International Niagara Board of Control

One Hundred Seventeenth Semi-Annual Progress Report

to the

International Joint Commission

Covering the Period March 23 through September 14, 2011

EXECUTIVE SUMMARY

The level of Lake Erie began the reporting period 4 centimetres (1.6 inches) below the long-term average for the month of March. Well-above-average precipitation from February through May raised the lake level to above average in May. However, inflows to Lake Erie from upstream, via the Detroit River, remained below the long-term average during the reporting period (Section 2).

The level of the Chippawa-Grass Island Pool is regulated under the International Niagara Board of Control's 1993 Directive. The Power Entities (Ontario Power Generation (OPG) and the New York Power Authority (NYPA)) were able to comply with the Board's Directive at all times during the reporting period (Section 3).

Use of the cableway, located just upstream of the OPG and NYPA plants, for the Board's flow measurement program has become redundant. NYPA, on behalf of the Power Entities, has undertaken to have the cableway removed (Section 7).

OPG continues with construction of the Niagara Tunnel Project. The Tunnel Boring Machine (TBM) completed its journey on May 13 (Section 8).

Removal of the Lake Erie-Niagara River Ice Boom began on April 12 and was completed on April 22 (Section 9).

The Peace Bridge Authority abandoned plans to construct a second bridge (Section 10).

The Board held a meeting with the public on August 17 in Niagara Falls, Ontario (Section 11).

COVER: **Photograph of Ontario Power Generation's tunnel boring machine "Big Becky" completing its 10 kilometre (6.2 mile) journey on May 13 (courtesy of Ontario Power Generation).**

TABLE OF CONTENTS

SECTION		PAGE
1	GENERAL	1
2	LAKE LEVELS	1
3	OPERATION AND MAINTENANCE OF THE INTERNATIONAL NIAGARA CONTROL WORKS	6
4	FLOWS OVER NIAGARA FALLS	7
5	DIVERSIONS AND FLOW AT QUEENSTON	9
6	GAUGING STATIONS	11
7	FLOW MEASUREMENTS IN THE NIAGARA RIVER AND WELLAND SHIP CANAL	12
8	NIAGARA TUNNEL PROJECT AND PLANT UPGRADES	13
9	ICE CONDITIONS AND ICE BOOM OPERATION	14
10	PEACE BRIDGE EXPANSION	15
11	MEETING WITH THE PUBLIC	16
12	MEMBERSHIP OF THE BOARD	16
13	ATTENDANCE AT BOARD MEETINGS	16

TABLES **PAGE**

1	MONTHLY AVERAGE LAKE ERIE WATER LEVEL	3
2	MONTHLY AVERAGE PRECIPITATION ON THE LAKE ERIE BASIN	3
3	MONTHLY NIAGARA RIVER FLOWS AT QUEENSTON	10
4	MONTHLY MAXIMUM AND MINIMUM NIAGARA RIVER FLOWS AT QUEENSTON	11

FIGURES

1	MONTHLY MEAN WATER LEVEL - LAKE ERIE	4
2	MONTHLY PRECIPITATION - LAKE ERIE BASIN	4
3	MONTHLY NET BASIN SUPPLY - LAKE ERIE BASIN	5
4	MONTHLY MEAN FLOW - NIAGARA RIVER AT BUFFALO, NEW YORK	5

ENCLOSURES

1	MAP OF THE UPPER NIAGARA RIVER
2	NIAGARA RIVER DAILY MEAN LEVEL AT MATERIAL DOCK GAUGE
3	DAILY FLOW OVER NIAGARA FALLS
4	DAILY DIVERSIONS OF NIAGARA RIVER WATER FOR POWER PURPOSES

INTERNET SITES

International Joint Commission
www.ijc.org

International Niagara Board of Control
www.ijc.org/conseil_board/niagara/en/niagara_home_accueil.htm
www.ijc.org/conseil_board/niagara/fr/niagara_home_accueil.htm

Lake Erie-Niagara River Ice Boom
www.iceboom.nypa.gov

INTERNATIONAL NIAGARA BOARD OF CONTROL

International Joint Commission
Washington, D.C.
Ottawa, Ontario

September 14, 2011

Chicago, Illinois
Burlington, Ontario

Commissioners:

1. GENERAL

The International Niagara Board of Control (Board) submits its One Hundred Seventeenth Semi-Annual Progress Report, covering the reporting period March 23 through September 14, 2011.

2. LAKE LEVELS

All elevations in this report are referenced to International Great Lakes Datum 1985 (IGLD 1985). The values are expressed in metric units, with approximate customary units (in parentheses) for information purposes only. The monthly lake level data are based on a network of four gauges to better represent the average level of the lake.

The level of Lake Erie began the reporting period 4 centimetres (1.6 inches) below the long-term average for March. Well-above-average precipitation from February through May pushed the level above average in May and the lake peaked in June at 174.58 metres (572.77 feet), 25 centimetres (9.8 inches) above the long-term average for that month. This

amount contrasts with the year before, when Lake Erie peaked 2 centimetres (0.8 inch) below average. In August, the level was at 174.38 metres (572.11 feet), or 13 centimeters (5.1 inches) above average. Recorded water level data for the period March through August 2011 and departures from long-term averages are shown in Table 1 and depicted graphically in Figure 1.

Precipitation on the Lake Erie basin was above average every month of the reporting period except June. Precipitation was near record highs in both April and May. Over the reporting period, the basin received approximately 67.36 centimetres (26.52 inches) of precipitation, which is about 37% above average. Precipitation data for the period March through August 2011 and departures from long-term averages are shown in Table 2 and are depicted graphically in Figure 2.

The level of Lakes Michigan and Huron continued to be well below long-term average during this reporting period. As a result, inflows to Lake Erie from the upstream lakes were below the long-term average for the six-month period March through August 2011.

The water supplied to Lake Erie from its local drainage basin is referred to as its net basin supply (NBS). The lake's NBS reflects the amount of water the lake receives from precipitation falling directly on its surface and runoff (including snow melt) from its surrounding area minus the amount of water that evaporates from its surface. The above-average precipitation in February and March, along with the near record high precipitation in April and May, contributed to the very high net basin supplies received in March, April and May. The May 2011 net basin supply was the second highest May supply on record. Lake Erie net basin supplies for the period March through August 2011 are depicted in Figure 3.

The water level of Lake Erie naturally affects the outflow into the Niagara River, as does the amount of flow retardation in the river due to ice and weeds. Similar to the level of

Lake Erie, the Niagara River flow rose above average in May. The flow in the Niagara River is graphically depicted in Figure 4 and summarized in Section 5.

The September 2011 water level forecast indicates that the level of Lake Erie is expected to be above the long-term average during the next six months.

TABLE 1 - MONTHLY AVERAGE LAKE ERIE WATER LEVEL

(Based on a network of 4 water level gauges)

International Great Lakes Datum (1985)

	Metres			Feet		
Month	Recorded* 2011	Average 1918-2010**	Departure	Recorded* 2010-11	Average 1918-2010**	Departure
March	174.03	174.07	-0.04	570.96	571.10	-0.14
April	174.20	174.22	-0.02	571.52	571.59	-0.07
May	174.46	174.30	0.16	572.38	571.85	0.53
June	174.58	174.33	0.25	572.77	571.95	0.82
July	174.48	174.31	0.17	572.44	571.88	0.56
August	174.38	174.25	0.13	572.11	571.69	0.42

*Provisional **Period of record is 1918-2010

TABLE 2 - MONTHLY AVERAGE PRECIPITATION ON THE LAKE ERIE BASIN

	Centimetres			Inches			
Month	Recorded* 2011	Average 1900-2008+	Departure	Recorded* 2010-11	Average 1900-2008+	Departure	Departure (in percent)
March	9.80	6.99	2.81	3.86	2.75	1.11	40
April	14.73	8.02	6.71	5.80	3.16	2.64	84
May	17.12	8.51	8.61	6.74	3.35	3.39	101
June	5.28	8.77	-3.49	2.08	3.45	-1.37	-40
July	9.91	8.60	1.31	3.90	3.39	0.51	15
August	10.52	8.17	2.35	4.14	3.22	0.92	29

*Provisional +Most recent period of record is 1900-2008

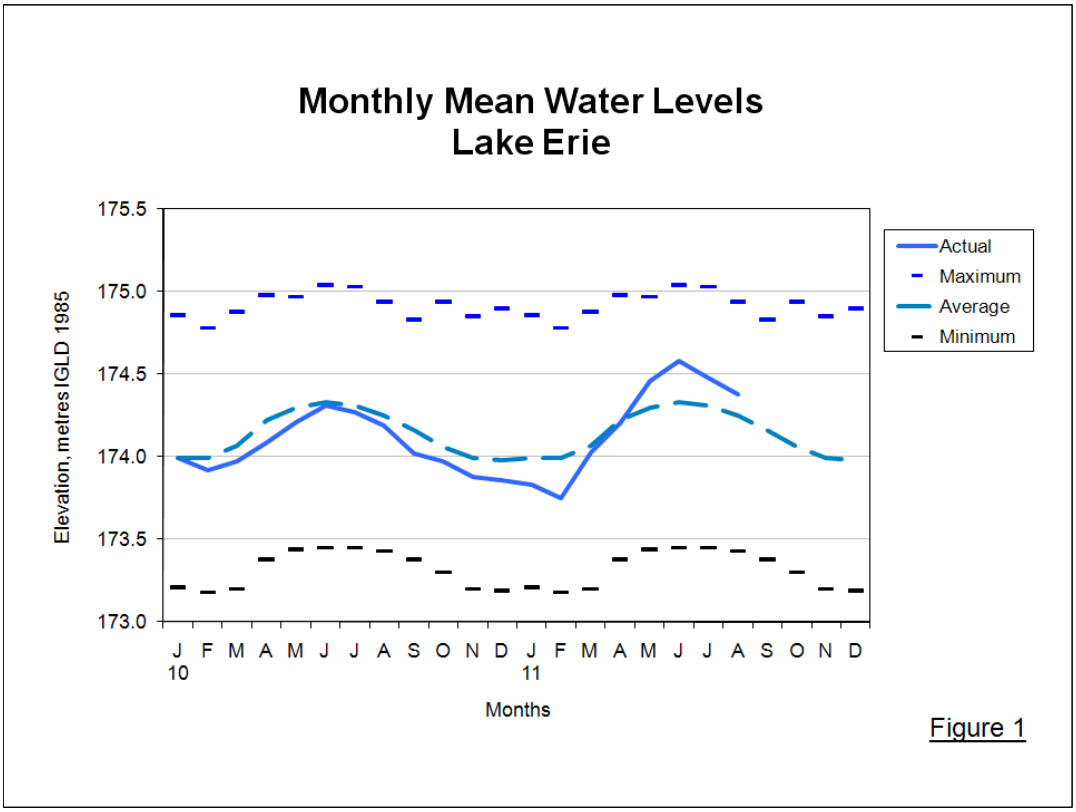


Figure 1

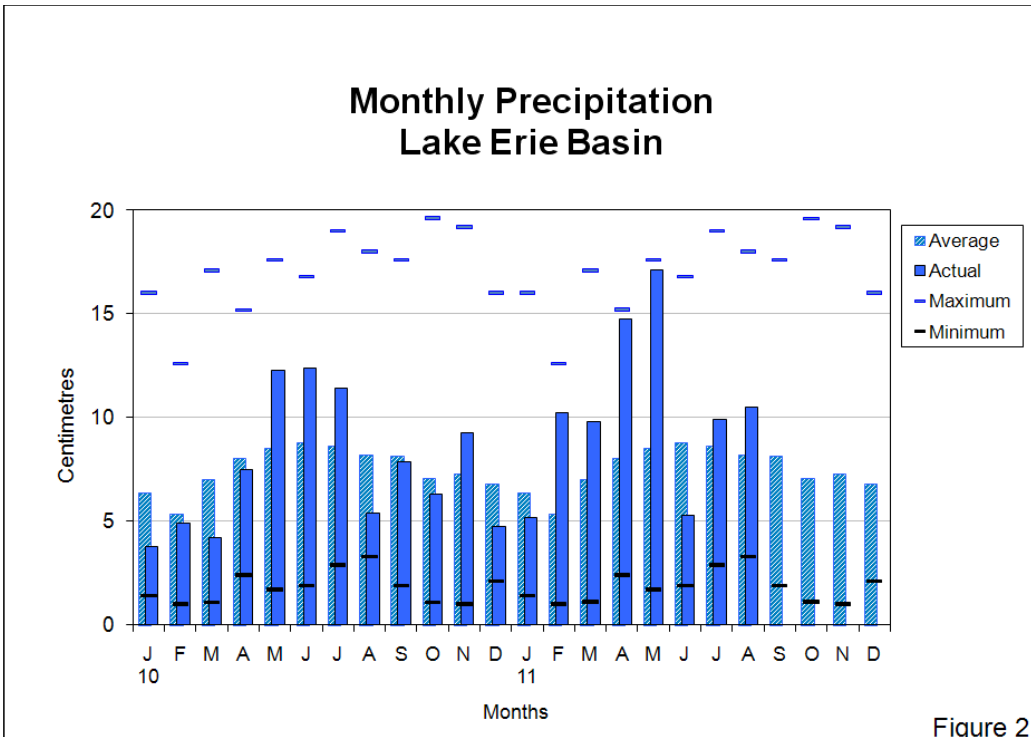


Figure 2

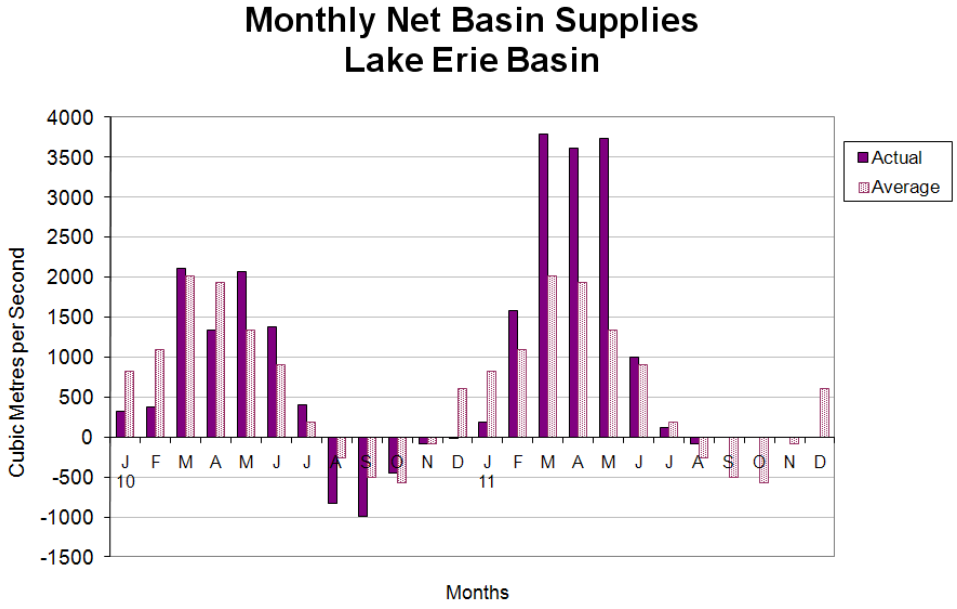


Figure 3

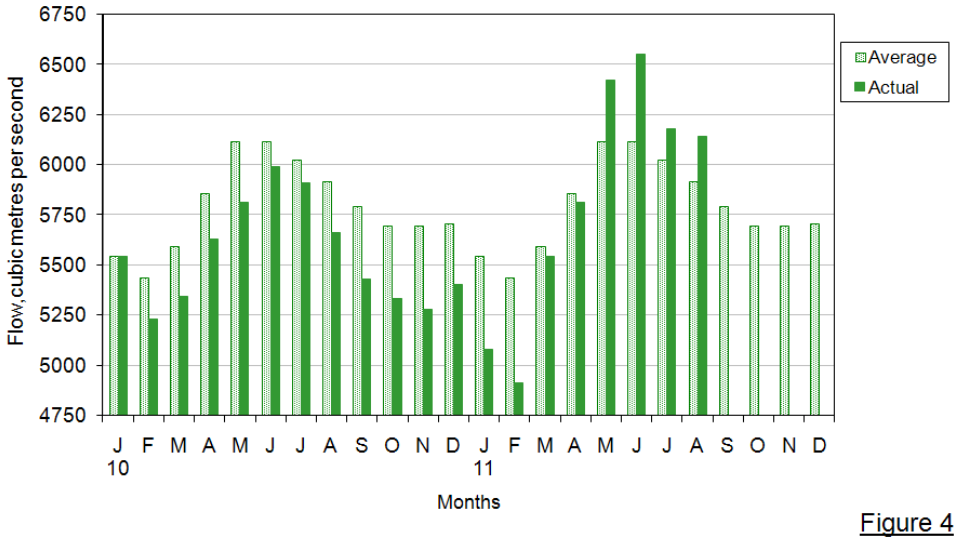


Figure 4

3. OPERATION AND MAINTENANCE OF THE INTERNATIONAL NIAGARA CONTROL WORKS

The water level in the Chippawa-Grass Island Pool (CGIP) is regulated in accordance with the Board's 1993 Directive. The Directive requires that the Power Entities, Ontario Power Generation (OPG) and the New York Power Authority (NYPA), operate the International Niagara Control Works to ensure the maintenance of an operational long-term average CGIP level of 171.16 metres (561.55 feet) to ameliorate adverse high or low water levels in the CGIP. The Directive also establishes tolerances for the CGIP's level as measured at the Material Dock gauge.

The Power Entities complied with the Board's Directive at all times during the reporting period.

The accumulated deviation of the CGIP's level from March 1, 1973 through August 31, 2011 was 0.57 metre-month (1.87 foot-month) above the long-term average elevation. The maximum permissible accumulated deviation is +/- 0.91 metre-month (3.00 foot-month).

As provided for by the Directive, tolerances for regulation of the CGIP level were suspended for June 18 and 19, July 18 and 19 and August 15 due to actions taken in response to police emergencies. Tolerances were also suspended for two days in April to assist in ice management and for one day in April due to abnormally high flows.

The locations of the water level gauges on the Niagara River are shown in Enclosure 1. Recorded daily Material Dock water level, covering the period March through August 2011, is shown in Enclosure 2.

As a result of inspections completed in 2008, replacement of oil lines on Gates 1-13 commenced in 2010 when work was completed on Gate 2. Overhaul of Gate 10 (seals, cylinders, pistons and replacement of the roll plate) was also completed in 2010. However, the gate remained out of service until replacement of the oil line was completed in July 2011. The oil line replacement project continues with work scheduled for Gates 3, 6, 7, 10 and 11 in 2011 and Gates 1,4,5,8,9,12 and 13 scheduled for 2012. Oil lines of the newer gates (Gates 14-18) do not need to be replaced.

4. FLOWS OVER NIAGARA FALLS

During the tourist season daylight hours, the required minimum Niagara Falls flow is 2832 cubic metres per second (m^3/s) (100,000 cubic feet per second (cfs)). At night and during the winter months, the required minimum Falls flow is 1416 m^3/s (50,000 cfs). The operation of the International Niagara Control Works, in conjunction with power diversion operations, ensures sufficient flow over the Falls to meet the requirements of the Niagara Treaty of 1950 (Treaty).

Actions were taken by the operator of the International Niagara Control Works to reduce Falls flow to assist in the rescue of two New York State Parks Police officers in the early hours of June 18. Their vessel had become stranded upstream of the Horseshoe Falls during the successful recovery of 4 people from a disabled boat. The rescue was completed around 08:30, with the officers hoisted ashore by helicopter. As a result of the operation, morning transition to tourist hour Falls flow was delayed. The result was a Falls flow of 1800 m^3/sec for 08:00 and 2600 m^3/sec for 09:00, deficiencies of 1032 m^3/sec and 232 m^3/sec respectively.

The State Parks Police initiated a salvage plan later that day that called for a New York Army National Guard Chinook helicopter to lift the stranded vessel out of the river early in the following morning, prior to the transition from the night-time to day-time tourist season

minimum Falls flows. The recovery was successful; however, due to unforeseen delays and complications, transition was delayed. The result was a Falls flow of 2262 m^3/sec for 08:00 on June 19, which corresponds to a deficiency of 570 m^3/sec.

Removal of New York State Parks Police boat (photo Mike Lindsay OPG)

Flows were reduced for a period on July 18 to assist in the successful rescue of an individual from the river near the brink of the Horseshoe Falls. Flows of 2558 m^3/sec for 14:00 and 2621 m^3/sec for 15:00 were recorded. These amounts were 274 m^3/sec and 211 m^3/sec, respectively, below the Treaty minimum requirement.

Actions were taken by the operator of the International Niagara Control Works to reduce Falls flow to assist Police in the recovery of a body from the lower Niagara River on August 15. Flows of 2056 m^3/sec for 08:00 and 2768 m^3/sec for 09:00 were recorded. These amounts were 776 m^3/sec and 64 m^3/sec, respectively, below the Treaty minimum requirement.

Falls flow met or exceeded minimum Treaty requirements at all other times during the reporting period. The recorded daily flow over Niagara Falls, covering the period March through August 2011, is shown in Enclosure 3.

5. DIVERSIONS AND FLOW AT QUEENSTON

Diversion of water from the Niagara River for power purposes is governed by the terms and conditions of the Treaty. The Treaty prohibits the diversion of Niagara River water that would reduce the flow over Niagara Falls for scenic purposes to below the amounts specified above.

The hydro power plants, OPG's Sir Adam Beck 1 and 2 in Canada and NYPA's Niagara Power Project in the United States, withdraw water from the CGIP above Niagara Falls and discharge it into the lower Niagara River at Queenston, Ontario and Lewiston, New York, respectively.

During the period March through August 2011, diversion for the Sir Adam Beck 1 and 2 plants averaged 1652 m^3/s (58,340 cfs) and diversion to the Robert Moses Niagara Power Project averaged 2089 m^3/s (73,770 cfs).

The average flow from Lake Erie to the Welland Canal for the period March through August 2011 was 239 m^3/s (8,440 cfs) compared to 220 m^3/s (7,770 cfs) for the same period in 2010. Diversion from the canal to OPG's DeCew Generating Stations averaged 189 m^3/s (6,670 cfs) for the period March through August 2011.

Records of diversions for power generation covering the period March through August 2011 are shown in Enclosure 4.

The monthly average Niagara River flows at Queenston, Ontario, for the period March through August 2011 and departures from long-term average are shown in Table 3. During the period March through August 2011, the flow at Queenston averaged 6142 m^3/s (216,900 cfs) with the monthly averages ranging between 5653 m^3/s (199,630 cfs) and 6561 m^3/s (231,700 cfs). In 2010, flows for the same period averaged 5755 m^3/s (203,240 cfs) with the monthly averages ranging between 5439 m^3/s (192,080 cfs) and 6000 m^3/s (211,890 cfs).

TABLE 3 - MONTHLY NIAGARA RIVER FLOWS AT QUEENSTON

	Cubic Metres per Second			Cubic Feet per Second		
Month	Recorded 2011	Average 1900-2010	Departure	Recorded 2011	Average 1900-2010	Departure
March	5653	5640	13	199,630	199,170	460
April	5915	5893	22	208,890	208,110	780
May	6442	6093	349	227,500	215,170	12330
June	6561	6067	494	231,700	214,250	17450
July	6183	5968	215	218,350	210,760	7590
August	6100	5957	143	215,420	210,370	5050

Maximum and minimum monthly average flows, for the period 1900-2010, are shown in Table 4. The March through August 2011 flows were well within the historical range.

TABLE 4 - MONTHLY MAXIMUM AND MINIMUM NIAGARA RIVER FLOWS AT QUEENSTON

	Cubic Metres per Second				Cubic Feet per Second	
Month	Maximum	Year	Minimum	Year	Maximum	Minimum
March	6880	1986	4340	1934	242,960	153,260
April	7220	1986	4320	1934	254,970	152,560
May	7030	1986	4190	1934	248,260	147,970
June	7410	1985	4270	1964	261,680	150,790
July	7240	1987	3960	1964	255,680	139,850
August	6900	1987	3320	1936	243,670	117,240

6. GAUGING STATIONS

The Niagara River gauges used to monitor the CGIP levels and the flow over Niagara Falls are the Slater's Point, Material Dock, American Falls and Ashland Avenue gauges (see Enclosure 1). Both the U. S. National Oceanic and Atmospheric Administration (NOAA) and the Power Entities operate water level gauges at the Ashland Avenue location. The Power Entities' gauge is used for officially recording water levels to determine the flows over Niagara Falls subject to continuing comparison checks of the water level data from both gauges by the International Niagara Committee (INC).

Outages to the Power Entities' Ashland Avenue gauge were experienced for some hours on August 9, 16 and 17. These outages were attributed to a failed modem. The NOAA gauge was used as an alternate during these outages. NOAA daily values will be used as the official value for these dates. Comparison of water level readings from both gauges showed that they were within acceptable INC tolerances for the rest of the reporting period.

All gauges required for the operation of the International Niagara Control Works were in operation during the remainder of the reporting period.

7. FLOW MEASUREMENTS IN THE NIAGARA RIVER AND WELLAND SHIP CANAL

Discharge measurements are regularly scheduled in the Niagara River and Welland Canal as part of a program to verify the gauge ratings used to determine flows in these channels for water management purposes. All measurements are obtained through joint efforts of the United States Army Corps of Engineers (Corps) and Environment Canada. Measurement programs require boat, equipment and personnel from both agencies to ensure safety, quality assurance checks between equipment and methods, and bi-national acceptance of the data collected. The Corps and Environment Canada continue their efforts to standardize measurement equipment and techniques.

Discharge measurements were conducted near the Cableway Section in October 2010. This series was made to verify the present Ashland Avenue gauge rating of the outflow from the Maid-of-the-Mist Pool below the Falls. The 2010 measurements fit the 2009 Ashland rating, with all measurements being within the accepted accuracy of 5% of the rating curve. No Board required discharge measurements are planned in 2011.

In the spring of 2007, Acoustic Doppler Current Profiler (ADCP) technology replaced conventional current meter measurements to verify the Ashland rating. This change made the continued use of the cableway, located just upstream of the OPG and NYPA plants, redundant. NYPA, on behalf of the Power Entities, has undertaken to have the cableway removed. A contractor was selected and removal was scheduled for mid-May. Just prior to the removal date, a rock slide resulting from significant rainfall obstructed portions of the access road to OPG's Sir Adam Beck complex. The rock-fall event prevented safe access to the cable anchor point on the Canadian side of the gorge. As a result, cable removal will be re-scheduled to 2012.

As a result of reviewing previous discharge measurements made near the International Railway Bridge, a revision of the 2001 Buffalo rating equation is underway.

This rating is used by the Power Entities to determine preliminary estimates of Niagara River flows and ice and weed retardation. It is also used in Great Lake water supply routing models to estimate the flow in the Niagara River and to verify other Niagara River flow estimates.

Scheduled measurements were made in May 2010 to verify the rating used to determine flow through the Welland Canal Supply Weir. Due to the St. Lawrence Seaway Management Corporation's inability to provide water level data for the time period that is needed to complete the 2010 program, flow measurements will need to be rescheduled.

The next scheduled measurements are to be made near the International Railway Bridge and in the American Falls Channel in the spring of 2012.

8. NIAGARA TUNNEL PROJECT AND PLANT UPGRADES

OPG continues with construction of the Niagara Tunnel Project. The Tunnel Boring Machine (TBM) advanced into the intake grout tunnel on March 1. The official breakthrough, shown on the cover, occurred on May 13. As of September 7, invert (bottom) concrete lining had been completed on 7626 metres (25,020 feet) while arch (top) concrete lining had progressed 3875 metres (12,713 feet). When completed, the increased diversion capacity will mean that OPG's Sir Adam Beck plants can more fully utilize Canada's diversion entitlement for power production. Increased diversion will not affect the regulation of the CGIP, which is governed by the International Niagara Board of Control's 1993 Directive, or compliance with the Treaty Fall's flow requirements.

OPG has also undertaken a unit runner replacement program for its 60 Hz Beck I units. Unit G9 upgrade was completed in December 2010 with a performance test, to determine water use and establish a unit rating table, undertaken in June and July 2011. Work to replace the G3 runner and generator re-wind is planned to begin in January 2012.

The Beck I units were originally built with Johnson Valves at the bottom of the penstocks that could be activated to stop water from entering the units. These are being removed and their function replaced with headgates that can prevent water from entering the penstocks. As the units are upgraded, sleeves will be installed where the Johnson Valves were removed to improve flow through that portion of the penstock. A sleeve was not installed when G7 was recently upgraded. This unit will be out of service from early March until mid-November 2011 to have this work done.

In addition, after replacement of ND1's (DeCew) penstocks, that station's G7 and G8 units were returned to service in May 2011, with G5 and G6 to be returned to service in October 2011.

9. ICE CONDITIONS AND ICE BOOM OPERATION

The Lake Erie ice cover was greater than normal throughout most of the 2010-11 ice season. By mid-March, the ice cover on Lake Erie was about 40% compared to the average of 30% for that point in the season.

Representatives of the International Niagara Board of Control conducted a fixed-wing flight on March 24 to determine the extent of ice remaining on the eastern basin of the lake. It was determined that approximately 1380 square kilometres (530 square miles) or 27% of the basin remained ice covered. The Board advised the Commission that due to the amount of ice remaining, a delay in ice boom opening beyond April 1 was expected.

Although the amount of ice cover on Lake Erie diminished over the next several days, as ice migrated eastward within the lake, the cover on the eastern basin increased. The result was that on March 30, ice cover on the eastern basin was observed to be 1580 square kilometres (610 square miles). By April 6, that amount had decreased to 670

square kilometres (260 square miles) and by April 11, it was 230 square kilometres (90 square miles). Considering the amount of ice remaining and the absence of an ice build up in the Maid-of-the-Mist Pool below Niagara Falls, the Board issued a media advisory on April 11 that preparations for boom opening were underway.

Boom opening operations began with two spans being opened on April 12. One span was opened on April 13, and five more were opened on April 14. High winds forced lake ice over the remaining spans of the boom that were still in place, as well as through the open section, causing a large amount of ice to enter the upper Niagara River. The boom opening was suspended as ice breaker efforts were needed to keep ice moving past the power entities' intakes in the CGIP. Removal operations were resumed on April 19 when six spans were opened. The final phase of the operation was completed on April 22 when the last eight spans were removed.

Floatation barrels were removed from the lake on April 25 and 26. Both the Canadian and U.S. Coast Guards were then notified that this year's ice boom removal from the lake had been completed.

On May 2, the NYPA crew began towing the individual spans up the Buffalo River to the storage site, where the ground crew pulled them on shore. This operation, delayed for a few days due to high winds and equipment problems, resumed on May 5 and was completed on May 11.

10. PEACE BRIDGE EXPANSION

In July, the Peace Bridge Authority (formerly the Buffalo and Fort Erie Public Bridge Authority) announced that plans for bridge expansion, under study in various forms for about twenty years, were no longer being considered due to lack of U.S. Government funding for a new U.S. plaza. Plaza development was considered essential for bridge

capacity expansion to proceed. The Peace Bridge Authority intends to finance a scaled-down version of a new U.S. Plaza at a cost of $60 million. The project will take about three years to complete. The Canadian plaza was re-done during 2005-07 at a cost of $50 million.

11. MEETING WITH THE PUBLIC

In accordance with the Commission's requirements, the Board held an annual meeting with the public. This year, the meeting was held on August 17 in Niagara Falls, Ontario with three members of the public in attendance. Information on items including current and projected Great Lakes levels, the operation of the Lake Erie-Niagara River Ice Boom, and OPG's Niagara Tunnel Project was discussed.

12. MEMBERSHIP OF THE BOARD

Ms. Jennifer Keyes of Ontario's Ministry of Natural resources was appointed to the Canadian Section of the Board on September 9.

13. ATTENDANCE AT BOARD MEETINGS

The Board met once during this reporting period. The meeting was held in Quebec City on September 14. Mr. Thompson and Colonel Drolet, alternate U.S. Board Chair, attended. Ms. Keyes, having just been recently appointed to the Board, did not have sufficient time to make travel arrangements.

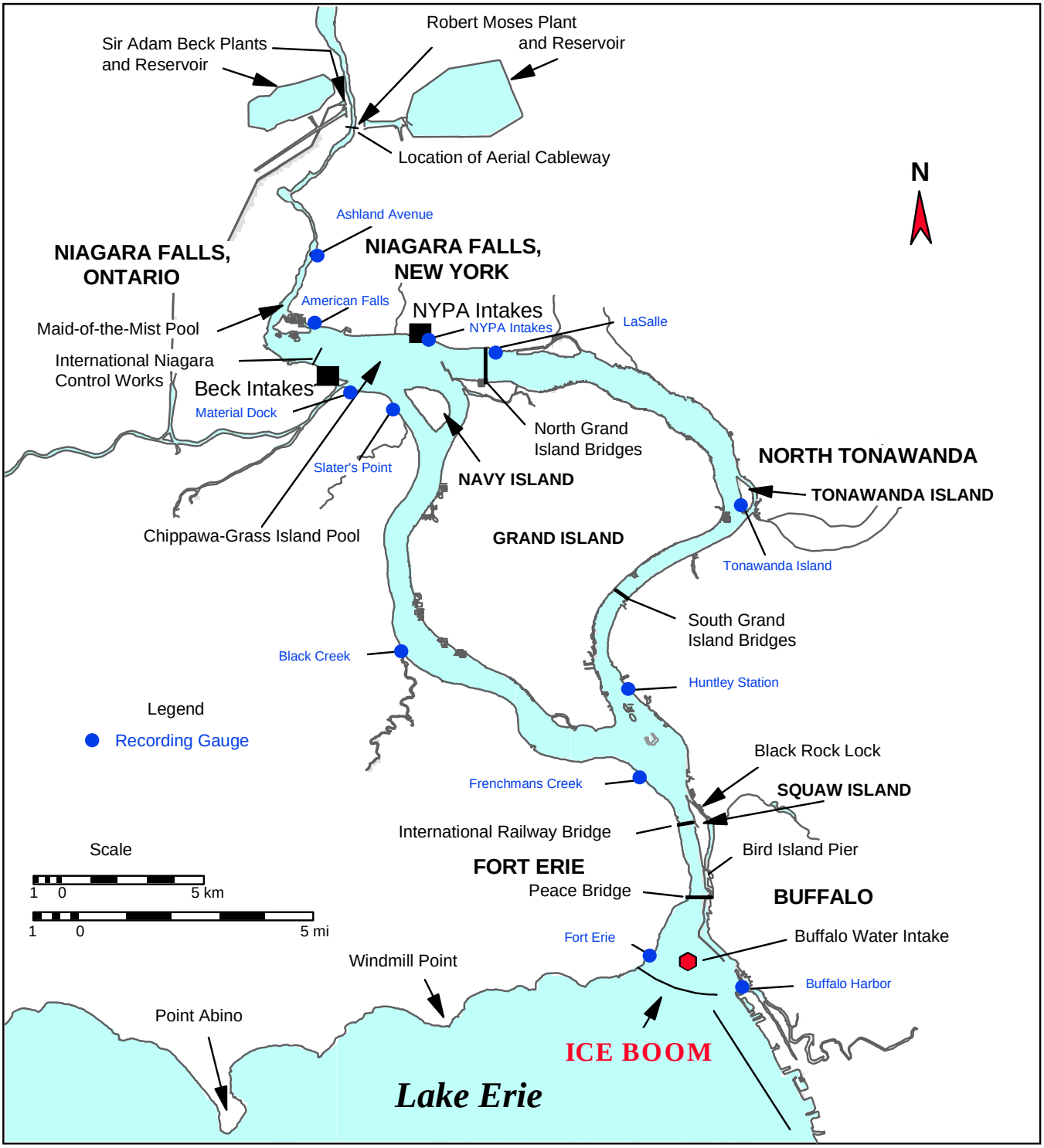
Respectfully Submitted,

MAJOR GENERAL JOHN W. PEABODY
Chair, United States Section

AARON THOMPSON
Chair, Canadian Section

DANIEL J. MAHONEY
Member, United States Section

JENNIFER KEYES
Member, Canadian Section

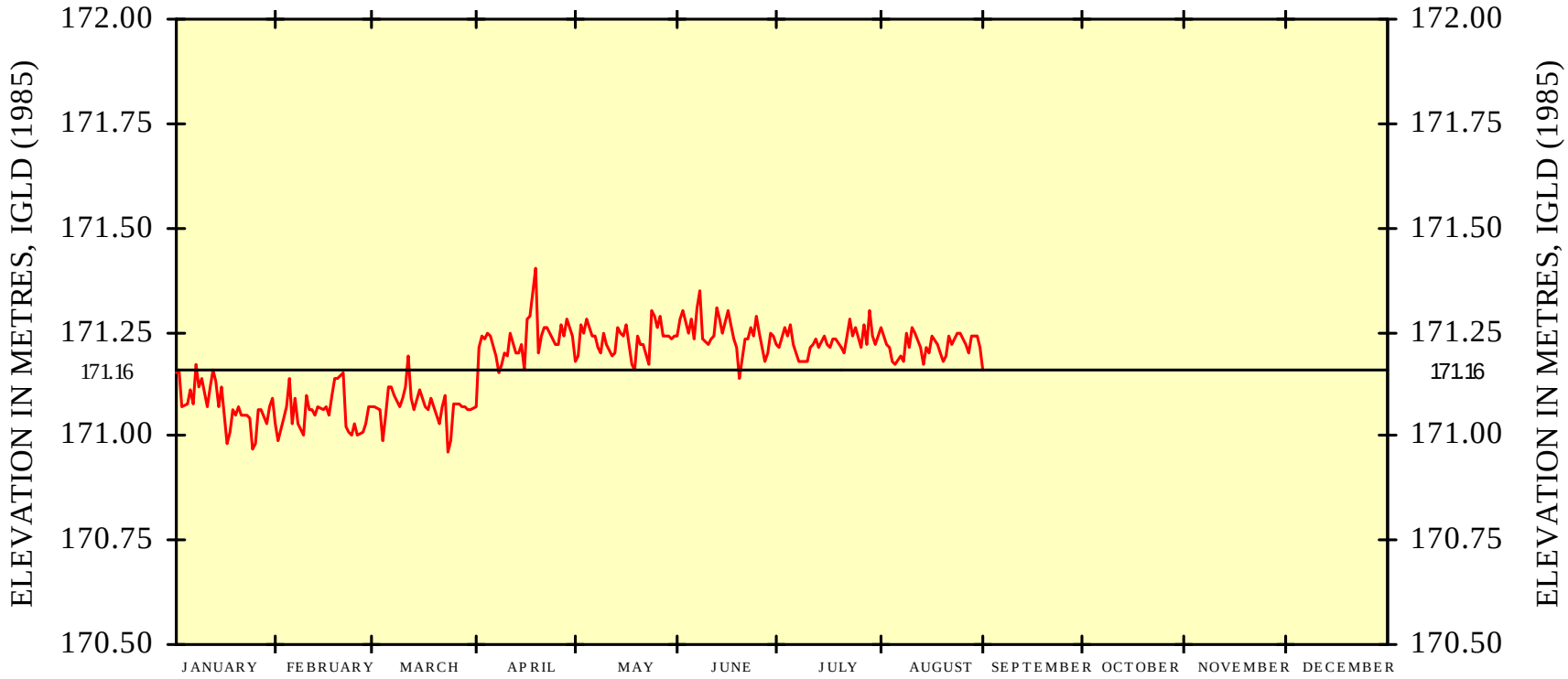

Sir Adam Beck Plants
and Reservoir
Robert Moses Plant
and Reservoir
Location of Aerial Cableway
N
Ashland Avenue
NIAGARA FALLS,
ONTARIO
NIAGARA FALLS,
NEW YORK
American Falls
NYPA Intakes
NYPA Intakes
LaSalle
Maid-of-the-Mist Pool
International Niagara
Control Works
Beck Intakes
Material Dock
North Grand
Island Bridges
NORTH TONAWANDA
TONAWANDA ISLAND
Slater's Point
NAVY ISLAND
Chippawa-Grass Island Pool
GRAND ISLAND
Tonawanda Island
South Grand
Island Bridges
Black Creek
Huntley Station
Legend
Recording Gauge
Black Rock Lock
Frenchmans Creek
SQUAW ISLAND
International Railway Bridge
Bird Island Pier
Scale
FORT ERIE
Peace Bridge
BUFFALO
1 0 5 km
1 0 5 mi
Fort Erie
Buffalo Water Intake
Windmill Point
Buffalo Harbor
Point Abino
ICE BOOM
Lake Erie

ENCLOSURE 1

NIAGARA RIVER DAILY MEAN LEVEL AT MATERIAL DOCK GAUGE

NOTE: LONG-TERM MEAN STAGE = 171.16 METRES, IGLD (1985)

2011



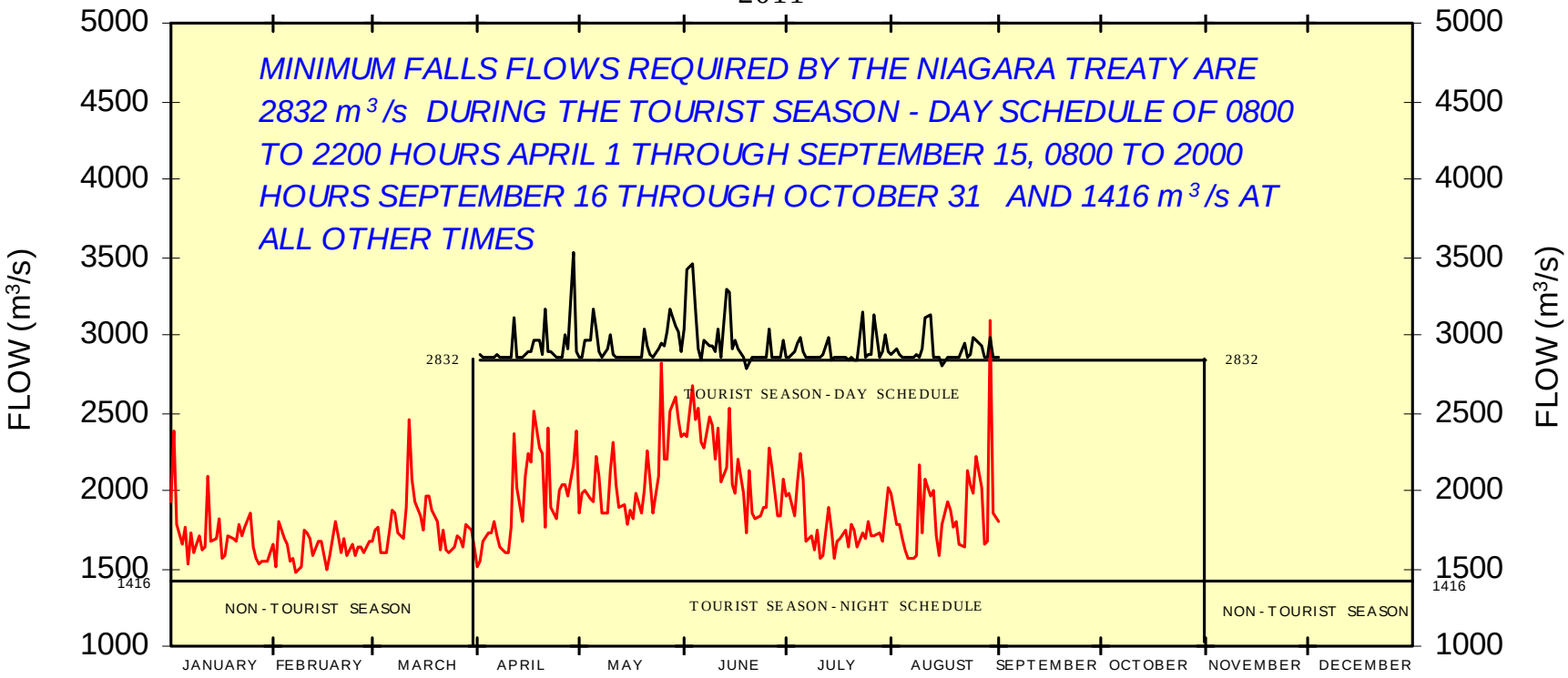
ENCLOSURE 2

DAILY FLOW OVER NIAGARA FALLS

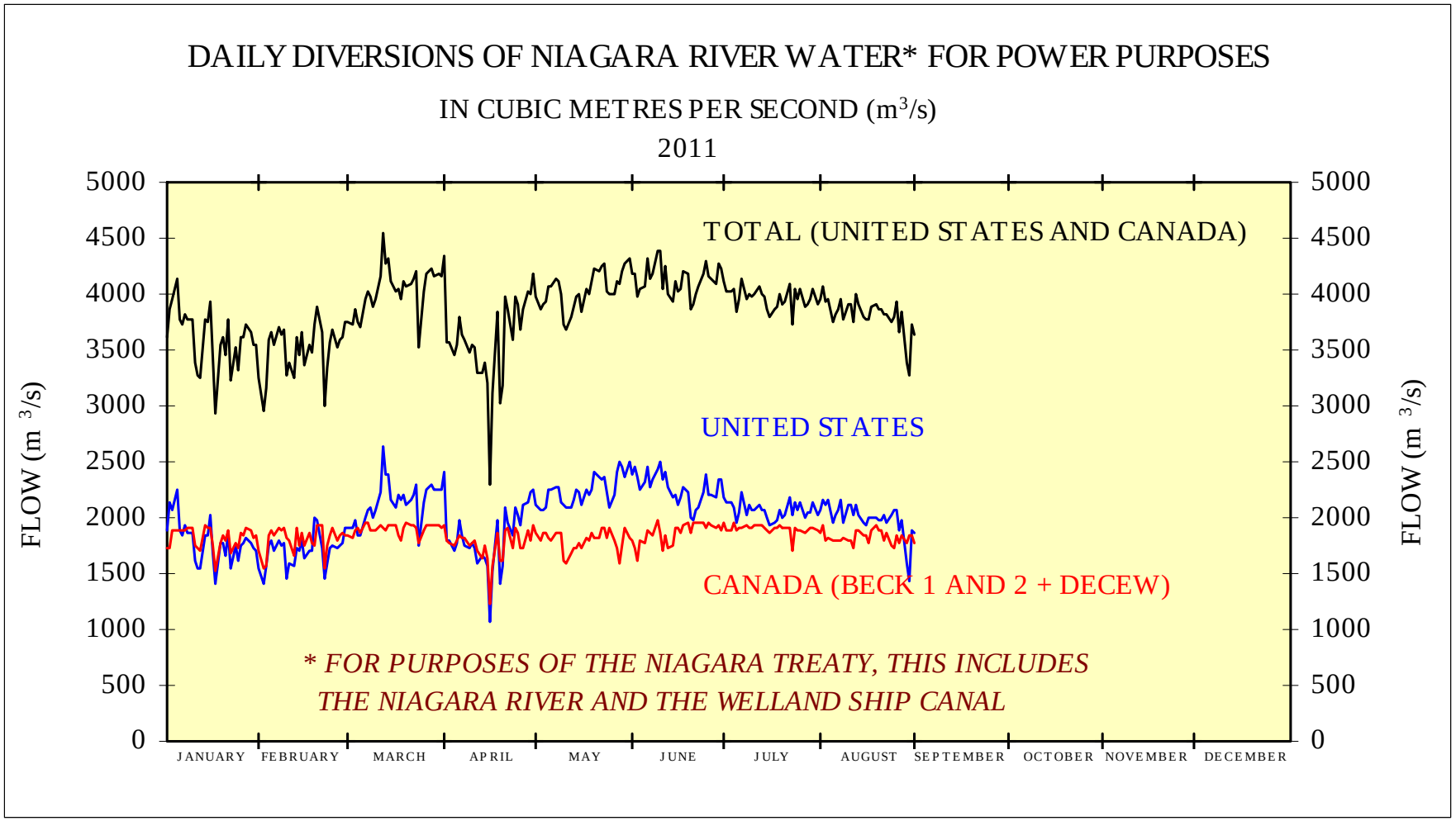
FLOW AT ASHLAND AVENUE GAUGE MINUS CN AND OP DIVERSIONS

IN CUBIC METRES PER SECOND (m^3/s)

2011



ENCLOSURE 3


DAILY DIVERSIONS OF NIAGARA RIVER WATER* FOR POWER PURPOSES
IN CUBIC METRES PER SECOND (m3/s)
2011
TOTAL (UNITED STATES AND CANADA)
UNITED STATES
CANADA (BECK 1 AND 2 + DECEW)
* FOR PURPOSES OF THE NIAGARA TREATY, THIS INCLUDES
THE NIAGARA RIVER AND THE WELLAND SHIP CANAL
FLOW (m 3/s)
FLOW (m 3/s)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER

ENCLOSURE 4