Adopted Regulation Strategy – LWCB Regulation Meeting – September 24, 2003

Overview

How dry has it been?

- In the Lake of the Woods basin, 2002-2003 winter (November through March) precipitation was the 2nd lowest in 91 years (since 1913). Only the winter of 1914-1915 was drier by our records. Rainy-Namakan basin 2003 winter precipitation was the lowest on record in the same period.

- Total inflow to Lake of the Woods for the one-year period September 1, 2003 through August 31, 2003 was only 145 m^3/s, the was the 3rd lowest in 87 years of record. Only 1977 and 1931 had lower inflows for this period.

- Average outflow from Lake of the Woods from November 1, 2002 to September 15, 2003 was the lowest since 1977 and the 6th lowest in 103 years of record. The other years with lower outflow in this period were: 1932, 1931, 1925 & 1912.

- The state of the major lakes in the basin on September 15 was as follows:
  - Lake St Joseph 26 %ile / 10th lowest in 66 years / lowest since 1998
  - Lac Seul 12 %ile / 6th lowest in 69 years / lowest since 1987
  - Lac La Croix 42 %ile / lowest since 2002
  - Namakan Lake 20 % of IJC band
  - Rainy Lake 58 cm below IJC LRC / 12th lowest in 93 years / lowest since 1998
  - Lake of the Woods 4 %ile / 7th lowest in 88 years / lowest since 1980

- Lac Seul basin winter 2002-2003 precipitation was the lowest since 1994, and 4th lowest in 89 years of record.

- Total inflow to Lac Seul for the one-year period September 1, 2003 through August 31, 2003 was only 173 m^3/s, the 5th lowest since 1958 when Lake St. Joseph water was first diverted into the Lac Seul basin. The drier years were: 1988, 1987, 1981 & 1977.

What is the impact of the storm of September 16-19?

- Both Lac Seul and Lake of the Woods responded with a quick rise in level due to direct rainfall on the lake surface, with some rainfall stations reporting over 100 mm (4 in)
- Overall, the Lac Seul basin appeared to receive the highest rainfall. In addition, the Lac Seul basin was already somewhat wetter than the Lake of the Woods basin. As a result, the inflow response to the rainfall is expected to be more long-lived in the Lac Seul basin with the potential for near median inflow through the winter.
- Rainy Lake received much lower direct rainfall and remains well below its IJC rule curve band. Higher inflow to Lake of the Woods will not be sustained until Rainy Lake level is back within the rule curves and Rainy Lake outflow into the Rainy River is increased. Rainfall in the Lac La Croix basin was higher than in the Rainy Lake area and flows are increasing slowly. Rainy Lake inflows have also increased, but only very modestly, and it is not yet clear how long the impact of the rainfall will be sustained.

Lac Seul

i) Scenarios

The attached graph for Lac Seul shows scenarios of lake levels that would result from 5 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 nor are they necessarily linked to the operating strategy.

	Inflow				
	Continuous ¼ Month	Bulk Seasonal	Average Outflow (m^3/s)	Mar 31 Elevation (m)	%ile
S1	75 %ile	70 %ile	355	354.63	45 %ile
S2	50 %ile	50 %ile	295	354.46	35 %ile
S3	25 %ile	20 %ile	255	354.20	10 %ile
S4	10 %ile	10 %ile	215	354.20	10 %ile
S5	4 %ile	Min*	190	353.90	5 %ile

*Since 1958

ii) Seasonal Considerations

- While other interests on Lac Seul are considered to the extent possible, Lac Seul is primarily a hydropower reservoir. When basin flows are low, Lac Seul may need to be drawn down lower over the winter to provide power production.
- When planning for an end of winter level at this time of year, a conservative approach should be taken since winter inflows and demands for winter are largely unknown
- The English River basin inflows are approaching more normal conditions after being dry. Final end of winter target levels and winter outflows should be set by the Board in late November to early December, once winter water supplies can be estimated with more confidence.

iii) Strategy

a) Low Inflow Conditions
- Set releases to target for an end-of-winter (March 31) elevation no lower than lower decile (354.2 m / 1162 ft) if conditions remain dry. The end-of-winter target may well be set lower later, but the target should not be set below this so early in the season. This leaves reserve storage in place for extreme conditions or unforeseen events.

b) Moderate Inflow Conditions
- With inflows in the moderate range, discharge power flows as required by the provincial power utilities, keeping in mind the below normal starting storage for the lake.

c) High Inflow Conditions
- Through the fall period, target for a November 15 Lac Seul level no higher than 356.6 m (1169.8 ft) with outflow no higher than 450 m^3/s, 356.80 m (1170.5 ft) with outflows no higher than 500 m^3/s and 356.90 m (1170.9 ft) with outflows up to 600 m^3/s.
- Closure of the Lake St. Joseph Diversion would have to be considered if outflows exceed 400 m^3/s and the level reaches 1170 ft (356.6 m).

- If the November 30 targets cannot be met with flows no higher than 600 m^3/s, the Board would have to set revised outflow and lake level targets to balance upstream and downstream impacts.
- Avoid Winnipeg River flows in Manitoba in excess of 1800 m^3/s.
- Target for Winnipeg River flows in Manitoba no higher than 1400 m^3/s during the critical freeze-up period.

d) Short Term Regulation
- Maintain Lac Seul outflow at 50 m^3/s for the present time. Begin increasing by 50 m^3/s per week on September 29, up to a maximum of 300 m^3/s, unless hydrologic conditions justify further increases according to the strategy. The tentative end of winter (March 31) target level is no lower than lower decile (354.20 m / 1162.0 ft).

Lake of the Woods

i) Scenarios

The attached graph for Lake of the Woods shows scenarios of lake levels that would result from 5 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 nor are they necessarily linked to the operating strategy.

	Inflow				
	Continuous ¼ Month	Bulk Seasonal	Average Outflow (m^3/s)	Mar 31 Elevation (m)	%ile
S1	75 %ile	75 %ile	460	322.79	60 %ile
S2	50 %ile	45 %ile	335	322.35	25 %ile
S3	25 %ile	15 %ile	240	322.33	25 %ile
S4	10 %ile	5 %ile	190	322.27	20 %ile
S5	6 %ile	Min	190	322.14	10 %ile

ii) Seasonal Considerations

- Based on public input in response to the 2001 high water event and to summer water levels in general, the Board made a commitment to work towards achieving somewhat lower summer levels on Lake of the Woods, in the order of up to 15 cm (6 in). The Board stated that this would be a trial and error process, very much subject to the inflows provided by nature and the impacts noted on the various interests.
- Lake of the Woods basin inflows remain well below normal. Final end of winter target levels and winter outflows should be set by the Board in late November to early December, once winter water supplies can be estimated with more confidence.

iii) Strategy

a) Low Inflow Conditions
- Conserve water while balancing upstream and downstream interests. The lake should be targeted for an end-of-winter (March 31) level no lower than lower quartile (322.35 m / 1057.6 ft) at this time of year (late September). This cautious strategy will leave reserve water in storage in the event of extremely dry conditions or unforeseen events.

b) Moderate Inflow Conditions
   - Because of the dry basin conditions that have been experienced over the past year, and the low lake level for this time of year (late September), the recommended moderate strategy is the same as that for low inflow conditions.

c) High Inflow Conditions
   - through the fall period, target for a November 15 Lake of the Woods level no higher than upper quartile (323.05 m / 1059.9 ft) with an outflow no greater than 700 m^3/s and to no higher than upper decile (323.15 m / 1060.2 ft) with outflow no greater than 900 m^3/s.
   - Set outflows as high as necessary to maintain the mean lake level below 323.47 m (1061.25 ft)
   - if possible, set Lake of the Woods outflow no higher than 700 m^3/s.
   - avoid freeze-up flows in excess of 1400 m^3/s on the Winnipeg River in Manitoba, if possible.

d) Short Term Regulation
   - Lake of the Woods outflow will be increased from 100 to 125 m^3/s on October 1, with one unit to be brought online at the Norman powerhouse. The tentative end of winter (March 31) target level is no lower than lower quartile (322.35 m / 1057.6 ft).

Winnipeg River Flows in Manitoba

Unregulated inflows below Lake of the Woods and Lac Seul to Seven Sisters from now to March 31 are as follows:

90 %ile	240 m^3/s
75 %ile	185 m^3/s
50 %ile	145 m^3/s
25 %ile	90 m^3/s
10 %ile	50 m^3/s
Min	-2 m^3/s

As an example, taking numbers from the Lac Seul and Lake of the Woods scenario tables, and the Seven Sisters local inflows above:

LS outflow @ 50 %ile (Scenario S2) + LW outflow @ 10 %ile (Scenario S4) + Seven Sisters local inflow @ 25 %ile = a total inflow to Seven Sisters of 575 m^3/s (295 + 190 + 90).

Conference Call

A Board conference call is scheduled for Thursday, November 27 at 2:00 pm CDT to confirm winter regulation strategy and end of winter target elevations. (Note: The conference call was later changed to December 4, 2003.)

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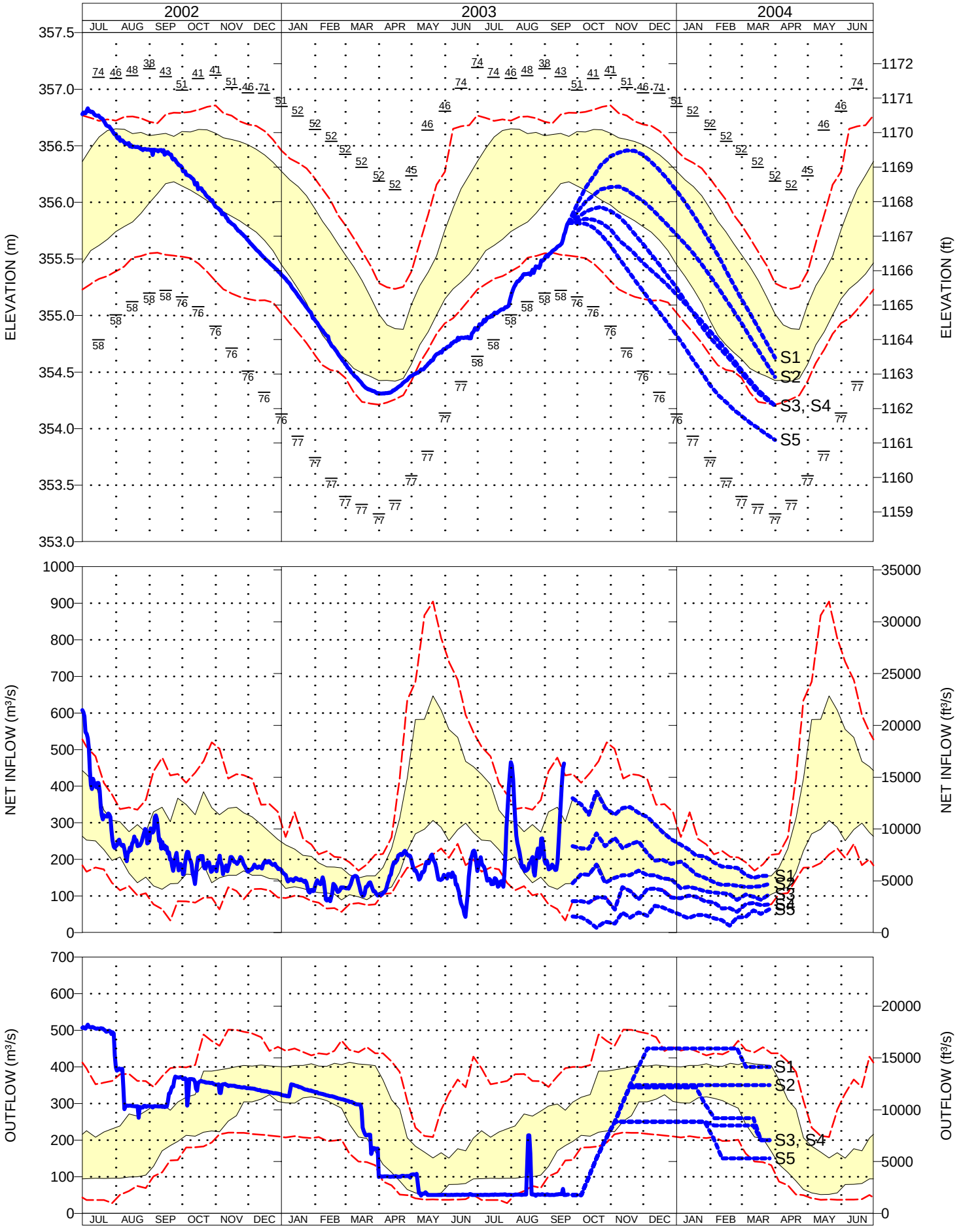
LAC SEUL

ISSUED: 2003.09.22
** Provisional Data **



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