8.0 EVALUATION METHODS & CRITERIA

8.1 Approach

In this water management planning process, all decisions were made by consensus. The Planning Team defined consensus as the act of gaining general agreement such that all committee members support a decision. If one member can not support a decision then consensus is not achieved, and voting does not constitute consensus. The Planning Team first developed options through brainstorming, accepting all options that are within scope of the plan. The benefits and conflicts of each option were listed. The following are the prioritized rankings of the planning objectives by the Planning Team and PAC, to assist in comparing options that conflicted between planning objectives:

Objective	Planning Team Priority	PAC Priority
Fisheries	3	1
Navigation	10	4
Recreation	9	7
Flooding	2	3
First Nations	4	8
Cultural Heritage	8	8
Erosion	7	6
Wildlife	5	1
Economics	6	5
Public Safety	1	2
Power Generation	4	6

Natural Flow Regime was not originally rated as a separate objective; but rather used as a guide for enhancing other objectives such as fisheries and to improve overall ecosystem health.

Options were compared and when consensus could not be reached, additional options were developed, some of which were combinations of other options, until consensus was achieved for the preliminary preferred options. Options were selected such that the selected options would provide the maximum net benefit to all users, i.e. provide the most benefit and least conflict taking into account the prioritized objectives. The PAC and Steering Committees had reviewed the options and preliminary preferred options and provided their concurrence.

The public comments received on the options and Draft Plan were considered in making the final selection of options.

Trade-Offs:

The majority of facilities were built for the primary purpose of generating electricity. Operation of these facilities has resulted in some negative impacts to the natural environment and other users, and in some cases has resulted in benefits. Selecting an overall option that results in the best balance between environmental, social and economic needs results in trade-offs, with some objectives benefited and others negatively impacted. The selected options were chosen with the goal of developing operational plans that provide the maximum net benefit to all users, while mitigating the negative impacts (trade-offs).

Evaluation of Hydroelectric Generation Impacts:

The following method was used to estimate hydro-electric losses for a proposed change:

- Assumed an average annual usage per household to be 12,000 KWh
- The losses for a specific constraint were estimated in kWh
- The annual loss in number of households was determined by dividing the loss by the average loss per household per year.

Eg. 2,400 MWh annual loss in generation
2,400,000 KWh / 12,000 KWh/household/yr
= 200 households in lost generation for one year.

When considering hydroelectric losses, it is important to note that any lost hydroelectric generation must be replaced by another form of generation such as fossil, or out of province supply that is usually fossil. This alternative generation would come at a higher cost to produce since hydroelectric generation is the most cost effective means of generating electricity for the province of Ontario. The following lists the comparative costs of power generation for the various types:

Hydroelectric	$20 / MWh
Nuclear	$33 / MWh
Coal	$45 / MWh
Gas	$70 / MWh
NUG	slightly higher than gas
Out-of-province	supply market value capped at $200 / MWh

Another significant factor to be considered is that fossil generation has a much greater environmental impact than hydroelectric generation. The following would be the emissions for coal generation:

SOx – 4.01 Gg/TWh
NOx – 0.99 Gg/TWh
COx – 0.95 Tg/TWh

Eg. 2,400 MWh annual loss in hydroelectric generation
If replaced by coal fired generation, which is probably the case, would result in the following emissions:

SOx - 4.01 Gg/TWh x 0.0024 TWh	= 0.009624 Gg
	= 9.624 tonnes SOx emissions annually
NOx – 0.99 Gg/TWh x 0.0024 TWh	= 0.002376 Gg
	= 2.376 tonnes NOx emissions annually
COx – 0.95 Tg/TWh x 0.0024 TWh	= 0.00228 Tg
	= 2,280 tonnes COx emissions annually

Therefore, when considering modifications to operating regimes, one must consider the local impacts to the environment, but as can be seen from the above discussion, one must also consider the broader environmental impact of reduction in hydroelectric generation. Hydroelectric generation is indigenous to the province of Ontario and is a renewable resource.