MANITOBA HYDRO
APRIL 1, 2004 AND APRIL 1, 2005 RATE INCREASE APPLICATION
ENERGY SUPPLY

7.1 OVERVIEW OF ENERGY SUPPLY

Manitoba Hydro's hydraulic generating stations utilize water flowing into Manitoba from Alberta, Saskatchewan, northwestern Ontario, Minnesota, North Dakota, South Dakota and Montana. Water flows into the Winnipeg River do have particular significance as that water flows through not only all of the plants on that river, but ultimately the big Nelson River plants. The broad geographical area of Manitoba's watersheds provides a degree of diversity in precipitation to reduce the frequency and impact of droughts on the Manitoba Hydro system. Even with this diversity, there is a one-in-ten chance of drought in any one year. To ensure that these periodic droughts won't result in energy shortages, the generation system is planned to meet committed firm loads under a repeat of the lowest system water supplies (from records dating back to 1912) using hydro plants, thermal generation and imports. In addition actual system operations follow specific criteria to assure that the Manitoba load will be met without undue risk.

7.2 POWER RESOURCE PLANNING CRITERIA

In planning a reliable supply of electric power for Manitobans, Manitoba Hydro has established the following criteria:

Capacity Criterion

The capacity criterion for the Manitoba Hydro system requires that planned generation capacity (MW) must not be less than forecast firm annual peak demand plus a reserve requirement of 12% of forecast firm loads.

Reserves are intended to protect against capacity shortfalls resulting from three types of contingencies: breakdown of generating equipment, increases in peak load due to extreme weather, and deviation from the peak load forecast due to higher than projected provincial economic growth in the short term.

Reserve margins of 12% are adequate in Manitoba Hydro's predominantly hydraulic system because of the relatively low outage rates of hydro generating units combined with relatively small size of units. For comparison, reserve margins on thermal systems are typically in the 15% to 30 % range.

Dependable Energy Criterion

Manitoba Hydro has adopted an energy supply planning criterion which recognizes the limitation of hydraulic generation during drought conditions. The energy criterion requires that the Manitoba System shall be capable of a dependable supply of energy to meet forecast firm load demand. Specifically, there must be sufficient firm energy sources to meet firm energy demand in the event of a repeat of the lowest historic river flow conditions.

The dependable supply includes energy from hydro electric and thermal stations, firm energy imports from out-of-province, as well as contracted non-firm imports from the reserves of neighbouring utilities. Contracted non-firm imports for meeting firm load should not exceed 10% of firm energy requirement. Non-firm imports are not included in the 10% limit if they consist of an energy guarantee to Manitoba Hydro during low flow years and they are associated with a firm export sale of an equal or greater magnitude.

7.3 WATER CONDITIONS

Hydraulic generation over the last six years was at or above average until the summer of 2002. Low rainfall after July was followed by a winter with little snow cover. Although the spring and summer of 2003 had sufficient rainfall to grow crops in most parts of southern Manitoba, there were insufficient amounts to result in significant runoff. Overall water supplies across the Churchill / Nelson River basin are at lows that on average would only be experienced once in every 50 years. Going into the winter of 2003/04 reservoirs were at or near historic lows. Manitoba Hydro has been importing energy consistently since the spring of 2003 and expects to incur unprecedented power purchase costs as a result.

The historical water supply as a percentage of average is shown in Figure 7.3.3. Overall hydraulic supplies for 2003/04 are forecast to be similar to the 1988/1989 period, the second driest on record since 1912. In addition, energy in storage in reservoirs affecting Manitoba Hydro is as shown in Figure 7.3.4. Hydraulic reserves remain well below

average and remain below the previous minimum set since regulation of Lake Winnipeg and Churchill River Diversion began in 1976. Releases from Manitoba Hydro reservoirs are being minimized to protect storage reserves for next year.

Hydroelectric generation for 2003/04 is forecast to be 20,791 GWh down 7,809 GWh from the long term mean as shown in Figure 7.3.5. The reduced hydro generation will be replaced with increased thermal generation and power purchases at additional cost. The forecast of net interchange revenue (net cost) for 2003/04 is ($158) million, down $398 million from the 2002/03 actual results. If the drought conditions persist throughout 2004 then a similar result in net interchange revenue can be expected in 2004/05. Net interchange revenues above are defined as export revenues minus generation costs which include import, thermal and water rental costs.

It is estimated that a repeat of the worst drought on record would cost the Corporation at least $1.1 billion for the loss of energy volumes and potentially much more if combined with market price increases for imports and thermal energy. Financing these losses over a period of time would add to the overall cost. The current below-normal water supply has weakened Manitoba Hydro's financial structure and slowed its progress toward achievement of financial targets.

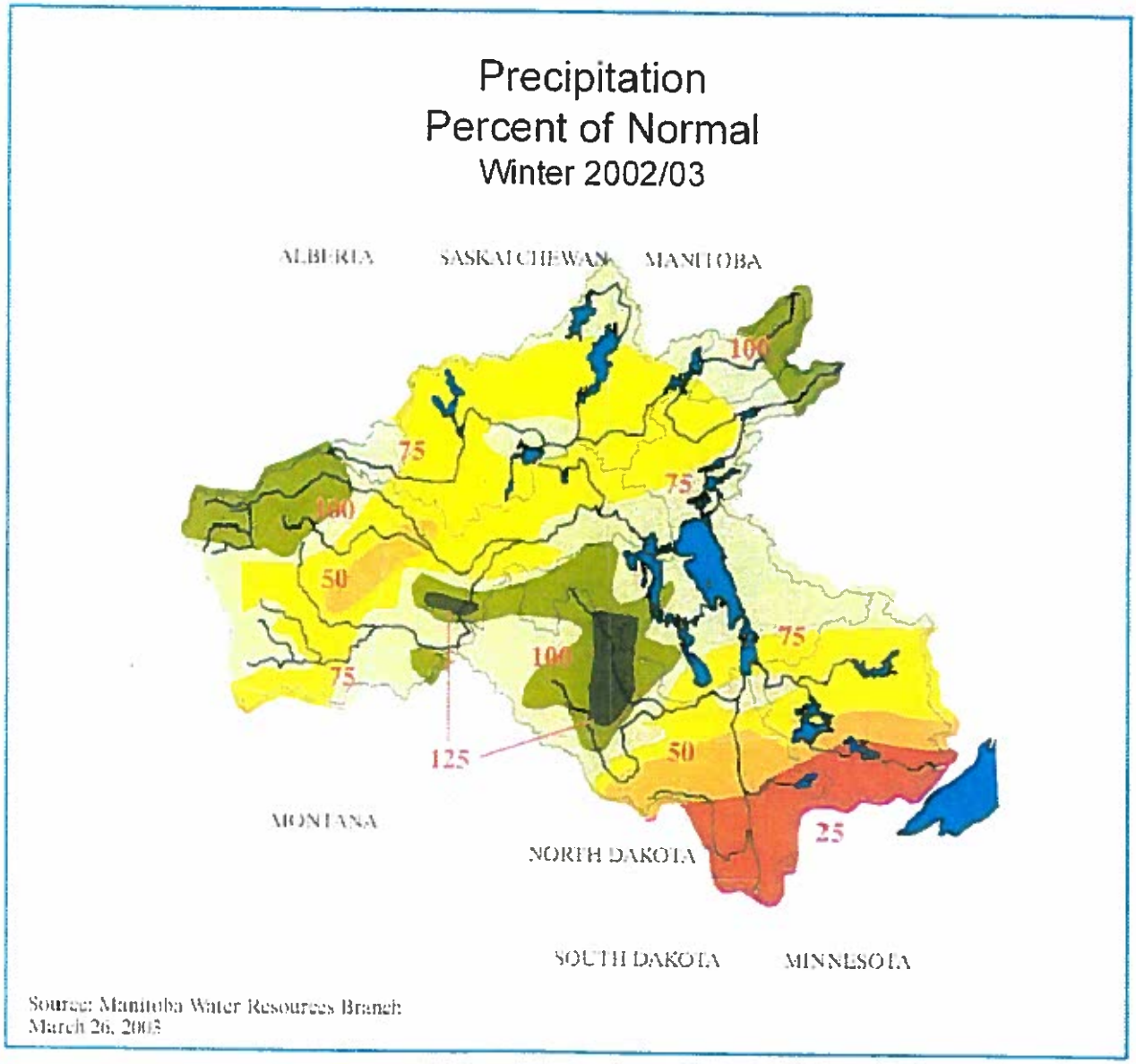
Precipitation
Percent of Normal
Winter 2002/03
ALBERTA
SASKATCHEWAN
MANITOBA
100
75
75
100
50
75
100
75
125
50
25
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
Source: Manitoba Water Resources Branch
March 26, 2003

Figure 7.3.1

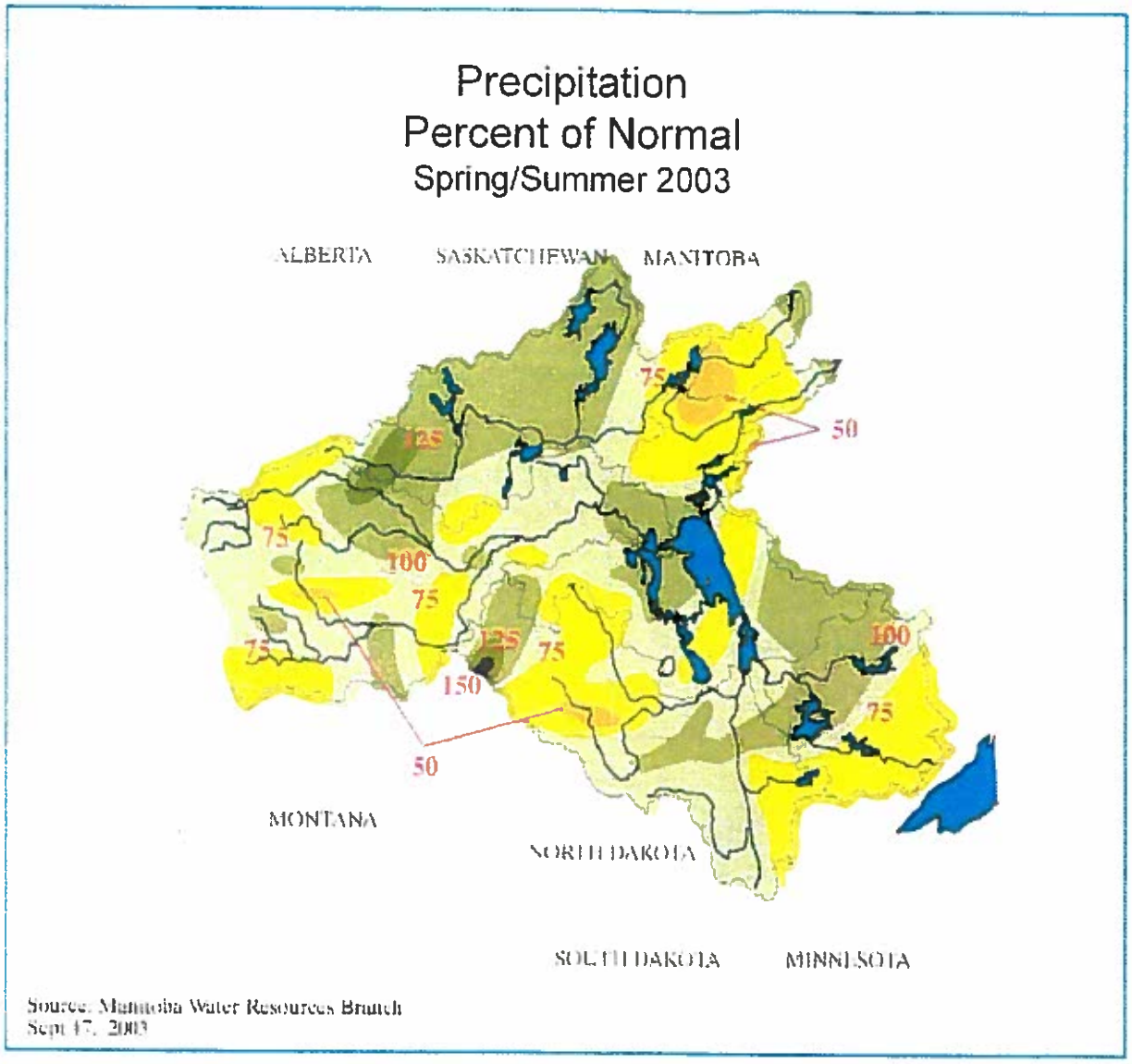
Precipitation
Percent of Normal
Spring/Summer 2003
ALBERTA
SASKATCHEWAN
MANITOBA
75
50
125
75
100
75
75
125
75
150
100
75
50
MONTANA
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
Source: Manitoba Water Resources Branch
Sept 17, 2003

Figure 7.3.2

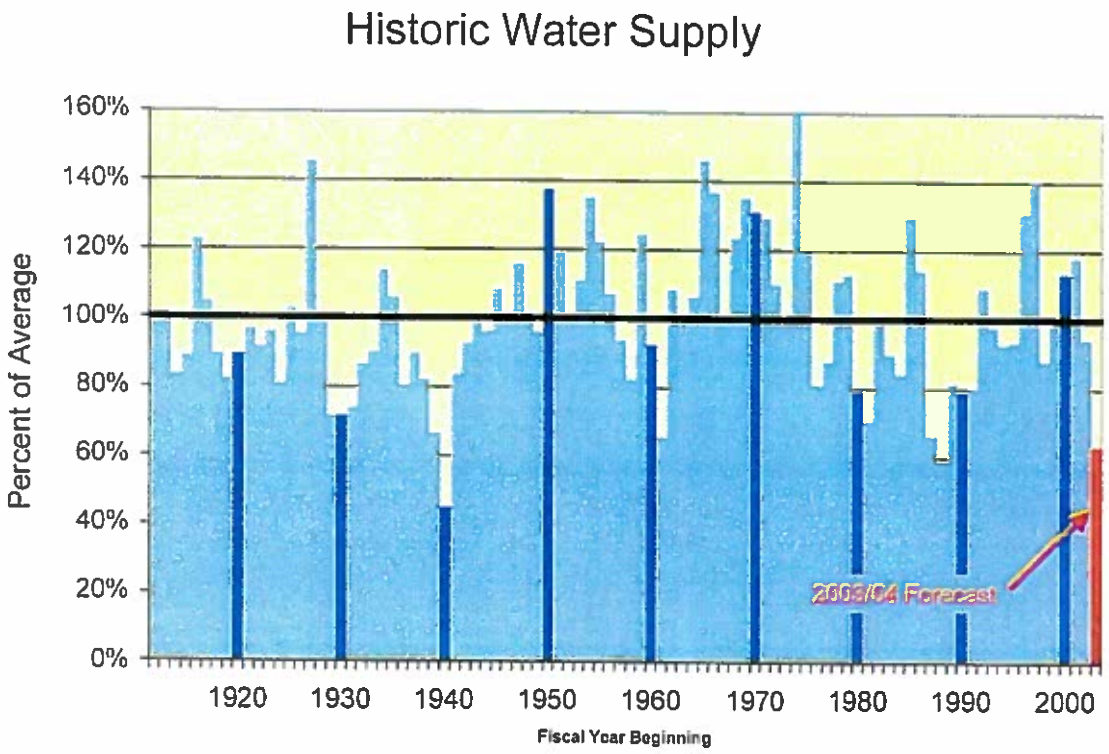

Figure 7.3.3

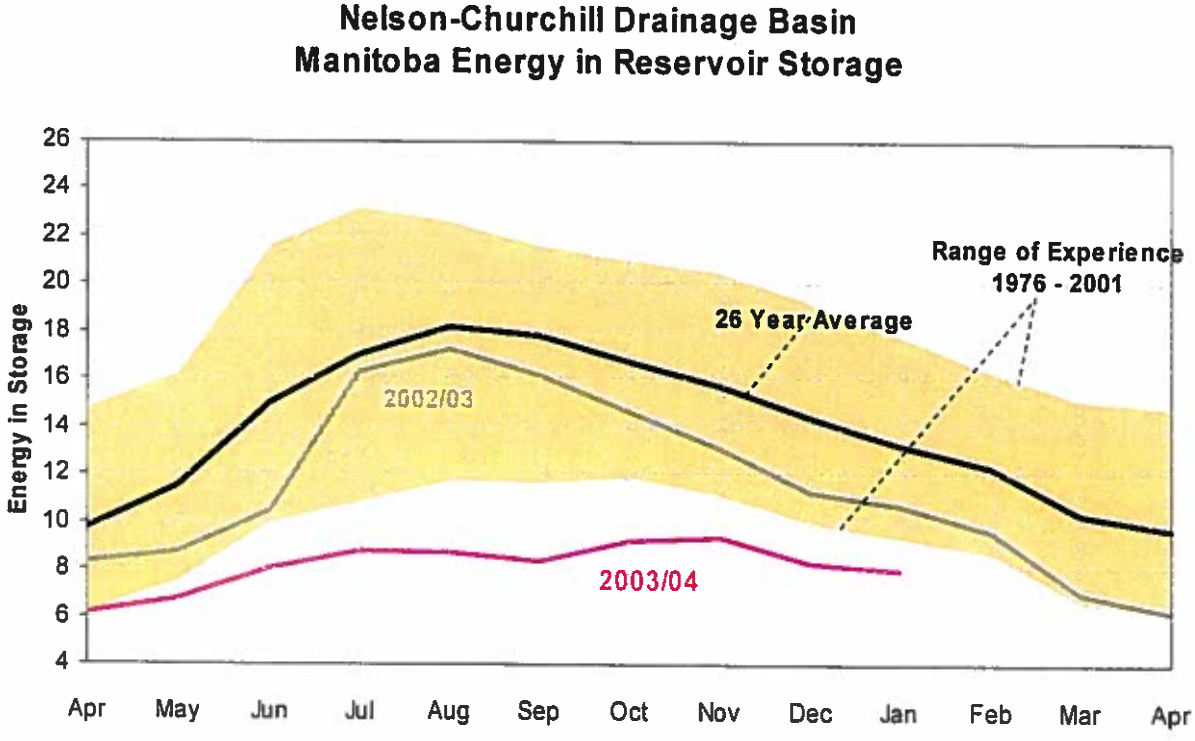

Figure 7.3.4

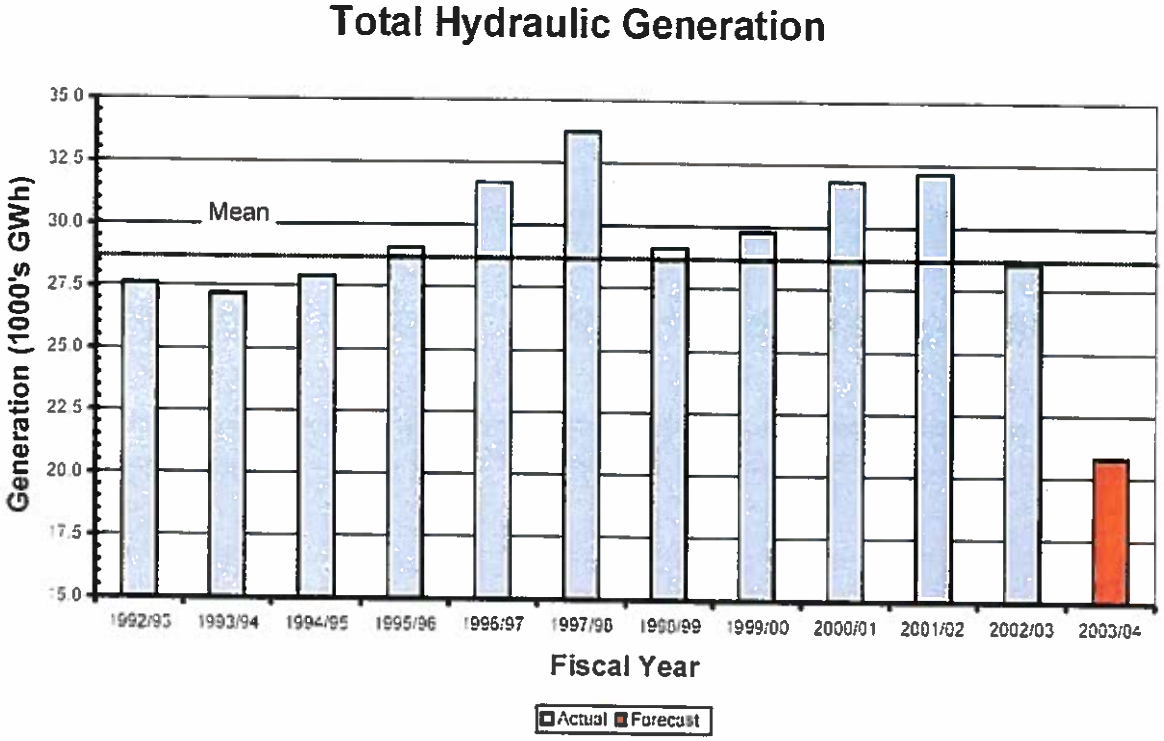
Total Hydraulic Generation
Generation (1000's GWh)
35.0
32.5
30.0
27.5
25.0
22.5
20.0
17.5
15.0
Mean
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
2000/01
2001/02
2002/03
2003/04
Fiscal Year
Actual
Forecast

Figure 7.3.5