1,029.3	1,240.2	1,022.0
July	621.7	686.7	879.5	653.7
August	498.3	512.5	574.3	827.1
September	497.6	621.3	471.6	1,297.9
October	564.7	597.6	578.4	2,091.6
November	590.7	668.3	577.5	1,560.7
December	557.8	1,004.2	716.1	1,472.5
Average Monthly:	969.8	839.3	932.3	1,245.6
Maximum Daily:	114.3 May 9	69.0 Apr. 10	78.0 Apr. 26	84.9 May 8
Minimum Daily:	11.4 Sept. 23	12.4 Aug. 4	14.0 Sept. 26	17.3 Aug. 1

NOTE: Flow figures were not available for 1961

TABLE IV- i (cont'd)

OTTAWA RIVER FLOW AT GRENVILLE - CARILLON AREA

(Reported by Department of Mines and Technical Surveys)
(in 1000's cfs)

Month	1961	1962	1963	1964	1965
January	*1,444.7	1,772.3	1,037.7	1,610.2	1,378.1
February	1,164.1	1,642.3	932.4	1,428.2	1,271.8
March	1,516.8	1,799.1	1,268.8	1,966.2	1,572.4
April	2,605.1	3,600.2	3,397.2	2,707.4	2,218.2
May	2,868.0	3,498.0	2,523.0	2,456.1	3.114.7
June	1,974.5	1,667.2	1,579.3	1,873.5	1,607.2
July	1,906.2	1,129.0	1,119.9	1,387.1	1,113.5
August	1,694.6	1,108.4	** 931.1	1,011.2	1,364.7
September	1,635.8	990.1	1,142.7	901.6	1,898.9
October	1,689.5	1,143.7	1,190.4	1,083.6	3,465.5
November	1,527.8	1,279.3	1,381.0	1,089.6	2,768.0
December	1,807.1	1,126.3	1,732.2	1,350.1	2,481.8
Average Monthly:	1,819.5	1,729.7	1,519.6	1,572.1	2,021.2
Maximum Daily:	113.9 Apr. 28	165.0 May 8	180.7 Apr. 3	129.4 Apr. 18	144.4 Oct. 21
Minimum Daily:	29.2 Feb. 19	22.8 Aug. 26 & Sept. 23	21.8 Sept.29	21.8 Sept. 27	20.1 Mar. 28

*From January 1, 1961 to July 31, 1963 flow figures were derived from the stage discharge relationship for the Grenville gauge.

**From August 1, 1963 to December 31, 1965 flow figures were the discharge taken at the Carillon Power Project.

TABLE V

MAJOR WATER WORKS SYSTEMS EMPLOYING OTTAWA RIVER WATER

MUNICIPALITY	CAPACITY MGD	INTAKE DIAMETER INCHES	INTAKE LENGTH FEET	TYPE OF TREATMENT
TOWN OF DEEP RIVER - MUNICIPAL	2.81	---	---	SCREENING, CHLORINATION, FLUORIDATION AND SOMETIMES CORROSION CONTROL
VILLAGE OF CHALK RIVER		1) 30	200	
- ATOMIC ENERGY PLANT	3.24	2) 30	325	SCREENING, CHLORINATION
TOWNSHIP OF PETAWAWA				
- CAMP PETAWAWA	2.06	24	800	CHLORINATION
TOWN OF PEMBROKE - MUNICIPAL	8.53	1) 18	2,300	
		2) 20	1,600	SCREENING, CHLORINATION
		3) 30	2,300	
TOWNSHIP OF HORTON				
- CHENAUX GENERATING STATION AND TOWNSITE	0.552	---	NIL	CHLORINATION
CITY OF OTTAWA				
- LEMIEUX ISLAND	42.0	---	NIL	COAGULATION, SETTLING, FILTRATION, CHLORINATION, FLUORIDATION
- BRITTANIA	42.0	66	900	COAGULATION, SETTLING, FILTRATION, CHLORINATION, FLUORIDATION
TOWN OF ROCKLAND - MUNICIPAL	0.013	8	100	CHLORINATION, PRESSURE FILTRATION
TOWNSHIP OF ALFRED - LEFAIVRE	0.047	4	40	CHLORINATION
TOWNSHIP OF LONGUEUIL - LANTHIER	0.018	3	800	CHLORINATION
POLICE VILLAGE OF WENDOVER	0.066	4	500	CHLORINATION
TOWN OF HAWKESBURY - MUNICIPAL	1.67	60	100	COAGULATION AND SETTLING IN SOLIDS CONTACT UNIT, FILTRATION, CHLORINATION

--- INFORMATION NOT AVAILABLE

TABLE VI

MAJOR CENTRES OF POPULATION AND INDUSTRIES DISCHARGING WASTES TO THE OTTAWA RIVER

MUNICIPALITY	AVERAGE DAILY SEWAGE FLOW MGD	PLANT CAPACITY MGD	OUTFALL DIAMETER INCHES	OUTFALL LENGTH FEET	TREATMENT PROVIDED
TOWN OF DEEP RIVER - MUNICIPAL	0.310	0.605	18	600	IMHOFF TANK AND CHLORINATION
VILLAGE OF CHALK RIVER					
- ATOMIC ENERGY OF CANADA LIMITED	0.60	0.25	12	500	IMHOFF TANK AND CHLORINATION
TOWNSHIP OF PETAWAWA - CAMP PETAWAWA	1.041	2.8	18	2,000	PRIMARY SETTLING, CHLORINATION, SLUDGE DIGESTION
TOWN OF PEMBROKE - MUNICIPAL	1.3	---	---	---	NIL
TOWN OF ARNPRIOR - MUNICIPAL	0.87	---	TO MADAWASKA RIVER AND OTTAWA RIVER		NIL
TOWNSHIP OF NEPEAN - MUNICIPAL	2.1	1.5	TO WATTS CREEK AND OTTAWA RIVER		SECONDARY TREATMENT (ACTIVATED SLUDGE PROCESS), EFFLUENT CHLORINATION, SLUDGE DIGESTION AND SLUDGE LAGOONING.
CITY OF OTTAWA - MUNICIPAL	37.0	40.0	---	---	PRIMARY SETTLING, CHLORINATION, SLUDGE DIGESTION AND SLUDGE LAGOONING
- E. B. EDDY COMPANY	5.7	---	---	---	MECHANICAL REMOVAL OF SETTLEABLE SOLIDS
TOWNSHIP OF GLOUCESTER / TOWNSHIP OF CUMBERLAND - MUNICIPAL	---	---	---	---	NIL
TOWN OF ROCKLAND - MUNICIPAL	---	0.4	15	[illegible]100	WASTE STABILIZATION POND (COMMENCED OPERATION OCT., 1965)
VILLAGE OF L'ORIGNAL - MUNICIPAL	---	---	---	---	NIL
TOWN OF HAWKESBURY - MUNICIPAL	1.56	---	---	---	NIL
- CANADIAN INTERNATIONAL PAPER COMPANY LIMITED	27.6	---	---	---	LAGOON

--- INFORMATION NOT AVAILABLE


PROVINCE OF QUEBEC
PROVINCE OF ONTARIO
NIPISSING
RENFREW
CARLETON
RUSSELL
PRESCOTT
ONTARIO
QUEBEC
CAMERON
CLARA
MARIA
HEAD
ROLPH
WYLIE
BUCHANAM
PETAWAWA
ALICE
ALLUMETTE ISLAND
WESTMEATH
STAFFORD
ROSS
HORTON
McNAB
FITZROY
TORBOLTON
MARCH
NEPEAN
GLOUCESTER
CUMBERLAND
CLARENCE
NORTH PLANTAGENET
ALFRED
LONGUEUIL
WEST HAWKESBURY
HAWKESBURY
DEUX RIVERS
STONECLIFFE
DES JOACHIMS
DEEP RIVER
ARMY CAMP PETAWAWA
PEMBROKE
WALTHAM
LA PASSE
BRYSON
CALUMET FALLS
PORTAGE DU FORT
CHENAUX GENERATING STATION
CHATS FALLS DAM
ARNPRIOR
HULL
OTTAWA
DESCHENES RAPIDS
MASSON
CUMBERLAND
ORLEANS
THURSO
ROCKLAND
MONTEBELLO
TREADWELL
FASSETT
L'ORIGINAL
HAWKESBURY
POINT FORTUNE
PETAWAWA RIVER
BARRON R.
INDIAN R.
MUSKRAT R.
BONNECHERE R.
MADAWASKA R.
MISS. R.
CARP R.
WATTS CR.
RIDEAU RIVER
GATINEAU RIVER
GREEN CR.
RIVIERE DU LIEVRE
RIVIERE BLANCHE
SOUTH NATION R.
0-313.8 A-C
0-292.8 A-C
0-292.0
0-283.6 A-C
0-269.8
0-269.6 A-E
0-252.0 A-E
0-248.5 A-E
0-242.9 A-E
OP-251.2
OMU-241.8
0-237.3 A-C
0-239.0
0-222.1 A-C
0-209.9 A-C
OC-198.9 A-C
OC-197.1 A-C
0-188.6 A-E
0-181.6
0-174.2 A-C
0-169.6
0-169.4
OMI-169.2
0-163.6
0-162.6
0-160.6
0-151.0
0-150.0
0-141.0
OW-139.2
0-134.0
0-132.6 A-C
0-130.2 A-C
0-129.0 A-C
0-127.1 A-C
0-125.7 A-C
OG-124.4 A-D
0-123.4 A-E
0-121.0 A-C
OGR-120.5
0-120.3 A-C
0-118.0 A-C
OL-113.2 E+W
0-112.0 A-C
0-107.0
0-106.0
0-102.3 A-C
OSN-95.4
0-90.0
0-82.0 A-C
0-73.2 A-C
0-71.7
0-69.1
0-68.0 A-E
0-67.5 A-E
0-56.0 A-D
LEGEND
0-292.8 A-C - MILEAGE OF SAMPLING RANGE - SAMPLES IN RANGE
ONTARIO WATER RESOURCES COMMISSION
OTTAWA RIVER
WATER POLLUTION SURVEY
1961 - 1965
SCALE: 8 0 4 8 MILES
DRAWN BY: M.I.H.
DATE: AUGUST 1966
CHECKED BY: R.A.W.
DRAWING No: 66-52