

AMENDED WATER QUALITY CERTIFICATION

(P.L. 92-500, Section 401)

In the matter of: Nantana Mill Dam Partnership
1 Mill Street
Burlington, VT. 05401
Application for C.T.I.P., Inc.
Hydroelectric Project

The Water Quality Division of the Vermont Department of Water Resources and Environmental Engineering (the Department) originally issued a certification to C.T.I.P., Inc. on January 5, 1983. The ownership of C.T.I.P., Inc. subsequently changed, and on January 28, 1985, the rights to develop the hydroelectric project were transferred to Nantana Mill Dam Partnership. They are, therefore, now considered to be the "applicant" in this certification. Additionally, this new certification includes the review of a proposal filed by Vermont Hydroelectric, Inc. on behalf of the applicant to change the equipment to be installed. The Department has made the following findings:

1. The applicant proposes to develop the site of an existing dam located on the Dog River at the former Nantana Woolen Mill in the Village of Northfield. The penstock, one turbine and the powerhouse are also existing. The dam, built by Northfield Mills between 1947 and 1950, is a reinforced concrete arch structure, 90 feet long and 22 feet high. The principal spillway crest elevation is 686' NGVD.

2. Three (3.0) feet of flashboards are to be installed across the crest, raising the pool elevation to 689' NGVD and increasing the surface area from about 1.0 acre to 1.6 acres. The applicant has indicated that this is the historic operating level. The gross storage volume will be about 8 acre-feet; however, the project will not be operated from storage.

The application does not indicate how much further the backwater from the dam will extend as a result of the installation of flashboards. It does state, however, that the backwater will not extend past the sewerline crossing downstream of the Vermont Route 12 bridge. That would suggest that the additional backwater would not extend more than about 1800 feet upstream of the dam. Located between that point and the bridge is the Cross Brothers Dam, which is now partially breached. The District Fisheries Biologist, in reviewing this project, concludes that there will be about 300 feet of additional backwater and that a 100-foot cobble riffle section will be flooded.

3. Since the original January 5, 1983 certification, the turbine/generator units to be installed have changed. Two new crossflow units manufactured by New Found Power Company of Hope Valley, Rhode Island are to be used. As a result, the hydraulic capacity range of the units has changed from 30-169 cfs to 20-140 cfs. The gross head available is 25 feet. The steel penstock is 7.0 feet in diameter and 40 feet long.

4. The U.S.G.S. has operated two surface water gaging stations in the Dog River Basin - gage #42865 was operated at Northfield from water years 1913 to 1934 and gage #42870 has been operated at Northfield Falls from October, 1934 to the present. The watershed areas at the gaged sites are 52 square miles and 76.1 square miles, respectively. At the dam, the watershed area is 62 square miles. Based on an adjustment for the watershed area and for the gage periods of record, following are several estimated hydrologic values for the site of this project:

<u>Parameter</u>	<u>Value (cfs)</u>
Mean flow	97
7Q10	5
95% exceedance	9
50% exceedance (median)	46
10% exceedance	222

5. The project is run-of-the-river. On a long term, flows should be sufficient for operation about 60% of the time. Some flow is withdrawn from the impoundment in order to facilitate operation of the Northfield wastewater treatment plant.

6. Water from the powerhouse is returned to the river about 130 feet downstream of the dam via an unlined earthen tailrace channel. The bypass section is comprised of a short plunge pool and a shallow ledge portion. The applicant has agreed to pass some flow over the dam in order to maintain the bypassed section.

7. The Dog River has been classified by the Vermont Water Resources Board as Class C waters from the southern limits of Northfield Village downstream. Class C waters are suitable for recreational boating, irrigation of crops not used for consumption without cooking, habitat for wildlife and for common food and game fishes indigenous to the region, and such industrial uses as are consistent with other class uses. At the north end of the village, about one mile downstream of the project, the river receives a treated waste discharge from the Northfield Village plant. The Dog River is Water Management Type I or II. The minimum standard for dissolved oxygen (D.O.) is 6 mg/l, with the possible limit of 7 mg/l in spawning areas.

8. No water quality data has been collected by the applicant; however, it is not anticipated that the project as proposed will lower D.O. levels significantly. The facility will not be operating during periods of low flow. By condition of this certification, a minimum flow of 5 cfs will be required over the dam at all times and, whenever the facility is shut down, all inflows will be spilled.

9. The Dog River has an excellent coldwater fishery, mainly comprised of rainbow and brown trout. It is felt that the fishery population between the two dams is a result of downstream drift.

The basin will soon be evaluated as a potential spawning area for inclusion in the Vermont Department of Fish and Wildlife's programs for steelhead and landlocked Atlantic salmon fisheries in Lake Champlain.

10. Crossflow turbines characteristically have high mortality rates for fish passing through the units. The District Fisheries Biologist has requested that the intake be screened in order to protect fish moving downstream.

11. Following each reinstallation of flashboards, special provisions for the passage of flows at the dam must be made in order to maintain aquatic life downstream and to provide stream flow at the wastewater treatment plant to receive the effluent discharge.

CONDITIONS

The Vermont Department of Water Resources and Environmental Engineering certifies that this project will meet Vermont Water Quality Standards with the following conditions:

A. Except as covered in Condition B, the hydroelectric facility shall be operated in a strict run-of-the-river manner, with instantaneous flows downstream of the tailrace equivalent to instantaneous inflows to the impoundment. A minimum flow of 5.0 cfs, or instantaneous inflow to the impoundment, if less, shall be spilled at the dam at all times. All flows shall be passed at the dam when the facility is not operating. The applicant shall provide the Department with a description and plans detailing how releases will be made at the dam for review and approval before construction may commence.

B. The Department recognizes that there will be times when some inflow must go into storage resulting in an alteration of the natural flow regime. Two such cases would be when flashboards are installed and when the pool is drawn for a maintenance operation. During such periods, the facility must maintain a minimum instantaneous flow below the tailrace of 17 cfs (0.28 cfs/square/mile, or the estimated August median flow), or the instantaneous impoundment inflow, if less.

C. During the final engineering phase or earlier, the applicant shall file a comprehensive erosion and sediment control plan with the Department. The plan shall cover temporary and permanent measures to limit adverse impacts on water quality from turbidity and sedimentation with regard to construction activities. It is recommended that the applicant consult with the Department for input during the development of the plan.

D. The applicant shall insure that every reasonable precaution is taken during construction to prevent the discharge of petro chemicals, wet concrete and debris to state waters.

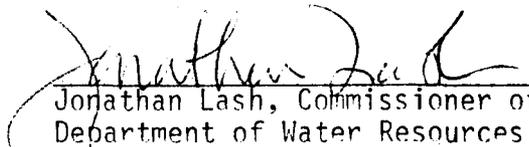
E. Any debris removed from the project area during construction and later operation shall be disposed of properly.

F. Any significant changes to the project including changes to the operational scheme must be submitted to the Department for approval.

G. Upon completion of the project, the applicant shall provide the Department with an as-built set of plans for the record.

H. No construction may commence until the Department has issued written approvals under conditions A, C, and F. Operational changes made after project completion are subject to condition F and must be approved prior to effecting the change.

I. No construction may commence until the Vermont Department of Fish and Wildlife approves a proposal for screening the intake to minimize turbine mortality. The screening shall be maintained and kept in place during all operating periods.


Jonathan Lash, Commissioner of
Department of Water Resources
and Environmental Engineering

Dated at Montpelier, Vermont this
11 day of March, 1985

JRC/gp