

10-23-89

WATER QUALITY CERTIFICATION AMENDMENT  
(P.L. 92-500, Section 401)

In the matter of:

Thomas J. Stuwe  
RD #1  
Barre, Vermont 05641

William Porter  
PO Box 35  
Adamant, Vermont 05640

Application for amendment to the  
North Montpelier Hydroelectric Project  
Water Quality Certificate

The Water Quality Division of the Vermont Department of Environmental Conservation has reviewed the Water Quality Certificate filing of November 1, 1988, and information of February 22, July 12, and September 7, 1989, submitted by Messrs. Stuwe and Porter (the applicants) and finds:

1. The applicants' existing hydroelectric project consists of a stone masonry dam with a concrete facing. It is about 72 feet long and 10 feet high. A 289-foot long, 5-foot diameter penstock, which bypasses 320 feet of stream, conveys water to a powerhouse containing two 100 kW Flygt propeller turbines having an operating range of 27 to 55 cfs.
2. A FERC order amending an exemption of November 18, 1983, issued on June 26, 1989, allows the installation of 6 inches of flashboards. The exemption is based on historical use of flashboards at the project site. The applicants wish to cycle the level of North Montpelier

Pond from the top of the flashboards to a drawdown level of 5 inches below the concrete dam crest.

3. At present, a minimum instantaneous flow of 37 cfs or instantaneous inflow to North Montpelier Pond, if less, is maintained at the project tailrace. The pool elevation of North Montpelier Pond is cycled behind the flashboards as limited by minimum flow constraints below the tailrace and below the dam. A continuous flow of 10 cfs or inflow to the impoundment, if less, is passed over the dam crest at all times, on an instantaneous basis. When the project is not operating, all inflows are passed at the dam.

A mini-turbine which operates at 27 cfs is proposed for installation on the south bank 21 feet downstream of the dam with a connection to the existing penstock. The mini-turbine will provide minimum flows of 27 cfs to the bypass when in operation. Flows over the dam will be available during periods of high flow when the capacity of the existing and proposed turbines are exceeded and during periods of low flow. Roughly half the time, there will be no spillage under the proposed operating mode.

Except during high flow, the powerhouse units will be used to cycle the pond to maximize onpeak power production. As inflows recede and the powerhouse units cycle infrequently as a result, the powerhouse units

will be shut down; the flashboards will be removed; and the mini-turbine shut down. As proposed, if the pond were to be below the dam crest, the mini-turbine would be kept on line until spillage is occurring.

This action is proposed to occur when inflows have receded to 30 cfs; however, with a 5 inch drawdown below the crest, it would take over five days in theory to refill the reservoir. Lag times on this order are unacceptable because inflows may continue to recede making it impossible to restore the pond elevation. Either the 30 cfs limiting flow would have to be increased or the drawdown not allowed to drop below the dam crest. The Department is, therefore, not permitting a drawdown below the dam crest as part of this certification action.

During periods when the external electrical supply to the project is interrupted, the applicant states the mini-turbine will run in overspeed at 600 rpm, therefore providing the necessary flow in the bypass.

4. The lack of spillage over the dam for extended periods will reduce the attractiveness of this riverine resource. The Agency of Natural Resources has reviewed this negative impact and feels that it has been balanced by the applicants' proposal to enhance recreational opportunities at the site and by the increase in flows through the bypassed channel.

5. The mini-turbine will be anchored 8 feet from the existing penstock to an existing concrete cradle penstock support and to the ledge at the base of the dam. Some relatively small stones lying in the pool where the turbine will be placed will be removed and stacked along the streambank with other loose stones now lining the bank. These stones will be removed by hand using no mechanical means. The installation will have minimal potential to cause erosion or damage to the river or streambanks.
6. The short section between the dam and proposed discharge point is rocky and not conducive to biological activity. No fisheries or aquatic biota will be unduly affected by the placement of the mini-turbine.
7. The loss of spillage over the dam and its effect on stream reaeration is projected to be offset by the increase in flows through the bypass reach. This action is expected to be consistent with the standards for dissolved oxygen.

Based on its review and findings, the Department of Environmental Conservation hereby amends the North Montpelier Hydroelectric Project Water Quality Certification by revising Conditions A and H, deleting E, and adding Conditions I, J, and K.

- A. A minimum instantaneous flow of 27 cfs or instantaneous inflow to North Montpelier Pond, if less, shall be maintained in the bypass. A protocol shall be established to ensure that adequate warning is available to shut down the mini-turbine and remove flashboards when inflow falls below 30 cfs. The protocol shall be practical and reliable in the light of the facility lacking a full time on-site operator. It shall also include provisions to ensure adequate flow in the bypass when flows increase and the transition is made to power generation. Until the protocol is established and approved by the Department, the spillage and downstream flow requirements being amended shall remain in effect.
- B. Under no conditions shall the project totally interrupt stream flow in order to facilitate repairs or maintenance operations. If the impoundment is to be drawn down, prior approval is to be obtained from the Department.
- C. The pond level shall be maintained at or above the present crest elevation. The Department may at any

time order the permanent removal of the flashboards if it is found that they cause a degradation of upstream habitat conditions or adversely affect riparian use or flooding. The flashboards shall be designed to fail if overtopped by an excess of 2 feet of water.

- D. Any desilting shall be done in accordance with the Agency of Natural Resources' Desilting Policy, a copy of which is attached.
- F. The applicant shall ensure that every reasonable precaution is taken to prevent the discharge of petrochemicals and debris to state waters.
- G. Any debris removed from the dam crest, trashracks, and work area during construction and later operation shall be disposed of properly.
- H. Any significant changes to the project, including the operational scheme, must be submitted to the Department of Environmental Conservation for review and approval prior to effecting the change. The approval of the Department shall be obtained under Condition A prior to operating the new turbine.
- I. Notice of installation of the mini-turbine shall be provided to the Department at least 48 hours before work is to begin.
- J. There shall be no interruption of flow to the river during the installation of the mini-turbine.
- K. The Department may order modifications to the project at any time if the project is found to be causing

violations of Vermont Water Quality Standards,  
including the criteria for dissolved oxygen.



Timothy Burke, Commissioner  
Department of  
Environmental Conservation

Dated at Waterbury, Vermont  
this 23<sup>rd</sup> day October, 1989

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