Adopted Regulation Strategy
LWCB Regulation Meeting – March 22, 2007

The following strategy was adopted by the Lake of the Woods Control Board at its Regulation Meeting in Kenora on March 22. The strategy was formulated considering basin conditions and forecasts, and the input of the Board's Secretariat, Specific Interest Groups and Resource Advisors.

The spring and early summer period is the most volatile season of the year hydrologically. Snow melt has an impact on the basin early in the season, but rainfall through the spring is the largest factor in determining the condition of the lakes and rivers as the season progresses. Future rainfall cannot yet be forecast with any accuracy, and therefore future runoff in the basin is also largely unknown. The strategy attempts to strike a balance among the various interests in the Winnipeg River Drainage basin, while considering the limitations of hydraulics and the large range of possible future conditions.

At the time of the meeting, conditions in the basin were quite dry. The following statistics indicate the strength of the drought that has been experienced since the summer of 2006.

- From October 2006 to mid-March 2007, Lac Seul inflow averaged only 9%ile, the driest such period since 1982.
- For the same period, as well as for the entire period from June 1, 2006 to mid-March 2007, Lake of the Woods inflow was the second lowest in 91 years of record.
- March 1, 2007 snow surveys taken by the US Army Corps of Engineers in the United States portion of the upper boundary waters basin indicated average water content was about 84% of normal. Values for individual stations for water content ranged from 40% to 116% of normal.
- Similarly, in the Ontario portion of the basin, Ontario Power Generation's March 1, 2007 snow survey results in Ontario showed water content ranging from 112% of normal at Kenora to 33 % at Sioux Lookout.

LAC SEUL

A) Seasonal Considerations

Lac Seul regulation over the near term will be influenced by the drier than normal conditions across the basin and the below normal level of Lac Seul. It is highly desirable from a fisheries perspective to have levels rising after mid-April. In addition, tourist outfitters may have navigational problems if the lake level does not rise significantly by mid-May. The points below reflect a number of ideal or desirable regulation objectives over the next few months, based on input provided to the Board.

- Attempt to meet the preferred Lac Seul, Pakwash Lake and English River levels for the fishery and tourist outfitter interests, to provide good spring spawning conditions and adequate navigation levels at the start of the walleye fishing season.
- Lac Seul level should be constant or rising after April 15 for spring spawning fish.
- The desirable lake level on May 15 is no less than 355.1 m (1165 ft) for navigation for the start of the walleye fishing season.
- The tourist outfitters preferred summer maximum level is 356.6 m (1170 ft).
- Supply water requested by Ontario Power Generation and Manitoba Hydro for hydroelectric energy generation; avoid spill in wet conditions and violation of low flow constraints in dry conditions.

- A minimum flow of 180 m^3/s below Manitou Falls is desirable during spring spawning. If there is not sufficient water to meet this criteria, Lac Seul discharge should be set to maintain a uniform flow through the spawning period.
- River flows at Grassy Narrows should be less than 550 m^3/s.
- Use Lac Seul storage to offset Lake of the Woods high/low outflows for the benefit of users of the Winnipeg River in Manitoba.
- Lac Seul level and outflow should be managed to reduce flood risk on the lake and downstream in Ontario and Manitoba.
- Avoid closing the Lake St. Joseph diversion with resulting spill down the Albany River.

B) Strategy

To April 15 (Drawdown Period)

Plan outflow reductions at Ear Falls to try to prevent any further decline in Lac Seul level after April 15. Try to time outflow reductions to offset inflows such that any decline in flow in the Winnipeg River in Manitoba is minimized.

After April 15 (Refill Period)

i) Low Inflow Conditions
- Outflow should be managed to ensure that Lac Seul level does not decline, and preferably rises, while providing sufficient outflow to meet downstream hydropower generation and fishery requirements.
- Target for an end of June level no lower than 355.1 m (1165 ft) with an outflow no lower than 25 m^3/s.
- Consultation with interests, including OMNR staff, tourist outfitters and the provincial hydro utilities, may be necessary to arrive at the appropriate balance between lake levels and outflows.
- If inflow remains low throughout the refill period, outflow should be adjusted to maintain a balance between upstream and downstream interests. Note that a lower decile outflow for May for the 1970-1999 period was approximately 40 m^3/s while a 5%ile outflow was below 20 m^3/s.

ii) Moderate Inflow Conditions
- As starting spring water levels will be low, the first priority if inflow conditions improve, will be to restore more normal water levels.
- Generally target for lake levels between lower and upper quartile, while supplying water for hydropower production and for English River fishery concerns.
- Use additional water to maintain desired fishery flows in the English River below Manitou Falls, provided this does not cause high flow conditions on the Winnipeg River in Manitoba.
- Attempt to meet the outfitters Lac Seul lake level target of 355.1 m (1165 ft) for May 15, with outflows no lower than 50 m^3/s.

iii) High Inflow Conditions
- Balance Ear Falls outflow with the rise in Lac Seul level to reduce flood risk both on Lac Seul and on downstream areas such as Pakwash Lake.
- An effort should be made to maintain Lac Seul levels (or projected levels) below upper decile through May, with a transition to near upper quartile by the end of June. Outflows should remain below 450 m^3/s for moderately wet conditions, below 500 m^3/s for most conditions and below 600 m^3/s in all but extreme conditions.
- Under very wet conditions, maintain Lac Seul level to no higher than upper decile at the end of

June with outflow no higher than 600 m^3/s.

- Increase to as much as 800 m^3/s to keep the level below 357.1 m (1171.6 ft).
- When Lac Seul is above the level at which the Lake St. Joseph diversion comes under Board jurisdiction (356.01 m / 1168.0 ft until the end of May; 356.31 m / 1169.0 ft for June), the diversion flow should be reduced before increasing Lac Seul outflow to more than 500 m^3/s.

LAKE OF THE WOODS

A) Seasonal Considerations

The Lake of the Woods basin is even drier than the Lac Seul basin at the present time. Lac La Croix inflow over the winter has been the third lowest in 84 years of record, and only one-third of normal. Since last June, its inflow is also the third lowest on record. Rainy Lake and Lake of the Woods inflows over the winter have been the second lowest on record (over 90 years) and inflows for both of these lakes has been the lowest on record since last June. Note that, in response to the dry conditions, average outflow from both Rainy Lake and Lake of the Woods has been the lowest in over 100 years of record. The International Rainy Lake Board of Control has a Supplementary Order in place (until June 30) authorizing it to maintain outflow from Rainy Lake at 65 m^3/s, instead of the normal 100 m^3/s, when Rainy Lake is below its lower rule curve. Regulation, at least for the near term, will be focussed on conserving water while providing critical downstream flows. The points below reflect a number of ideal or desirable regulation objectives over the next few months, based on input provided to the Board.

- Adjust lake level and outflow to achieve a balance between upstream and downstream interests, as inflow dictates.
- Minimize ice damage when possible. Ice damage is greater in the spring if there are rapid changes in levels (on either the lake or the river) and especially if the level rises while there is still a solid ice cover.
- The preferable end of April Lake of the Woods fishery level is no lower than 322.5 m (1058 ft). Higher levels would be beneficial to northern pike.
- Regulate to avoid, to the extent possible, any reductions in outflow or any large increases in outflow during the spring spawning season on the Winnipeg River (late April to early June).
- For loons on the Winnipeg River, flow changes during the incubation period (approximately mid-May to the end of June) should be minimized.
- A summer Lake of the Woods level 10-15 cm (4-6 in) below the summer peak median level of 323.14 m (1060.2 ft) is desired for south shore residents. This criteria would result in a peak summer level of about 323.0 m (1059.7 ft).
- For wild rice on Lake of the Woods and the Winnipeg River, maintain lower lake and river levels and minimize level and flow increases during the floating leaf stage in June and early July
- For piping plovers on Lake of the Woods, maintain lower lake levels and minimize lake level increases during their nesting and rearing season of May, June and July.
- Within the regulation parameters for Lake of the Woods, regulate outflows to assist in meeting targets/preferences for the Winnipeg River in Manitoba.

B) Strategy

<u>To March 31 (Drawdown Period)</u>

Allow the lake level to decline only very slowly to month-end, with a March 31 level between lower decile and lower quartile – preferably close to 322.3 m (1057.4 ft). Try to time outflow reductions to

offset inflows such that any decline in flow in the Winnipeg River in Manitoba is minimized.

After March 31 (Refill Period)

Refill of Lake of the Woods is largely dependent on spring rainfall and is highly variable. There is no single outflow that can accommodate the range of possible future conditions at this time of year. Lake level and flow outlooks must be continually updated and outflows adjusted in response to changes in conditions or forecasts.

There is significant concern about the risk of low spring levels and flows due to the very dry condition of the entire basin. After March 31, the focus of regulation will likely be on preventing the lake from declining further and promoting a controlled lake level recovery while maintaining critical flows downstream.

i) Low Inflow Conditions
   - Adjust outflows as necessary (subject to minimum flow requirements) to keep the lake from declining. If possible, have the lake maintain at least a 10 %ile level, with outflows no lower than 100 m^3/s.
   - Assess conditions immediately before spawning begins in the Winnipeg River so that outflows can be set to prevent, as much as possible, the need for further flow reductions during the spawning season (late April to early June), while ensuring the lake level does not decline.
   - Satisfy minimum Winnipeg River flow requirements as recommended by the Ontario Ministry of the Environment.
   - If inflow remains low throughout the refill period, outflow should be adjusted to maintain a balance between upstream and downstream interests. Note that during the 1977 drought, minimum outflows during the April to June period were close to 60 m^3/s. However, with the mill closed, dilution requirements for the river are lower now than they would have been during the 70's.

ii) Moderate Inflow Conditions
   - As starting spring water levels will be low, the first priority if inflow conditions improve, will be to restore more normal water levels.
   - Assess conditions immediately before spawning, as described under "Low Inflow Conditions" above.
   - Outflow increases should be kept moderate during the spawning period and reductions should be minimized.
   - Set outflow to as much as 800 m^3/s to prevent the peak lake level from exceeding 323.09 m (1060 ft) for the benefit of Lake of the Woods cottagers, if inflow is no higher than median.
   - Attempt to keep the summer lake level 10-15 cm (4-6 in) below the summer peak median level of 323.14 m (1060.2 ft) in accordance with the commitment made by the Board following the high water year of 2001. To achieve this, the lake level targets would be approximately 322.7 m (1058.7 ft) for the end of May and 322.9 m (1059.4 ft) at the end of June. Try to balance this with avoiding outflows in excess of the generation capability at Kenora and optimizing hydroelectric generation downstream.
   - Through late May and June, attempt to limit Lake of the Woods outflow changes that would adversely affect nesting loons on the Winnipeg River.
   - Through June (and early July), try to manage lake levels to limit the rate of rise for wild rice.
   - By managing LW outflows, along with LS outflows, try to maintain Nutimik Lake levels in the preferred range.

iii) High Inflow Conditions

- Balance higher water levels on the lake with the impact of increased outflows downstream, both in Ontario and Manitoba.
- Do not increase outflow above 800 - 900 m^3/s to keep the lake level (or projected level) below upper quartile in June (approximately 323.2 m / 1060.4 ft). A flow of 900 m^3/s on the Winnipeg River would cause the level below the Norman Dam to be about 1.4 m (4.6 ft) above normal; upper quartile level is 0.2 m (8 in) above median on the lake.
- Increase outflow as necessary to prevent the lake level (or the projected level) from rising above 323.47 m (1061.25 ft), which is the legislated top of the normal operating range. Note however, that the Convention and Protocol states "during periods of excessive precipitation the total discharge from the lake shall, upon the level reaching 1061 sea-level datum, be so regulated as to ensure that the extreme high level of the lake shall at no time exceed elevation 1062.5 sea level datum". In future years, the Board may wish to consider making use of this flood storage during periods of high inflow.
- An attempt should be made to keep outflow increases to a maximum of 100 m^3/s per week, except during the spawning season when it would be desirable to not exceed 50 m^3/s per week. Note however, that persistent higher inflows could necessitate inflow increases of 200 m^3/s per week or more.