

## WATER QUALITY CERTIFICATION AMENDMENT

(P.L. 92-500)

In the matter of: Missisquoi Associates  
c/o Boise Cascade Corporation  
Specialty Paperboard Division  
P.O. Box 498  
Brattleboro, VT 05301  
Application to Amend the Sheldon Springs  
Hydroelectric Power Project Water  
Quality Certification

The Water Quality Division of the Vermont Department of Water Resources and Environmental Engineering has reviewed Missisquoi Associates' request by letter dated June 27, 1984, to amend their project's Water Quality Certification because of certain changes to the project design. The Department finds:

1. The project was certified on March 30, 1984. Present plans are to start construction as early as this year.
2. The following design changes have been made:
  - a. The invert elevation of the new intake structure has been lowered fifteen (15.0) feet from 305.0' NGVD to 290.0' NGVD. Also, the purpose of dredging in the intake area is now described as being "to form a channel to direct flow to the structure".
  - b. The penstock size has been increased to a sixteen (16.0) foot diameter, and it will now be reinforced concrete instead of steel.

- c. The rated horsepower of each of the two new turbines has been increased to 14000 HP (12100 HP originally). Full gate flow has been increased from 1265 cfs, each unit, to 1500 cfs, each unit. The minimum operating flow for each unit has increased from 140 cfs to 390 cfs.
- d. The net head at the new powerhouse at full gate flow has been increased by almost ten feet, from 92.8 feet to 102 feet. This is a result of more accurate field surveys, and not a result of a redesign of the tailrace.
- e. The project operation has been modified to maximize the power production of the new powerhouse during the peak-power demand periods of 7:00 A.M. to 11:00 P.M., Monday through Saturday. In order to accomplish this, the project would utilize the two feet of storage available between the top of the flashboards and the dam crest, about 300 acre-feet. This would result in the project operating in a daily peaking mode about 70% of the time, assuming the flashboards are in place year around.

The original proposal was to cycle only when available flows were between 140 cfs and 280 cfs, about 10% of the time. With the required minimum flows (270 cfs), however, the project subsequently became almost strictly run-of-the-river.

3. The Department finds that project changes a to d, above, would not significantly effect water quality. The increase in the hydraulic capacity of the powerhouse will result in a small percentage increase in the amount of time that only minimum flows are discharged into the bypassed section.

4. Change e, the peaking operation, has been carefully reviewed as the natural flow regime of the river would be changed.

By letter dated September 4, 1984, the applicant provided a detailed description of the proposed operation including a tabulation of how the project would operate on a daily basis, Monday through Saturday, for each increment of 100 cfs inflow between 100 cfs and 4000 cfs. Sunday operation would be run-of-the-river, except for when the available inflows are less than 660 cfs. At such times, inflows above the 270 cfs minimum would be stored so one of the new powerhouse units could be operated, similar to the plant's weekday mode.

The proposed daily cycling, Monday through Saturday, places up to 300 acre-feet (3630 cfs-hours) into storage to favor maximizing generation at the new powerhouse during the 16-hour

period. The release from storage would be as short as 0.6 hour (when a long storage period is required because of low flows) and as long as 18.0 hours (at 880 cfs available inflow, where full storage is achieved in a 6-hour cycle with the 270 cfs minimum release). The peaking release will generally be distributed through the 16-hour period instead of favoring short peaking cycles closer to the plant capacity. This will result in a maximum change in instantaneous flow of 822 cfs during the daily cycle. The normal change would be 681 cfs.

The applicant has calculated a change in downstream river stage of six to ten inches attributable to the peaking operation. Because of the deep, non-riffle type configuration of the downstream river channel and the limited flow variation caused by the cycling proposal, the macroinvertebrate and fisheries habitat will not be significantly impacted.

Conditions

Based on its review and findings, the Department hereby amends the Sheldon Springs Water Quality Certification by adding Condition L:

L. When flashboards are in place and the project is operated in a peaking mode, the applicant shall operate the project in a manner conforming to the proposal outlined in the tabulation provided to the Department by letter dated September 4, 1984, with no regulation of flow resulting in a change in river flow greater than 822 cfs. The project may modify the natural river flow by greater than 822 cfs only under rare emergency conditions beyond the control of the applicant.

  
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John R. Ponsetto, Commissioner  
Department of Water Resources  
and Environmental Engineering

Dated at Montpelier, Vermont  
this 19<sup>th</sup> day of October, 1984.

JRC/rh