

INTERNATIONAL RAINY LAKE BOARD OF CONTROL
INTERNATIONAL RAINY RIVER WATER POLLUTION BOARD

SPRING 2009 REPORT

Submitted to

The International Joint Commission

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TABLE OF CONTENTS

1 INTRODUCTION	1
2 LAKE LEVEL REGULATION	1
2.1 OVERVIEW	1
2.2 REGULATION CONCERNS AND RESPONSE	3
3 BASIN ISSUES AND OTHER BUSINESS	6
3.1 PROPOSED HYDROPOWER DEVELOPMENTS ON THE NAMAKAN RIVER IN ONTARIO.....	6
3.2 ENVIRONMENTAL MONITORING FOR FUTURE RULE CURVE EVALUATION	6
3.3 HYDROPOWER PEAKING	7
3.4 IJC INTERNATIONAL WATERSHEDS INITIATIVE	7
3.5 MEETINGS.....	8
3.6 LAKE OF THE WOODS MULTI-AGENCY WORKING ARRANGEMENT	9
APPENDIX.....	11

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1 INTRODUCTION

The International Rainy Lake Board of Control (IRLBC) and the International Rainy River Water Pollution Board (IRRWPB) report jointly to the International Joint Commission (IJC) in the spring and the fall of each year. Both reports address activities and basin issues of interest occurring since the previous report and may include sections on specific topics under review by the Boards. In addition, the spring reports address regulation of Rainy and Namakan lakes over the past calendar year, while the fall reports address environmental quality and related issues.

Section 2 of this report addresses the regulation of Rainy and Namakan lakes during 2008. Section 3 of the report addresses other activities of the Boards and items of interest in the basin. A map of the basin ([Figure 1](#)) can be found in the Appendix.

2 LAKE LEVEL REGULATION

2.1 Overview

The year 2008 proved to be another wet year in the basin, continuing the trend for more variable and more extreme inflows (both high and low) since 2000 when compared with the 1980s and 90s. In spite of 2008 being wet overall, with annual inflows of 83 percentile (%ile) and rank 16 out of 97 years of record to Rainy Lake and 93%ile (rank 6 out of 67 years) to Namakan, there were still periods of inflow during the year that were low enough that the outflow had to be reduced to the IJC-specified minimum twice on Rainy and to near-minimum twice on Namakan. Since the new millennium began, the level of Rainy Lake has risen above its operating band in four years (2001, 2002, 2005 and 2008), fallen below its band in three years (2003, 2006 and 2007), and remained within its band in only two years (2000 and 2004). These events have all been due to either well-above or well-below normal precipitation and its resultant impact on inflows. The 2008 quarter-monthly precipitation for the Lac la Croix and Rainy-Namakan subbasins is shown in [Figure 2](#). Water levels, net inflows and outflows are shown on [Figures 3 and 4](#), respectively, for Namakan and Rainy lakes. [Figure 5](#) provides a legend for these figures.

Both Rainy and Namakan lakes started the year with inflows of 80%ile, a carryover from the wet fall of 2007 when inflow to Namakan had peaked in October at the maximum on record (for the time of year) and Rainy inflow had peaked at 95%ile. Inflows continued to decline gradually over the first quarter of the year, reaching 15%ile or less by early April. As inflows declined, the Companies managed the lake levels by reducing outflows as well. Namakan Lake started the year with its level at 45 percent (%) of the IJC band and remained close to mid-band through the quarter, ending March at 49% of band. Rainy started the year a little higher, at 73% of band, but reached mid-band by mid-January and ended March at 51% of band. The level of Rainy Lake continued to decline into April, reaching only 22% of band by April 15, in spite of the outflow being reduced to the normal IJC minimum of 100 m³/s. Precipitation recorded over the winter was below normal but March snowpack water content was about median.

Inflows to both lakes rose sharply in mid-April as a result of two late-season snowfall events and then, after a brief lull, continued to rise due to a series of significant rainfall events. Namakan inflow rose from 10%ile in mid-April to 85%ile at end-April, to greater than 95%ile by May 13 and to a new maximum of record (for the time of year) by May 30. Inflow continued at maximum of record (for the time of year) through June 17 and was still greater than 95%ile through July 5. Over April and May, Namakan inflow rose over eleven-fold, from a low of 59 m³/s to a high of 654 m³/s. On Rainy Lake, inflow rose from less than 5%ile in mid-April to 70%ile at end-April, to 85%ile by May 14, to 95%ile

by May 31 and was mostly greater than 95%ile from June 12 through July 22. From April to June, Rainy inflow rose over fourteen-fold, from a low of 84 m³/s to a high of 1184 m³/s.

The Companies responded to these high inflows by increasing outflow through the dams on both lakes. The Namakan dams were nearly fully open by April 28, had their outflow reduced a little in early May during a lull in rising inflow, and then were fully open from May 12 through July 7. Nevertheless, the inflow exceeded the outflow capacity of the dams, resulting in Namakan being above its Upper Rule Curve (URC) from May 13 to July 7. Its peak level was 341.21 m (1119.5 ft) on June 15, while the maximum deviation above its URC was 31 cm (12.2 in) on June 16. Higher levels occurred on Crane Lake, at the upper end of the Namakan reservoir. On Rainy Lake, the first sluice was opened on May 5 and all 15 were open from June 6 to July 17. As with Namakan, Rainy Lake rose above its URC due to inflow being greater than the outflow capacity. Rainy was above its URC from May 13 to July 23, reached 39 cm (15.4 in) above its URC on June 17 and peaked at 338.11 m (1109.3 ft) on June 29. The outflow from Namakan peaked at 620 m³/s on June 15, while Rainy outflow peaked at 1019 m³/s on July 4. As a result of these high outflows, water levels on the Rainy River rose 4.0 m (13.1 ft) just below the Fort Frances – International Falls dam and 3.8 m (12.6 ft) at Manitou Rapids from early-April to mid-June.

Although inflows continued to be well-above normal through June and into July, they were declining and had fallen to the normal range by about the third week of July. Reductions in outflow from both lakes began in July and continued in steps in order to control the rate of decline of the lake levels. On Rainy, all gates in the dam were closed by August 1 and further outflow reductions continued but, with inflows declining to only 15%ile by late August, outflow through the powerhouses was actually reduced to the IJC-specified minimum (for the second time in the year, despite the summer's high inflows) in order to maintain the lake level within the operating band. Outflows from Namakan Lake were also reduced to near their IJC minimum after mid-September.

Inflows to both lakes increased a little (more so to Namakan) in late September, such that it was possible for the Companies to increase outflows above the IJC minimum. While only a small increase was possible on Rainy, a significant increase in Namakan outflow in late September was required to keep Namakan within its operating band; it peaked at 99% of band on September 28 but was back down to mid-band by October 3. Several larger rainfall events then led to more significant increases in inflow in both October and November and resulted in sustained upper quartile inflows through to year-end. The level of Namakan Lake rose above 60% of band before mid-October and tracked in the 60-70% of band range through to early November. Inflow then increased by 100 m³/s, from 65 to 85%ile, over only a few days, resulting in the lake level rising above the URC. Outflow was not increased as quickly as normal under these circumstances as the Companies were thwarted by jammed stop-logs in the Kettle Falls dam and illness of the dam tender. The lake level was above its URC for 16 days, from November 9 through November 23, but with a maximum deviation of only 7.5 cm (3 in) above the URC on November 17. At year-end, the level of Namakan was 50% of the IJC band and both inflow and outflow were a little above 75%ile.

The level of Rainy Lake also varied (between 50 and 89% of band) through the final quarter of the year in response to the rainfall events but was contained within its IJC operating band and ended the year at 78% of band. A number of outflow changes were required to keep the level within the band in response to the varying inflows. From the minimum outflow of 100 m³/s in late September, outflow was increased to as much as 539 m³/s on November 15.

2.2 Regulation Concerns and Response

With yet another year of high and variable lake levels and river flows, public criticism and concern regarding regulation continued in 2008. To some, the introduction of new Rainy and Namakan rule curves in 2000, and the occurrence of more frequent high and low water levels in the 2000s, is more than just unfortunate coincidence. Some blame the change in rule curves rather than the more variable and extreme weather events, even though these have been well-documented. The timeliness of regulation operations has also been questioned, and whether the Companies have sufficient flexibility to respond to conditions as they see fit locally.

In response to past public concern, the IRLBC conducted detailed reviews of the 2001 and 2002 high water events and issued separate reports on these events; these are available on the Board's web site. Following the 2005 high water event, the Board evaluated several alternate regulation proposals submitted to the IJC by the Border Lakes Association (BLA); this evaluation is documented in the Boards' joint Spring 2006 Report to the IJC and is also available on the IRLBC web site. As, in the Boards' view, much of this past material is relevant to the 2008 event, the Boards will not be duplicating that content herein but instead recommend that these reports be referred to again. In addition, though, at the August 2008 public meeting in Fort Frances, the Boards did commit to reporting on several issues raised this year, and that follows below.

Rule Curve Operations

Similar to questions raised in previous years, attendees at the August public meeting questioned:

- what would be the benefit to Rainy Lake of storing more water on Namakan Lake, instead of following the declining summer level of the 2000 rule curves, so as to lessen Rainy Lake inflow?
- what would be the benefit of having the levels of both lakes at their LRCs (or even lower) at the beginning of the runoff event? What would have resulted with the 1970 rule curves? Why must the Companies target the middle portion of the IJC operating band instead of drawing the lake level lower if there is lots of snow?

Subsequently, in September, the BLA passed a resolution recommending that the Companies be allowed to target any area within the IJC bands in the March 15 to April 15 period, so as to allow for lower lake levels in advance of anticipated high runoff, and also recommending that Namakan operations should default to the 1970 rule curves when Rainy Lake is high (thereby allowing more water to be stored on Namakan over the summer).

The Boards responded to the BLA in early December. Regarding the first recommendation, freedom to target other than the middle portion of the IJC operating bands from mid-March to mid-April, it was noted that this objective is already allowed under the current IJC Order, not only in this period but year-round. Further, the Boards stated their desire and intent to work co-operatively with the Companies at all times on regulation matters, and noted that the Companies can initiate contact with the IRLBC at any time to discuss regulation and propose actions, and the IRLBC can approve any target level within the IJC band once agreement is reached.

Regarding the second BLA recommendation, that the 2000 Rule Curve for Namakan Lake be replaced with the 1970 Rule Curve when Rainy Lake is high in the summer (in order to delay the required drawdown of Namakan), it was noted that the IJC Order does not allow switching back and forth between rule curve sets. However, the IRLBC can propose operations outside the rule curves to the IJC

under unusual circumstances and, if authorized by the IJC via a Supplementary Order, can then carry out the proposed action. The response did note, however, that the declining summer level on Namakan was deemed to be important for environmental reasons, and studies after the 2001/02 high water events showed that the storage of additional water in Namakan had only a very small impact on Rainy Lake levels.

The response to the BLA also noted that:

- Chapters 5, 7 and 8 of the “Report on Year 2002 High Water Levels in the Rainy/Namakan Basin” provided insights directly related to their recommendations
- The Boards find that the facts and conclusions of the 2005 review (reported in the Spring 2006 Report to the IJC) are still valid.
- The peak level reached in 2008 on Rainy Lake was rank 13 out of 97 years of record. The levels reached in a number of the higher ranked years were considerably higher than in 2008 and, of the 12 years with higher peak levels than 2008, two occurred since the Year 2000 rule curves were adopted and 10 occurred previously.
- The storage of more water on Namakan would have negative impacts on the upper reaches of the Namakan Chain. As in 2005, the peak level of Crane Lake in 2008 rose significantly higher than the level recorded at the Kettle Falls gauge. In 2008, the Namakan-Kabetogama level peaked at 26 cm (10 in) above the maximum level of the upper rule curve for Namakan Lake, whereas Crane Lake peaked an additional 11 cm (4 in) higher. Also, while the Namakan-Kabetogama level was above the maximum upper rule curve level for 42 days, the Crane lake level was above this point for 49 days.

Since responding to the BLA, the IRLBC has been able to carry out some computer-based modeling to quantify the effects that would have resulted in 2008 from the actions proposed by questioners at the public meeting and also by the BLA. The modeling followed the same approach as used in assessing the 2005 event; details of model assumptions and functioning, and cautions in interpreting the results, can be found on page 3 of the Spring 2006 Report. The model indicated that:

- If the level of Namakan Lake had not been pulled down lower than the highest point on its IJC 2000 URC (same maximum elevation as with the IJC 1970 URC), the peak level on Rainy Lake would still have been the same. This is simply because the peak on Rainy occurred while Namakan was still above its maximum URC level.
- If the level of both lakes had been at the mid-point of their IJC 2000 operating bands at mid-April (Namakan was actually at 56% of band, while Rainy was at 22%), but the discharge from both lakes had been maintained at up to the maximum possible in order to try to hold the lake levels at mid-band as long as possible as the season progressed (rather than allowing the levels to rise within the bands earlier as they did), the peak level on Rainy Lake would have been 5 cm (2 in) lower. Such a policy would mean that the upper portions of the operating bands would only rarely be reached in the spring, thereby negating the environmental benefits of some of the rule curve changes made in 2000.
- If the level of both lakes had been at their IJC 2000 LRCs at mid-April, and both lakes had discharged the maximum possible (a function of lake level) as soon as the event began, the peak level on Namakan Lake would have been 4 cm (1.5 in) lower, while the peak on Rainy Lake would have been 10 cm (4 in) lower. Of course, operating at maximum discharge from mid-April into July would have been a very extreme approach and very difficult to justify with the information available at the time, but this approach in modeling shows the maximum possible benefit that could have been achieved; the actual benefit in real life would be less.

- Similar to the above, but if operation had commenced with both lakes on the LRC of the IJC 1970 rule curves, the peak level on Namakan Lake would have been 7 cm (2.8 in) lower, while the peak on Rainy Lake would have been 12 cm (4.7 in) lower. Compared to the result above, this shows that extreme operations with the IJC 1970 rule curves instead of the current IJC 2000 rule curves would have only lowered the Rainy Lake peak level by 2 cm (0.8 in).
- Given the large inflows that did occur in 2008, even if both lakes had been 1.2 m (4 ft) below their LRCs in mid-April and had continuously discharged the maximum possible outflows from then on, the peak level on Namakan Lake would have been only a little lower and the peak level on Rainy Lake would have still slightly exceeded its maximum URC level.

Rainy Dam Gate Operations

Another key concern, raised primarily by the Rainy Lake Sport Fishing Club both before and at the August public meeting, was that more gates should have been opened sooner in the Rainy Lake dam at Fort Frances – International Falls. While acknowledging that the Rainy Lake URC would still have been exceeded, the Club felt that quicker action could have resulted in a lower peak level on Rainy Lake.

In response, the IRLBC explained that, due to the constriction at the outlet of Rainy Lake at Ranier Rapids, the upper portion of the Rainy River cannot deliver the full discharge capacity of the dam down to the dam until the lake has reached near full summer level. Opening more gates at lower lake levels simply results in more drawdown of water level along the upper river and a low forebay at the dam, which has three results:

- Less “head” or potential energy to “push” water through the gates that are open
- Powerhouse turbine “cavitation”, which may force the units to be shut down, resulting in less discharge
- Pumps for the pressurized firewater system at the Canadian mill draw air; a risk factor for the mill and its workers

The end result is that opening more gates sooner does not result in more discharge, but does result in other negative impacts. Any significant improvement in discharge capacity at lower lake levels would require enlargement of the river channel at least at Ranier Rapids.

Throughout the high water event in 2008, IRLBC staff stayed in close contact with the Companies, ensuring that gates were opened as soon as they could be effective in increasing discharge. The Sport Fishing Club was provided with records of gate openings and discharge (including date, lake level, gates opened, discharge, etc) and was referred to a “calculator” available on the web site of the Lake of the Woods Control Board (www.lwcb.ca) that computes the estimated maximum Rainy Lake discharge at any given lake level. Using this information, the Club concluded that gate openings had in fact been timely.

Nevertheless, so as to eliminate one possible constraint in maximizing outflows, the Boards wrote to AbitibiBowater about the possible relocation of their fire pump intake away from the forebay of the dam. This would allow the forebay to be drawn lower without risk to the mill, so that it could be absolutely confirmed that not even a little more water could be discharged at lower lake levels.

Based on their August inspection of the dam, the Boards also wrote to ACH LP, the operator of the dam, regarding the amount of leakage through the sluices since the gates had been closed. The Boards asked what action was being taken, noting that this degree of leakage is of concern as it introduces errors to the

outflow records that are important for future studies of reservoir operations. It is also of concern during low inflow periods, when maintaining lake levels is difficult.

At time of reporting, the Boards had not received responses to either letter.

3 BASIN ISSUES AND OTHER BUSINESS

3.1 Proposed Hydropower Developments on the Namakan River in Ontario

As noted in the 2007 and 2008 reports, three sites on the Namakan River (in Canada, below Lac La Croix and above Namakan Lake) have been proposed for small hydroelectric developments. The proponent is the Ojibway Power and Energy Group (OPEG), a partnership between the Lac La Croix First Nation and Chant Construction. Field work and studies are continuing, public consultation is proceeding in steps, and the projects are subject to both federal (Canadian) and provincial environmental assessments.

As part of the development proposal studies, the Ontario Ministry of Natural Resources (OMNR) is studying the sturgeon population on the Namakan River. Dovetailing with this are sturgeon studies in the Namakan Reservoir being conducted by Voyageurs National Park (VNP), with the involvement of the Minnesota Department of Natural Resources (MDNR). Preliminary results of this joint effort were published in local media in February 2009, noting in particular significant movement of the fish between the river and the reservoir, and movement both upstream and downstream past the existing water falls and rapids on the river.

As reported previously, there has been considerable public concern voiced regarding these proposed developments, but there is some support as well. Following their public meeting in 2007, the Boards wrote to the IJC to advise the Commission of the public concern, noting in particular the public expectation that the IJC would be involved in spite of Commissioner Olson's statement at the meeting that the IJC has no authority to act unless the issue is referred to the IJC by the governments of Canada and the USA. The IJC subsequently sent letters to both governments to alert them to the issue. The Boards continue to monitor the issue and will keep the Commission advised.

3.2 Environmental Monitoring for Future Rule Curve Evaluation

When new rule curves were adopted for Rainy and Namakan lakes in 2000, they were to be subject to review in 15 years. The IJC requested the basin natural resource agencies to collect the data needed to support such a review. In response, the resource agencies on both sides of the border established the Rainy Lake and Namakan Reservoir Environmental Monitoring Committee. While data is being collected and studies are on-going on the lakes, concern continues that current funding is insufficient to complete this work. In addition, the required work has not yet been defined and initiated on the Rainy River, and needed socio-economic data is missing in all areas, due to lack of funding and other resources. These concerns were raised by the resource agencies at their meetings with the Boards in 2006 and 2007 and in turn were relayed to the IJC. In response, the IJC set up the 2000 Rule Curve Assessment Workgroup, to develop and cost a plan of study (POS) to address the information gaps, as a basis for seeking required funds from governments.

The Boards' fall 2008 report provided some detail on the work currently underway by the resource agencies' Committee. In mid-December, 2008, the Committee provided the Boards with the final report

for the benthic macroinvertebrate portion of the five part Rainy Lake / Namakan Reservoir lake levels study (2004-2006); this work was to be presented at VNP on March 10 and at the Lake of the Woods Water Quality Forum on March 11, 2009.

Regarding the Rule Curve Workgroup, as reported in the fall 2008 report, the Workgroup held several meetings and a workshop in 2008 and submitted a draft POS to the IJC in June 2008. After considering comments received on the draft, discussing issues with IJC staff and conducting further work, the Workgroup issued a final draft in late February, 2009, with the objective of submitting the final report to the IJC in April, 2009.

3.3 Hydropower Peaking

Due to concerns about the impacts of hydropower peaking operations (at Fort Frances – International Falls) on the Rainy River, a “Peaking Workgroup” was set up in the fall of 2006. This led to an agreement for a two year trial (2007 and 2008) during which there would be no peaking for 2½ months in the spring spawning period. Nominal dates of April 15 to June 30 were selected, with provision for adjustment based on monitoring. The background of this issue has been addressed in previous reports.

The Workgroup met on February 12, 2009 to review the two-year trial; it was agreed that the Workgroup and its process would continue, subject to annual review and with amendments as determined by consensus. The Workgroup also agreed to consider a future proposal by the Companies (AbitibiBowater, ACHLP and Boise) requesting a trial to determine if potential impacts from limited peaking operations during the spring spawn window are close enough to natural flow variability to be acceptable to the resource agencies. This proposal’s metrics are to include detailed information on natural variability, economics and biota (spring spawning fish species). The Workgroup also agreed to further discuss a water temperature probe network in the river in order to refine the determination of the start and stop dates for the spring spawn, when peaking should be avoided or minimized.

3.4 IJC International Watersheds Initiative

The International Watersheds Initiative (IWI) promotes an integrated, ecosystem approach to issues arising in transboundary waters through enhanced local participation and strengthened local capacity. Since the Rainy basin was identified by the IJC as a potential IWI watershed, the Boards have been involved in a number of IWI-related activities. The public can read more about the IWI at:

http://www.ijc.org/en/activities/bassins_watersheds.htm

Rainy River Modeling

With funding provided by the US Section of the IJC, the US Army Corps of Engineers has developed a computer-based hydraulic model of the lower Rainy River (from the International Falls – Fort Frances dam to Lake of the Woods). Survey work to define the river bed geometry was conducted by the US Geological Survey. Work on the model was completed in late 2007 but completion of an independent technical review and a final report, which was expected to be finished by December 2008, is not yet done.

Additional Projects

Canadian funding for IWI projects became available in 2008 and an open process was set up by the IJC for its Boards to submit proposals for funding. While the Rainy Boards submitted a total of four

projects for consideration, none are proceeding. Two of these were approved but, as they involved work best done by the American team who worked on the lower Rainy River model (addressed above), they could not be funded by the Cdn Section of the IJC. A third proposal, to purchase temperature probes in support of the water temperature network needed by the Peaking Workgroup, will likely be re-submitted once a source of on-going operational support can be identified. Finally, the Boards have nearly completed a new proposal for survey work in the upper Rainy River in 2009, needed for the ultimate development of a hydraulic model for that reach, similar to the model already developed for the lower Rainy River.

In addition, the IJC's Health Professionals Task Force sought the support of the Boards in December 2008 for its proposal to fund the creation of a detailed inventory of public health information related to water quality issues in the Rainy and Lake of the Woods basins. The Boards agreed to support the proposal, it was subsequently approved by the IJC, and work is underway with an expected completion date of end-March, 2009.

Board Merger and Mandate Expansion

On October 20, 2008, in response to the IJC's request and as a follow-up to a Board presentation to the IJC in April 2008, the Boards submitted a letter detailing their views on the merger of the two boards and expansion of the geographical area under Board mandate. Based on a number of considerations, the Boards recommended their merger and expansion of mandate to include water quality issues on Lake of the Woods, subject first to consultations between the IJC and federal governments, and subject secondly to consultations with various basin agencies, municipalities and the general public. The IJC thanked the Boards for their input at the late October 2008 IJC meetings; the Boards await word from the IJC.

IWI Workshops and Input to 3rd IWI Report to Governments

Several members and staff of the two Boards attended the IJC's inaugural IWI Workshop in Vancouver in March 2008. This workshop was held to refine the focus of the concept and share ideas among the affected boards. Board members and staff also participated in discussions at a follow-up workshop in Ottawa in October 2008. Subsequently, the Boards submitted materials for inclusion in the IJC's 3rd IWI Report to the federal governments and provided comments on the draft.

3.5 Meetings

IJC Fall Semi-Annual Meeting

IRLBC and IRRWPB members and staff attended the fall semi-annual meeting of the IJC in Ottawa ON on October 29. The Boards' presentation to the IJC addressed water quality, basin activities, Board meetings, lake regulation and potential merger of the Boards and expansion of their mandate. The water quality component reported on water sampling, fish consumption advisories, municipal/industrial point source discharges and trends in BOD (biochemical oxygen demand) and phosphorus loads on the Rainy River. While no violations were reported at municipal or industrial operations, it was noted that federal guidelines for several water quality indicators had been exceeded at Manitou Rapids in the spring and fall of 2007. When problems were discovered, the sewage lagoon operators managed discharges so as to minimize impact on the environment. The basin activities component provided an update on spring hydropower peaking operations, environmental monitoring for future rule curve evaluation (work by both the committee of the resource agencies and by the workgroup named by the IJC to develop a Plan of Study), the proposed Namakan River hydropower developments, the status of the Pine Island peat

mine, and work under the IJC's International Watersheds Initiative. The latter included an update on the Rainy River hydraulic model and a summary of projects submitted for funding. The meetings component addressed the Boards' meetings in the basin in August, noting in particular the concerns raised at the public meeting. These were the need for an IJC board to address water quality issues on Lake of the Woods, risks associated with proposed sulphide mining near Ely MN, and 2008 high water levels. The submissions received by the Boards on these issues were subsequently provided to the Commission, and the first two issues continued to be monitored by the Boards.

Board Meetings and Conference Calls

In addition to meeting in Ottawa on October 29, 2008, both before and after their presentation to the IJC, the two Boards continued to maintain contact via email exchanges throughout the reporting period. They also held joint conference calls on December 17, 2008 and March 2, 2009. As well, several subsets of Board members and staff held separate conference calls to deal with specific issues.

When in Ottawa, the Boards finalized their presentation to the IJC, addressed revisions to their fall report to the IJC, discussed the IWI Workshop and the status of several projects proposed for IWI funding, and reviewed the status of several basin issues and activities. Decisions were made regarding several matters, including follow-ups to concerns raised at the August public meeting, replies to submissions to the Boards, a plan to assess the 2008 high water event, and follow-ups to regulation issues. The need to update the Boards' workplan was noted, tentative meeting and activity plans were discussed for 2009 (the IJC centennial year) and arrangements were made to carry on without a Board Secretary, as Kari Layman (US Army Corps of Engineers) would no longer be available for this role. On the December and March conference calls, the Boards reviewed and discussed several outstanding action items, another submission received by the Boards, IWI projects, how to simplify and share the preparation of Minutes without a Board Secretary, several draft reports, and preparations for the IJC spring semi-annual meetings.

International Lake of the Woods Water Quality Forum

Several members and staff of both Boards attended the 6th annual International Lake of the Woods Water Quality Forum on March 11-12, 2009 in International Falls. The Forum was well attended by over 60 scientists and resource managers, despite a blizzard that closed Fort Frances and International Falls airports the previous day. Two workshops were held to discuss "Aquatic Invasive Species" and "Monitoring Coordination", and two presentations on "Lake of the Woods International Coordination" were given. As well, there were numerous scientific presentations on recent studies in the basin, including a few that highlighted ecological benefits of the 2000 Rule Curves for Rainy and Namakan lakes. The IJC's centennial celebration display ("The Boundary Waters Treaty: A century of cooperation protecting our shared waters") was set up at the poster session for the benefit of attendees.

3.6 Lake of the Woods Multi-Agency Working Arrangement

To effectively address international water quality issues in Lake of the Woods, a multi-agency Working Arrangement is being developed among agencies conducting science activities in the basin (currently Ontario Ministry of the Environment, Ontario Ministry of Natural Resources, Manitoba Water Stewardship, Environment Canada, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources, U.S. Environmental Protection Agency and the Lake of the Woods Water Sustainability Foundation). The purpose of the Arrangement is to foster coordination and collaboration on science and/or management activities aimed at enhancing/restoring water quality in the Lake of the

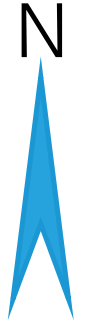
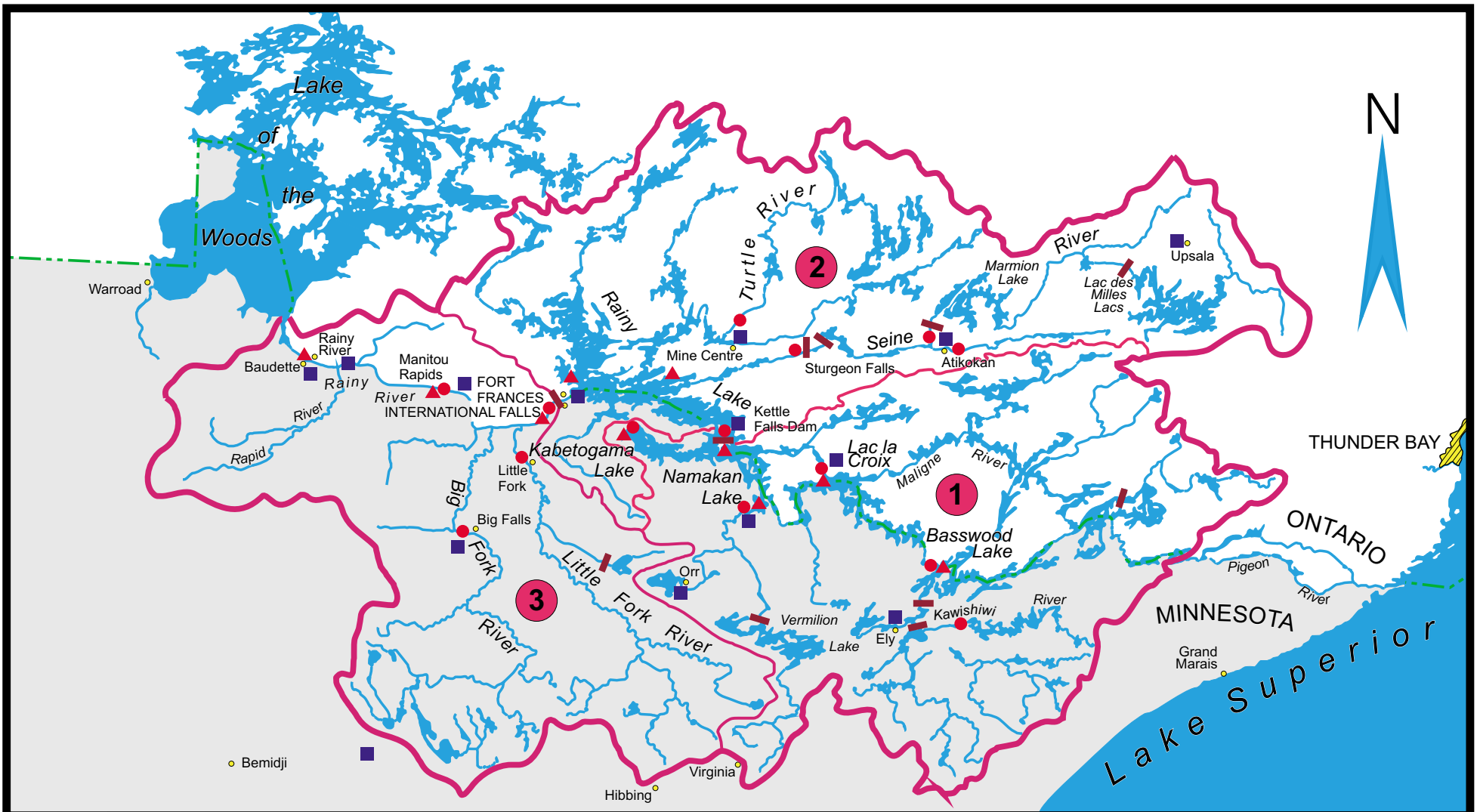
Woods watershed (including Rainy River basin) through the establishment of a Working Group. The agencies met during the International Lake of the Woods Water Quality Forum to finalize the Arrangement and share work plans for the next year.

APPENDIX

Figure 1	Rainy River Drainage Basin Map
Figure 2	Rainy Basin Precipitation
Figure 3	Namakan Lake Elevation, Net Inflow and Outflow
Figure 4	Rainy Lake Elevation, Net Inflow and Outflow
Figure 5	Legend for Lakes and River Graphs

NOTE

All precipitation, water level and flow data used in the text and figures of this report were taken from the database of the Secretariat of the Lake of the Woods Control Board. At the time of preparation of this report, this data was still provisional and subject to revision.



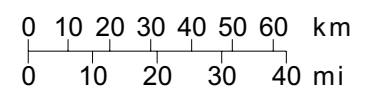
LEGEND

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- Drainage Basin - - - - -
- Sub-Basins - - - - -
- ① Namakan Lake
- ② Rainy Lake
- ③ Rainy River

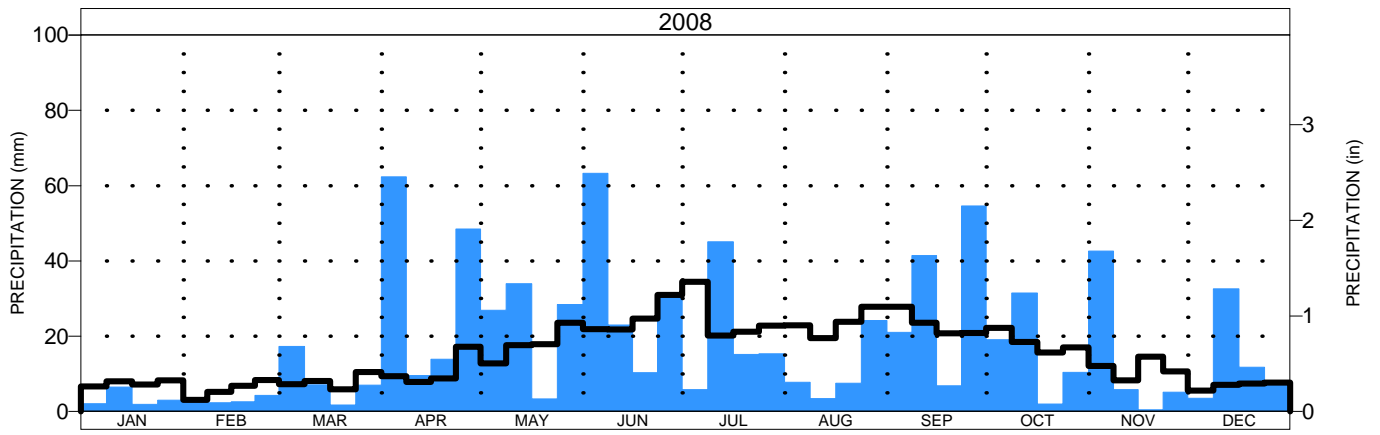
- Control Dams - - - - -
- Data Gauges (Near Real Time)
- Stream Flow - - - - -
- Water Level - - - - -
- Precipitation - - - - -

**International Rainy Lake Board of Control
IRLBC**

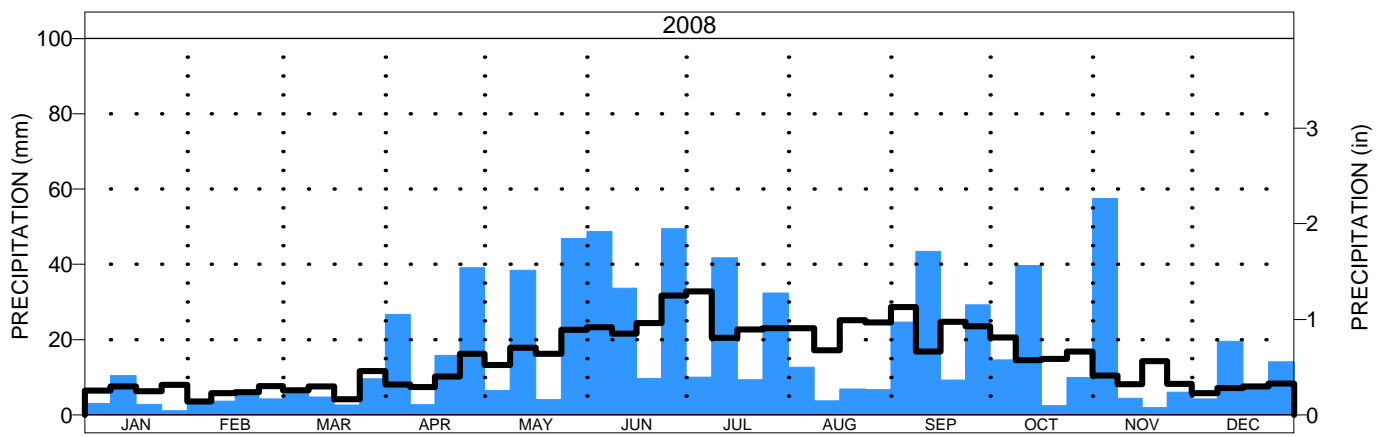
**Rainy River
Drainage Basin**



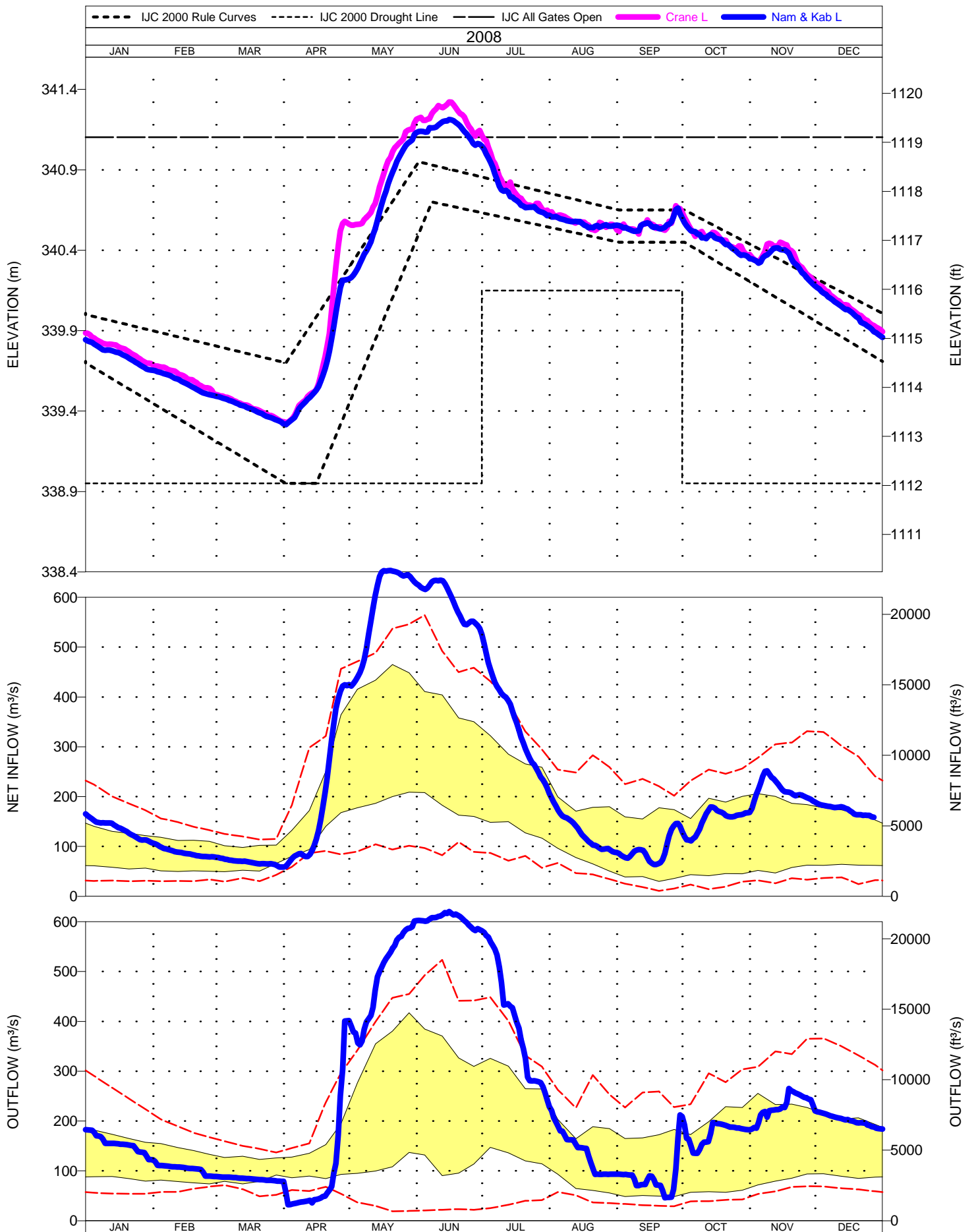
LAC LA CROIX PRECIPITATION



RAINY-NAMAKAN PRECIPITATION



NAMAKAN LAKE



RAINY LAKE

