Adopted Regulation Strategy
Lake of the Woods Control Board
October 10, 2018

The Lake of the Woods Control Board held a Regulation Meeting on October 10, 2018 in Kenora and adopted a regulation strategy for the late fall and winter period. The strategy was formulated considering basin conditions, hydrological and meteorological forecasts, and the input of various interests concerned with basin management. Input was provided in written and verbal reports as well as from the Board's Regulation Guide: (http://www.lwcb.ca/reg-guide/index.html).

For an update on current conditions, please refer to the Basin Data section of the Board's web site at http://www.lwcb.ca/waterflowdata.html. For regulation actions and directives taken under the strategy please see the Regulation Actions at http://www.lwcb.ca/regulation/index.html.

Lac Seul

A) Seasonal Considerations

Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- Operate Lac Seul primarily as a hydropower reservoir to benefit downstream hydropower plants in Ontario and Manitoba, but with consideration of other interests, such as the fishery.
- To the extent possible, limit winter drawdown on Lac Seul to provide good spring spawning conditions and to protect eggs of fall spawning fish (i.e. to minimize whitefish egg exposure and mortality).
- Regulate Lac Seul outflow to assist in providing satisfactory freeze-up conditions on the English and Winnipeg Rivers (for both level concerns and to avert frazil ice problems) as well as on Lac Seul.
- Use Lac Seul storage to offset Lake of the Woods high/low outflow for the benefit of users of the Winnipeg River in Manitoba.
- Avoid closing the Lake St. Joseph diversion with resulting spill down the Albany River.
- For powerhouse heating requirements maintain the Lac Seul total outflow no lower than 200 m^3/s when temperatures are consistently below freezing.

B) Adopted Strategy

The regulation of Lac Seul over the winter should balance drawdown for fishery benefits against hydropower flow requirements and preferences. Regulation should strive to conserve water to hedge against a weak spring refill, as necessary, based on regular evaluation of conditions and forecasts. Preferred hydropower flows on the English River system are: 300 to 365 m^3/s at Ear Falls through the core winter period and decreasing into March and April; below 550 m^3/s at Manitou Falls; and below 640 m^3/s at Caribou Falls. These flows should be achievable under

normal inflow conditions but could prove challenging should the current low inflow conditions continue.

i) Short-term Regulation (up to freeze-up; typically mid to end November)

- Set outflow based on available inflow to continue raising the lake level to approach the normal end-of-October range of 356.0 to 356.2 m / 1168.0 ft and 1168.6 ft.
- Maintain outflow no lower than 150 m^3/s once the end-of-October range has been reached or freeze-up commences, whichever comes first.
- The Lac Seul freeze-up level should preferably be no higher than 356.5 m / 1169.6 ft with outflow no higher than 400 m^3/s and Winnipeg River flows in Manitoba below 1400 m^3/s (to avoid frazil ice problems).
- Should conditions become quite wet, Lac Seul should be regulated to target for an end of October water level below 356.35 m / 1169.1 ft with outflow at or below 600 m^3 /s. The Lake St. Joseph diversion should be reduced to the extent necessary before Lac Seul outflow is increased above 550 m^3/s. (The Lake St Joseph Diversion falls under LWCB authority when Lac Seul level is above 356.62 m / 1170.0 ft during the period of July through December.)
- If inflow increases and the lake level rises above median, increase outflow as appropriate to provide a reasonable balance between increased outflow and higher lake level, with due consideration of required winter outflow and spring target levels.

ii) Early March Level

- Regulate the level of Lac Seul so that the level on March 1st is limited to a maximum of 355.5 m / 1166.3 ft, and preferably no higher than 355.15 m / 1165.2 ft.
- The end-of-winter (April 15) target level for Lac Seul should be set during the LWCB's March Regulation Meeting, taking current conditions and forecasts into account.

iii) Low Inflow Winter Conditions

- Winter outflow should be no lower than 150 m^3/s, with a core winter flow no lower than 230 m^3/s.
- To meet minimum winter peak power demands in Manitoba, winter core period flows on the Winnipeg River in Manitoba should be no lower than:
  - ◊ 485 m^3/s from mid-November to end-November and mid-February to mid-March
  - ◊ 685 m^3/s from December to mid-February.
- Strive to meet the above minimum winter peak power demands while targeting a March 1st elevation no lower than 355.1 m / 1165.0 ft.
- If flows are greater than 685 m^3/s on the Winnipeg River in Manitoba, the March 1st elevation should be allowed to decline to no lower than 354.6 m / 1163.4 ft.
- Core winter minimum outflow requirements for the Winnipeg River in Manitoba should not prevent accomplishing drawdown targets in the spring under this scenario.

iv) Moderate Inflow Winter Conditions

- Winter outflow should be between 200 and 450 m^3/s with a core winter flow of between 300 and 400 m^3/s.

- The March 1st elevation should be no lower than 354.9 m / 1164.4 ft to meet Winnipeg River flow targets.
- Combined with Lake of the Woods regulation, winter core period flows on the Winnipeg River in Manitoba should be between 800 and 960 m^3/s.
- If flows on the Winnipeg River in Manitoba are greater than 960 m^3/s, the end-of-winter elevation should be allowed to decline no lower than the fisheries spring target level of 354.8 m / 1164.0 ft or a maximum drawdown of 1.5 m / 4.9 ft, whichever is higher, subject to flood risk constraints.
- If there is excess water downstream, water should be stored in Lac Seul subject to targeting for a March 1st level no higher than 355.6 m / 1166.7 ft, and preferably no higher than 355.5 m / 1166.3 ft, subject to flood risk constraints.

v) High Inflow Winter Conditions

- Regulate Lac Seul outflow to as high as 550 m^3/s to prevent the lake exceeding a March 1st level of 355.6 m / 1166.7 ft.
- If 550 m^3/s is insufficient outflow to stay below 355.6 m / 1166.7 ft, aim to limit or close the diversion into Lac Seul whether or not the Lake St. Joseph diversion is under LWCB authority. (Note: The Board only has authority to restrict diversion flow when Lac Seul exceeds certain levels as defined in the Lake of the Woods Control Board Act. However, Manitoba can restrict diversion flow when Winnipeg River flows in Manitoba exceed 963 m^3/s and OPG can also be requested to restrict diversion flow voluntarily.)
- Once the diversion is closed, increase outflow to the extent necessary to ensure that the March 1st lake level is no higher than 355.8 m /1167.3 ft.
- Combined with Lake of the Woods regulation, strive to keep Winnipeg River flows in Manitoba below 1600 m^3/s through the winter.

Lake of the Woods

A) Seasonal Considerations

The points below set out ideal or desirable regulation objectives. As with Lac Seul, some objectives are incompatible, and trade-offs may be necessary.

Ideal or desirable regulation objectives for the next several months, based on input provided to the Board, include the following:

- Adjust lake level and outflow to achieve a balance between upstream and downstream interests, as inflow dictates. Plan winter drawdown to provide the appropriate balance between the various interests.
- Regulate Lake of the Woods outflow to assist in providing satisfactory freeze-up conditions on the Winnipeg River to avoid frazil ice problems and a high freeze-up level.
- Limit winter drawdown on the lake to provide good spring spawning conditions, to protect the eggs of fall spawning fish and to reduce potential damage from ice.
- Within the regulation parameters for Lake of the Woods, regulate outflow to assist in meeting targets/preferences for the Winnipeg River in Manitoba.

- For powerhouse heating requirements, maintain Lake of the Woods total outflow no lower than 180 m^3/s when temperatures are consistently below freezing.

B) Adopted Strategy

i) Short-term Regulation (up to freeze-up; typically mid to end November)

- Set outflow based on available inflow to maintain the lake level within the normal freeze-up level range of 322.6 to 322.8 m / 1058.4 to 1059.1 ft.
- Preferred outflow is between 150 and 470 m^3/s with Winnipeg River flows in Manitoba no higher than 960 m^3/s. If high or low inflow precludes the preferred conditions, then adjust both level and outflow without deviating from the target range more than necessary.
- Should conditions become quite wet, combined with Lac Seul regulation, target to keep Winnipeg River flows in Manitoba below 1400 m^3/s during the critical ice cover formation period to prevent frazil ice problems.
- Due to concerns over freezing of domestic water lines along the Winnipeg River during some recent years, avoid setting Lake of the Woods outflow below 250 m^3/s, if feasible, before an insulating layer of ice and snow forms on the river late in the year.

ii) End-of-winter Levels (typically end-March)

- The Board's approach in recent years has been to aim for somewhat lower summer levels. To achieve this in the long term, the overall level range should be moved downward. The end-of-winter level, based on factors other than winter inflow, is ideally 322.38 m / 1057.7 ft and preferably no higher than 322.5 m / 1058.0 ft. However, the actual end-of-winter level will vary depending on the winter inflow received, as noted in sections iii) to v) below.
- The preferred end-of-winter level for fishery interests as defined by the OMNR is no lower than 322.5 m / 1058.0 ft, subject to consideration of potential negative impacts downstream. In addition, for fall spawning fish, the preferred maximum drawdown during the winter is no more than 30 cm / 1.0 ft. However, for south shore property owners, who would like to see lower summer levels, lower end-of-winter levels would be preferable. The Minnesota DNR supports this position and has stated that lower spring water levels do not negatively impact the fishery in their portion of the lake.
- The preferred winter flow for H2O Power LP, to maximize their hydropower production, is 400 to 470 m^3/s at the Lake of the Woods outlet. OPG would prefer flows closer to 575 m^3/s at Whitedog Falls and Manitoba Hydro's flow preference for the Winnipeg River in Manitoba is 960 m^3/s.
- The end-of-winter target level should be adjusted upward (no higher than 322.6 m / 1058.4 ft) to relieve high flows on the Winnipeg River downstream in Ontario and Manitoba by storing water in the lake. In contrast to this, avoid storing more water than is necessary if seasonal snowpack accumulation is high. Although the refill of Lake of the Woods is more dependent on spring rainfall than on snowpack, higher snowpack does increase the risk of high early spring runoff.

iii) Low Inflow Conditions

- Winter outflow should be no lower than 125 m^3/s and preferably no lower than 200 m^3/s.
- If outflow is greater than 125 m^3/s, the end-of-winter elevation should be no lower than 322.34 m / 1057.5 ft.

- Combined with Lac Seul regulation, try to achieve winter core period flows on the Winnipeg River in Manitoba no lower than 485 m^3/s with Lake of the Woods drawn no lower than 322.34 m / 1057.5 ft to achieve this.
- If conditions allow, augment flows to combine with Lac Seul regulation in achieving flow of 685 m^3/s on the Winnipeg River in Manitoba to meet winter peak period power demands, with an end-of-winter level no lower than 322.38 m / 1057.7 ft.

iv) Moderate Inflow Conditions
- Winter outflow should be between 300 and 700 m^3/s with a preferred end-of-winter level of 322.38 m / 1057.7 ft, but not above 322.5 m / 1058.0 ft.
- Combined with Lac Seul regulation, winter core period flows on the Winnipeg River in Manitoba should be between 800 and 960 m^3/s.

v) High Inflow Conditions
- While targeting an end-of-winter level no higher than 322.6 m / 1058.4 ft, balance higher water levels on the lake with the impact of increased outflow downstream, both in Ontario and Manitoba.
- If winter conditions indicate above normal risk of high spring inflow, aim for end-of-winter level no higher than 322.4 m / 1057.7 ft.
- Combined with Lac Seul regulation, strive to keep Winnipeg River flows in Manitoba below 1600 m^3/s through the winter.