INTERNATIONAL ST. CROIX RIVER BOARD

ANNUAL REPORT

2002

ST. CROIX RIVER
MAINE AND NEW BRUNSWICK

2002 ANNUAL REPORT

of the

INTERNATIONAL ST. CROIX RIVER BOARD

covering

The Orders of Approval with respect to the control of the discharge of the St. Croix River at Forest City, Vanceboro, and the water levels of East Grand Lake, Spednic Lake, Grand Falls Flowage and Milltown Dam Forebay.

The Water Quality and Aquatic Ecosystem for the St. Croix River Boundary Waters.

SUBMITTED TO

THE INTERNATIONAL JOINT COMMISSION

April 8, 2003

International Joint Commission
United States and Canada

International Joint Commission
International St. Croix River Board

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International Joint Commission
Canada and United States

March 20, 2003

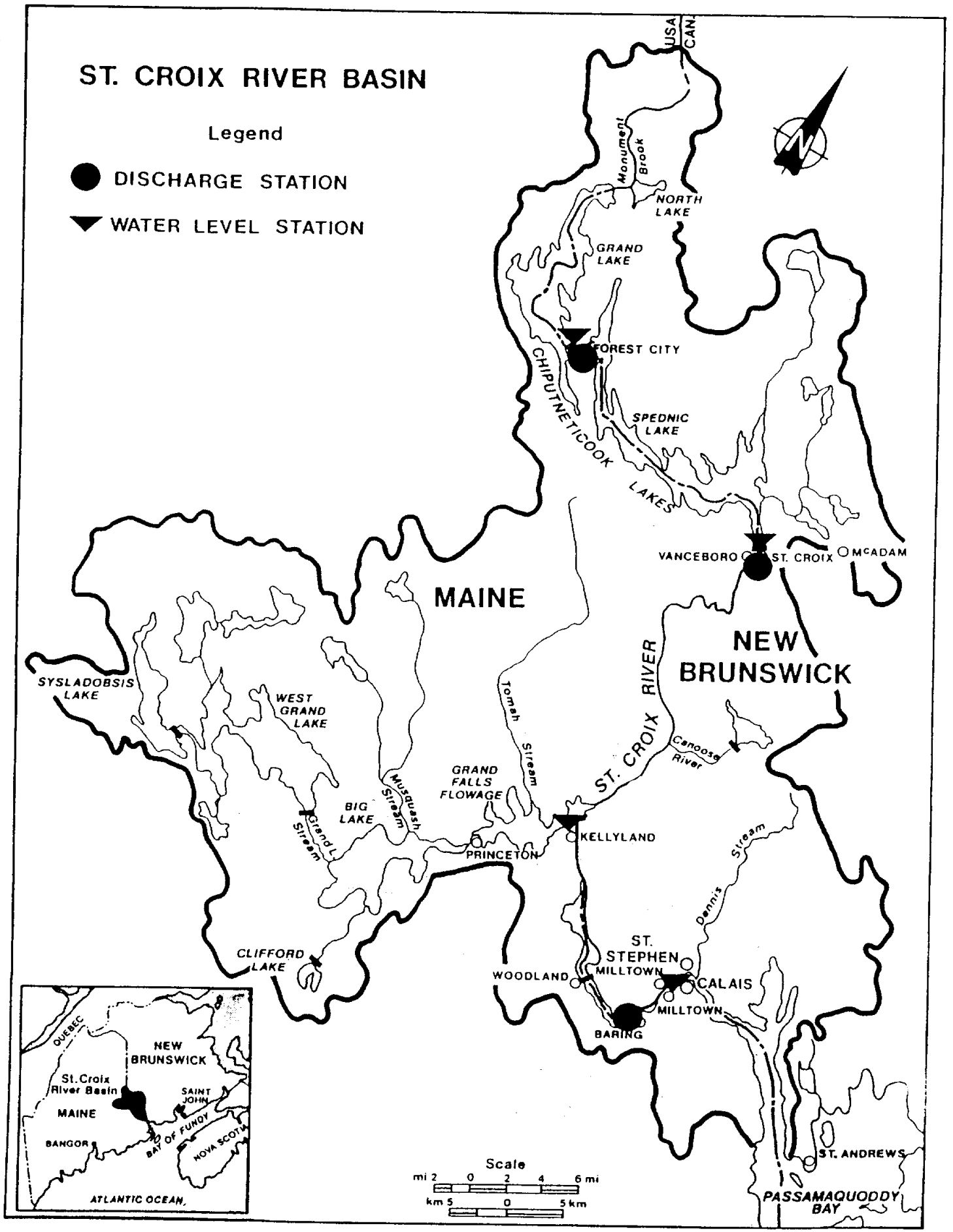
Ladies and Gentlemen:

The International Saint Croix River Board herein provides its Annual Report of 2002, of the Saint Croix River, Maine and New Brunswick.

Respectively submitted,

Bill Appleby
Canadian Co-Chair
International St. Croix River Board

Don Porteous
U.S. Co-Chair
International St. Croix River Board


ST. CROIX RIVER BASIN
Legend
DISCHARGE STATION
WATER LEVEL STATION
USA
CAN.
Monument Brook
NORTH LAKE
GRAND LAKE
FOREST CITY
CHIPUTNETICOOK LAKES
SPEDNIC LAKE
VANCEBORO
ST. CROIX
McADAM
MAINE
NEW BRUNSWICK
ST. CROIX RIVER
SYSLADOBSIS LAKE
WEST GRAND LAKE
Tomah Stream
Canoose River
GRAND FALLS FLOWAGE
Musquash Stream
BIG LAKE
Grand L. Stream
KELLYLAND
PRINCETON
Dennis Stream
CLIFFORD LAKE
ST. STEPHEN
MILLTOWN
WOODLAND
CALAIS
MILLTOWN
BARING
ST. ANDREWS
PASSAMAQUODDY BAY
QUEBEC
NEW BRUNSWICK
St. Croix River Basin
SAINT JOHN
MAINE
BANGOR
BAY OF FUNDY
NOVA SCOTIA
ATLANTIC OCEAN
Scale
mi 2 0 2 4 6 mi
km 5 0 5 km

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1.0 GENERAL

1.1 Board Membership

The Board membership changed during 2002 with the resignation of one US member, Dr. Fred Kircheis, and the appointment of one new member from the US, Dr. Joan G. Trial. In addition, Colonel Brian Osterndorf was reassigned in July 2002 and was replaced by Colonel Thomas Koning. In October 2002, the Board Co-chairs were rotated and Mr. Donald Porteous was appointed as US Co-chair and Mr. Bill Appleby as Canadian Co-chair.

1.2 Policy of the Board Regarding Dam Regulation

The Board continued its policy of leaving the regulation of the Dams at Forest City, Vanceboro, Grand Falls, and Milltown in the owners' hands, exercising only that oversight necessary to ensure adherence to the requirements of the Commission's Orders. During the reporting period, the Board reviewed conditions prevailing in the River by the following means: a continuous record of water elevations of East Grand Lake and continuous record of discharge below Forest City Dam; a continuous record of water elevations of Spednic Lake and a continuous record of discharge at Vanceboro; a continuous record of water levels above the Dam at Grand Falls; a continuous record of discharge at Baring, Maine; and monthly reports received from NB Power indicating daily forebay elevations obtained during regular work days at the Milltown Dam and details of changes in gate and stop log openings. Data are

discussed in Section 2 of this report and summarized on Tables and Figures in the Appendix.

1.3 International Joint Commission Semi-Annual Meeting

Board representatives attended the spring Semi-Annual Meeting of the International Joint Commission (IJC) in Washington, DC on April 9, 2002, to present the Board's annual report. Presenting for the Board were Colonel Brian Osterndorf, Mr. Don Porteous and Mr. Ken Hamilton. Board Secretaries Mr. Peter Eaton and Ms. Barbara Blumeris also attended.

1.4 Annual Public Meeting in Basin

The annual public meeting was held in the Saint Croix Basin on the evening of August 14, 2002 at the McAdam Lions Club, McAdam, NB. The agenda included welcoming remarks by the IJC Commissioners, the Rt. Hon. Herb Grey and Mr. Dennis Schornack and presentations by the St. Croix River Board; Ms. Donna Adams, Hydro Superintendent of Domtar; and Ron Brokaw, Regional Fisheries Biologist, Maine Division of Inland Fisheries and Wildlife. About 30 people attended. Questions were asked regarding the alewife and bass fisheries and the low levels at Spednic Lake.

1.5 Annual Inspection Tour of Facilities in the St. Croix River Basin

On 14 and 15 August 2002, the Board conducted its annual inspection tour of the facilities in the St. Croix River Basin, Maine and New Brunswick covered under IJC

orders of approval. Inspections were performed on the Forest City Dam and fish ladder; Vanceboro Dam and fish ladder; Grand Falls Flowage Dam and fish passages, and Milltown Dam and fish passages. All facilities except for Milltown are owned and operated by Domtar Industries, Inc. The Milltown facility is owned and operated by the New Brunswick Power Corporation. A summary of the inspections is included in the Appendix. Following completion of the facilities inspection tour on August 15, members of the IJC and the Board participated in a boat tour of the estuary led by Lee Sochasky, St. Croix International Waterway Commission and Art MacKay, St. Croix Estuary Project. The tour included a stop at Saint Croix Island in the estuary.

1.6 Workshop State of the St. Croix Ecosystem

A Science Workshop to examine the State of the Saint Croix Ecosystem was held on November 13-14, 2002 at the Washington County Technical College in Calais, Maine. The workshop was funded by the IJC and sponsored by the St. Croix Board.

This two-day workshop provided a forum to explore the state of the St. Croix River Basin ecosystem in Maine and New Brunswick, including the estuary. Four Sessions were included in the workshop: Session 1 - Climate and Hydrology; Session 2 - Water Quality and Management; Session 3 - Freshwater and Estuarine Biota and Session 4 - Human Activites. A workshop report is being prepared which includes a summary of session findings and presentation abstracts.

1.7 Board Meeting

The annual fall Board meeting was held in Calais Maine at the Calais Motor Inn meeting room on the evening of November 13, 2002. Discussions included the Domtar Black Liquor spill in September 2002 (invited Domtar officials provided an account of the event and actions taken), the alewife literature review project sponsored by the IJC, Board Membership, and other items. Board meeting notes are available on the Board's website: http://www.ijc.org/boards/saint.html.

2.0 MANAGEMENT OF THE WATER LEVELS AND FLOWS

In 2002, the yearly mean water level at East Grand Lake was 131.640 metres (431.89 feet), which is slightly lower than the long term mean value of 131.792 metres (432.39 feet).

The annual mean flow from the lake at Forest City Stream was 4.29 m^3/s (151 cfs), 31 % less than the long term mean value of 6.24 m^3/s (220 cfs).

The average water level for the year at Spednic Lake was 115.878 metres (380.18 feet) and is below the long term mean value of 116.316 metres (381.61 feet).

The yearly mean flow as recorded at Vanceboro was 14.4 m^3/s (509 cfs), 46 % less than the long term mean of 21.0 m^3/s (742 cfs).

The annual mean flow at Baring was 55.2 m^3/s (1950 cfs), which is less than 30% of the long term mean at Baring of 71.9 m^3/s (2540 cfs).

2. 1 East Grand Lake Reservoir And Discharges Below The Forest City Dam

During the period from 1 January to 31 December, the reservoir was operated between a maximum daily mean of 132.236 metres (433.85 feet) on 3 June, and a minimum daily mean of 130.912 metres (429.50 feet) on 5 January. The maximum lake level as prescribed by the Commission's Order is 132.571 metres (434.94 feet); the minimum is 130.438 metres (427.94 feet). The Order was maintained throughout the year. The daily mean elevations are presented in Table I and depicted in Figure I of the Appendix.

Table II and Figure II of the Appendix presents the daily mean discharges below the Forest City Dam at the outlet of East Grand Lake for 2002. The maximum daily mean for the reporting period was 14.3 m^3/s (505 cfs) on 5 October and the minimum daily mean was 2.21 m^3/s (78 cfs) on 6 January. The mean discharge for the year was 4.29 m^3/s (151 cfs). The Commission's Order of a minimum discharge of 2.12 m^3/s (75 cfs) was maintained throughout the year with the exception of a 3 hour period on November 28 beginning at approximately 1900 hours EST, when an alarm was issued from the datalogger on Forest City Stream. Dam tenders from Domtar were dispatched to the site where shell ice was discovered restricting flow at the gate to the outlet of East Grand Lake. Flow to the stream was restored at approximately 2215 hours EST. A memo was released on November 28 by Domtar personnel to the Board and IJC acknowledging this incident. The minimum instantaneous water level reached was 130.343 metres (427.63 ft.) which relates to an approximate flow of 0.10 m^3/s (3.53 cfs) .

2.2 Spednic Lake Reservoir and Discharges below Vanceboro Dam

During the year, levels in the reservoir ranged from a maximum daily mean of 117.183 metres (384.46 feet) on 10 July, to a minimum daily mean of 113.892 metres (373.66 feet) on 10 January. The maximum limit specified in the Commission's Order is 117.610 metres (385.86 feet). The minimum allowable level is 113.233 metres (371.50 feet) for the period of 1 October to 30 April inclusive, and 114.757 metres (376.50 feet) for the period of 1 May to 30 September inclusive. The Order was maintained throughout the year. The daily mean elevations for the Spednic Lake Reservoir during the year are presented in Table III and depicted in Figure III of the Appendix.

The maximum daily mean discharge recorded from the outflow at the reservoir at Vanceboro was 47.9 m^3/s (1690 cfs) on 24 October and the minimum daily mean recorded was 4.76 m^3/s (168 cfs), on 11 April. The Commission's Order of a minimum flow of 5.66 m^3/s (200 cfs) was maintained throughout the year except for an apparent unexplained low flow event beginning on April 10 and ending on April 12. During this time an apparent change in flow below the minimum was recorded at the Vanceboro Gauge. Domtar personnel were not immediately aware of the low flow condition, as the alarm from the Vanceboro gauge did not activate to alert staff that flows had dropped below the minimum. As soon as Domtar was aware of the situation, they immediately dispatched dam tending personnel to the site to investigate. On April 12 at 0830, dam tending personnel increased flows to approximately 1000 cfs briefly to flush

any debris they thought might have restricted flows. The flows were then adjusted to slightly above the required minimum. No further action was taken and flows resumed above 5.66 m^3/s (200 cfs) minimum. Investigation of the data by the USGS could not provide any additional details to explain the incident beyond an apparent gate change or blockage at the Spednic Lake Dam. Domtar has no record and are not aware of any deliberate change at the Dam to cause the low flow. At the time of the event, Domtar was targeting a flow just above 200 cfs to restore reservoir levels. Daily mean discharges are presented in Table IV and depicted in Figure IV of the Appendix.

2.3 Water Levels Above The Grand Falls Dam

Table V of the Appendix and Figure V includes a list of the water level elevations of the headpond of the Grand Falls Dam for the report period. The recorded maximum daily mean elevation was 61.979 metres (203.34 feet) on 5 April and the minimum recorded elevation was 61.564 metres (201.98 feet) on 12 October.

The maximum prescribed elevation of 62.106 metres (203.76 feet) (adjusted), as set by the Commission, was not exceeded at any time during the year.

2.4 Discharges at Baring, Maine

Table VI of the Appendix and Figure VI presents and depicts the daily mean discharges of the St. Croix River at Baring, Maine. The mean discharge for the report period was 55.2 m^3/s (1950 cfs). The maximum daily mean was 246 m^3/s (8690 cfs) on 5 April.

The minimum daily mean was 15.4 m^3/s (543 cfs) on 7 February. This discharge is below the normal minimum flow requirement of 21.2 m^3/s (750 cfs) as stipulated by State of Maine's, Department of Environmental Protection. However due to unprecedented low flow levels throughout the St. Croix Basin, The Maine State Department of Environmental Protection on January 10, 2002 granted permission for Domtar to reduce the minimum flow requirement from 21.2 m^3/s (750 cfs) to 15.5 m^3/s (500 cfs) until such time that normal minimum flows could be indefinitely sustained. Flows were restored to above normal limits on February 27, 2002.

2.5 Headwater Elevations Above the NB Power Corp. Milltown Dam

Table VII and Figure VII of the Appendix presents and depicts daily water elevations in the forebay of The NB Power Corporation plant at Milltown, New Brunswick. These elevations refer to mean sea level datum. As daily observations of elevation are not obtained on holidays or weekends, maximum and minimum daily mean water levels are not quoted in this report.

3.0 WATER QUALITY

3.1 Milltown Monitor

There were two periods of lower dissolved oxygen readings during the monitoring period that occurred in conjunction with high water temperatures. These occurred in early July and mid August. Low flows and low reservoir levels may have contributed to these higher water temperatures and low dissolved oxygen readings.

Specifically, a minimum dissolved oxygen reading of 4.9 mg/L on August 19, 2002 was observed. The mean dissolved oxygen reading for that day was 5.5 mg/L. A high water temperature of record was recorded on July 4, 2002, based on the record since September 1969.

St. Croix River at Milltown Station # 01021050
Water-Quality 2002

	June	July	August	September
		Dissolved Oxygen (mg/l) IJC objective = 5.0 mg/l minimum		
Maximum	8.4	7.4	8.2	8.5
Minimum	6.0	5.4	4.9	6.1
Mean	7.4	6.7	6.5	7.5
		Water Temperature (degrees centigrade)		
Maximum	25.6	28.4	27.8	23.8
Minimum	15.1	19.2	21.5	15.8
Mean	18.9	23.0	24.1	19.6
		pH (standard units)		
Maximum	7.1	7.1	7.0	7.1
Minimum	6.7	6.5	6.7	6.6
Mean	6.9	6.7	6.8	6.8

3.2 Water Quality Classification

In 2002, New Brunswick adopted a Water Classification Regulation under its Clean Water Act to set future quality standards for the Province's surface waters. This "ABC" grading system is based upon, and nearly identical to, Maine's water classification system. The NB Department of the Environment &

Local Government (DELG) will implement the new standards on a watershed-by-watershed basis -- beginning with the St. Croix watershed in 2003. DELG will hold public information sessions on the proposed St. Croix classification in April and hopes to move toward adoption of a final St. Croix regulation by late summer 2003. St. Croix field studies and public consultations for this program were carried out by the St. Croix International Waterway Commission under contract to DELG.

The St. Croix International Waterway Commission continues to be instrumental in monitoring water quality in the basin. The extreme drought conditions of 2001 and early 2002 made it impossible to meet the minimum flow requirement without draining all lake storages and certain stream reaches. To avoid the environmental impacts of such a continued drawdown, Domtar was permitted to reduce the minimum flow to 500cfs on a temporary basis in early 2002.

On January 17, January 28 and February 17, 2002, water samples were collected from three principal river sampling stations at the new reduced flows (563-598cfs), when effluent dilution rates would be less than usual. Flows and percent of effluent to river flow on these dates were: January 17 (36.5cfs effluent/ 571cfs river, 6.4%), January 28 (34.1cfs effluent/563cfs river, 6.0%) and February 17 (38.4cfs effluent/598cfs river, 6.4%). Compared to samples collected outside this low flow window, these samples showed no notable difference in dissolved oxygen, pH, temperature or the majority of

tested parameters. Slightly higher values were noted for chloride, conductivity, ammonia, sulfate, phosphorus and nitrogen.

On April 30, 2002, samples were collected at the same three stations at the onset of the mill's annual maintenance shutdown. Average effluent flows of 37.1cfs in the week prior to the outage dropped to 4.8cfs on the morning of April 30. River flows declined from 3050cfs to 1330cfs over the same period, with the percent of effluent to river flow falling from 1.2% to 0.4%. The influence of this reduced loading was observed in the samples taken: somewhat lower values were noted for 14 of the 34 parameters analyzed but not for pH or dissolved oxygen.

In July and August 2000 and 2001 rock-filled riffle bag sets, designed by DELG to assess the health and diversity of benthic invertebrates which enter and inhabit the rocks within the bags, were placed at four lower river monitoring sites. The resulting data, was processed through the Maine Department of Environmental Protection's biomonitoring classification attainment model, showed general classification of the lower section of the river to be Class A and B with one sample in Class C. Some improvement was evident between 2000 and 2001.

4.0 STATUS OF POLLUTION ABATEMENT

4.1 Maine

The Calais sewage treatment plant (STP), that has not been well operated over the

past several years and has been the subject of several State actions, is now under the operation of a private consultant on behalf of the town of Calais. This situation appears to be working well and further difficulty is not expected over the effective operation of the plant. The plant has been in compliance with the requirements of the State Maine over the period covered by this report.

The wastewater treatment plant operated by Domtar met the effluent standards for the State of Maine throughout 2002, the period covered by this report.

During 2002, there was a significant spill of Weak Black Liquor at the Domtar mill. At approximately 10:15 a.m. Friday, September 13 an expansion joint failed on the line feeding the Liquor flow pumps associated with a Weak Black Liquor storage tank. Weak Liquor is an alkaline material containing sodium hydroxide, water suspended wood solids and dissolved wood extracts. Domtar immediately took action to contain the spill and notified authorities listed in its spill notification plan. The leaking Black Liquor was at a temperature in excess of 250 degrees F. and the high temperatures of the material aggravated the containment efforts. Initially Domtar thought the spill was about 2,700 gallons. However, due to leaking at the containment site through cracks in the floor, the spilled material saturated the ground and continued to flow from the site into the river. The final spill estimate was about 156,600 gallons. The effect of the spill on water quality at the time is unclear, however the fish hatchery at Milltown that used river water for its tanks did experience mortality of salmon parr. No effect was

observed at the USGS Milltown monitor station during or following the event. Domtar did increase flows to dilute the spill during the event.

Following the spill, Domtar, river stakeholders and regulatory agencies met to discuss ways to improve the spill notification system along the river.

4.2 New Brunswick

The sewage treatment plants at St. Stephen and Milltown did not report any serious upsets during 2002. Waste currently treated at these two plants will be combined and treated in a new plant located on the south side of the town of St. Stephen. Design and permitting are in progress and work on the plant is expected to begin in late summer 2003. The plant will be primary and secondary treatment, but its capacity and the use of updated technology will provide added safeguards for the River and are expected to improve water quality in the estuary. Infrastructure funding provided by the federal and provincial governments has made this badly needed change possible.

5.0 FISHERIES

5.1 Alewife

The blockage of alewife migration in the St. Croix River, which was initiated by the State of Maine in 1995, is still in place. The Board was hopeful that the problem would be resolved following a series of exchanges between the State of Maine and the U.S. Fish and Wildlife Service where it was suggested that the provision of annual funding from

the Service would be withheld unless Maine operated the fishways in a manner that was intended when they were originally built with federal funds. It has become recently apparent that the time limitation (25 years) on the federal claim to the fishways has expired. Therefore, the opportunity to use this federal leverage to encourage the State to reconsider the alewife blockage is not available. It appears that there will not likely be any move by the State to cooperate with those fisheries interests (and the interest of the Board) that would like to see implementation of the management plan which has been designed for limited alewife access to the system combined with studies of their effect on other species. From an ecosystem perspective, the Board still supports the management plan that would restore alewives to the river and will continue to monitor the situation and seek a resolution.

In 2001, the number of returning alewives had dropped to 5202 from a sustained average migrating population in the early 1990's of 338,000. In 2002 this number reached a 22 year low of 900 fish. Department of Fisheries and Oceans continued to truck alewives from Milltown to the Woodland Flowage below Grand Falls as part of its stated position over Maine's continuance of the blockage. Approximately 3756 alewives were trucked in a three-week period during May 2001. In 2002, 807 fish were trucked.

In late 2000/early 2001, a management plan was developed by the St. Croix Fisheries Steering Committee, comprised of representatives of the U.S. Fish and Wildlife Service,

Canadian Department of Fisheries and Oceans (DFO), Maine Dept. of Inland Fisheries and Wildlife, Maine Department of Marine Resources, Maine Atlantic Salmon Commission, New Brunswick Department of Natural Resources and Energy, and St. Croix International Waterway Commission. The management plan (MOU) for alewives and smallmouth bass would permit controlled access of alewives (4 fish per surface acre) past the Grand Falls Dam, for studies, but would continue to block their access to Spednic Lake. Although senior officials of all agencies agreed to the plan, a bill which was submitted to the Maine Legislature to rescind the 1995 Legislation did not pass. Failure of the bill was attributed to a strong lobby from a group of stakeholders (guides) determined to defeat the bill in the interest of a lucrative smallmouth bass sport fishery in the system's larger lakes and flowages, which they claim to be in conflict with the presence of alewives. Their arguments are not well supported from a scientific or ecological perspective.

The Board, through funding made available from the Washington office of the IJC, has undertaken a review of the available literature on alewife - bass interaction and hopes to continue efforts to support further such studies and research which would supply a better understanding of the implications of anadromous alewives in the system. The importance of a stronger association with the St. Croix Fisheries Steering Committee has become apparent to the Board and efforts to enhance that relationship are being made. Board attendance at the 2002 October Fisheries Forum was part of this effort.

5.2 Landlocked Alewives

Concern continues over the growth and spread of landlocked alewives throughout the upper part of the basin. They have now spread down the system and can be found in Grand Falls Flowage and below. This species competes with native landlocked smelt for habitat and has altered the diet of larger sport fish. The presence of landlocked alewives appears to upset the balance between landlocked salmon and smelt and jeopardize the viability of the salmon populations for the sport fishery. It may be that the absence of sea-run alewives has provided them a selective advantage. Sport fishermen and freshwater biologists are concerned about this displacement and plan to study its impact on other fish species. The Maine Department of Inland Fish and Wildlife have collected samples of landlocked alewives for genetic analysis to determine how distinguishable they are from anadromous strains.

5.3 Atlantic Salmon

The research trap at the head of the Milltown fishway was operated and monitored continuously from April 19 to November 1, 2002. The fisheries program at Milltown is supported by agencies and user interests on both sides of the U.S./Canada border. This demonstrates a shared commitment to the value of the St. Croix's anadromous fish stocks and to the benefits to be gained from public/private collaboration. The St. Croix International Waterway Commission (IWC) provides leadership and logistical support for this initiative.

Returns of Atlantic salmon continue to be low. Of the 26 fish counted at the Milltown fish trap only 6 were aquaculture escapees. The remaining 20 adult salmon were retained as brood stock to support the restoration program aimed at maintaining and enhancing the native population in the River. The number of aquaculture escapees were much lower than the average 25 - 30 fish in recent years. Aquaculture escapees are a major concern of fisheries biologists who fear that inter-breeding of native an aquaculture fish will dilute the gene pool of native fish with unknown consequences for the future survivability of the species in the wild.

During recent years, juvenile salmon resulting from eggs hatched and reared from native brood stock have been released into the River in the fall. A total of 23,858 were released in 2002 and 31,950 eggs are currently being incubated for rearing and release in 2003. Additional smaller releases of older juvenile salmon and smolt and a return of the spawned fish to the River complete the Salmon restoration activities for the year. Studies of fish health, juvenile recruitment, movement of young and adult salmon and other research initiatives are supported by the IWC and fisheries interests in the basin.

6.0 STUDIES

6.1 Environmental Trends in the St Croix Estuary Study

This is a multi-stage, two-year project designed to determine the current health of the St. Croix Estuary and the ecological trend in the estuary for the last 20 years. Tasks, deliverables, status, and deadlines for the two year term of the project were monitored

and discussed by the funding agencies of which the IJC Board was one.

This overall project, which is being undertaken by the St. Croix Estuary Project (SCEP), is scheduled for completion in 2003. The portion of the work which was funded by the IJC includes monitoring and sample collection along several underwater transects in the St. Croix estuary at roughly the same locations as a 1970 study. Water chemistry data is also being collected at stations throughout the estuary. Current work will document changes and allow an evaluation of any trends which seem to have taken place over the past 30 years. Part of the effort has been the accumulation of literature and references and SCEP now has an extensive library resource specializing in the St. Croix Estuary and Passamaquoddy Bay Region with total acquisitions of 1,943 titles. Other elements of the project include; training of monitoring and sampling staff, biological sampling, bacterial monitoring and chemistry and microbiological data collection.

An important part of the study has been the development and adoption of appropriate protocols. Transects were established in ten study zones throughout the estuary along which benthic and intertidal sampling has been carried out. Water quality sampling along the transects has also been conducted. Survey work has been carried out to help determine pollution sources.

Data collected in this work will be compiled in a database, which is being developed for

the study and will connect with other work that is going on among agencies and other organizations in the basin. A status update was provided to the Board by SCEP in November 2002 and a report on the segment of the study funded by the Board will be available in Summer 2003. Status of current work and other SCEP initiatives can be viewed at their web site, which is http://www.scep.org/intro.html.

6.2 Sewage Treatment Plant Protocols Study

Work on an Operations and Performance Survey of Sewage Treatment Plants in the St. Croix River was carried out in mid October, 2001 by CPO Inc. of Burlington, Ontario. The survey focused on four plants at Milltown, St. Stephen, NB and Bangor and Baileyville in Maine. This project was funded by the IJC and carried out under the supervision of the Canadian Board Secretary, Dr. Peter Eaton. Involved in the survey along with CPO Inc. were staff of the Maine Department of Pollution Prevention and the NB Department of Environment and Local Government as well as operators at the plants.

In addition to documenting and verifying effluent quality from the four plants and assessing operational practices, the study identified differences in operating protocols, reporting procedures, management pressures, monitoring practices and other areas which could affect water quality in the river or the ability of the agencies to manage emergencies and other upsets or developments concerning STPs. The exercise served as a valuable learning opportunity for the Maine DEP and NB DELG staff. A final report

has been provided to the Board and is being presented to the IJC for approval and further distribution. The study recommends improved data gathering and reporting, particularly in NB, and the development of specific procedures for contingency sludge disposal at Calais among other recommendations aimed at improving the operation of all of the plants studied.

6.3 Anadromous Alewife - Bass Interactions: a Literature Review

The Board, with the assistance of the U.S. Office of the IJC, has undertaken a review of available data and information on aspects of the life history of the anadromous alewife in the St. Croix Watershed and its interaction with small mouth bass. This work is being carried out under contract to Dr. Allen Curry at the University of New Brunswick. Dr. Curry is Acting Chair and Associate Professor in the Biology Department and is the DNRE/Cloverleaf Professor of Recreational Fisheries and Assistant Director, New Brunswick Cooperative Fish and Wildlife Research Unit. He has connections with the Canadian Rivers Institute at the University of New Brunswick and has conducted studies on anadromous alewives and related species. The project is costing approximately $15K, U.S., and will be completed in spring 2003.

7.0 OTHER ISSUES

7.1 Land Use

Land use and shoreline development are important concerns of the Board and have the potential of placing increasing stress on the water quality of the St. Croix River over the

next decade or so. Several initiatives taking place in Maine and NB are addressing this issue. The purchase of Devil's Head, a 315-acre promontory on the St. Croix estuary at Calais, was completed in February 2003. This site, which is the highest headland in the St. Croix basin, will be owned by the City of Calais under state agreements for permanent conservation and public access. It directly faces a 330-acre property at Todd's Point, New Brunswick, which was acquired as a nature park in March 2002. The Devil's Head and Todd's Point projects were sponsored by the St. Croix International Waterway Commission and St. Croix Estuary Project, respectively.

A multi-million dollar initiative to acquire and protect 49 miles of Maine shoreland on Spednic Lake and the upper St. Croix River is expected to conclude successfully in late March 2003. This is the final stage of an eleven-year project in Maine and New Brunswick to conserve nearly 70 miles of riparian corridor in the center of the international St. Croix watershed. The new acquisition, a 500-foot wide shoreland corridor and a number of islands, will be added to state-owned lands purchased previously.

This complements similar action in New Brunswick. In 1999, the province acquired over 380,000 acres of forestland (much of the upper St. Croix watershed), including the lands along the headwater lakes and upper river from the Georgia-Pacific Corporation. The province has established

Protected Natural Areas (designated wilderness areas) on a 100 square mile segment along the shores of Spednic Lake and on at a smaller (3,990 hectare) site surrounding Canoose Flowage, also in the St. Croix watershed. Formal legislation and conservation plans for these areas are now being developed. The remaining lands acquired from G-P have been retained as commercial forest, with established shoreland buffers along the St. Croix boundary waters.

APPENDIX TO

2002
ANNUAL REPORT

of the

INTERNATIONAL ST. CROIX RIVER BOARD

covering

The Orders of Approval with respect to the control of the discharge of the St. Croix River at Forest City, Vanceboro, Woodland and the water levels of East Grand Lake, Spednic Lake, Grand Falls Flowage and Milltown Dam Forebay.

SUBMITTED TO

THE INTERNATIONAL JOINT COMMISSION

CONVERSION EQUATIONS AND SIGNIFICANT FIGURES

Cubic metres per second x 35.315 = cubic feet per second

Metres x 3.2808 = feet

Water discharge	- cubic metres per second reported to 3 significant figures but not more than three decimal places.
Water levels	- observations made to nearest 0.002 metre and are referred to mean sea level datum.
Water levels	- publications and computations quoted to nearest 0.001 metre and are referred to mean sea level datum.

ORDERS OF APPROVAL

INTERNATIONAL JOINT COMMISSION

9 November, 1915- For approval of a dam and power canal and the obstruction, diversion and use of the waters of the St. Croix River at Grand Falls in the State of Maine and the Province of New Brunswick: Maximum elevation 202.0 feet m.s.l.

3 October, 1923- Erection and repairs of fishways in the St. Croix River.

6 October, 1931- For the obstructions of the waters of the St. Croix River at Grand Falls in the State of Maine and the Province of New Brunswick. Increase in elevation to 203.5 feet m.s.l.

2 October, 1934- For the reconstruction of a dam across the St. Croix River from Milltown in the Province of New Brunswick to Milltown in the State of Maine.

15 October, 1965- For the construction of a storage dam in the St. Croix River at Vanceboro, Maine and St. Croix, New Brunswick:

Discharge from Spednic Lake-	200 cfs (5.66 m3\s) minimum
Elevation of Spednic Lake-	385.86 feet (117.611 metres) maximum
Between 1 October and 30 April-	371.50 feet (113.233 metres) minimum
Between 1 May and 30 September-	376.50 feet (114.759 metres) minimum
Discharge from East Grand Lake-	75 cfs (2.12 m3\s) minimum
Elevation of East Grand Lake-	434.94 feet (132.571 metres) maximum 427.94 feet (130.438 metres) minimum

16 November, 1982- For the reconstruction of the diversion dike in the St. Croix River near Baileyville, Maine.

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INSPECTION TOUR OF IJC REGULATED FACILITIES
14-15 AUGUST 2002

The individuals identified below attended all or part of the facilities inspection tour.

Name	Position/Representing
Rt. Hon. Herb Grey	Commissioner, IJC, Canadian Section
Mr. Dennis Schornack	Commissioner, IJC, US Section
Murray Clamen	Secretary, IJC, Canadian Section
Gerry Galloway	Secretary, IJC, US Section
Mr. Rudy Koop	Engineering Advisor, IJC, Canadian Section
Nick Heisler	IJC, Canadian Section
Mr. Ken Hamilton	St Croix Board, Canadian Section
Mr. Bill Appleby	St. Croix Board, Canadian Section
Mr. Bill Ayer	St. Croix Board, Canadian Section
Mr. Joe Arbour	St Croix Board, Canadian Section
Mr. Paul Noseworthy	Environment Canada
Col. Thomas Koning	St. Croix Board, US Section
Mr. Don Porteous	St. Croix Board, US Section
Mr. Ed Logue	St Croix Board, US Section
Mr. Peter Eaton	Secretary, St Croix Board, Canadian Section
Ms. Barbara Blumeris	Secretary, St. Croix Board, US Section
Ms. Donna Adams	Domtar Industries, Inc.

Mr. Jay Phelps	Domtar Industries, Inc.
Mr. James Provencher	Domtar Industries, Inc.
Mr. Jay Beaudoin	Domtar Industries, Inc.
Ms. Gaile Nicholson	Domtar Industries, Inc.
Mr. Jeff Babcock	New Brunswick Power Co.
Mr. Glen Hanson	New Brunswick Power Co.
Lee Sochasky	St. Croix International Waterway Commission

FOREST CITY DAM & FISH LADDER

General

The Forest City Dam is a small timber crib rock filled dam with three (3) wooden sluice gates that are operated utilizing a wooden ratchet lever system that lifts the gates by a steel cable or steel chain. The three gates have an opening of 8'-4" (2.54 m) and a sill elevation of 427.94 feet (130.44 m) NGVD. Full pond elevation is at elevation 434.94 feet (132.57 m) NGVD, and impounds 105,300 acre-feet (0.130 km3) of water. The fishway is located on the left side (facing downstream) of the dam and consists of timber baffle system with a timber trash rack upstream. There is a gauging station located immediately downstream on the right bank that measures information regarding stage that, through the use of a rating table can be converted to determine discharge from East Grand Lake. There is also a gauging station upstream to measure the East Grand Lake water level.

Inspection Comments

During the time of the inspection East Grand Lake elevation was 433.24 feet (132.054 m). East Grand Lake was approximately 75.83 percent full. The number 1 and 2 sluice gates were in the closed position. Sluice gate 3 was opened 24 inches. The discharge at the time of the inspection was approximately 216 cfs.

The timber structures of the dam, the gates and fish passage facility appear to be in satisfactory condition. As noted in past inspections there was still a tilting of the left section of the timber cribbing and the fish passage facility. The tilting appears to be the result of settling or other soil action at the left section of the timber crib dam and fish passage area. Domtar agreed to continue monitoring this by periodic surveying to determine any movement. Domtar refurbished the crib and ballast at the dam in 2000 and plan to replace the gates in Fall 2002. Both the upstream and downstream gages were inspected and minor maintenance will be performed at the lake level gauge.

Conclusion

The facility appears to be in satisfactory condition. Domtar will continue to monitor the dam concerning any movement of the left abutment near the fishway. Gates are scheduled to be replaced in Fall 2002.

VANCEBORO DAM & FISH LADDER

General

The Vanceboro dam consists of a concrete gate structure and earth embankment with rock filled gabions in the upstream face. The concrete structure is 69 feet (21 m) long, containing a fishway and two taintor gates, each 22'-6" (6.9 m) wide by 14'-6" (4.4 m) high. The gates are operated electrically utilizing cable lifts. The gate structure is located on the International Boundary line between the United States and Canada. The gate sill elevation is at 371.5 feet (113.23 m) NGVD. Normal full pond elevation is at 385.86 feet (117.61 m), with an impounded surface of 20,870 acres (84.5 km2). There are approximately 221,200 acre-feet (0.27 km3) of useable storage at normal full pond. The fishway is located on the left side of the dam and consists of 10 bays or pools and has 5 vertical lift wooden gates to regulate flow through the ladder. The trash rack on the upstream face of the fish passage consists of steel bars spaced approximately 1 foot in the horizontal direction and 3 feet in the vertical.

Inspection Comments

During the time of the inspection, Spednic Lake, controlled by the Vanceboro Dam, was at an elevation of 383.63 feet (116.932 m) and was approximately 84.51 percent full. The two taintor gates were opened 8.4 inches each and a discharge of approximately 670 cfs was being released.

The facility appeared to be in good condition and the taintor gates are operational. Minor seepage was observed in a construction joint at the fish passage facility similar to what was observed in 2001. The lake level gage was inspected and found to be operational. Paul Noseworthy, Environment Canada, suggested that Domtar may wish to consider an upgrade to the lake level data logger in future.

Conclusion

The Vanceboro facility appears to be in good condition.

GRAND FALLS FLOWAGE DAM & PASSAGE FACILITIES

General

The Grand Falls Flowage Dam located approximately 8 miles upstream of the town of Baileyville, Maine, controls the water that drains from the west branch of the St. Croix River and can store approximately 88,000 acre-feet of water. The Grand Falls Flowage Dam has 9 steel taintor gates located on the right of the spillway and a concrete emergency spillway approximately 800-850 feet in length running from the concrete gatehouse and ending at the left shoreline. The gatehouse used to operate the gates is located between the gates and the emergency spillway. The spillway has 113 wooden flashboard sections that increase the pool height approximately 6-8 feet. The spillway area is equipped with a bubbler system to reduce the effects of ice on the flashboards and spillway. The entire upstream length of the spillway can be inspected via a floating walkway. There is a gauging station that records the Grand Falls Lake level located on the right bank of the dam.

The downstream face of the emergency spillway/dam consists of a concrete face sloping downstream at an angle of approximately 45 degrees supported by concrete buttresses along its length. Between these buttresses are bays with a space between the face of the dam/spillway and the supporting buttresses that has been enclosed by a pressure treated timber log system. This log system was installed to attempt to minimize this temperature differential in the downstream face area during freezing conditions to reduce possible degradation of the concrete face. The downstream face of the dam/spillway may be examined via a walkway located between the dam face and the log system.

The fish passage facilities at Grand Falls are located in the area around the Domtar hydroelectric generating plant. Water is impounded behind Grand Falls Flowage Dam and delivered to the hydroelectric plant and fish passage facilities via a channel that is located on the right side of the impoundment pool approximately 1000 feet upstream of the impoundment dam.

The water to the turbines flows via three steel penstocks (two of which have surge tanks). The downstream passage facilities are located on the right of the hydroelectric plant (looking in a downstream direction). The downstream passage facility consists of a steel V-shaped flume supported on metal cradles. The upstream fish passage facilities are located on the left of the hydro plant and consist of a series of concrete pools or bays that allow the fish to slowly passage upstream. The bays are equipped with guide slots that allow for the installation of pressure treated lumber frames to direct the flow from one bay to the next.

Inspection Comments

At the time of the inspection, the pool level behind the Grand Falls Dam was approximately 197.38 feet (60.162 m) and this pool level is about 81 percent of full pool condition. During the inspection, the downstream flow was approximately 1,445 cfs. All of the taintor gates were in the closed position. The gage that measures the pool level behind the Grand Falls dam was inspected and found to be operating properly.

The downstream face of the facility was viewed and a great deal of cracking, spalling and delamination of the gunite layer on downstream face was noted as in prior years. It should be noted that this gunite layer provides a wearing surface and is not considered a structural element of the facility. On the left abutment area there was a U-shaped spalled area 6-inches deep with exposed rebar. Reinforcing bars were also exposed on the downstream face along several of the bays.

On the interior inspection, several of the bays showed spalling and seepage, mainly through construction joints. Minor seepage was observed in several of the Bays. It should be noted that spalling and minor seepage is common in facilities of this age, particularly in the severe climatic conditions the facility endures.

The upstream and downstream fish passage facilities were also viewed and no significant repair issues were noted.

Conclusion

The facility appears to be in satisfactory condition although several possible rehabilitation and maintenance items were noted as in past years.

MILLTOWN DAM & FISH PASSAGE FACILITIES

General

The Milltown facility is located in Milltown, New Brunswick across the river from Calais, Maine and approximately one mile upstream from the international bridge between Calais and St. Stephen, New Brunswick. The facility consists of a powerhouse with 7 hydroelectric generating units, an upstream fish passage facility that goes from the lower pool around the left side of the powerhouse to the upper pool. The emergency spillway is located to the right of the powerhouse and has 6 openings that have large wooden stoplogs that can be removed or installed via a railed vertical lifting mechanism. Other sections of the emergency spillway have been equipped with wooden stoplogs that will fail during periods of high stage. At the far end of the emergency spillway running perpendicular from the spillway to the right bank is a gatehouse with 5 vertical lift wooden gates used to control the forebay elevation. A wooden chute downstream fish passage facility is located in the area between the spillway and the gatehouse.

Inspection Comments

The Board examined the concrete crack in the interior of the powerhouse running the length of the powerhouse in front (downstream) of turbines 5-7 and up the brick wall separating unit 5 and unit 4. NB power continues to monitor the movement of the downstream wall of the powerhouse at units 5 to 7 to determine when and if remediation will be required

NB continues to work on the repair of the external brickwork on the powerhouse. NB indicated they plan to complete work on the power house brick work in 2003.

The Board observed seepage through the stone blocks in the downstream wall of the powerhouse. This seepage had been observed in prior years. NB indicated

that they have asked their engineering consultant to take a look at this and report back on any required maintenance.

As in past inspections, extensive spalling of concrete was observed to the concrete piers of the spillway. The spalling in the bottom area of these piers has exposed the steel reinforcing of the piers. The New Brunswick Power (NB) representative indicated that there are no immediate plans to take any corrective action regarding the spalling of concrete piers, but is included in maintenance plan for 2005/2006.

The Board inspected the gatehouse and noted that restoration work here is almost completed and NB noted will be completed in 2002.

During the inspection the upstream and downstream fish passage facilities were also viewed. NB recently completed resurfacing work on the downstream passage baffles.

Conclusion

Although there is no evidence to suggest that the spalling and cracking of the piers of the Milltown spillway and the spillway section poses an immediate problem, it does allow water penetration and will accelerate deterioration of the concrete and reinforcing steel. It is assumed that NB Power will, as indicated by its representative, continue to monitor the cracking situation in the powerhouse.

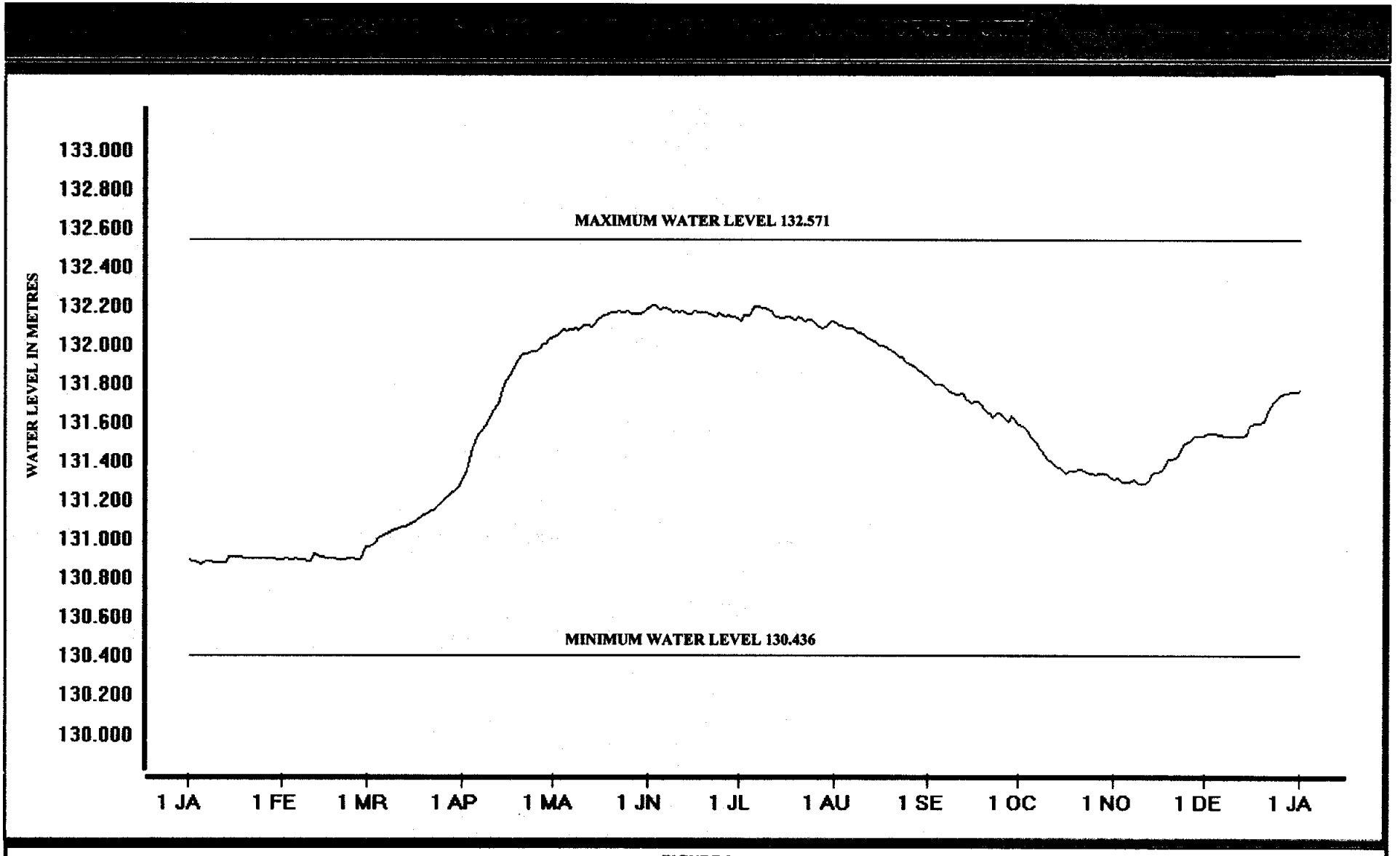

WATER LEVEL IN METRES
133.000
132.800
132.600
132.400
132.200
132.000
131.800
131.600
131.400
131.200
131.000
130.800
130.600
130.400
130.200
130.000
MAXIMUM WATER LEVEL 132.571
MINIMUM WATER LEVEL 130.436
1 JA
1 FE
1 MR
1 AP
1 MA
1 JN
1 JL
1 AU
1 SE
1 OC
1 NO
1 DE
1 JA

FIGURE I

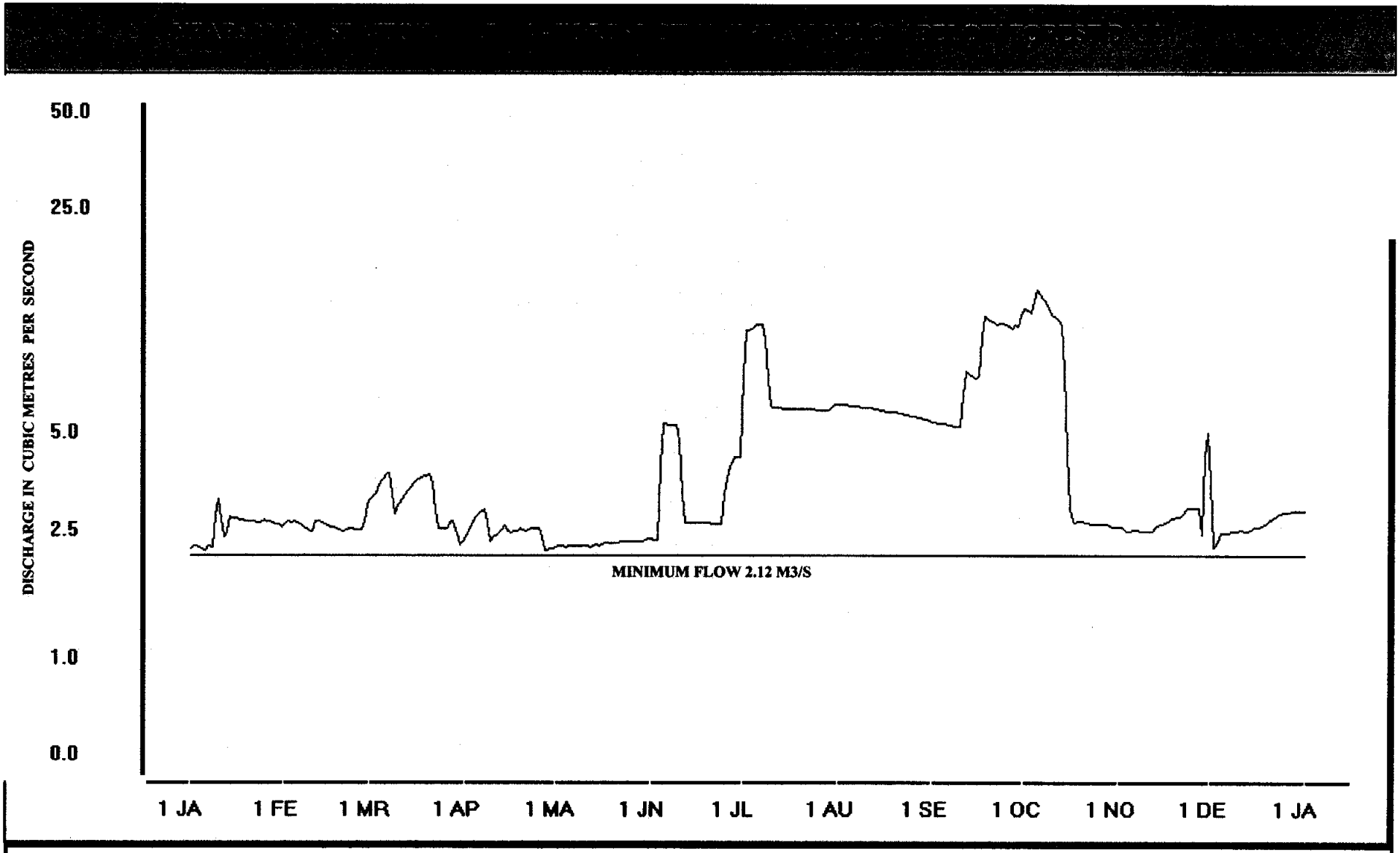

50.0
25.0
5.0
2.5
1.0
0.0
DISCHARGE IN CUBIC METRES PER SECOND
MINIMUM FLOW 2.12 M3/S
1 JA
1 FE
1 MR
1 AP
1 MA
1 JN
1 JL
1 AU
1 SE
1 OC
1 NO
1 DE
1 JA

FIGURE II

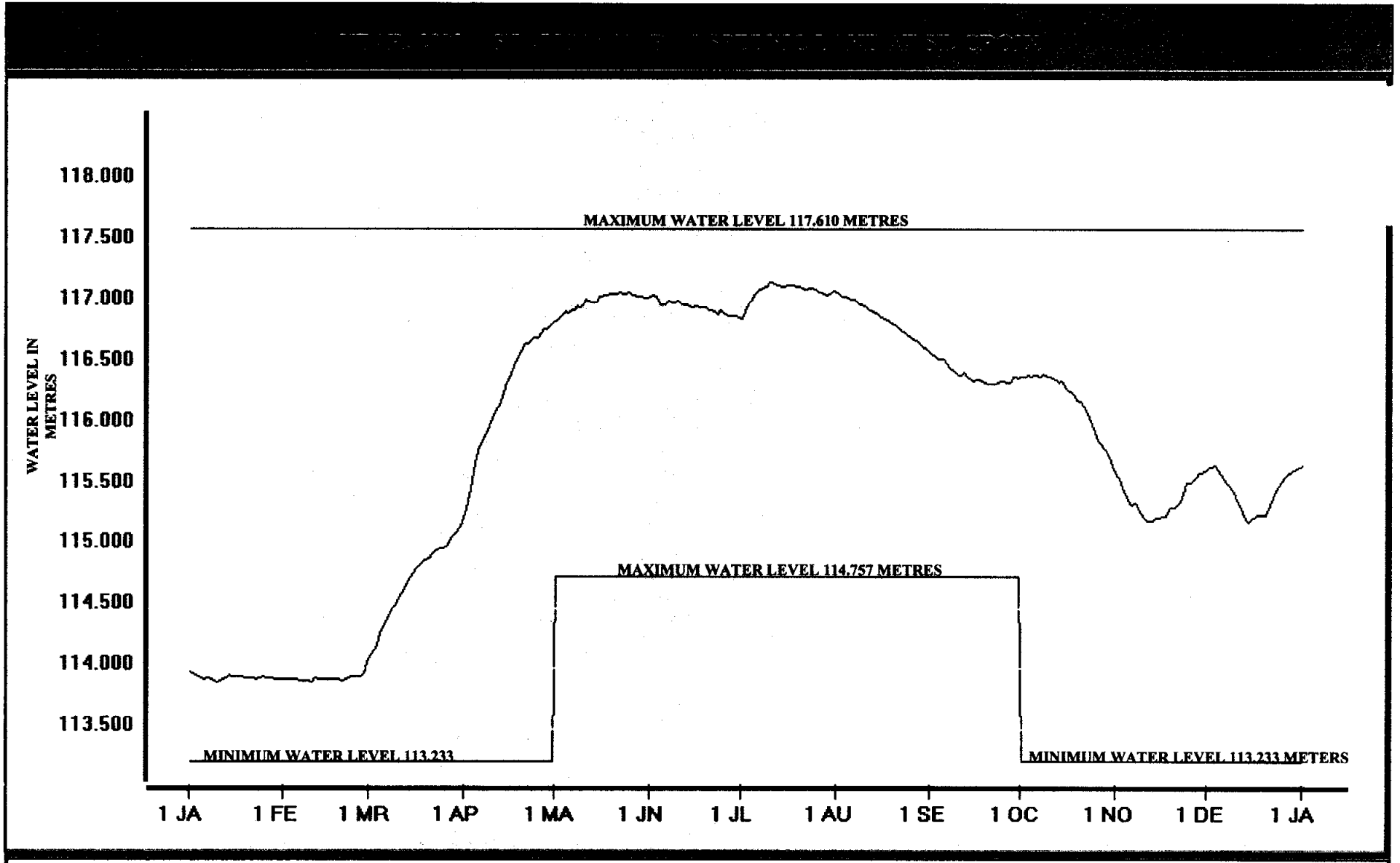

118.000
117.500
117.000
116.500
116.000
115.500
115.000
114.500
114.000
113.500
WATER LEVEL IN METRES
MAXIMUM WATER LEVEL 117.610 METRES
MAXIMUM WATER LEVEL 114.757 METRES
MINIMUM WATER LEVEL 113.233
MINIMUM WATER LEVEL 113.233 METERS
1 JA
1 FE
1 MR
1 AP
1 MA
1 JN
1 JL
1 AU
1 SE
1 OC
1 NO
1 DE
1 JA

FIGURE III

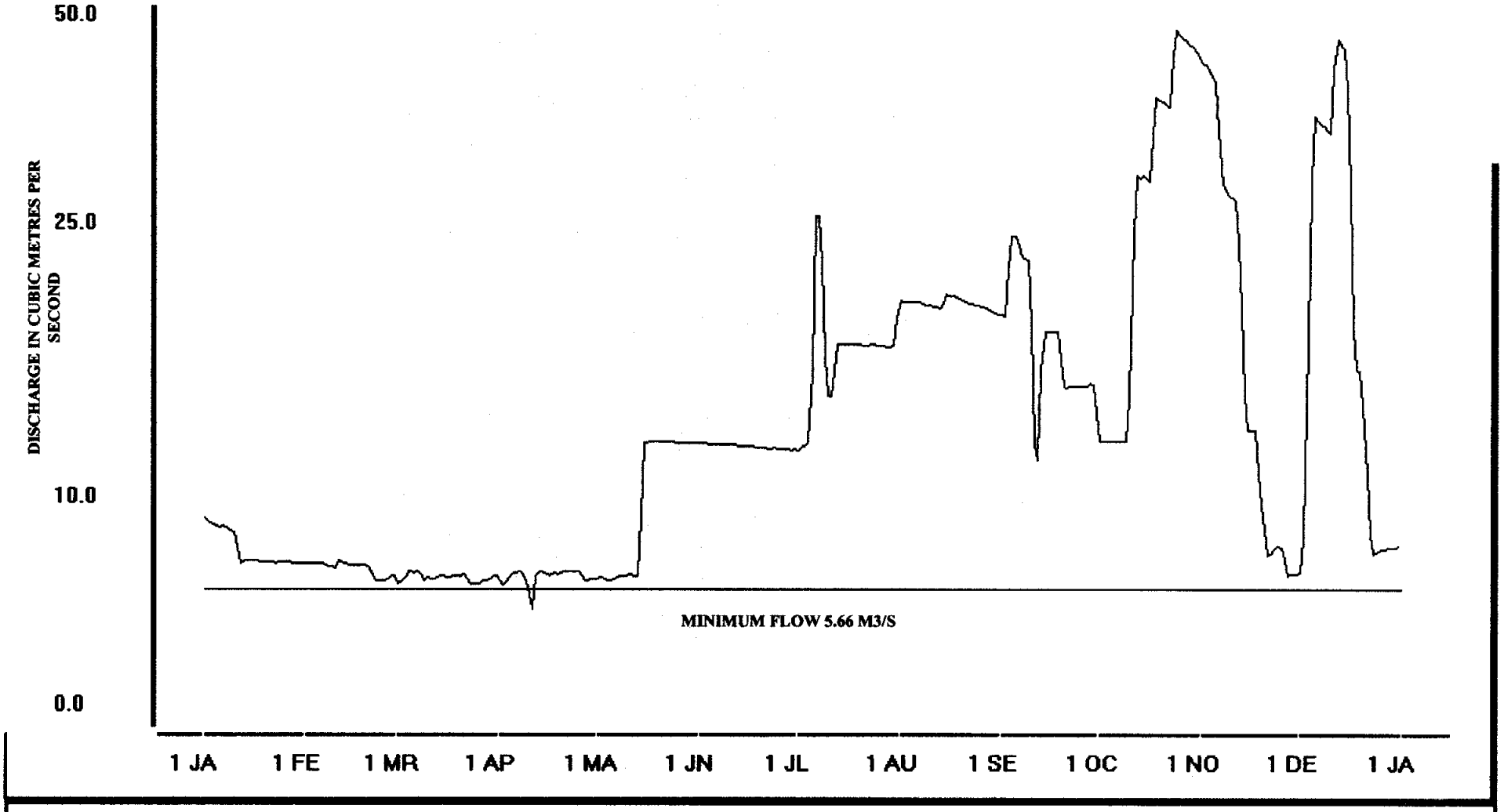

50.0
25.0
10.0
0.0
DISCHARGE IN CUBIC METRES PER SECOND
MINIMUM FLOW 5.66 M3/S
1 JA
1 FE
1 MR
1 AP
1 MA
1 JN
1 JL
1 AU
1 SE
1 OC
1 NO
1 DE
1 JA

FIGURE IV

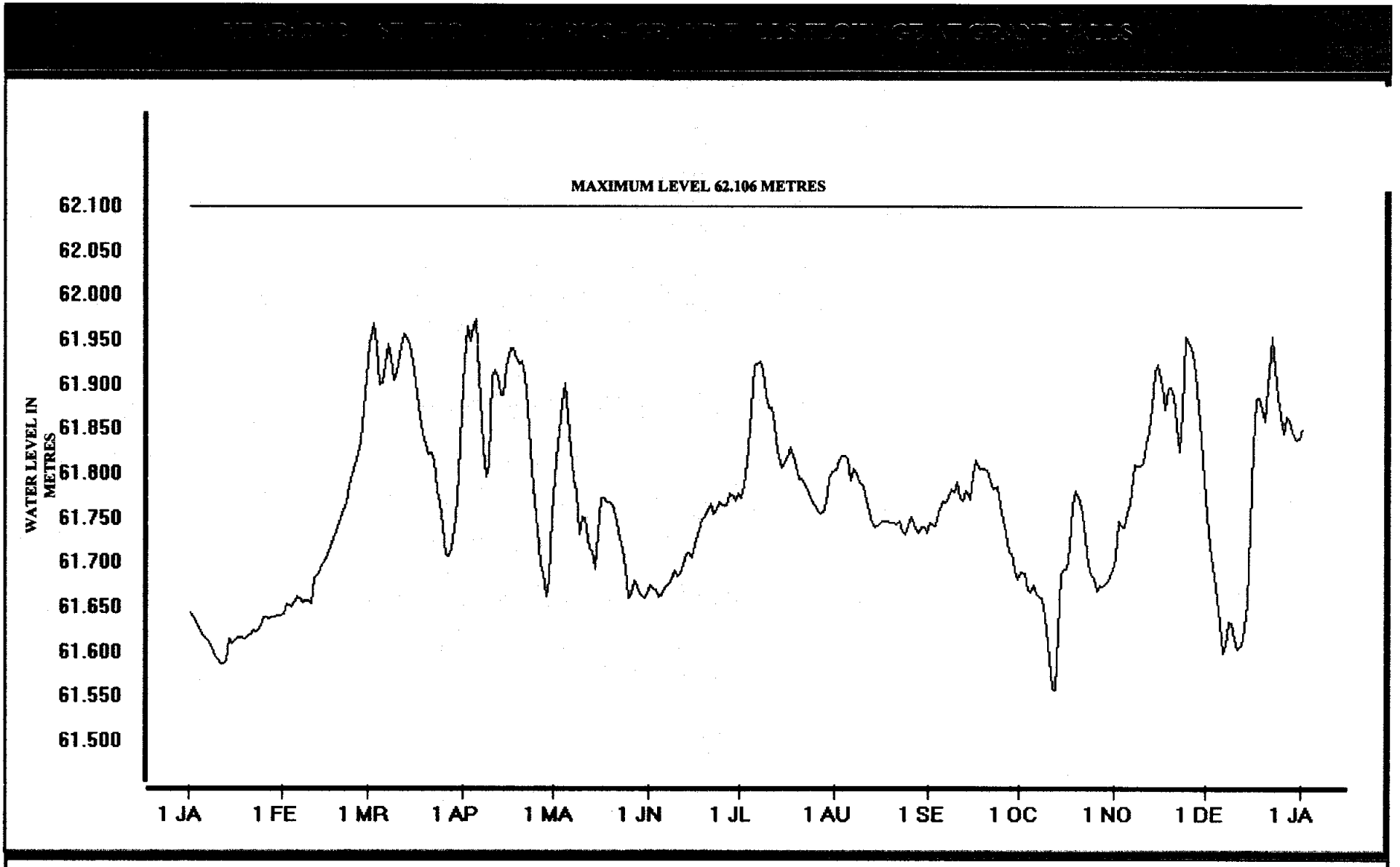
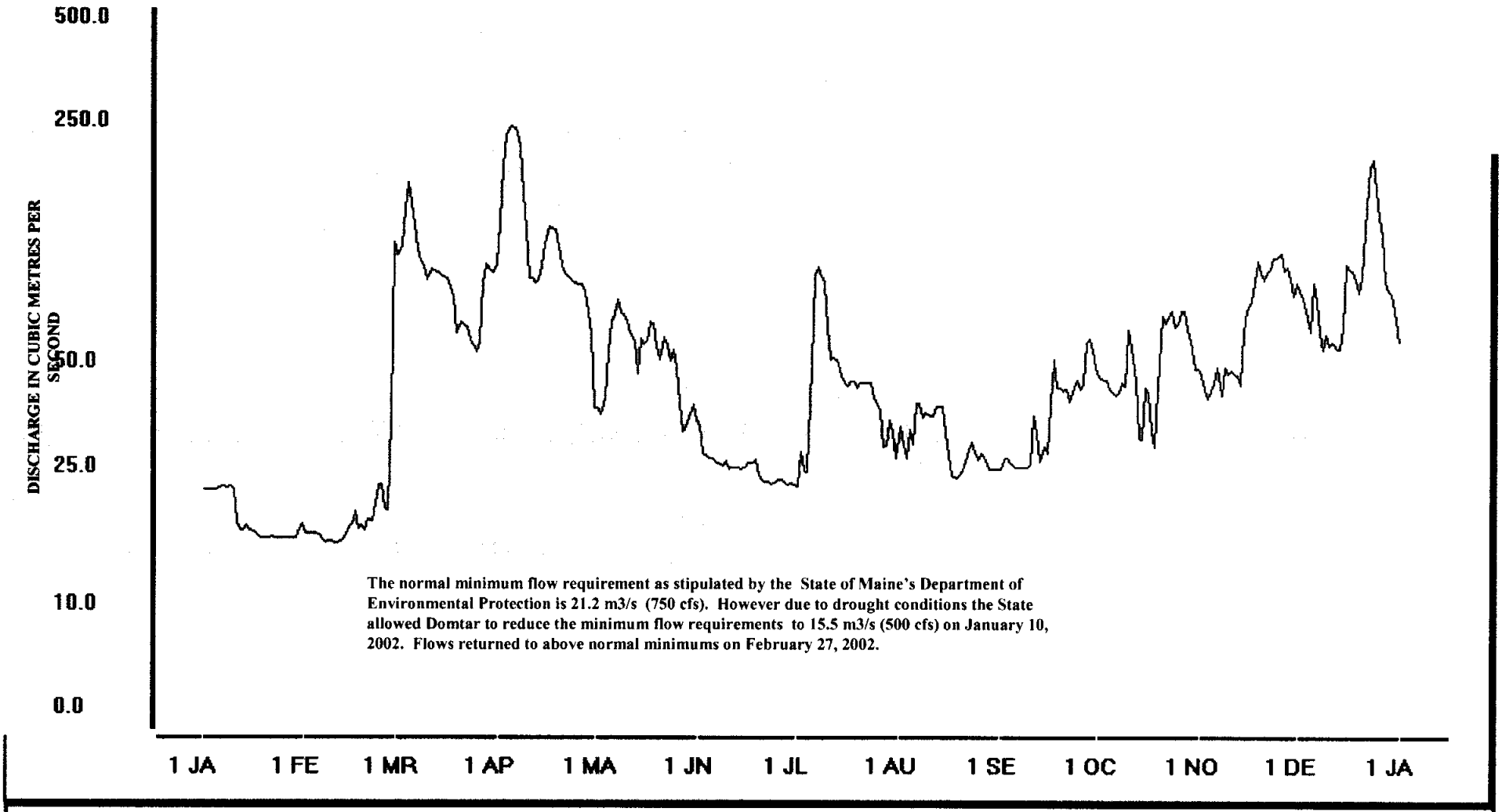

MAXIMUM LEVEL 62.106 METRES
62.100
62.050
62.000
61.950
61.900
61.850
61.800
61.750
61.700
61.650
61.600
61.550
61.500
WATER LEVEL IN METRES
1 JA
1 FE
1 MR
1 AP
1 MA
1 JN
1 JL
1 AU
1 SE
1 OC
1 NO
1 DE
1 JA

FIGURE V



The normal minimum flow requirement as stipulated by the State of Maine's Department of Environmental Protection is 21.2 m3/s (750 cfs). However due to drought conditions the State allowed Domtar to reduce the minimum flow requirements to 15.5 m3/s (500 cfs) on January 10, 2002. Flows returned to above normal minimums on February 27, 2002.

FIGURE VI

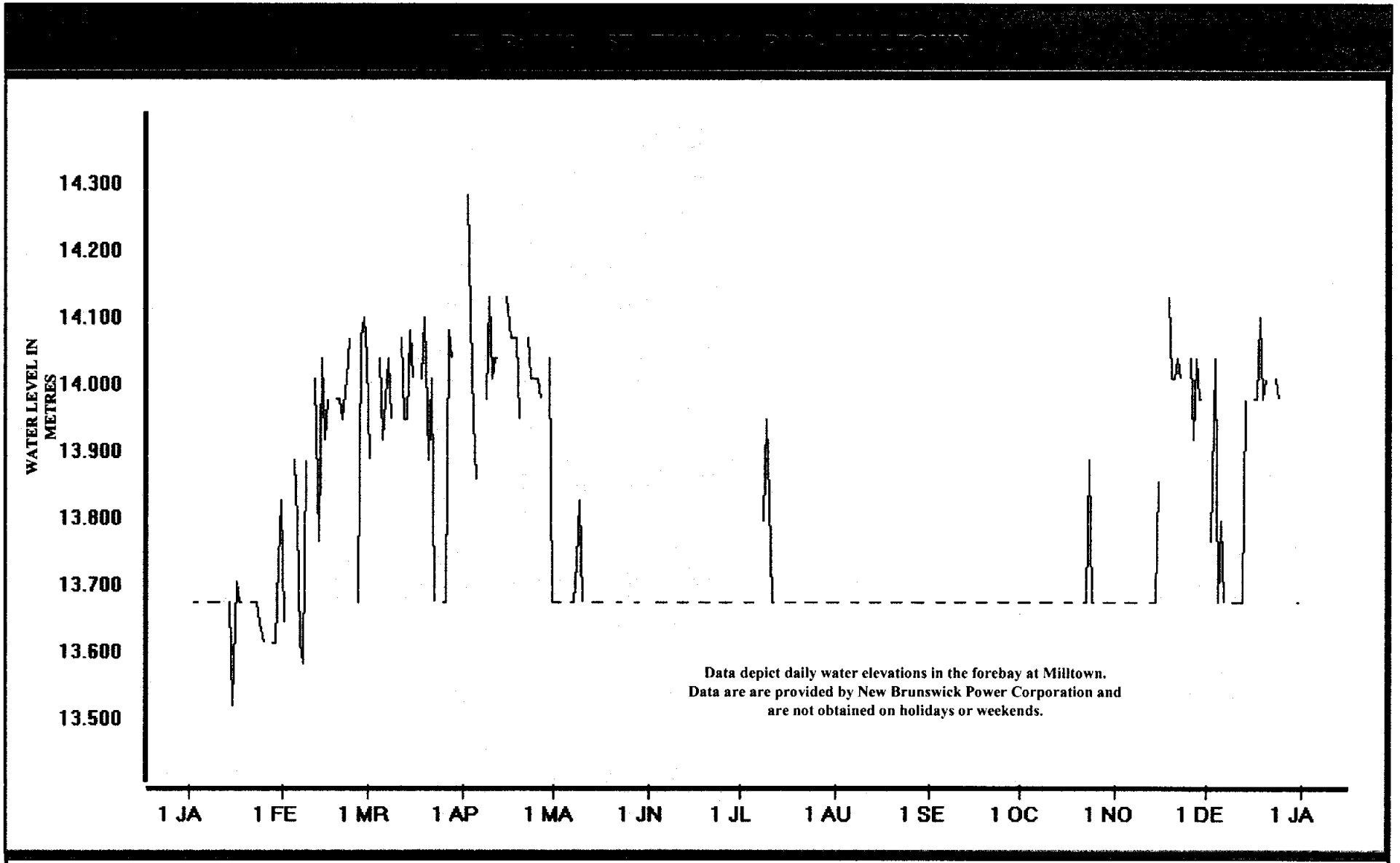

WATER LEVEL IN METRES
14.300
14.200
14.100
14.000
13.900
13.800
13.700
13.600
13.500
1 JA
1 FE
1 MR
1 AP
1 MA
1 JN
1 JL
1 AU
1 SE
1 OC
1 NO
1 DE
1 JA
Data depict daily water elevations in the forebay at Milltown.
Data are are provided by New Brunswick Power Corporation and
are not obtained on holidays or weekends.

FIGURE VII

GRAND LAKE AT FOREST CITY
DAILY MEAN WATER LEVEL IN METRES FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	130.930	130.931	130.995	131.358	132.075	132.228	132.162	132.151	131.860	131.622	131.347	131.575	1
2	130.926	130.935	131.003	131.393	132.086	132.236	132.185	132.139	131.847	131.609	131.351	131.579	2
3	130.921	130.933	131.020	131.440	132.106	132.236	132.187	132.135	131.835	131.597	131.341	131.582	3
4	130.918	130.934	131.044	131.506	132.111	132.226	132.191	132.129	131.831	131.568	131.330	131.582 A	4
5	130.912	130.935	131.051	131.540	132.108	132.215	132.235	132.123	131.836	131.551	131.330	131.574	5
6	130.912	130.933	131.057	131.571	132.110	132.225	132.234	132.120	131.818	131.535	131.329	131.571	6
7	130.921	130.931	131.065	131.596	132.110	132.221	132.233	132.121	131.806	131.511	131.345	131.567	7
8	130.923	130.929	131.074	131.618	132.122	132.210	132.224	132.109	131.797	131.495	131.327	131.565	8
9	130.918	130.925	131.082	131.643	132.116	132.205	132.221	132.099	131.789	131.472	131.325	131.565	9
10	130.918	130.923	131.085 A	131.675	132.132	132.209	132.219	132.088	131.782	131.450	131.322	131.565	10
11	130.918	130.961	131.090 E	131.701	132.139	132.204	132.206	132.080	131.784	131.433	131.326	131.565	11
12	130.915	130.951	131.100 E	131.724	132.132	132.206	132.190	132.070	131.786	131.418	131.334	131.565	12
13	130.916	130.948	131.103 E	131.750	132.130	132.203	132.178	132.060	131.762	131.401	131.364	131.565	13
14	130.945	130.944	131.110 E	131.803	132.143	132.198	132.171	132.052	131.745	131.403	131.379	131.577	14
15	130.948	130.940	131.118 E	131.846	132.167	132.197	132.170	132.042	131.735	131.386	131.384	131.617	15
16	130.947	130.939	131.125 E	131.879	132.173	132.212	132.183	132.034	131.748	131.377	131.392	131.624	16
17	130.944	130.939	131.138 E	131.907	132.186	132.205	132.177	132.029	131.743	131.386	131.406	131.631	17
18	130.944	130.935	131.144 E	131.934	132.190	132.203	132.171	132.016	131.728	131.388	131.444	131.635	18
19	130.942	130.933	131.158 E	131.955	132.198	132.202	132.164	132.009	131.710	131.385	131.445	131.636	19
20	130.940	130.930	131.168 E	131.977	132.199	132.199	132.178	132.000	131.694	131.399	131.448	131.642	20
21	130.938	130.930	131.182 E	131.990	132.202	132.194	132.171	131.988	131.684	131.394	131.452	131.701	21
22	130.940	130.939	131.184 E	131.991	132.209	132.190	132.160	131.974	131.664	131.386	131.469	131.725	22
23	130.937	130.938	131.200 E	131.998	132.205	132.182	132.163	131.970	131.682	131.379	131.504	131.745	23
24	130.936	130.936	131.210 E	132.004	132.203	132.205	132.163	131.953	131.684	131.374	131.533	131.761	24
25	130.940	130.934	131.225 E	132.003	132.209	132.189	132.150	131.945	131.670	131.371	131.534	131.773	25
26	130.940	130.935	131.239 E	132.020	132.198	132.180	132.135	131.934	131.653	131.365	131.548	131.785	26
27	130.937	130.963	131.257 E	132.041	132.198	132.184	132.125	131.924	131.638	131.378	131.566	131.788	27
28	130.936	130.994	131.270 E	132.040	132.197	132.183	132.117	131.909	131.670	131.375	131.570	131.790	28
29	130.935		131.287 A	132.061	132.194	132.179	132.131	131.896	131.654	131.372	131.566	131.793	29
30	130.933		131.303	132.070	132.203	132.171	132.142	131.886	131.633	131.362	131.566	131.794	30
31	130.932		131.325		132.219		132.156	131.875		131.351		131.794	31
TOTAL	4058.862	3666.298	4065.412	3954.034	4096.970	3966.097	4097.492	4092.860	3952.268	4074.493	3942.577	4081.231	TOTAL
MEAN	130.931	130.939	131.142	131.801	132.160	132.203	132.177	132.028	131.742	131.435	131.419	131.653	MEAN
MAX	130.948	130.994	131.325	132.070	132.219	132.236	132.235	132.151	131.860	131.622	131.570	131.794	MAX
MIN	130.912	130.923	130.995	131.358	132.075	132.171	132.117	131.875	131.633	131.351	131.322	131.565	MIN

SUMMARY FOR THE YEAR 2002
Mean water level, 131.640 Metres
Maximum daily water level, 132.236 Metres On 2002-06-02
Minimum daily water level, 130.912 Metres On 2002-01-05

NOTES: THE DISCHARGE ARE PROVISIONAL AND ARE SUPPLIED BY ENVIRONMENT CANADA IN COOPERATION WITH DOMTAR.
A - PARTIAL DAY
E - ESTIMATED

TABLE I

FOREST CITY STREAM BELOW FOREST CITY DAM
DAILY MEAN DISCHARGE IN CUBIC METRES PER SECOND FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	2.23	2.67	3.18	2.45	2.25	2.40	7.57	6.29	5.57	12.5	2.60	3.72	1
2	2.27	2.73	3.27	2.52	2.28	2.39	10.7	6.27	5.53	12.3	2.60	2.27	2
3	2.29	2.69	3.43	2.65	2.28	2.37	10.7	6.26	5.51	12.1	2.58	2.36	3
4	2.25	2.72	3.59	2.77	2.25	3.91	10.7	6.25	5.49	13.2	2.55	2.50	4
5	2.23	2.70	3.69	2.85	2.28	5.47	11.1	6.23	5.47	14.3	2.54	2.51	5
6	2.21	2.68	3.78	2.91	2.29	5.47	11.1	6.21	5.41	13.9	2.57	2.51	6
7	2.27	2.61	3.85	2.96	2.29	5.45	11.1	6.23	5.40	13.4	2.57	2.52	7
8	2.26	2.58	3.37	2.72	2.29	5.44	10.1	6.20	5.36	13.1	2.53	2.52	8
9	2.80	2.54	2.87	2.36	2.29	5.42	7.58	6.17	5.35	12.5	2.53	2.53	9
10	3.20	2.53	3.04	2.44	2.29	4.84	6.19	6.16	5.34	12.0	2.53	2.54	10
11	2.79	2.73	3.19	2.46	2.29	3.34	6.17	6.14	6.64	11.7	2.53	2.55	11
12	2.44	2.73	3.29	2.51	2.26	2.71	6.16	6.13	8.00	11.4	2.54	2.54	12
13	2.51	2.71	3.39	2.55	2.28	2.71	6.13	6.10	7.81	11.1	2.60	2.53	13
14	2.81	2.67	3.47	2.65	2.31	2.71	6.10	6.08	7.69	8.29	2.64	2.56	14
15	2.79	2.64	3.56	2.55	2.29	2.71	6.10	6.05	7.60	4.56	2.68	2.62	15
16	2.78	2.62	3.66	2.51	2.32	2.70	6.10	6.03	7.70	3.03	2.70	2.62	16
17	2.76	2.61	3.69	2.52	2.33	2.70	6.10	5.99	10.1	2.72	2.73	2.63	17
18	2.76	2.59	3.72	2.53	2.33	2.70	6.08	5.97	11.9	2.71	2.79	2.64	18
19	2.74	2.56	3.76	2.58	2.34	2.69	6.09	5.95	11.7	2.71	2.80	2.68	19
20	2.71	2.52	3.80	2.55	2.34	2.69	6.10	5.94	11.5	2.72	2.81	2.71	20
21	2.71	2.56	3.59	2.55	2.34	2.68	6.10	5.91	11.3	2.71	2.81	2.78	21
22	2.72	2.58	2.97	2.55	2.34	2.68	6.08	5.87	11.2	2.69	2.87	2.81	22
23	2.69	2.58	2.58	2.58	2.35	2.68	6.07	5.85	11.3	2.67	2.97	2.86	23
24	2.69	2.57	2.58	2.58	2.35	2.67	6.07	5.83	11.3	2.67	2.99	2.88	24
25	2.75	2.57	2.58	2.58	2.35	3.26	6.04	5.79	11.2	2.67	2.99	2.89	25
26	2.73	2.57	2.59	2.45	2.35	3.91	6.03	5.76	11.0	2.67	2.99	2.89	26
27	2.72	2.71	2.70	2.22	2.36	4.11	6.03	5.74	10.8	2.67	2.99	2.91	27
28	2.70	3.08	2.73	2.21	2.36	4.30	6.03	5.70	11.1	2.67	2.48 E	2.94	28
29	2.67		2.51	2.24	2.36	4.30	6.03	5.66	11.0	2.65	4.28	2.94	29
30	2.66		2.32	2.24	2.37	4.30	6.15	5.64	11.9	2.63	5.14	2.93	30
31	2.63		2.35		2.41		6.29	5.60		2.62		2.94	31
TOTAL	80.77	74.05	99.10	76.24	71.82	105.71	224.89	186.00	257.17	219.56	84.93	83.83	TOTAL
MEAN	2.61	2.64	3.20	2.54	2.32	3.52	7.25	6.00	8.57	7.08	2.83	2.70	MEAN
DAM3	6980	6400	8560	6590	6210	9130	19400	16100	22200	19000	7340	7240	DAM3
MAX	3.20	3.08	3.85	2.96	2.41	5.47	11.1	6.29	11.9	14.3	5.14	3.72	MAX
MIN	2.21	2.52	2.32	2.21	2.25	2.37	6.03	5.60	5.34	2.62	2.48	2.27	MIN

SUMMARY FOR THE YEAR 2002
Total discharge, 135000 DAM3
Mean discharge, 4.29 M3/S
Maximum daily discharge, 14.3 M3/S On 2002-10-05
Minimum daily discharge, 2.21 M3/S On 2002-01-06

NOTES: THE DISCHARGE ARE PROVISIONAL AND ARE SUPPLIED BY ENVIRONMENT CANADA IN COOPERATION WITH DOMTAR.
E - ESTIMATED

TABLE II

SPEDNIC LAKE AT ST. CROIX
DAILY MEAN WATER LEVEL IN METRES FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	113.976	113.921	114.112	115.285	116.862	117.071	116.880	117.098	116.602	116.402	115.589	115.659	1
2	113.965	113.924	114.158	115.379	116.883	117.071	116.949	117.081	116.582	116.409	115.571	115.671	2
3	113.953	113.921	114.210	115.482	116.927	117.062	117.011	117.071	116.561	116.416	115.501	115.673	3
4	113.946	113.919	114.291	115.629	116.948	117.010	117.030	117.062	116.546	116.403	115.435	115.647	4
5	113.934	113.918	114.351	115.746	116.937	117.000	117.092	117.051	116.549	116.414	115.391	115.608	5
6	113.924	113.913	114.402	115.839	116.952	117.010	117.112	117.045	116.517	116.421	115.351	115.577	6
7	113.931	113.909	114.452	115.906	116.961	117.025	117.125	117.041	116.484	116.412	115.370	115.539	7
8	113.920	113.906	114.492	115.957	116.994	117.017	117.132	117.021	116.461	116.429	115.314	115.508	8
9	113.906	113.905	114.523	116.003	116.979	117.018	117.148	117.005	116.439	116.415	115.280	115.474	9
10	113.902	113.892	114.571	116.063	117.006	117.027	117.183	116.989	116.423	116.408	115.249	115.423	10
11	113.907	113.930	114.629	116.115	117.038	117.007	117.181	116.974	116.420	116.399	115.226	115.361	11
12	113.917	113.924	114.674	116.157	117.017	117.006	117.171	116.953	116.443	116.378	115.220	115.295	12
13	113.926	113.924	114.717	116.209	117.014	117.003	117.161	116.943	116.410	116.356	115.226	115.238	13
14	113.950	113.922	114.758	116.281	117.017	116.992	117.154	116.929	116.389	116.369	115.243	115.206	14
15	113.947	113.916	114.795	116.358	117.062	116.980	117.150	116.911	116.375	116.330	115.250	115.234	15
16	113.945	113.917	114.831	116.431	117.061	116.992	117.162	116.895	116.380	116.304	115.259	115.245	16
17	113.941	113.920	114.859	116.492	117.080	116.985	117.161	116.887	116.379	116.291	115.258	115.268	17
18	113.940	113.925	114.879	116.545	117.080	116.980	117.159	116.864	116.371	116.264	115.320	115.274	18
19	113.936	113.916	114.899	116.589	117.093	116.975	117.148	116.852	116.358	116.221	115.330	115.270	19
20	113.933	113.913	114.912	116.644	117.089	116.963	117.148	116.834	116.352	116.210	115.335	115.272	20
21	113.928	113.918	114.945	116.683	117.094	116.954	117.141	116.813	116.347	116.169	115.356	115.355	21
22	113.936	113.931	114.968	116.688	117.098	116.947	117.129	116.792	116.343	116.120	115.379	115.419	22
23	113.926	113.940	114.980	116.709	117.093	116.927	117.136	116.782	116.363	116.069	115.453	115.474	23
24	113.929	113.941	114.993	116.725	117.089	116.962	117.137	116.755	116.374	116.009	115.538	115.514	24
25	113.938	113.939	115.001	116.732	117.098	116.928	117.121	116.740	116.372	115.957	115.535	115.544	25
26	113.932	113.941	115.010	116.767	117.074	116.913	117.106	116.725	116.364	115.885	115.558	115.588	26
27	113.930	113.970	115.057	116.807	117.074	116.913	117.095	116.708	116.360	115.862	115.586	115.608	27
28	113.927	114.066	115.096	116.801	117.071	116.912	117.083	116.684	116.408	115.825	115.616	115.623	28
29	113.925		115.125	116.827	117.059	116.904	117.080	116.660	116.406	115.778	115.618	115.639	29
30	113.925		115.161	116.848	117.058	116.895	117.092	116.646	116.395	115.709	115.636	115.652	30
31	113.924		115.215		117.055		117.110	116.624		115.642		115.660	31
TOTAL	3531.919	3189.981	3557.066	3488.697	3627.863	3509.449	3630.487	3623.435	3492.773	3602.276	3461.993	3579.518	TOTAL
MEAN	113.933	113.928	114.744	116.290	117.028	116.982	117.112	116.885	116.426	116.202	115.400	115.468	MEAN
MAX	113.976	114.066	115.215	116.848	117.098	117.071	117.183	117.098	116.602	116.429	115.636	115.673	MAX
MIN	113.902	113.892	114.112	115.285	116.862	116.895	116.880	116.624	116.343	115.642	115.220	115.206	MIN

SUMMARY FOR THE YEAR 2002
Mean water level, 115.878 Metres
Maximum daily water level, 117.183 Metres On 2002-07-10
Minimum daily water level, 113.892 Metres On 2002-02-10

NOTES: WATER LEVELS ARE IN METRES AND ARE REFERRED TO GEODETIC SURVEY OF CANADA DATUM. THE WATER LEVEL DATA ARE PROVISIONAL AND ARE SUPPLIED BY ENVIRONMENT CANADA IN COOPERATION WITH DOMTAR.

TABLE III

ST. CROIX RIVER AT VANCEBORO
DAILY MEAN DISCHARGE IN CUBIC METRES PER SECOND FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	9.12	6.97	6.00	6.17	6.23	12.1	11.8	19.5	18.5	12.1	43.0	6.49	1
2	9.03	6.99	6.12	5.92	6.29	12.1	11.9	19.4	18.5	12.2	42.8	8.18	2
3	8.92	6.97	6.32	6.09	6.26	12.1	12.0	19.3	21.7	12.2	41.9	17.1	3
4	8.86	6.97	6.57	6.32	6.14	12.0	12.1	19.4	24.1	12.2	41.1	28.9	4
5	8.75	6.99	6.57	6.46	6.14	12.1	15.3	19.3	24.1	12.2	40.2	36.0	5
6	8.66	6.94	6.49	6.54	6.26	12.0	25.7	19.3	23.3	12.2	34.3	35.4	6
7	8.75	6.88	6.60	6.57	6.32	12.0	25.9	19.3	22.6	12.2	28.6	35.1	7
8	8.64	6.85	6.43	6.43	6.34	12.0	22.0	19.2	22.4	12.2	28.0	34.8	8
9	8.52	6.82	6.14	6.06	6.34	12.1	16.1	19.2	22.3	12.2	27.6	34.3	9
10	8.49	6.74	6.32	5.44	6.40	12.0	14.2	19.1	17.9	14.1	27.4	34.0	10
11	7.76	7.11	6.26	4.76	6.43	12.0	14.2	19.1	12.1	24.5	27.1	42.2	11
12	6.94	6.97	6.20	6.37	6.40	12.0	15.4	19.0	11.4	29.5	23.5	46.4	12
13	7.02	6.94	6.32	6.51	6.40	12.0	16.8	19.0	15.4	29.2	19.0	45.6	13
14	7.14	6.91	6.34	6.63	9.23	12.0	16.8	19.3	17.6	29.5	14.2	45.0	14
15	7.14	6.88	6.37	6.51	12.1	12.0	16.8	19.8	17.5	29.2	12.6	39.4	15
16	7.11	6.88	6.29	6.40	12.1	12.0	16.8	19.8	17.6	28.9	12.6	28.3	16
17	7.11	6.91	6.32	6.46	12.1	12.0	16.8	19.7	17.5	33.7	12.6	17.7	17
18	7.08	6.91	6.34	6.49	12.1	11.9	16.8	19.6	17.5	38.2	10.9	15.4	18
19	7.08	6.88	6.37	6.46	12.1	11.9	16.8	19.5	16.0	37.9	9.77	15.4	19
20	7.05	6.85	6.40	6.51	12.1	11.9	16.8	19.4	14.6	37.7	8.61	13.7	20
21	7.02	6.40	6.46	6.57	12.1	11.9	16.8	19.3	14.6	37.4	7.36	10.9	21
22	7.05	6.17	6.26	6.57	12.1	11.9	16.8	19.3	14.6	37.1	7.45	8.41	22
23	6.99	6.17	5.97	6.57	12.1	11.9	16.8	19.3	14.6	44.2	7.62	7.45	23
24	7.02	6.17	6.00	6.57	12.1	11.9	16.8	19.2	14.6	47.9	7.79	7.50	24
25	7.08	6.17	6.00	6.60	12.1	11.9	16.8	19.1	14.6	47.3	7.73	7.59	25
26	7.05	6.20	6.00	6.40	12.1	11.9	16.7	19.0	14.6	46.7	7.11	7.65	26
27	7.02	6.40	6.12	6.17	12.1	11.9	16.7	18.9	14.6	46.4	6.37	7.67	27
28	6.99	6.34	6.17	6.17	12.1	11.8	16.7	18.9	14.8	45.9	6.43	7.73	28
29	6.97		6.23	6.20	12.1	11.8	16.7	18.7	14.7	45.3	6.46	7.76	29
30	6.97		6.34	6.20	12.1	11.8	16.7	18.7	13.4	44.5	6.46	7.76	30
31	6.94		6.40		12.1		18.3	18.6		43.6		7.79	31
TOTAL	236.27	188.38	194.72	189.12	296.88	358.9	516.8	596.2	517.7	928.4	576.56	667.58	TOTAL
MEAN	7.62	6.73	6.28	6.30	9.58	12.0	16.7	19.2	17.3	29.9	19.2	21.5	MEAN
DAM3	20400	16300	16800	16300	25700	31000	44700	51500	44700	80200	49800	57700	DAM3
MAX	9.12	7.11	6.60	6.63	12.1	12.1	25.9	19.8	24.1	47.9	43.0	46.4	MAX
MIN	6.94	6.17	5.97	4.76	6.14	11.8	11.8	18.6	11.4	12.1	6.37	6.49	MIN

SUMMARY FOR THE YEAR 2002
Total discharge, 455000 DAM3
Mean discharge, 14.4 M3/S
Maximum daily discharge, 47.9 M3/S On 2002-10-24
Minimum daily discharge, 4.76 M3/S On 2002-04-11

NOTES: DATA ARE SUPPLIED BY THE UNITED STATES GEOLOGICAL SURVEY AND ARE PROVISIONAL.

GRAND FALLS FLOWAGE AT GRAND FALLS
DAILY MEAN WATER LEVEL IN METRES FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	61.651	61.650	61.952	61.932	61.803	61.681	61.779	61.811	61.751	61.696	61.712	61.759	1
2	61.645	61.660	61.974	61.971	61.839	61.679	61.795	61.822	61.750	61.695	61.754	61.725	2
3	61.640	61.657	61.948	61.955	61.886	61.677	61.818	61.826	61.749	61.677	61.748	61.691	3
4	61.632	61.662	61.906	61.972	61.909	61.669	61.857	61.827	61.763	61.674	61.747	61.667	4
5	61.626	61.668	61.908	61.979	61.870	61.669	61.927	61.823	61.775	61.681	61.764	61.639	5
6	61.623	61.667	61.928	61.914	61.833	61.679	61.929	61.800	61.774	61.672	61.773	61.605	6
7	61.619	61.662	61.952	61.837	61.801	61.682	61.933	61.812	61.780	61.668	61.816	61.614	7
8	61.611	61.664	61.936	61.801	61.786	61.688	61.922	61.807	61.789	61.667	61.816	61.641	8
9	61.601	61.664	61.911	61.817	61.738	61.698	61.894	61.798	61.786	61.646	61.814	61.639	9
10	61.597	61.660	61.921	61.916	61.758	61.692	61.881	61.792	61.797	61.615	61.818	61.621	10
11	61.594	61.689	61.950	61.923	61.757	61.695	61.880	61.777	61.779	61.565	61.840	61.609	11
12	61.593	61.694	61.963	61.914	61.722	61.704	61.861	61.762	61.776	61.564	61.854	61.615	12
13	61.597	61.705	61.959	61.896	61.719	61.716	61.831	61.752	61.788	61.630	61.883	61.634	13
14	61.620	61.707	61.951	61.896	61.699	61.717	61.814	61.746	61.778	61.694	61.921	61.661	14
15	61.617	61.716	61.932	61.928	61.740	61.712	61.820	61.748	61.806	61.699	61.929	61.747	15
16	61.622	61.724	61.909	61.947	61.779	61.726	61.825	61.752	61.822	61.699	61.905	61.836	16
17	61.622	61.733	61.883	61.948	61.780	61.744	61.836	61.753	61.814	61.726	61.878	61.890	17
18	61.623	61.742	61.860	61.935	61.774	61.755	61.827	61.753	61.812	61.772	61.901	61.892	18
19	61.622	61.752	61.844	61.929	61.775	61.758	61.814	61.751	61.812	61.787	61.904	61.879	19
20	61.624	61.762	61.828	61.933	61.771	61.766	61.801	61.752	61.810	61.776	61.894	61.865	20
21	61.626	61.774	61.831	61.916	61.751	61.773	61.800	61.751	61.799	61.761	61.862	61.923	21
22	61.631	61.794	61.820	61.880	61.733	61.762	61.794	61.754	61.789	61.734	61.831	61.960	22
23	61.629	61.806	61.787	61.833	61.722	61.768	61.784	61.742	61.792	61.704	61.877	61.925	23
24	61.632	61.816	61.773	61.791	61.699	61.774	61.776	61.738	61.772	61.693	61.960	61.892	24
25	61.645	61.830	61.747	61.743	61.666	61.771	61.771	61.749	61.754	61.690	61.951	61.873	25
26	61.645	61.844	61.716	61.705	61.671	61.772	61.764	61.758	61.741	61.675	61.942	61.851	26
27	61.645	61.879	61.714	61.695	61.686	61.785	61.762	61.744	61.719	61.682	61.920	61.870	27
28	61.645	61.915	61.722	61.668	61.680	61.783	61.763	61.740	61.717	61.680	61.882	61.867	28
29	61.646		61.756	61.686	61.671	61.776	61.775	61.747	61.697	61.684	61.846	61.853	29
30	61.648		61.805	61.759	61.667	61.784	61.801	61.746	61.688	61.691	61.799	61.845	30
31	61.647		61.875		61.672		61.808	61.740		61.700		61.845	31
TOTAL	1910.418	1728.496	1917.961	1856.019	1914.357	1851.855	1916.642	1914.873	1853.179	1912.297	1855.541	1914.933	TOTAL
MEAN	61.626	61.732	61.870	61.867	61.753	61.728	61.827	61.770	61.773	61.687	61.851	61.772	MEAN
MAX	61.651	61.915	61.974	61.979	61.909	61.785	61.933	61.827	61.822	61.787	61.960	61.960	MAX
MIN	61.593	61.650	61.714	61.668	61.666	61.669	61.762	61.738	61.688	61.564	61.712	61.605	MIN

SUMMARY FOR THE YEAR 2002
Mean water level, 61.771 Metres
Maximum daily water level, 61.979 Metres On 2002-04-05
Minimum daily water level, 61.564 Metres On 2002-10-12

NOTES: WATER LEVELS ARE IN METRES AND ARE REFERENCED TO GEODETIC SURVEY OF CANADA DATUM. THE WATER LEVEL DATA ARE PROVISIONAL AND ARE SUPPLIED BY ENVIRONMENT CANADA IN COOPERATION WITH DOMTAR.

TABLE V

ST. CROIX RIVER AT BARING
DAILY MEAN DISCHARGE IN CUBIC METRES PER SECOND FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	21.9 B	16.4 B	104	129	37.7	33.4	22.3	33.1	25.2	46.2	46.7	82.7	1
2	21.9 B	16.4 B	111	189	36.0	27.8	28.2	29.5	26.8	45.3	42.5	78.2	2
3	21.9 B	16.4 B	143	232	40.2	27.4	24.9	27.1	26.9	45.6	40.2	68.8	3
4	21.9 B	16.4	169	243	54.7	26.9	24.5	32.6	26.2	42.8	42.2	62.9	4
5	21.9 B	16.2	148	246	66.8	27.0	49.8	29.7	25.4	41.9	44.7	86.9	5
6	22.1	15.7 B	127	242	70.2	26.3	91.2	38.8	25.3	41.1	49.6	76.5	6
7	22.3	15.4 B	108	215	77.0	26.2	96.6	38.8	25.3	41.6	41.1	62.3	7
8	22.2	15.5	100	157	71.1	25.7	90.6	35.4	25.3	44.5	49.3	55.5	8
9	22.3	15.5	96.0	124	70.2	26.4	86.7	36.5	25.4	43.6	47.6	61.4	9
10	21.8	15.4 B	88.6	89.5	66.5	25.2	64.0	35.7	25.9	63.1	48.4	57.2	10
11	17.6	15.4 B	95.4	89.2	62.0	25.2	51.8	35.7	35.7	52.4	47.6	58.6	11
12	16.8	15.7 B	94.6	86.4	58.0	25.3	52.7	38.2	32.0	45.0	47.0	55.8	12
13	16.8	16.2 B	92.9	88.6	47.3	25.3	52.1	37.9	26.5	30.9	44.2	55.8	13
14	17.2	17.1 B	91.7	97.1	59.7	25.2	46.7	38.2	29.2	30.6	62.6	64.6	14
15	16.7	17.3	90.0	112	57.8	25.2	44.7	31.7	27.9	43.0	73.1	98.5	15
16	16.5	18.9	89.8	126	59.2	26.1	43.6	27.5	38.5	41.3	76.5	95.1	16
17	16.2	16.9	84.1	125	66.5	26.3	45.0	24.0	51.8	32.3	87.5	94.0	17
18	15.9	17.2	79.3	124	66.0	26.8	45.0	23.6	43.0	29.2	101	88.6	18
19	15.9	16.6	62.0	110	56.6	24.0	43.3	24.0	43.0	43.3	93.7	81.6	19
20	15.9	18.1	66.8	97.7	52.1	23.3	44.7	24.9	42.2	69.9	88.9	90.0	20
21	15.9	17.8	65.7	92.0	60.0	23.2	44.7	26.3	42.5	66.0	92.9	145	21
22	16.0	20.0	64.8	90.0	56.9	23.1	44.7	28.3	39.4	69.4	95.1	189	22
23	15.8	22.7	58.9	88.6	51.3	22.7	44.5	30.0	43.0	71.6	103	197	23
24	15.9 B	22.7	57.2	86.4	55.5	22.9	39.9	28.1	45.6	64.6	103	162	24
25	15.9 B	19.3	54.7	85.8	49.0	23.2	38.5	26.8	42.8	66.3	106	135	25
26	15.9 B	19.1	58.0	86.1	38.8	23.2	36.8	28.0	44.7	71.6	94.3	119	26
27	15.9	35.4	86.7	81.6	32.3	22.8	28.9	26.7	58.0	72.2	96.0	88.1	27
28	15.9	114	98.8	71.4	33.1	22.5	29.5	25.1	59.7	63.4	89.2	82.7	28
29	15.9		94.3	61.2	35.4	22.8	34.5	25.2	55.5	56.1	80.1	80.7	29
30	16.9		92.9	37.7	38.5	22.7	31.7	25.2	49.3	48.7	87.2	68.0	30
31	17.4		98.8		34.8		27.0	25.2		49.0		58.0	31
TOTAL	563.1	599.7	2872.0	3703.3	1661.2	754.1	1449.1	937.8	1108.0	1572.5	2121.2	2799.5	TOTAL
MEAN	18.2	21.4	92.6	123	53.6	25.1	46.7	30.3	36.9	50.7	70.7	90.3	MEAN
DAM3	48700	51800	248000	320000	144000	65200	125000	81000	95700	136000	183000	242000	DAM3
MAX	22.3	114	169	246	77.0	33.4	96.6	38.8	59.7	72.2	106	197	MAX
MIN	15.8	15.4	54.7	37.7	32.3	22.5	22.3	23.6	25.2	29.2	40.2	55.5	MIN

SUMMARY FOR THE YEAR 2002
Total discharge, 1740000 DAM3
Mean discharge, 55.2 M3/S
Maximum daily discharge, 246 M3/S On 2002-04-05
Minimum daily discharge, 15.4 B M3/S On 2002-02-07

NOTES: DATA ARE SUPPLIED BY THE UNITED STATES GEOLOGICAL SURVEY AND ARE PROVISIONAL.
B - ICE CONDITIONS

MILLTOWN
DAILY WATER LEVEL IN METRES FOR 2002

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	DAY
1	---	13.652	13.896	---	13.682	---	---	13.682	---	13.682	13.682	---	1
2	13.682	---	---	14.292	13.682	---	13.682	13.682	---	13.682	---	13.774	2
3	13.682	---	---	14.109	13.682	13.682	13.682	---	13.682	13.682	---	14.048	3
4	13.682	13.896	14.048	13.957	---	13.682	13.682	---	13.682	13.682	13.682	13.682	4
5	---	13.804	13.926	13.865	---	13.682	13.682	---	13.682	---	13.682	13.804	5
6	---	13.621	13.987	---	13.682	13.682	---	13.682	13.682	---	13.682	13.682	6
7	13.682	13.591	14.048	---	13.682	13.682	---	13.682	---	13.682	13.682	---	7
8	13.682	13.896	13.957	13.987	13.743	---	13.804	13.682	---	13.682	13.682	---	8
9	13.682	---	---	14.140	13.835	---	13.957	13.682	13.682	13.682	---	13.682	9
10	13.682	---	---	14.018	13.682	13.682	13.835	---	13.682	13.682	---	13.682	10
11	13.682	14.018	14.079	14.048	---	13.682	13.682	---	13.682	13.682	---	13.682	11
12	---	13.774	13.957	14.048	---	13.682	13.682	13.682	13.682	---	13.682	13.682	12
13	---	14.048	13.957	---	13.682	13.682	---	13.682	13.682	---	13.682	13.987	13
14	13.682	13.926	14.089	---	13.682	13.682	---	13.682	---	---	13.682	---	14
15	13.529	13.987	14.018	14.140	13.682	---	13.682	13.682	---	13.682	13.865	---	15
16	13.712	---	---	14.079	13.682	---	13.682	13.682	13.682	13.682	---	13.987	16
17	13.682	---	---	14.079	13.682	13.682	13.682	---	13.682	13.682	---	13.987	17
18	13.682	13.987	14.018	14.079	---	13.682	13.682	---	13.682	13.682	14.140	14.109	18
19	---	13.987	14.109	13.957	---	13.682	13.682	13.682	13.682	---	14.018	13.987	19
20	---	13.957	13.896	---	---	13.682	---	13.682	13.682	---	14.018	14.018	20
21	13.682	14.018	14.018	---	13.682	13.682	---	13.682	---	13.682	14.048	---	21
22	13.682	14.079	13.682	14.079	13.682	---	13.682	13.682	---	13.682	14.018	---	22
23	13.682	---	---	14.018	13.682	---	13.682	13.682	13.682	13.896	---	14.018	23
24	13.652	---	---	14.018	---	13.682	13.682	---	13.682	13.682	---	13.987	24
25	13.621	13.682	13.682	14.018	---	13.682	13.682	---	13.682	13.682	14.048	---	25
26	---	14.079	13.682	13.987	---	13.682	13.682	13.682	13.682	---	13.926	---	26
27	---	14.109	14.089	---	13.682	13.682	---	13.682	13.682	---	14.048	13.926	27
28	13.621	14.048	14.048	---	13.682	13.682	---	13.682	---	13.682	13.987	---	28
29	13.621		---	14.048	13.682	---	13.682	13.682	---	13.682	13.987	---	29
30	13.743		---	13.682	---	---	13.682	13.682	13.682	13.682	---	13.682	30
31	13.835		---		13.621		13.682	---		13.682		13.682	31

NOTES: THE WATER LEVELS ARE SUPPLIED BY NB POWER CORPORATION.

TABLE VII