Adopted Regulation Strategy – LWCB Regulation Meeting – March 10, 2005

Overview

March 1 snow surveys taken by the US Army Corps of Engineers in the upper boundary waters basin indicate that snow depth is above normal, at about 67 %ile (136 % of normal). Snow water equivalent is also about 67 %ile (119 % of normal). Ontario Power Generation's March 1 snow survey results were as follows (mm water equivalent / % of normal):

Rat Rapids	149 / 116 %	Ear Falls	107 / 112 %
Sioux Lookout	158 / 159 %	Atikokan	145 / 153 %
Kenora	117 / 160 %		

The strategy for managing the levels of Lac Seul and Lake of the Woods, and the flows in the English and Winnipeg Rivers, attempts to minimize negative impacts and balance conditions across the basin, a complex problem given the diverse nature of the different interests and the volatile, largely unpredictable nature of the hydrology that drives the system. In setting an operational strategy for the coming months, it is vital to consider level and outflow targets together, as well as the interrelationships between the various interests. The impact of the combined operation of Lac Seul and Lake of the Woods on the Winnipeg River in Manitoba is also important. Although conditions appear on the "wet" side at the moment, the spring period is the most volatile one of the year.

Lac Seul

a) Overall Objectives

Lac Seul regulation over the near term will be highly influenced by the high inflows that have been experienced throughout the winter, the above-average end of winter lake level and the above-normal winter precipitation and resulting snowpack. In the longer term, spring inflows after the initial freshet have been shown to be highly variable. The risk of higher early spring runoff is certainly increased, but total spring inflow volume, used to fill the lake, is very much an unknown.

Given the current basin conditions, and reviewing the input of various interests in the Draft Regulation Guide, the following overall objectives from now through June are proposed:

- Regulate Lac Seul level and outflow to manage flood risk on the lake and downstream in Ontario and Manitoba.
- Attempt to meet the preferred Lac Seul, Pakwash Lake and English River levels for the fishery and tourist outfitter interests; provide good spring spawning conditions and adequate navigation levels at the start of the walleye fishing season.
- 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.
- Use Lac Seul storage to offset Lake of the Woods high/low outflows 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.

b) Scenarios

The attached graph for Lac Seul shows scenarios of lake levels that would result from 3 different combinations of assumed inflows and outflows. It should be noted that the scenarios show a range of possible future conditions and are not forecasts. The Lake St. Joseph diversion dam is assumed to be open in these scenarios. The scenarios are:

S1 – very high inflow – 95 %ile Lac Seul basin inflow
S2 – high inflow – 75 %ile Lac Seul basin inflow
S3 – moderate inflow - 50 %ile Lac Seul basin inflow
S4 – low inflow - 25 %ile Lac Seul basin inflow

c) Strategy

To April 15 (Drawdown Period)

The short-term strategy that follows deals with the remainder of the winter drawdown period. For Lac Seul, this period extends to about mid-April. Lac Seul outflow should remain at the current 500 m^3/s to lower the lake level to approximately 355.1 m (1165.0 ft). If inflows decline, the level may fall further to near 354.95 m (1164.5 ft) by mid-April. However, given the ongoing wet conditions, somewhat lower lake levels at the onset of the spring freshet would be desirable. On the other hand, if late winter inflows are higher than anticipated, previous investigations have indicated that an end of winter level up to 355.3 m (1165.7 ft) does not unduly increase flood risk. Note that an end of winter level of 355.1 m (1165 ft) would correspond to a drawdown of approximately 1.5 m (4.9 ft) below the November 1 level, the maximum drawdown target set in the October strategy to benefit fall spawning fish species. As spring freshet approaches, outflow should be reduced to: a) reduce spring flows downstream in Manitoba during the freshet and b) to store the excess freshet water in Lac Seul.

After April 15 (Refill Period)

i) Low Inflow Conditions

- Outflow should be managed to ensure that Lac Seul continues to rise, while ensuring that there is sufficient outflow to meet downstream hydropower generation and fishery requirements.
- The end of winter level on Lac Seul is expected to be above both the preferred fishery levels for spawning and the preferred outfitter targets for navigation at the beginning of the walleye season in late May; therefore, it will be adequate for these Lac Seul interests if water levels continue to rise slowly.
- 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.
- Target for an end of June level no lower than lower quartile, with an outflow no lower than 100 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

quartile outflow for May for the 1970-1999 period was approximately 50 m^3/s while a lower decile outflow was approximately 40 m^3/s.

ii) Moderate Inflow Conditions

- Generally target for lake levels between lower and upper quartile, with a transition from the above-normal end of winter level, 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.
- Under a moderate inflow scenario, interest group lake level preferences are already satisfied by the above-normal end of winter level, provided that the lake level continues to rise slowly.

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) Overall Objectives

- Carry out lake regulation with due regard for the Canada-United States Treaty and Canadian legislation regarding Lake of the Woods levels and outflows.
- 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.
- 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)
- Within the regulation parameters for Lake of the Woods, regulate outflows to assist in meeting targets/preferences for the Winnipeg River in Manitoba

b) Scenarios

The attached graph for Lake of the Woods shows scenarios of lake levels that would result from 4 different combinations of assumed inflows and outflows. The scenarios show a range of

possible future conditions and are not forecasts. The scenarios are:

S1 – high inflow – 90 %ile total Lake of the Woods inflow
S2 – moderate inflow – 50 %ile total Lake of the Woods inflow
S3 – moderate inflow – 50 %ile total Lake of the Woods inflow (higher outflow than S2)
S4 – low inflow – 25 %ile total Lake of the Woods inflow

c) Strategy

To March 31 (Drawdown Period)

The winter drawdown period for Lake of the Woods extends to approximately the end of March. During this short period, the Board has only limited regulation flexibility. A change in outflow of 100 m^3/s will change the lake level by less than 5 cm (2 in). With a projected March 31 level of upper quartile (322.59 m / 1058.4 ft), the recommended strategy is to maintain outflow at the current authorized discharge of 600 m^3/s. Abitibi-Consolidated should adjust outflow so that the mean outflow from now to March 31 is 600 m^3/s.

After March 31 (Refill Period)

While total refill of Lake of the Woods is largely dependent on spring rainfall, the Secretariat recommends a strategy that is weighted to avoiding the negative impacts of above normal spring inflows. This recommendation is based on the current above-normal level of the lake, the above-normal inflows and the higher than normal snowpack. The regulation outlook is made worse since Lac Seul end of winter levels are above normal and inflows to that basin are very high, with an outlook for continued above normal flows for at least the near future. This means that there is likely to be less opportunity to reduce Lac Seul outflow to provide relief on the Winnipeg River in Manitoba to offset possible higher outflows from Lake of the Woods.

Note that somewhat similar Lake of the Woods conditions for winter hydrology and an upper quartile end of winter level were experienced in 1993 and 2001. Spring freshet in 1993 was almost non-existent and outflow reductions were initiated in early April to assist lake level recovery. In 2001, very heavy rainfall began in early April and continued, leading to the highest Lake of the Woods levels in 50 years.

i) Low Inflow Conditions
- 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 flow requirements as recommended by the Ontario Ministry of the Environment.
- Maintain the lake level above lower quartile if possible, with outflow no lower than 200 m^3/s.

ii) Moderate Inflow Conditions
- Assess conditions immediately before spawning, as described under “Low Inflow Conditions” above.
- Outflow increases should be kept moderate during the spawning period.
- 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.

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 on the scenarios, however, that persistent 90 %ile inflows would necessitate inflow increases of 200 m^3/s per week.

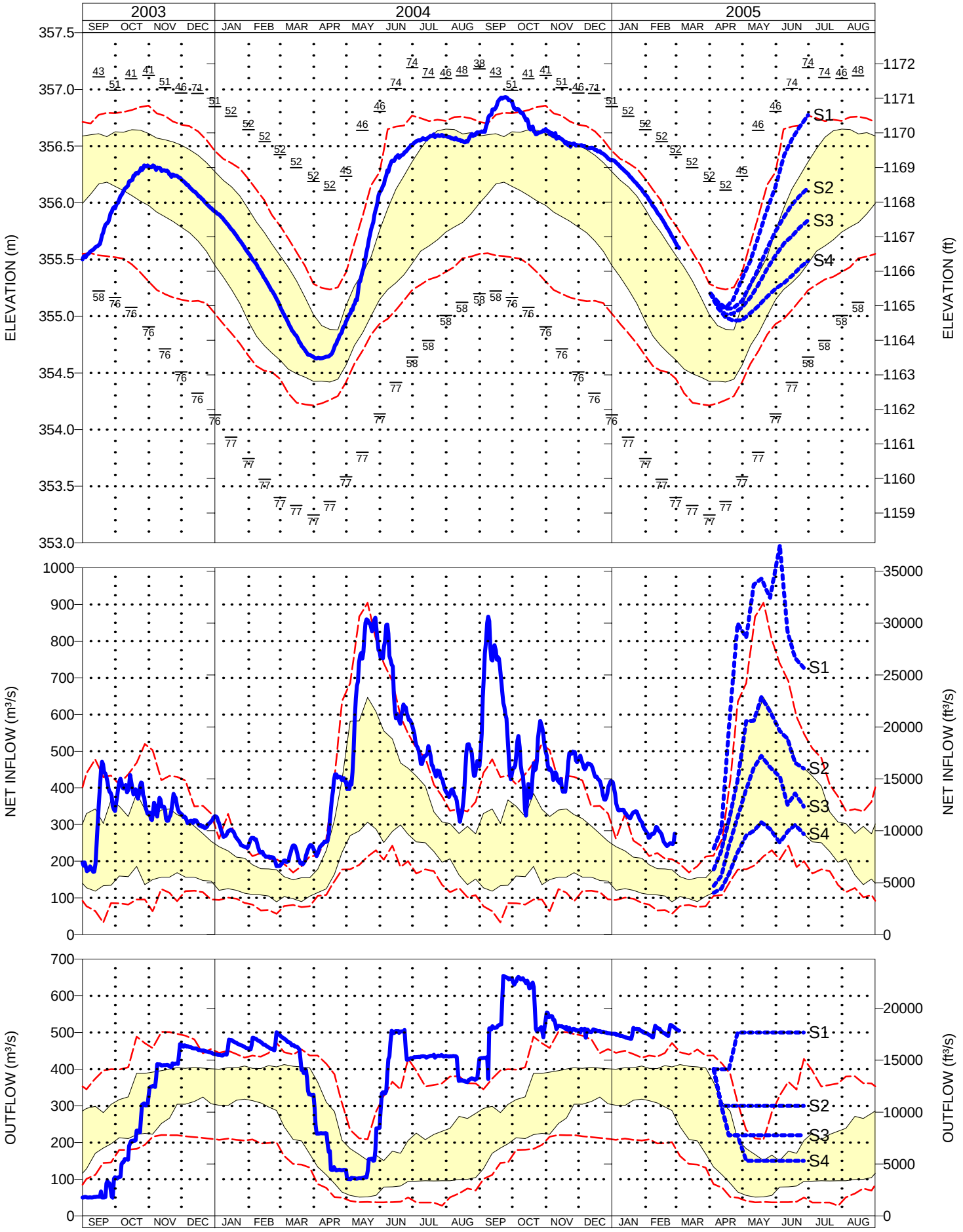
Winnipeg River in Manitoba

Spring flows along the Winnipeg River in Manitoba are determined by the combination of local inflows and outflows from Lac Seul and Lake of the Woods. With current basin conditions, it is anticipated that early spring freshet flows in Manitoba will be relatively high, as snowpack is above normal and there is little opportunity to make significant outflow reductions from either Lake of the Woods or Lac Seul. Over the longer term, flows through the Whiteshell will depend on spring rainfall and flows throughout the basin. Average local inflow above Slave Falls (m^3/s) for the April through June period is:

90 %ile	75 %ile	50 %ile	25 %ile	10 %ile
603	480	304	150	85

LAC SEUL

ISSUED: 2005.03.03
** Provisional Data **



LAKE OF THE WOODS

ISSUED: 2005.03.04
* Provisional Data *