

Exhibit B – Water Quality

Copies of the following documents are attached:

Maine Department of Environmental Protection letter of January 18, 2002, confirming that compliance with 401 water quality certification conditions is complete.

Maine Department of Environmental Protection “Maine Waterway Development and Conservation Act and Water Quality Certification” dated July 13, 1998



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
GOVERNOR

January 18, 2002

MARTHA KIRKPATRICK
COMMISSIONER

Bearl S. Keith
Project Administrator
Miller Hydro Group
148 Middle Street
Portland, ME 04101

RE: Compliance Status
Worumbo Hydro Project
FERC No. 3428

Dear Bearl:

This is to confirm that compliance with 401 water quality certification conditions for the Worumbo Hydro Project, FERC No. 3428, is now complete.

A Compliance Status Report for this project is enclosed for your records.

Thank you for your attention to these compliance requirements. If you have any questions about your compliance status, or any information contained in the enclosed report, please give me a call at 207-287-7784, or you can contact me by e-mail at dana.p.murch@state.me.us.

Sincerely,

Dana Paul Murch
Dams & Hydro Supervisor

cc: Fred Springer, Compliance-FERC

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 764-1507

WQC COMPLIANCE STATUS REPORT

PROJECT: WORUMBO

LOCATION: Town of Lisbon
Androscoggin River

FERC No. 3428

Date license issued: 12/24/1985

DEP # L-10930

Date 401 cert issued: 06/12/1985

OWNER/OPERATOR: MILLER HYDRO GROUP

CONDITION NUMBER	DESCRIPTION	DATE DUE	DATE APPROVED
1	Water Level Maintenance (no compliance filing required)	-----	-----
2	Minimum Flow Requirements (no compliance filing required)	-----	-----
3(A)	Interim Minimum Bypass Flow (no compliance filing required)	-----	-----
3(B)	Bypass Flow Study Plan	06/12/1988	09/21/1987
3(C)	Bypass Flow Study Results/Bypass Flow Proposal	1 yr after project goes on-line	03/20/1992
3(A)**	Permanent Minimum Bypass Flow (no compliance filing required)	-----	-----
3(B)**	Annual Funding for Fisheries Management Activities (no compliance filing required)	-----	-----
3(C)**	Dam Modifications to Concentrate Spill over West Section of Dam	Per FERC order	07/26/1994
3(D)**	Minimum Flow Monitoring Plan	6 mos after FERC approval	07/26/1994
4(B)	Erosion and Sedimentation Control Plan	Prior to project construction	01/15/1986
4(B)(1)*	Construction & Excavation Spoils Disposal Plan	Prior to off-site disposal	Not needed
5(A)	Downstream Fish Passage Facilities	To be operational concurrent with project	Installed & operating

5(B)	Upstream Fish Passage Facilities	To be operational by 05/01/1989	Installed & operating
5(C)	Upstream and Downstream Fish Passage Design Plans	Prior to passage construction	03/03/1988
6(B)	Bypass Fish Passage Needs Study Plan	05/01/1988	-----
6(C)	Bypass Fish Passage Needs Study Results/Additional Fish Passage Proposal	5 yrs after powerhouse fishway goes on-line	See note below
7	Boat Access Facility Plans	Prior to project operation	03/03/1988
8	Evidence of Financial Capacity	Prior to project construction	05/06/1986
1***	Standards Conditions of Approval (no compliance filing required)	-----	-----
2***	All Existing Conditions in Effect (no compliance filing required)	-----	-----
3(C)***	Water Level Monitoring Plan	Prior to raising impoundment level	02/01/2000
4(C)***	Minimum Flow Monitoring Plan	Prior to raising impoundment level	02/01/2000
5***	Shoreline Erosion Survey Results	3 yrs after raising impoundment level	01/16/2002

* Per compliance order #I-10930-35-C-M issued 01/15/1986.

** Per amendment order #I-10930-35-L-A issued 03/20/1992.

*** Per modification order #I-10930-35-N-M issued 07/13/1998 (approving 1.5 ft increase in impoundment elevation).

Note: Fish passage efficiency studies were conducted annually from 1990 through 1995. The runs of alewives being studied were small, and study results were inconclusive. By Order dated November 12, 1998, FERC agreed that further studies should be discontinued until such time as needed.

c:\compliance\worumbo

COMPLIANCE COMPLETE



ANGUS S. KING, JR.
GOVERNOR

DEPARTMENT ORDER

IN THE MATTER OF

MILLER HYDRO GROUP, INC.)
LISBON, ANDROSCOGGIN COUNTY, ME.) MAINE WATERWAY DEVELOPMENT AND
WORUMBO HYDRO PROJECT) CONSERVATION ACT AND
FLASHBOARD REPLACEMENT) WATER QUALITY CERTIFICATION
#L-10930-35-N-M (Approval)) FINDINGS OF FACT AND ORDER
PERMIT MODIFICATION

Pursuant to the provisions of 38 MRSA Sections 464 et seq. and Sections 630 et seq., 06-096 CMR 450 (Administrative Rules for Hydropower Projects, effective date September 1, 1987), and Section 401 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act), the Department of Environmental Protection has considered the application of MILLER HYDRO GROUP, INC. with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. APPLICATION SUMMARY

- Application.** The applicant proposes to replace the existing flashboard system and modify the operation of the existing Worumbo Hydro Project, located on the Androscoggin River in the Towns of Lisbon and Durham, Androscoggin County, Maine.
- Existing Project.** The Worumbo Project consists of a 770-foot-long concrete and timber crib overflow dam, a gated spillway section, an intake section, and an integral powerhouse equipped with two turbine-generator units having a rated capacity of 19.2 MW at a net operating head of 30 feet. The dam creates an impoundment with a surface area of 190 acres at a normal full pond elevation of 97.0 feet msl. The project is currently operated as a run-of-river facility, with outflow approximately equal to inflow on an instantaneous basis. The project is also operated to provide seasonally-varied minimum flow releases into the 850-foot-long bypassed river reach between the Durham-side dam and the end of the tailrace training wall.

The construction and operation of the existing project has been approved by the Board of Environmental Protection (Board Order #L-10930-35-A-N, dated June 12, 1985, as amended). The project is operated as a hydroelectric generating facility under the terms of FERC License No. 3428.



RECYCLING SYMBOL

MILLER HYDRO GROUP, INC.)
LISBON, ANDROSCOGGIN COUNTY, ME.) MAINE WATERWAY DEVELOPMENT AND
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- Summary of Flashboard Replacement Proposal.** The applicant proposes to install pneumatically operated hinged steel crest gates over the Durham-side dam and hinged conventionally operated flashboards over the remaining dam. The new crest gate/flashboard system will raise the normal full pond elevation of the impoundment by 1.5 feet, to 98.5 feet msl, and will have a negligible impact on the size of the impoundment.

To accommodate the new crest gates and flashboards, the applicant proposes to remove about 1,000 square feet of wooden planking; remove about 3 cubic yards of ledge; remove about 3.5 cubic yards of concrete; and add about 65 cubic yards of concrete to the existing dam structure. The proposed work will all take place using temporary sand bag cofferdams and limited impoundment drawdowns as needed.

In addition, in order to improve the stability of the dam, the applicant proposes to pour about 15 cubic yards of concrete about 2 feet wide and 4 feet high along about 35 feet of the downstream toe of the timbercrib dam section. This concrete mass will be pinned to the underlying ledge and will serve as a shear block to prevent dam failure.

With the higher operating head created by the increased impoundment level, the installed generating capacity of the project will increase by about 200 KW to 19.4 MW, and average generation will increase by about 4.2 million kilowatt hours a year.

The new crest gates/ flashboards will be designed to fully deflate or fail when overtopped by 2 feet of water.

The estimated cost of installation of the new crest gate/flashboard system is about \$500,000. The applicant expects to be able to complete the installation in a single summer low flow construction season.

- Summary of Proposed Project Operation.** Once the proposed new crest gate/flashboard system is in place, the applicant further proposes to modify current run-of-river operation to allow the impoundment to be drawn down by a maximum of 1.5 feet (which is equivalent to the proposed increase in headpond elevation). This will allow the owner to maximize the energy and capacity of the project, to provide short-term reserve capacity to the interstate power grid, and to provide ancillary services (i.e., Automatic Generation Control) to the power grid under future deregulated market conditions.

The applicant proposes to maintain a minimum flow release from the project of 1,700 cfs or inflow, whichever is less, during impoundment refilling, and to maintain the current minimum flow releases to the bypass reach.

2. JURISDICTION

- a. Hydropower Project Permit. The proposed flashboard replacement qualifies as the "construction, reconstruction or structural alteration of a hydropower project" under the Maine Waterway Development and Conservation Act (MWDCA), 38 MRSA Section 630 et seq. The proposed modification of project operation qualifies as a change in the terms and conditions of the MWDCA permit currently in effect for the project that must be approved by the Department.

- b. Water Quality Certification. The proposed flashboard replacement and modification of project operation qualify as an "activity...which may result in (a) discharge into the navigable water (of the United States)" under the Clean Water Act (CWA), 33 USC 1251 et seq. Section 401 of the CWA requires that any applicant for a federal license or permit to conduct such an activity will comply with applicable State water quality standards.

The applicant has filed an Application for Amendment of License for the Worumbo Hydroelectric Project with the Federal Energy Regulatory Commission to authorize the proposed new crest gate/flashboard system and modification of project operation.

- c. Terms and Conditions. Section 401(d) of the CWA provides that a water quality certification shall set forth any limitations necessary to assure that an applicant for a federal license or permit will comply with any appropriate requirement of state law, and that such limitations shall become a condition on the federal license or permit issued for the activity. As discussed above, a permit is required under the MWDCA for the proposed new crest gate/flashboard system and modification of project operation. The MWDCA is a state water quality-related law. Consequently, the terms and conditions of any permit issued for this project constitute appropriate and necessary limitations to be set forth in any certification issued for the project.

3. APPLICABLE WATER QUALITY STANDARDS

- a. Classification. The Androscoggin River is classified as having Class C waters from the Ellis River in Rumford to a line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay.
- b. Designated Uses. Class C waters shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; and as habitat for fish and other aquatic life.
- c. Numeric Standards. The dissolved oxygen content of Class C waters shall be not less than 5 parts per million or 60% of saturation, whichever is higher, except that in identified salmonid spawning areas where water quality is sufficient to ensure spawning, egg

incubation and survival of early life stages, that water quality sufficient for these purposes shall be maintained.

- d. Narrative Standards. Discharges to Class C waters may cause some changes to aquatic life, provided that the receiving waters shall be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

The habitat characteristics and aquatic life criteria of Class C are deemed to be met in an existing impoundment which is classified C provided that any reasonable changes are implemented that do not significantly affect existing energy generation capability and that would result in an improvement in the habitat and aquatic life of the impounded waters. Where the actual quality of the impounded waters attains any more stringent habitat characteristic or aquatic life criteria than that required under Class C, that existing water quality must be maintained and protected.

- e. Antidegradation. The Department may only approve water quality certification if the standards of classification of the waterbody and the requirements of the State's antidegradation policy will be met. The Department may approve water quality certification for a project affecting a waterbody in which the standards of classification are not met if the project does not cause or contribute to the failure of the waterbody to meet the standards of classification.

3. DISSOLVED OXYGEN

The proposed increase in impoundment full pond level and allowance for a 1.5 foot impoundment drawdown will not result in any significant increase in time-of-travel through the impoundment. Therefore, these proposals are not expected to have any adverse impact on dissolved oxygen levels in the river.

4. AQUATIC LIFE

The proposed increase in impoundment full pond level will not result in any significant increase in impoundment volume. The proposed allowance for a 1.5 foot impoundment drawdown will not result in any significant dewatering of aquatic habitat. Therefore, these proposals are not expected to have any beneficial or adverse impacts on aquatic life in the river.

5. FISH RESOURCES

The lower Androscoggin River is currently managed for warmwater game species, principally smallmouth bass, pickerel and yellow perch, and forage species such as minnows and white suckers. Brown trout are currently being experimentally stocked in the project area. The three lowermost dams on the river (Brunswick, Pejepscot and Worumbo) are currently operated with

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upstream and downstream passage facilities for migrating anadromous fish, including Atlantic salmon, American shad and alewife.

The Department of Inland Fisheries and Wildlife has commented that present warmwater game fish populations are being maintained under current project conditions, and that the proposed increase in impoundment full pond level and allowance for a 1.5 foot impoundment drawdown should not interfere with these populations, provided that minimum flow releases are provided as proposed by the applicant.

The Department of Marine Resources has commented that, due to high mean flows during the May and June fish migration season, any impoundment drawdown will be infrequent and of limited duration, and that the proposed increase in impoundment full pond level and allowance for a 1.5 foot impoundment drawdown should not have any significant impact on anadromous fish habitat or fish passage, provided that minimum flow releases are provided as proposed by the applicant.

6. RECREATION

Public recreational boat access to the project impoundment is available at the Town of Lisbon boat launch located on the Sabattus River immediately above its confluence with the Androscoggin River. The proposed increase in normal impoundment level will decrease the clearance for boats under the railroad bridge and Route 196 highway bridge, both of which are located between the boat launch and the Androscoggin River.

The DIF&W and the Department of Conservation have both commented that adequate clearance will be maintained under the bridges under the new impoundment level, and that the project should not interfere with existing recreational access.

7. HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Maine Historic Preservation Commission has commented that the proposed increase in normal impoundment level will not exacerbate erosion of any archaeological sites.

8. WILDLIFE AND WETLANDS

There are no endangered or threatened species of wildlife known to reside in the project area. In addition, no Significant Wildlife Habitats has been identified in the project area.

The DIF&W has commented that steep banks along the impoundment have limited the development of wetlands and that the proposed increase in impoundment full pond level is unlikely to substantially affect wetland wildlife habitat.

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9. FLOOD CONTROL

Under flood conditions, the new crest gates will be completely deflated and the new flashboards will have failed so as to have no impact on the level of the impoundment at all river flows above about 30,000 cfs. Therefore, the project will not result in any loss of existing flood control.

10. SOIL STABILITY

The proposed increase in normal impoundment level has the potential for increasing erosion along any unstable sections of impoundment shoreline.

The applicant proposes to conduct a survey of the impoundment shoreline both prior to and during the first three years following the raising of the impoundment level. The applicant should be responsible for addressing any significant erosion that is found to occur as a result of the raising of the impoundment.

11. HYDROELECTRIC POWER GENERATION

The proposed increase in impoundment level will increase average annual generation at the Worumbo Project by 4.2 million kilowatt hours. This is equivalent to the electricity that would be produced by burning 7,000 barrels of oil or 1,946 tons of coal each year.

12. OTHER ISSUES; REVIEW COMMENTS

Erosion and sedimentation caused by the movement of construction equipment and supplies can result in degradation of water quality and impairment of aquatic habitat.

"Fresh" concrete can be toxic to aquatic life when placed in contact with river water prior to curing.

Concrete chippings and other construction debris can cause environmental problems unless disposed of adequately.

Impoundment drawdowns during construction may interfere with fish passage or impact fish habitat.

No other significant issues involving any statutory criteria of the Maine Waterway Development and Conservation Act have been identified. No objections to the proposed activity have been raised by State review agencies or the affected municipalities.

BASED on the above Findings of Fact, and the evidence contained in the application and supporting documents, and subject to the Conditions listed below, the Department makes the following CONCLUSIONS:

MILLER HYDRO GROUP, INC. 7 MAINE WATERWAY DEVELOPMENT AND
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1. The applicant has the financial capacity and technical ability to undertake the project.
2. The applicant has made adequate provision for protection of public safety.
3. The project will result in significant economic benefits to the public.
4. The applicant has made adequate provision for traffic movement.
5. The proposed activity is not located within the jurisdiction of the Land Use Regulation Commission.
6. The applicant has made reasonable provisions to realize the environmental benefits and to mitigate the adverse environmental impacts of the project provided that:
 - a. All existing permit conditions remain in effect except as specifically modified by this approval;
 - b. Following the installation of the new crest gate/flashboard system, impoundment levels are maintained between elevation 98.5 feet msl and 97.0 feet msl;
 - c. Following the installation of the new crest gate/flashboard system, a minimum flow of 1,700 cfs or inflow, whichever is less, is maintained during impoundment refilling;
 - d. Adequate measures are taken to assess and mitigate any significant bank erosion caused by the raising of the impoundment;
 - e. All necessary measures are taken to control erosion and sedimentation due to construction activities;
 - f. Fresh concrete does not come into contact with surface water;
 - g. Concrete and ledge clippings and other construction debris are caught where safe to do so and disposed of in accordance with established regulations; and
 - h. Any temporary impoundment drawdowns during the approved flashboard installation and dam repair work are approved by the appropriate state fisheries agencies.
7. The advantages of the project are greater than the direct and cumulative adverse impacts over the life of the project provided that the project is undertaken in accordance with the provisions of Conclusion #6 above.

MILLER HYDRO GROUP, INC. 8 MAINE WATERWAY DEVELOPMENT AND
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THEREFORE, the Department APPROVES the above noted application of MILLER HYDRO GROUP, INC. to install a new flashboard system and undertake dam repairs at the Worumbo Hydro Project, as described above, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

1. STANDARD CONDITIONS

The Standard Conditions of Approval for projects under the Maine Waterway Development and Conservation Act, a copy attached.

2. EXISTING PERMIT CONDITIONS

All existing permit conditions for the Worumbo Project as contained in Board Order #L-10930-35-A-N dated June 12, 1985, and as subsequently amended, shall remain in effect except as specifically modified by this approval.

3. WATER LEVELS

A. Following the installation of the new crest gate/flashboard system, and except as temporarily modified by approved maintenance activities, inflows to the project area, and operating emergencies beyond the applicant's control, as defined below, water levels in the project impoundment shall be maintained between elevation 98.5 feet and 97.0 feet msl.

B. Operating emergencies beyond the applicant's control include, but may not be limited to, equipment failure or other temporary abnormal operating condition, generating unit operation or interruption under power supply emergencies, and order from local, state, or federal law enforcement or public safety authorities.

C. The applicant shall, in accordance with a schedule established by FERC, submit plans for monitoring and providing the impoundment water levels required by Part A of this condition. These plans shall be reviewed by and must receive approval of the DEP Bureau of Land and Water Quality.

4. MINIMUM FLOWS

A. Following the installation of the new crest gate/flashboard system, and except as temporarily modified by approved maintenance activities, inflows to the project area, and operating emergencies beyond the applicant's control, as defined below, a minimum flow of 1,700 cfs or inflow, whichever is less, shall be maintained from the project during any impoundment refilling following a drawdown of up to a maximum of 1.5 feet.

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B. Operating emergencies beyond the applicant's control include, but may not be limited to, equipment failure or other temporary abnormal operating condition, generating unit operation or interruption under power supply emergencies, and order from local, state, or federal law enforcement or public safety authorities.

C. The applicant shall, in accordance with a schedule established by FERC, submit plans for monitoring and providing the minimum flows required by Part A of this condition. These plans shall be reviewed by and must receive approval of the DEP Bureau of Land and Water Quality.

5. EROSION SURVEY

The applicant shall, in consultation with the Department of Inland Fisheries and Wildlife, conduct a survey of shoreline erosion along the banks of the project impoundment both prior to and during the first three years following the raising of the impoundment. The applicant shall submit a report detailing the results of the survey and any measures taken or recommended to mitigate any significant bank erosion caused by impoundment water levels.

6. EROSION CONTROL

In addition to any specific erosion and sedimentation control measures proposed by the applicant and/or set forth in this Order, the applicant and its agents shall take all necessary measures to ensure that their activities do not result in measurable erosion or sedimentation during or after the approved work.

7. CONCRETE CURING

Concrete shall be precast and cured at least three weeks before placing in the water, or where necessary, shall be placed in forms and shall cure at least one week prior to contact with surface water. No washing of tools, forms, etc. shall occur in or adjacent to the waterway.

8. SPOILS DISPOSAL

Concrete and ledge chippings shall be caught and held for disposal where reasonable to do so, given consideration of worker safety, costs, and any constraints on access. All captured chippings and any other solid waste generated by the project shall be disposed of in accordance with the Maine Solid Waste Management Regulations.

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9. TEMPORARY CONSTRUCTION DRAWDOWNS

The applicant shall notify and receive approval from the Department of Inland Fisheries and Wildlife and the Department of Marine Resources that any temporary impoundment drawdowns needed to facilitate the installation of the new crest gate/flashboard system will not impair resident fisheries habitat or interfere with anadromous fish passage.

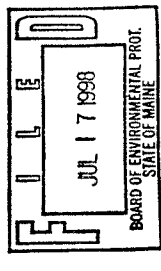
DONE AND DATED AT AUGUSTA, MAINE, THIS 13 DAY OF July, 1998.
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Edward O. Sullivan
Edward O. Sullivan, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 5/14/98

Date application accepted for processing: 5/19/98



Date filed with Board of Environmental Protection: _____

This Order prepared by Dana Murch.

VL10930nm.doc

STANDARD CONDITIONS OF APPROVAL TO BE ATTACHED TO ALL HYDROPOWER PERMITS

1. Limits of Approval. This approval is limited to and includes the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. All variances from the plans and proposals contained in said documents are subject to the review and approval of the Board or Commission prior to implementation.
2. Noncompliance. Should the project be found, at any time, not to be in compliance with any of the conditions of this approval, or should the permittee construct or operate this project in any way other than specified in the application or supporting documents, as modified by the conditions of this approval, then the terms of this approval shall be considered to have been violated.
3. Compliance with all Applicable Laws. The permittee shall secure and appropriately comply with all applicable federal, state and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation.
4. Inspection and Compliance. Authorized representatives of the Board, Commission or the Attorney General shall be granted access to the premises of the permittee at any reasonable time for the purpose of inspecting the construction or operation of the project and assuring compliance by the permittee with the conditions of this approval.
5. Initiation and Completion of Construction. If construction is not commenced within 3 years and completed within 7 years from the date of issuance of this permit, this approval shall lapse, unless a request for an extension of these deadlines has been approved by the Board or Commission.
6. Construction Schedule. Prior to construction, the permittee shall submit a final construction schedule for the project to the Commissioner or Director.
7. Approval Included in Contract Bids. A copy of this approval must be included in or attached to contract bid specifications for the project.
8. Approval Shown to Contractor. Work done by a contractor pursuant to this approval shall not begin before a copy of this approval has been shown to the contractor by the permittee.
9. Notification of Project Operation. The permittee shall notify the Commissioner or Director of the commencement of commercial operation of the project within 10 days prior to such commencement.
10. Assignment or Transfer of Approval. This approval shall expire upon the assignment or transfer of the property covered by this approval unless written consent to transfer this approval is obtained from the Board or Commission. A "transfer" is defined as the sale or lease of property which is the subject of this approval, or the sale of 50 percent or more of the stock of or interest in a corporation or a change in a general partner of a partnership which owns the property subject to this approval.

Effective 9/87

ENVIRONMENTAL ASSESSMENT

APPLICATION FOR AMENDMENT OF LICENSE

WORUMBO HYDROELECTRIC PROJECT

FERC PROJECT NO. 3428-080

MAINE

**Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Licensing and Compliance
888 First Street, N.E.
Washington, D.C. 20426**

AUGUST 1998

ENVIRONMENTAL ASSESSMENT

Project Name: Worumbo Hydroelectric Project

FERC Project No. 3428-080

A. APPLICATION

1. Application Type: Amendment of License
2. Date filed with the Commission: May 15, 1998
3. Applicant: Miller Hydro Group, Incorporated
4. Water Body: Androscoggin River
5. Nearest City or Town: Durham and Lisbon, Maine
6. County: Androscoggin State: Maine

B. PURPOSE AND NEED FOR ACTION

On May 15, 1998, Miller Hydro Group, Incorporated (licensee) filed an application to amend its license for the existing Worumbo Hydroelectric Project. The amendment would allow the licensee: (1) to increase the normal elevation of the project impoundment by 1.5 feet (from 97.0 feet mean sea level (msl) to 98.5 feet msl) by installing crest control gates on the Durham side and manual hinged flashboards on the Lisbon side of the existing dam; and (2) to implement cycling of generation, instead of the current run-of-river mode of operation, thereby periodically drawing down the reservoir by 1.5 feet.

The proposed 1.5-foot increase in headpond elevation would increase the project's gross head by 5.2 percent, resulting in an increase in its average yearly generation by 4,200,000 kilowatt-hours (kWh).

C. DESCRIPTION OF PROJECT

The existing dam at the project includes the following sections:

- (1) a 17-foot-high, 520-foot-long, rock-filled timber crib dam on the west (Durham side) of the river, including a 170-foot length reinforced by a concrete face, with a crest elevation of 97.0 feet mean sea level (msl);
- (2) a center section of exposed rock ledge, including a 150-foot length of concrete dike, with a maximum height of 4 feet and a crest elevation of 97.0 feet msl;
- (3) a 12-foot-high, 260-foot-long uncontrolled concrete ogee spillway on the east (Lisbon Falls) side of the river with a crest elevation of 97.0 feet msl; and

(4) a gated spillway containing four 23-foot-high by 19.25-foot-wide slide gates operated for flood control.

Existing project facilities also include:

- (1) a 180-acre reservoir at the current normal maximum elevation, 97.0 feet msl, having a gross storage capacity of 1,700 acre-feet;
- (2) a concrete intake structure, integral to the powerhouse, containing two vertical slide gates, an hydraulic trash rack, three entrances for downstream fish passage, and one exit for the upstream fish passage;
- (3) a 150-foot-long by 105-foot-wide, reinforced concrete powerhouse containing two Kaplan bulb turbines with a maximum hydraulic capacity of approximately 9,600 cubic feet per second (cfs) and a net head of 30 feet, directly connected to two synchronous generators, with a total authorized installed capacity of 19.2 megawatts (MW), but which together are able to generate a maximum of 18.4 MW;
- (4) a 450-foot-long tailrace channel;
- (5) a 500-foot-long, 34.5-kilovolt, underground transmission line;
- (6) upstream and downstream fish passage facilities; and
- (7) appurtenant facilities.

Existing upstream fish passage facilities at the project include two entrances, four attraction water pumps, a mechanically operated fish crowder, a cable-operated fish lift, an upper level canal, a fish counting room, and an automatic control system.

The project's downstream fish passage facilities include three entrances at the intake, a collection gallery, a 36-inch-diameter plastic transfer pipe, and a stop log-controlled plunge pool.

The project also includes a boat launch located at the upstream end of the project reservoir with adjacent parking and picnic facilities.

The project, which currently is operated as a run-of-river facility, generates an average of 80,000,000 kWh per year.

The original license for the Worumbo project required the licensee to provide a continuous minimum flow of 25 cfs in the project's 8-acre bypassed reach, which extends from the project

dam downstream to the Routes 9 and 125 highway bridge. In an order amending license, issued January 26, 1994, the Commission increased the project's minimum flow requirements such that bypassed reach flows vary seasonally from 50 to 300 cfs.

D. PROPOSED ACTION AND ALTERNATIVES

1. Proposed Action

The licensee proposes to install pneumatically operated, hinged crest gates over the Durham-side dam, and hinged conventionally-operated flashboards over the remainder of the dam. These facilities would allow the licensee to increase the project's normal reservoir surface elevation from 97.0 feet msl to 98.5 feet msl. This 5.2 percent increase in the project's gross head would expand the project's actual output by approximately 1.0 MW (to 19.4 MW) and its average annual generation by 4,200,000 kWh (to 84,200,000 kWh).

The licensee also requests that the existing license for the Worumbo Project be modified to allow the licensee to cycle generation periodically in order to provide reserve support to the regional power grid. This mode of operation would require the periodic fluctuation of the project's headpond between the normal elevation of 98.5 feet msl and 97.0 feet msl.

The licensee cannot specify the frequency of the periodic cycling of generation and subsequent reservoir drawdowns. They would occur when river flows are low (primarily during the summer and early fall) during weekday mornings and/or late afternoons. The small size of the project's impoundment, together with the reduction in head and, therefore, generation that would occur when the reservoir is lowered, could discourage regularly scheduled 1.5-foot drawdowns. Nevertheless, this EA evaluates these drawdowns based on the assumption that they are implemented fairly regularly on weekdays during low-flow periods.

2. Action Alternatives

There are no other action alternatives for this proposal.

3. No-Action Alternative

The no-action alternative would involve denying the requested license amendment. Under this alternative, the licensee would continue to operate the project as a run-of-river facility and to maintain the project reservoir's elevation at 97.0 feet msl.

E. CONSULTATION

The licensee, before filing the subject application, consulted with state and federal resource agencies and provided them with a draft application for comment.

The following agencies submitted comment letters to the licensee:

AGENCY	DATE OF LETTER
Maine Department of Conservation	April 13, 1998
Maine Inland Fisheries & Wildlife	April 15, 1998
Maine Dept. of Environmental Protection	April 16, 1998
Maine Historic Preservation Commission	April 17, 1998
Maine State Planning Office	April 21, 1998
U.S. Fish and Wildlife Service	April 27, 1998
Maine Department of Marine Resources	April 27, 1998

Issues and concerns raised in this correspondence are discussed in Section G of this EA.

On June 3, 1998, the Commission provided public notice of the subject application for amendment of license with a comment date of July 22, 1998.

On June 25, 1998, the Maine State Planning Office filed a motion to intervene, but did not provide any comments.

By letter dated July 23, 1998, the Department of Interior indicated that: raising the project headpond along with periodic cycling of generation would have little adverse impact on fish and wildlife resources, including the passage of migratory fish through existing fishways at the project; and existing aquatic and riparian habitats at the project, including wetlands, would be minimally affected due to the slope of the shoreline and gradient of the river bed.

F. AFFECTED ENVIRONMENT

1. General Description of the Project Area

The project is situated in a hilly, rural residential area of Southwestern Maine that includes scattered farms and commercial establishments. Lands adjacent to the reservoir, which are primarily undeveloped, consist of upland habitat with a hardwood overstory and a softwood understorey.

The area's climate is characterized by moderately warm summers and cold winters. Its average annual precipitation, including the water equivalent of snow, is approximately 44 inches. In 1990, the area's population totaled 12,300 persons;

Lewiston and Auburn, Maine, the nearest large cities, had a combined population of 64,066.

2. Geology and Soils

The project area is in the glaciated coastal lowlands of Maine. The Androscoggin River floodplain in the project area is bordered by low hills ranging from 150 to 300 feet high. Bedrock at the project is quartz-plagioclase-biotite gneiss that, in some places, has been extensively injected by pegmatites and cross-cut by basalt dikes. Unconsolidated deposits near the dam include glacial till on the northeast side of the river and ice-contact sands and gravels on the southwest side. Soils in the project area are primarily fine sandy loams and gravelly sand loams.

3. Water Quantity and Quality

The Androscoggin River flows 164 miles from its source at Umbagog Lake to tidewater at Brunswick Dam. The river drains a 3,450-square-mile area of which 80 percent lies in Maine and 20 percent in New Hampshire.

Based on flows measured at the U.S. Geological Survey gauge at Auburn, Maine, Androscoggin River flows at the Worumbo dam have ranged from 356 cfs to 142,000 cfs. The mean annual flow at the project is 6,296 cfs; the estimated 7-day average low flow that has a 1 in 10 year recurrence (7Q10) is approximately 1,680 cfs.

Flows at the Worumbo Project are controlled primarily by the operation of two upstream hydropower facilities, the Gulf Island Project, located approximately 19 miles upstream, and the Lewiston Falls Project, 14.5 miles upstream. The current operating regime at Gulf Island results in a weekly reservoir drawdown there of 2 to 4 feet and an outflow that varies from 6,450 cfs during peak periods to 1,000 cfs during off-peak periods. The Lewiston Falls Project also operates with a reservoir fluctuation of up to 4 feet per week; its releases have a similar range to those of Gulf Island. When peak outflows from Gulf Island arrive at the Worumbo Project about 6.5 hours after being released, their magnitude has diminished to approximately 4,000 cfs.

The State of Maine classifies the Androscoggin River immediately downstream of the Worumbo dam as Class C, which denotes waters suitable for: recreational boating and fishing; fish and wildlife habitat; and other uses except water contact recreation.

The State's minimum dissolved oxygen (DO) standard for Class C waters is 5 parts per million (ppm). Water quality monitoring conducted by the licensee from 1990 to 1994 determined that

project operation has not affected DO levels in the river below the project dam. Sampling during low flow, high temperature periods revealed that DO levels there are frequently at saturation or supersaturation, well above the required Class C standard.

4. Fish Resources

The project impoundment supports populations of largemouth bass, smallmouth bass, pickerel, yellow perch, and assorted non-game species, including white sucker and spottail shiner. In addition, runs of anadromous fish, primarily American shad and alewives, utilize the project's fishways. No federally listed threatened or endangered aquatic species exist in the project area.

5. Terrestrial Resources

With the exception of the Worumbo Mill Complex at the dam, the project area is forested with red pine, white pine, hemlock, white oak, red oak, American beech, American elm, and paper birch. The shoreline of the project impoundment includes only a few small forested wetland areas. Wildlife species occurring in the project area include raccoon, striped skunk, woodchuck, squirrel, chipmunk, and songbirds.

No federally listed threatened or endangered wildlife species inhabit the project area. Moreover, the area does not contain any state-protected wildlife habitat such as high- or moderate-value habitat for waterfowl, deer wintering areas or migration corridors (letter dated April 15, 1998, from Frederick B. Hurley, Jr., Deputy Commissioner, Maine Department of Inland Fisheries and Wildlife, Augusta, Maine).

6. Land Use and Recreation

The rebuilt Worumbo Mill is situated adjacent to the project powerhouse. Most land surrounding the project reservoir is undeveloped.

In 1987, the licensee constructed a boat ramp with adjacent parking and picnic areas at the upstream end of the project reservoir. Subsequently, the licensee transferred these facilities to the Town of Lisbon.

A short distance upstream of the project dam on the Lisbon side of the river, the licensee currently maintains a seasonal floating dock and ramp to permit canoeists to take out and portage the project.

Downstream of the project dam on the Lisbon side of the river, the licensee for the downstream Pejepscot Project, in

cooperation with the licensee for the Worumbo Project, constructed a bank fishing access site. Some recreational fishing also occurs on the Durham side of the river.

7. Cultural Resources

The Worumbo Mill was listed in the National Register of Historic Places (NRHP); after a fire in 1987 destroyed the building, it was removed from the list. There are no other known sites in the project area that are listed or eligible for listing in the NRHP.

G. ENVIRONMENTAL IMPACTS

1. Proposed Action

Geology and Soils

During pre-filing consultation meetings, representatives of the licensee, Maine Department of Environmental Protection (MDEP), and other resource agencies agreed that the proposed higher reservoir elevation together with periodic 1.5-foot reservoir drawdowns would cause only minimal impacts to the reservoir shoreline; however, to ensure that the new operating regime does not cause significant impacts to area soils, the licensee should monitor the reservoir shoreline for evidence of erosion.

The licensee proposes to monitor the shoreline for erosion in consultation with the resource agencies, as follows:

- (1) the licensee would survey and photograph portions of the reservoir shoreline in 1998 to document existing conditions;
- (2) approximately one year after implementation of the new operating regime, the licensee would conduct another survey of the reservoir shoreline to determine if erosion has occurred;
- (3) if areas of significant erosion are found, the licensee would propose specific mitigative measures;
- (4) the licensee would conduct shoreline monitoring for three successive years following implementation of the new operating regime; and
- (5) the licensee would discontinue monitoring after that time if its surveys find no evidence of substantial shoreline erosion.

The proposed higher reservoir elevation would affect about 10 acres of additional shoreline. The existing shoreline is relatively steep and rocky with stable soils. Consequently, we

concur with the agencies that the proposed operating regime and the increase in reservoir level will unlikely cause significant erosion of the reservoir shoreline. However, to ensure that adverse impacts do not occur, the licensee should be required to implement its proposed shoreline monitoring program.

Water Quantity

During high-flow periods and on weekends, the project would continue to operate as a run-of-river facility; consequently, outflow from the project would remain unchanged from current levels. On weekdays during low flow periods, the project could operate in a peaking mode in the morning and late afternoon, thereby causing downstream releases to vary from about 9,600 cfs during periods of peak demand to 1,700 cfs during periods of off-peak demand (that is, when the reservoir is refilled).

The proposed reservoir drawdowns would: (1) rerregulate some of the existing peaking flows in the lower Androscoggin River produced by Central Maine Power Company's Gulf Island Development (FERC Project No. 2283, located at River Mile 26.4) and Lewiston Falls Project (FERC Project No. 2302, located at River Mile 22.8); and (2) enable the Worumbo Project to increase its generation during periods of peak electrical loads (6:00 a.m. to 9:00 a.m. and 4:00 p.m. to 7:00 p.m. from Monday through Friday).

During an average water year, inflows to the Worumbo Project in the month of July have increased to about 4,000 cfs by early afternoon. Thus, even with a required discharge of 1,700 cfs, the project reservoir could be refilled within 1.5 hours, in time for the evening peak-load period.

Water Quality

On July 13, 1998, the Maine Department of Environmental Protection issued Water Quality Certification for the proposed license amendment.

Reservoirs of hydroelectric projects may impact DO levels and water temperature by retaining water long enough to stratify. A stratified reservoir with a deep water release may discharge flows low in DO; a stratified reservoir that discharges from its higher elevations may release water with relatively high temperatures.

As a result of high inflows and relatively shallow reservoir, the Worumbo Project reservoir currently does not stratify during the summer months. The proposed action would raise the reservoir's maximum surface elevation by 1.5 feet or 5.2 percent. The proposed peaking operation, however, would not allow this increase in elevation to obtain a "static" state that could contribute to the reservoir becoming stratified.

Consequently, the reservoir would not stratify and downstream water quality would remain unaffected.

Fisheries Resources

Raising the project headpond by 1.5 feet would inundate a small amount of existing rifle/run habitat at the upstream end of the impoundment. Maine Department of Inland Fisheries and Wildlife (DIFW) concludes that this effect would have only a minor impact on the reservoir's suitability for salmonid management purposes. Further, DIFW and the U.S. Fish and Wildlife Service indicate that the proposed 1.5-foot headpond elevation change, and periodic fluctuation within that range, would not affect the quantity of adult habitat nor the spawning success of warmwater species in the reservoir (letter dated April 15, 1998, from Frederick B. Hurley, Jr., Deputy Commissioner, Augusta, Maine; letter dated July 23, 1998, from Andrew L. Raddant, Regional Environmental Officer, Department of the Interior, Office of the Secretary, Boston, Massachusetts). We concur with these findings.

The headwaters of the Pejeboscot Project extend to the tailwaters of the Worumbo Project. By providing a 1,700 cfs project discharge during refill periods, the licensee would minimize any potential impacts caused by fluctuating releases at Worumbo on fish resources located in the downstream reservoir.

The existing upstream fish lift and the downstream fishway at the project are able to operate effectively when the elevation of the project reservoir is between 97.0 and 98.5 feet msl. The proposed increase in reservoir elevation, therefore, would not affect fish passage at the project. Also, during upstream fish migration in the spring, high project inflows will obviate the need for reservoir drawdowns; therefore, daily discharges will not vary significantly, and no adverse impacts would occur to migratory species.

Based on our evaluation, we conclude that mitigation for fisheries impacts is not required.

Terrestrial Resources

Activities associated with the installation of crest gates and flashboards at the Worumbo dam would result in the temporary disturbance or displacement of small mammals and birds. This unavoidable impact would not be significant.

The project reservoir elevation historically was operated at a normal elevation of 98 to 99 feet msl, with one to two feet of spill over the spillway crest elevation. Our review of National Wetlands Inventory Mapping for the project area indicates that

the existing reservoir shoreline supports only a few small areas of forested wetlands.

The Department of Interior's letter dated July 23, 1998, concludes that: "existing aquatic and riparian habitats at the project, including wetlands, are also likely to be minimally affected due to the slope of the shoreline and gradient of the river bed."

Consequently, we conclude that the proposed operating regime would have only minor impacts to the minimal amount of wetlands and other vegetation in the project area, and there is no need to require the licensee to implement mitigative measures for wetlands or other terrestrial resources.

Land Use and Recreation

Boaters on the Sabattus River traveling to the Androscoggin River pass under a railroad bridge that currently provides an underclearance of approximately 7 feet. The proposed higher reservoir elevation would reduce this clearance to 5.5 feet. The licensee concludes that this amount would be adequate for public safety. The agencies concur with this assessment.

During periods of very high river flows, clearance could be reduced even further. To warn boaters of the potential danger at the railroad bridge, the licensee proposes to post a warning sign at the Town of Lisbon's existing boat launch on the Sabattus River.

We agree that placing a sign at the Town's boat launch represents an appropriate precautionary measure. In addition, we conclude that there is a need for signing at the railroad bridge to warn boaters of the reduced (5.5-foot) clearance there during normal river flows. Thus, the licensee, in consultation with the Maine State Department of Conservation and the Town of Lisbon, should be required to install appropriate warning signs at both the Town's boat launch and at the railroad bridge, prior to increasing the reservoir elevation.

Cultural Resources

The State Historic Preservation Officer notified the licensee that the proposed operating regime would not exacerbate erosion of any archeological sites located above the pool elevation; consequently, the proposed undertaking would not affect properties of historic, architectural or archaeological significance (letter dated April 17, 1998 from Earle G. Shettleworth, Jr., Maine Historic Preservation Commission, Augusta, Maine).

2. No-Action Alternative

Under the no-action alternative, the licensee would not increase the normal elevation of the project reservoir, and would continue to operate the project as a run-of-river facility. Consequently, this alternative would not produce any impacts to the area's environmental resources.

H. CONCLUSIONS AND RECOMMENDATIONS

In our review of the project, we did not identify any significant impacts that would result from approving the proposed license amendment. We conclude that approval of the subject amendment of license would not constitute a major federal action significantly affecting the quality of the human environment.

I. LITERATURE CITED OR REVIEWED

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