

HYDRO MANAGEMENT GROUP, LLC

C/O ESSEX HYDRO ASSOCIATES, LLC
55 UNION STREET, 4TH FL
BOSTON, MA 02108

TELEPHONE: +617-367-0032
E-MAIL: AL@ESSEXHYDRO.COM

November 19, 2012

Ms. Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit St, Suite 10
Concord, NH 03301-2429

Attn: Executive Director and Secretary Howland

Dear Ms. Howland,



Pursuant to New Hampshire Administrative Code Puc 2500 Rule, Puc 2505.02 Application Requirements Laws of 2012, Chapter 0272, please find included with this letter an application for the qualification of Sugar River Hydroelectric Power Company's Sugar River 2 hydroelectric generating facility as a New Hampshire Class I RPS Resource.

An electronic copy of this application was emailed to you at executive.director@puc.nh.gov and Barbara Bernstein at barbara.bernstein@puc.nh.gov on Monday, November 19th 2012 and three hard copies were delivered to your attention at the New Hampshire PUC via overnight mail on Tuesday, November 20th, 2012.

Thank you in advance for review of this application and please contact me at 617-367-0032 or al@essexhydro.com with any questions

Sincerely,

Sugar River Hydroelectric Power Company
by Hydro Management Group, its agent
as aggregator


Andrew Locke
Vice President

- (b) provide documentation that eighty percent of its tax basis in the resulting plant and equipment of the eligible generation capacity, including the NHDES permitting requirements for new plants, but exclusive of any tax basis in real property and intangible assets, is derived from the new capital investments.
 - (c) N/A: Class I certification is NOT being sought for repowered Class III or Class IV sources.
17. If Class I certification is sought for formerly nonrenewable energy electric generation facilities, the applicant shall:
- (a) demonstrate that it has made new capital investments for the purpose of repowering with eligible biomass technologies or methane gas and complies with the certification requirements of Puc 2505.04, if using biomass fuels, and
 - (b) provide documentation that eighty percent of its tax basis in the resulting generation unit, including NHDES permitting requirements for new plants, but exclusive of any tax basis in real property and intangible assets, is derived from the new capital investments.
 - (c) N/A: Class I certification is NOT being sought for formerly nonrenewable energy electric generation facilities.
18. If Class IV certification is sought for an existing small hydroelectric facility, the applicant shall submit proof that:
- (a) it has installed upstream and downstream diadromous fish passages that have been required and approved under the terms of its license or exemption from the Federal Energy Regulatory Commission, and
 - (b) when required, has documented applicable state water quality certification pursuant to section 401 of the Clean Water Act for hydroelectric projects.
 - (c) N/A: Class IV certification is NOT being sought for existing small hydroelectric facilities.
19. If the source is located in a control area adjacent to the New England control area, the applicant shall submit proof that the energy is delivered within the New England control area and such delivery is verified using the documentation required in Puc 2504.01(a)(2) a. to e.
20. All other necessary regulatory approvals, including any reviews, approvals or permits required by the NHDES or the environmental protection agency in the facility's state.
21. Proof that the applicant either has an approved interconnection study on file with the commission, is a party to a currently effective interconnection agreement, or is otherwise not required to undertake an interconnection study.
22. A description of how the generation facility is connected to the regional power pool of the local electric distribution utility.
23. A statement as to whether the facility has been certified under another non-federal jurisdiction's renewable portfolio standard and proof thereof.
24. A statement as to whether the facility's output has been verified by ISO-New England.

- 25. A description of how the facility's output is reported to the GIS if not verified by ISO-New England.
- 26. An affidavit by the owner attesting to the accuracy of the contents of the application.
- 27. Such other information as the applicant wishes to provide to assist in classification of the generating facility.

28. This application and all future correspondence should be sent to:

Ms. Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit St, Suite 10
Concord, NH 03301-2429

29. Preparer's information:

Name: Andrew Locke

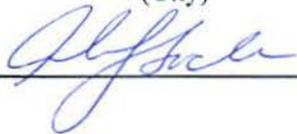
Title: Vice President

Address: (1) Hydro Management Group, LLC

(2) c/o Essex Hydro Associates, L.L.C.

(3) 55 Union Street, 4th Floor

Boston (City) MA (State) 02108 (Zip code)

30. Preparer's signature: 

HYDRO MANAGEMENT GROUP, LLC

C/O ESSEX HYDRO ASSOCIATES, LLC
55 UNION STREET, 4TH FL
BOSTON, MA 02108

TELEPHONE: +617-367-0032
E-MAIL: AL@ESSEXHYDRO.COM

November 19, 2012

Ms. Debra A. Howland
Executive Director and Secretary
State of New Hampshire
Public Utilities Commission
21 S. Fruit St, Suite 10
Concord, NH 03301-2429
Attn: Executive Director and Secretary Howland

Re: DE 12-210 Spaulding Ave Industrial Complex

Dear Ms. Howland,

In support of its application for qualification as a NH Class I Resource, the Sugar River Hydroelectric Power Company is pleased to provide the following answers to the questions posed in the State of New Hampshire Application for Renewable Resource Eligibility:

- (13) The Sugar River II hydroelectric project ("the project") is located on the Sugar River, in the town of Newport, Sullivan County, New Hampshire. The project is located at river mile 0.33 on the Sugar River.

The project is operated as a run-of-river facility. Outflows from the project equal inflows on an instantaneous basis, and water levels above the dam are maintained at the crest of the dam and are not drawn down for the purposes of generating power. The exemptee is required to maintain a minimum flow of 15 cfs to maintain water quality and protect aquatic habitat. Project works consist of: (a) a 42-foot-long, 6-foot-high reinforced concrete dam; (b) an impoundment having a surface area of 0.37 acre, with negligible storage, and a water surface elevation of 822 feet msl; (c) a 22-foot-wide and 112-foot-long rectangular intake; (d) a trapezoidal unlined earth canal 400 feet long with a bottom width of 5 feet and a top width of 25 feet; (e) an existing 9-foot-deep, 20-foot-wide and 400-foot-long canal; (f) an existing 250-foot-long, 7-foot-diameter concrete penstock; (g) an existing 27-foot-wide and 35-foot-long powerhouse, containing 1 generating unit with an installed capacity of 200 kW and a hydraulic capacity of 178 cubic-feet-per-second (cfs) at a net head of 18 feet; (h) an existing 75-foot-long, 4.16-kV transmission line; and (i) appurtenant electrical facilities. The project also includes downstream fish passage facilities consisting of angled trashracks and a bypass sluiceway.

The project was issued a License from the Federal Energy Regulatory Commission dated May 9, 1991.

The project utilizes a previously existing impoundment and the plant is unmanned, but operation is monitored on a 24/7 basis.

(14) N/A

(15) N/A

(16) The Sugar River 2 hydroelectric facility qualifies as a New Hampshire Class 1 RPS Resource for based on 362-F:4(j) of Section 362-F:4 of the New Hampshire Electric Renewable Portfolio Standard.

Please see the attached Appendix A-1 which includes a breakdown of capital investments directly related to restoring generation and increasing capacity as required to demonstrate that 80 percent of the resulting tax basis of the source's plant & equipment is derived from such investments.

(17) N/A

(18) N/A

(19) N/A - the Sugar River 2 hydroelectric facility is located in Newport, NH

(20) See Appendix B for the Sugar River 2 hydroelectric facility's ORDER ISSUING LICENSE from the Federal Energy Regulatory Commission Issued May 9, 1991.

See Appendix B-1 for the Environmental Assessment completed during the FERC licensing process which contains the comments and conditions from the relevant state and federal hydroelectric agencies.

See Appendix B-2 for the Sugar River Hydroelectric Power Company's filing with the Federal Energy Regulatory Commission (the "Commission") dated April 1, 2010 notifying the Commission that the project construction has been completed and the facility has been put online.

(21) See Appendix C for Sugar River 2's Operating and Interconnection Agreements with Public Service Company of New Hampshire.

The Sugar River 2 200 kW hydroelectric generating facility is interconnected with the electric system of Public Service Company of New Hampshire ("PSNH") in accordance with applicable New Hampshire Public Utilities Commission ("NHPUC") Orders and federal law. The delivery point is that point at which the facility interconnects with the 4.16 KV electric system of PSNH at circuit 42H2. All electric energy delivered to PSNH's system from the Facility is 4.16 KV, three phase, sixty hertz.

Under this Agreement, the Interconnector shall receive and pay for the services

necessary for the purpose of connecting, and providing the continued connection of, the Sugar River 1 Facility with the PSNH electrical system, including Pool Transmission Facilities (“PTF”) as defined by NEPOOL, and non-PTF.

- (22) The delivery point is that point at which the Sugar River 2 Hydroelectric Facility interconnects with the 4.16 kV electric system of PSNH at pole 33/5 on Canal Street in Newport, NH. All electric energy is delivered to PSNH’s system from the Facility at 4.16 kV, three-phase, sixty hertz.
- (23) The Sugar River 2 Hydroelectric Facility is not certified under another non-federal jurisdiction’s renewable portfolio standard.
- (24) The Facility’s output is verified by ISO-New England who is responsible for reporting the Facility’s generation to the NEPOOL GIS.
- (25) N/A – The Sugar River 2 Hydroelectric Generator is registered with the NEPOOL GIS and ISO New England under Asset ID No. MSS17223 and its generation is confirmed and reported to the GIS by ISO New England.
- (26) William B. Ruger Jr. attests to the accuracy of the contents of this application.
- (27) N/A

Attachment A

**Sugar River 2 Hydroelectric Project
(MSS17223)**

**STATEMENT OF CAPITAL INVESTMENTS MADE TO REPOWER THE
FACILITY**

Benjamin J. Chapman
Certified Public Accountant
97 Pleasant Street
Claremont, New Hampshire 03743
Telephone 603-543-0073
Bchapman97@gmail.com

November 1, 2012

Essex Hydro Associates, LLC
55 Union Street Floor 4
Boston, MA 02108

Attention: Steven Hickey

Dear Steve,

Please find attached William B. Ruger's Tax Basis depreciation schedule for Sugar River Hydro II that was placed in service during year 2010. The entire investment process was done over about ten years but first became operational in 2010. The entire amount was invested by William Ruger to create Sugar River Hydro II. The project uses a small blockhouse that existed prior but the blockhouse had negligible value so therefore was not utilized in the tax basis.

If you have any questions contact me at any time.

Regards,



Benjamin Chapman
Certified Public Accountant

**Depreciation and Amortization
(Including Information on Listed Property)**

2010

Department of the Treasury
Internal Revenue Service (99)

▶ See separate instructions. ▶ Attach to your tax return.

Attachment
Sequence No. **67**

Name(s) shown on return

WILLIAM B RUGER, JR

Identifying number

049-30-4892

Business or activity to which this form relates

Sch C Sugar River Hydro 2 Power

Part I Election To Expense Certain Property Under Section 179

Note: If you have any listed property, complete Part V before you complete Part I.

1	Maximum amount (see instructions)	1	500,000.
2	Total cost of section 179 property placed in service (see instructions)	2	
3	Threshold cost of section 179 property before reduction in limitation (see instructions)	3	2,000,000.
4	Reduction in limitation. Subtract line 3 from line 2. If zero or less, enter -0-	4	
5	Dollar limitation for tax year. Subtract line 4 from line 1. If zero or less, enter -0-. If married filing separately, see instructions	5	
6	(a) Description of property	(b) Cost (business use only)	(c) Elected cost
7	Listed property. Enter the amount from line 29	7	
8	Total elected cost of section 179 property. Add amounts in column (c), lines 6 and 7	8	
9	Tentative deduction. Enter the smaller of line 5 or line 8	9	
10	Carryover of disallowed deduction from line 13 of your 2009 Form 4562	10	
11	Business income limitation. Enter the smaller of business income (not less than zero) or line 5 (see instrs)	11	
12	Section 179 expense deduction. Add lines 9 and 10, but do not enter more than line 11	12	
13	Carryover of disallowed deduction to 2011. Add lines 9 and 10, less line 12	13	

Note: Do not use Part II or Part III below for listed property. Instead, use Part V.

Part II Special Depreciation Allowance and Other Depreciation (Do not include listed property.) (See instructions.)

14	Special depreciation allowance for qualified property (other than listed property) placed in service during the tax year (see instructions)	14	
15	Property subject to section 168(f)(1) election	15	
16	Other depreciation (including ACRS)	16	

Part III MACRS Depreciation (Do not include listed property.) (See instructions)

Section A

17	MACRS deductions for assets placed in service in tax years beginning before 2010	17	
18	If you are electing to group any assets placed in service during the tax year into one or more general asset accounts, check here <input type="checkbox"/>		

Section B – Assets Placed in Service During 2010 Tax Year Using the General Depreciation System

(a) Classification of property	(b) Month and year placed in service	(c) Basis for depreciation (business/investment use only – see instructions)	(d) Recovery period	(e) Convention	(f) Method	(g) Depreciation deduction
19a 3-year property						
b 5-year property						
c 7-year property						
d 10-year property						
e 15-year property						
f 20-year property		2,203,580.	20.0 yrs	MQ	150 DB	20,658.
g 25-year property			25 yrs		S/L	
h Residential rental property			27.5 yrs	MM	S/L	
i Nonresidential real property			27.5 yrs	MM	S/L	
			39 yrs	MM	S/L	
				MM	S/L	

Section C – Assets Placed in Service During 2010 Tax Year Using the Alternative Depreciation System

20a Class life					S/L	
b 12-year			12 yrs		S/L	
c 40-year			40 yrs	MM	S/L	

Part IV Summary (See instructions.)

21	Listed property. Enter amount from line 28	21	
22	Total. Add amounts from line 12, lines 14 through 17, lines 19 and 20 in column (g), and line 21. Enter here and on the appropriate lines of your return. Partnerships and S corporations – see instructions	22	20,658.
23	For assets shown above and placed in service during the current year, enter the portion of the basis attributable to section 263A costs	23	

Attachment B

**Sugar River 2 Hydroelectric Project
(MSS17223)**

**ORDER ISSUING LICENSE (MINOR) (FERC No. 10934)
dtd May 9, 1991**

Sugar River 2 FERC License

UNITED STATES OF AMERICA 62,118
FEDERAL ENERGY REGULATORY COMMISSION

William B. Ruger

Project No. 10934-000
New Hampshire

ORDER ISSUING LICENSE
(Minor Project)
(Issued May 9, 1991)

William B. Ruger (Ruger) filed a license application under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Sugar River II Project located on the Sugar River, in Sullivan County, New Hampshire. The project would affect the interests of interstate commerce.

Notice of the application has been published. No protests or motions to intervene were filed in this proceeding, and no agency objected to issuance of this license. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license.

Comprehensive Development

Sections 4(e) and 10(a)(1) of the Act require the Commission to give equal consideration to all uses of the waterway on which a project is located. When we review a proposed project, the environment, recreation, fish and wildlife, and other nondevelopmental values of the waterway are considered equally with power and other developmental values. In determining whether, and under what conditions, a hydropower license should be issued, we must weigh the various economic and environmental tradeoffs involved in the decision.

We identified no reasonable action alternative to licensing the Sugar River II Project for assessment. Based on our independent review and evaluation of the proposed project and the no-action alternative documented in this environmental assessment (EA) and the Safety and Design Assessment (S&DA), we selected the proposed project as the preferred option. We selected this option because: (1) with mitigation, the environmental effects of project construction and operation would be minor; and (2) the 650 megawatt-hours (Mwh) of electricity that would be generated from a renewable resource would be beneficial because it would reduce the use of fossil-fueled electric generating plants, thereby conserving nonrenewable primary energy resources and reducing atmospheric pollution. In making this decision, we considered the relative importance of the environmental resources at the project and in the Sugar River, mitigative measures needed to protect these environmental resources, benefits of the project versus the no-action alternative, and consistency of the proposed project with applicable comprehensive plans.

□

Sugar River 2 FERC License

2

We evaluated the effects of constructing and operating the proposed project on the environmental resources of the project area and the Sugar River, and require in this license, mitigative measures to protect and enhance these environmental resources. These measures were developed after careful consideration of the results of site-specific studies conducted by Ruger, research on the environmental effects of hydropower development, and agency comments and recommendations on the proposed project.

The mitigative and enhancement measures that are being required to protect the environmental resources include:

- (1) run-of-river project operation to minimize upstream and downstream water-level fluctuations to protect and enhance aquatic resources and to reduce erosion;
- (2) measures to provide minimum flows for the maintenance of water quality and aquatic resources in the bypass reach;
- (3) measures to monitor flows at the discharge points at the dam that would be provided to protect and maintain aquatic resources and water quality in the bypass reach, to include the installation of monitoring equipment; and
- (4) measures to provide for downstream fish passage immediately, and reserve authority to require for future upstream fish passage facilities when the need occurs.

Ruger has agreed to provide all of the proposed mitigative measures. Ruger included in its cost estimates these measures. We believe that the benefits derived from the imposition of mitigative measures justifies the potential loss of project energy.

Ruger plans on selling the project power to a local utility or business. The levelized cost of power from the hydro project would be about 79.8 mills per kilowatthour (mills/kwh) or about \$57,788 annually. We calculated the levelized value of the project power to be about 31.2 mills/kwh. The project would have a levelized net benefit of about 22.1 mills/kwh or about \$20,030 annually, and a rate of return of 12.6 percent. The project would be economically beneficial and financially feasible.

Section 10(a)(2) of the Act requires the Commission to also consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Under section 10(a)(2), federal and state agencies filed eight comprehensive plans that address various resources in New

□

Sugar River 2 FERC License

3

Hampshire. Of these, the staff identified and reviewed six plans relevant to this project. 1/ No conflicts were found.

Based on our review of the agency and public comments filed on this project, and on our independent analysis of the project pursuant to sections 4(e), 10(a)(1), and 10(a)(2) of the Act, we find that the proposed Sugar River II Project is best adapted to a comprehensive plan for the proper use, conservation, and development of the Sugar River and other project related resources.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of Federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. The EA for the Sugar River II Hydroelectric Project addresses the concerns of the Federal and state fish and wildlife agencies and the license includes conditions consistent with the recommendations of the agencies.

Section 18 of the Federal Power Act

Interior requests that Section 18 reservation of authority be incorporated in any license issued for the Sugar River II Project (letter dated October 16, 1990). Section 18 of the Federal Power Act provides the Secretary of Interior the authority to prescribe fishways. 2/ Although a fishway may not be prescribed by Interior at the time of project licensing, as is the case for the Sugar River II Project, the Commission's practice has been to include a license article which reserves

- 1/ Wild, scenic, & recreational rivers for New Hampshire, 1977, New Hampshire Office of State Planning; Rivers management protection act, 1990, New Hampshire Department of Environmental Services; A strategic plan for restoration of Atlantic salmon to the Connecticut River Basin, 1982, Policy Committee for Fisheries Management of the Connecticut River; New Hampshire rivers management protection program, 1988, State of New Hampshire; Connecticut river basin fish passage, flow, and habitat alteration considerations in relation to anadromous fish restoration, 1981, Technical Committee for Fisheries Management of the Connecticut River; New Hampshire outdoors 1988-1993, 1989, New Hampshire Office of State Planning.
- 2/ Section 18 of the Federal Power Act provides: "The Commission shall require construction, maintenance, and operation by a licensee at its own expense ... such fishways as may be prescribed by the Secretary of Commerce or the Secretary of Interior as appropriate."

□

4

Sugar River 2 FERC License

Interior's prescription authority. 3/ We recognize that future fish passage needs and management objectives cannot always be predicted at the time of license issuance. Article 406 reserves the authority of Interior to prescribe upstream fishways pursuant to section 18 of the Federal Power Act, if and when they are needed in the future, and reserves the Commission's authority to require the licensee to construct, operate, and maintain the prescribed fishway facilities.

Summary of Findings

We issued an EA for this project. The EA, attached to this order, includes background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment. The license conditions are consistent with the water quality certificate. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The project design is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the S&DA attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to William B. Ruger (licensee), for a period of 30 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the Sugar River II Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, shown by exhibit G:

Exhibit G-	FERC No. 10934-	Showing
G-1	5	Project Map

3/ Lynchburg Hydro Associates, 39 FERC 61,079 (1987).

□

(2) Project works consisting of: (a) a proposed 42-foot-long, 6-foot-high reinforced concrete dam; (b) an impoundment

Sugar River 2 FERC License

having a surface area of 0.37 acre, with negligible storage, and a water surface elevation of 822 feet msl; (c) a proposed 22-foot-wide and 112-foot-long rectangular intake; (d) a proposed trapezoidal unlined earth canal 400 feet long with a bottom width of 5 feet and a top width of 25 feet; (e) an existing 9-foot-deep, 20-foot-wide and 400-foot-long canal; (f) an existing 250-foot-long, 7-foot-diameter concrete penstock; (g) an existing 27-foot-wide and 35-foot-long powerhouse, containing 1 generating unit with an installed capacity of 200 kw and a hydraulic capacity of 178 cubic-feet-per-second (cfs) at a net head of 18 feet; (h) an existing 75-foot-long, 4.16-kV transmission line; and (i) appurtenant electrical facilities. The project would also include downstream fish passage facilities consisting of angled trashracks and a bypass sluiceway.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-12, (October 1975), entitled "Terms and Conditions of License for Unconstructed Minor Project Affecting the Interests of Interstate or Foreign Commerce", and the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

□

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 270 horsepower.

Sugar River 2 FERC License

Article 301. The licensee shall commence construction of the project works within 2 years from the issuance date of the license and shall complete construction of the project within 4 years from the issuance date of the license.

Article 302. The licensee, at least 60 days before start of construction, shall submit one copy to the Commission's Regional Director, and two copies to the Director, Division of Dam Safety and Inspections, of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, all necessary transmission facilities, the powerhouse, and water conveyance structures. The Director, Division of Dam Safety and Inspections, may require changes in the plans and specifications to ensure a safe and adequate project.

Article 303. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations before the start of construction, and shall ensure that construction of the cofferdams and deep excavations is consistent with the approved design. At least 30 days before the start of construction of the cofferdam, the licensee shall submit to the Commission's Regional Director, and the Director, Division of Dam Safety and Inspections, one copy each of the approved cofferdam construction drawings and specifications and letter(s) of approval.

Article 304. The licensee, within 90 days of completion of construction, shall file for approval by the Commission, revised exhibits A, F, and G, to describe and show the project as-built, including all facilities determined by the Commission to be necessary and convenient for transmission of all of the project power to the interconnected transmission system.

Article 401. The erosion and sediment control plan filed May 4, 1990, and consisting of six pages and two drawings, labelled Existing Conditions and Proposed Conditions, is approved and made a part of this license and shall be implemented with the following modifications:

- (1) Silt fences or temporary diversion dikes, with appropriate outlets or sediment traps, shall be installed along the river, at the base of all slopes to be disturbed, and at temporary topsoil stockpile sites before commencing any

□

other land-clearing or land-disturbing activities at the sites.

- (2) Control measures shall be inspected at the end of each working day and daily during holidays, weekends, and other breaks in construction, and shall be immediately maintained or repaired, as necessary, as a priority before continuing other construction activities.
- (3) Stabilized construction entrances shall be installed at all

Sugar River 2 FERC License

vehicle ingress and egress points to eliminate tracking sediments onto public streets. These shall be at least 50 feet long and a minimum of 10 feet wide, and consist of a minimum of 6-inch thickness of 2-inch diameter crushed stone aggregate or recycled concrete placed on filter cloth that covers the entire area to be covered with stone. These shall also include a mountable berm at the lower end if the grade slopes down to a public street.

- (4) Specifications shall be provided for applying mulch.
- (5) Specifications shall be provided for the design, installation, and removal of silt fence and haybale structures and for replacing haybales at least every 3 months.
- (6) A schedule shall be included that shows the timing for implementation, maintenance, and removal of control measures, including permanent and temporary stabilization, in relation to the various stages or phases of land-disturbance and construction.

The licensee shall file the final drawings, specifications, and implementation schedule for the plan, at least 60 days before the start of any land-clearing or land-disturbing activities at the project along with the final project drawings and specifications required by article 302.

The Commission reserves the authority to require changes to the plan, drawings, specifications, and schedule to ensure proper control of erosion and subsequent discharge of sediment to wetlands and watercourses, maintenance of stable slopes, revegetation of disturbed areas with species important to wildlife, and adequate protection of the environmental, scenic, and cultural values of the project area. The licensee shall implement the controls, and restore and revegetate disturbed areas according to the modified plan, drawings, specifications, and schedule, including any changes required by the Commission.

Article 402. The licensee shall operate the Sugar River II Project in an instantaneous run-of-river mode for the protection of fish and wildlife resources in the Sugar River. The licensee,

in operating the project in an instantaneous run-of-river mode, shall act at all times to minimize the fluctuation of the reservoir surface elevation, i.e., maintain discharges from the project so that the flow in the Sugar River, as measured immediately downstream from the project powerhouse tailrace, approximates the instantaneous sum of inflows to the project reservoir. Instantaneous run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee or for short periods upon mutual agreement between the licensee and the New Hampshire Fish and Game Department.

Sugar River 2 FERC License

Article 403. The licensee shall release a continuous minimum flow of 15 cubic feet per second, or inflow to the project reservoir, whichever is less, at the dam, for the protection of aquatic resources and water quality in the bypass reach of the Sugar River. This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement between the licensee and the New Hampshire Fish and Game Department.

Article 404. The licensee, after consulting with the U.S. Fish and Wildlife Service (FWS), the U.S. Geological Survey (USGS), and the New Hampshire Fish and Game Department (NHFGD), shall develop a final plan to install streamflow monitoring equipment in the project reservoir and in the Sugar River to monitor compliance with articles 402 and 403. The plan shall include, but not be limited to, an implementation schedule for installing the streamflow monitoring equipment, the proposed location, design and calibration of the monitoring equipment, the method of flow data collection, documentation of consultation with the agencies before preparing the plan, and a provision for providing flow data to the USGS, the FWS, and the NHFGD within 30 days from the date of the agency's request for the data.

The licensee shall include copies of agency comments or recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how all the agency comments were accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission.

The licensee shall file the flow monitoring plan with the Commission for approval at least 90 days prior to the start of project operation. The Commission reserves the right to require changes to the plan. Upon approval, the licensee shall implement the streamflow monitoring plan, including any changes required by the Commission.

Article 405. The licensee shall install, operate, and maintain the angled trashrack and downstream fish bypass facility

□

at the Sugar River II Project, as described in its December 6, 1990, filing with the Commission, to reduce entrainment of fish into the proposed powerhouse and provide protection to downstream fish migrants. The licensee shall file as-built drawings of the trashracks and fish bypass facilities pursuant to article 304.

Article 406. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of such fishways, as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Article 407. The licensee, before starting any land-clearing or land-disturbing activities, other than those

Sugar River 2 FERC License
specifically authorized in this license, including recreation
developments at the project, shall consult with the State
Historic Preservation Officer (SHPO).

If the licensee discovers previously unidentified
archeological or historic properties during the course of
constructing or developing project works or other facilities at
the project, the licensee shall stop all land-clearing and land-
disturbing activities in the vicinity of the properties and
consult with the SHPO.

In either instance, the licensee shall file for Commission
approval a cultural resource management plan prepared by a
qualified cultural resource specialist after having consulted
with the SHPO. The management plan shall include the following
items: (1) a description of each discovered property indicating
whether it is listed on or eligible to be listed on the National
Register of Historic Places; (2) a description of the potential
effect on each discovered property; (3) proposed measures for
avoiding or mitigating effects; (4) documentation of the nature
and extent of consultation; and (5) a schedule for mitigating
effects and conducting additional studies. The Commission may
require changes to the plan.

The licensee shall not begin land-clearing or land-
disturbing activities, other than those specifically authorized
in this license, or resume such activities in the vicinity of a
property discovered during construction, until informed that the
requirements of this article have been fulfilled.

Article 408. The licensee, shall permit public access to
the project impoundment, the bypass reach and shall maintain
the existing parking area on the north bank of the bypass reach.

Article 409. (a) In accordance with the provisions of this
article, the licensee shall have the authority to grant
permission for certain types of use and occupancy of project
lands and waters and to convey certain interests in project lands
and waters for certain types of use and occupancy, without prior
Commission approval. The licensee may exercise the authority
only if the proposed use and occupancy is consistent with the
purposes of protecting and enhancing the scenic, recreational,
and other environmental values of the project. For those
purposes, the licensee shall also have continuing responsibility
to supervise and control the use and occupancies for which it
grants permission, and to monitor the use of, and ensure
compliance with the covenants of the instrument of conveyance
for, any interests that it has conveyed, under this article. If
a permitted use and occupancy violates any condition of this
article or any other condition imposed by the licensee for
protection and enhancement of the project's scenic, recreational,
or other environmental values, or if a covenant of a conveyance
made under the authority of this article is violated, the
licensee shall take any lawful action necessary to correct the
violation. For a permitted use or occupancy, that action

Sugar River 2 FERC License

includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction; (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site; and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the

□

11

licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of; project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kv or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was

Sugar River 2 FERC License

conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying

12

any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved exhibit R or approved report on recreational resources of an exhibit E; or, if the project does not have an approved exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants

Sugar River 2 FERC License

running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to insure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not, in itself, change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and

0

13

maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. section 385.713. Filing a rehearing does not stay the effective date of this order or any date specified in this order. The licensee's failure to file a rehearing shall constitute acceptance of the license.

Attachment B-1

**Sugar River 2 Hydroelectric Project
(MSS17223)**

**ENVIRONMENTAL ASSESSMENT (FERC No. 10934)
dtd March 21, 1991**

Sugar River 2 FERC License
Fred E. Springer
Director, Office of
Hydropower Licensing

ENVIRONMENTAL ASSESSMENT
FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDROPOWER LICENSING
DIVISION OF PROJECT REVIEW

Date: March 21, 1991

Project name: Sugar River II Project

FERC Project No. 10934-000

A. APPLICATION

1. Application type: Minor License
2. Date filed with the Commission: May 4, 1990
3. Applicant: William B. Ruger Jr. (Ruger)
4. Water body: Sugar River River basin: Connecticut
5. Nearest city or town: Newport (See figure 1.)
6. County: Sullivan State: New Hampshire

B. PURPOSE AND NEED FOR ACTION

The proposed 200-kw project would provide an estimated 650 megawatthours (MWh) of electricity per year to be sold.

For proposed small hydroelectric facilities, we find it appropriate to address the need for power issue differently from that which would be used for a small fossil-fueled facility.

Public concerns about reliance on Middle East oil, the greenhouse effect and global warming are becoming more pervasive. Costs to electric utilities of complying with the Clean Air Act are escalating with each new projection. As a result, opposition to the combustion of coal to meet growing demands for electricity is making it difficult to obtain regulatory approval for the construction of new coal-fired steam-electric power plants. In contrast, hydroelectric power plants produce no atmospheric pollution and their primary energy is derived from a renewable resource.

We believe that, in all instances where economic, financial and environmental considerations permit, it is in the public interest to develop hydroelectric capacity whenever the opportunity arises. Although the new output is small, the aggregated output of several projects will make a substantial contribution to the ever-growing demand for electric resource capacity and energy.

C. PROPOSED PROJECT AND ALTERNATIVES

1. Description of the proposed action. (See figure 1.)

The project facilities consist of: (1) a proposed 42-foot-

Sugar River 2 FERC License
long, 6-foot-high reinforced concrete dam; (2) an impoundment

2

having a surface area of 0.37 acre, with negligible storage, and a water surface elevation of 822 feet msl; (3) a proposed 22-foot-wide and 112-foot-long rectangular intake; (4) a proposed trapezoidal unlined earth canal 400 feet long with a bottom width of 5 feet and a top width of 25 feet; (5) an existing 9-foot-deep, 20-foot-wide and 400-foot-long canal; (6) an existing 250-foot-long, 7-foot-diameter concrete penstock; (7) an existing 27-foot-wide and 35-foot-long powerhouse, containing 1 generating unit with an installed capacity of 200 kw and a hydraulic capacity of 178 cubic-feet-per-second (cfs) at a net head of 18 feet; (8) an existing 75-foot-long, 4.16-kv transmission line; and (9) appurtenant electrical facilities. The project would also include downstream fish passage facilities consisting of angled trashracks and a bypass sluiceway.

The project would operate in a run-of-river mode, where instantaneous inflows to the impoundment equal outflows in the river below the tailrace.

2. Applicant's proposed mitigative measures.

During construction, Ruger proposes measures to implement a soil and erosion control plan, such as the use of cofferdams, dust control, and revegetation of disturbed areas, for controlling erosion and sedimentation during project construction. To mitigate construction-related visual impacts, Ruger proposes to revegetate laydown and construction areas, control dust by applying water to exposed surfaces, and stabilize cleared areas to control erosion. Additionally, Ruger would cleanup the old mill ruins located on the west bank of the river.

During operation, Ruger proposes to protect the toe of the new canal embankment where it would coincide with the river bank by installing a wall of (5-foot minimum diameter) boulders and riprap along the river bank at the toe of the embankment.

Ruger proposes to operate in a strict run-of-river mode, and maintain a 15 cubic feet per second (cfs) flow to the bypassed reach of the Sugar River for the protection of aquatic habitat and water quality. Ruger would also install streamflow gages to verify run-of-river operation and flows to the bypassed reach. An angled trashrack and downstream fish bypass facility would be installed during project construction. Plans for upstream fishways have been developed, should they be needed at the project in the future.

To provide public access to the Sugar River, Ruger proposes to continue to provide parking along the north bank of the bypass reach. For safety reasons, Ruger would prohibit access to the tailrace area.

Sugar River 2 FERC License

3

3. Federal lands affected.

X No.

4. Alternatives to the proposed project.

a. X No reasonable action alternatives have been found. The no action alternative, denial of a license, would preclude the repair and reactivation of the inactive north powerhouse and the opportunity to produce 200 kw of energy at the site.

D. CONSULTATION AND COMPLIANCE

1. Fish and wildlife agency consultation (Fish & wildlife Coordination Act).

a. U.S. Fish & wildlife Service: X Yes. No.
b. State(s): X Yes. No.
c. National Marine Fisheries Service: X Yes. No.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: X None. Present:
b. Consultation: X Not required.
Required; completed: .

Remarks: No threatened or endangered aquatic species have been identified in or near the project area (letter dated August 23, 1988, Gordon E. Beckett, Supervisor, FWS, Concord, New Hampshire). In addition, the FWS determined that, except for occasional transient species, no federally listed or proposed threatened or endangered species are known to exist in the project area (personal communication, Bob Scheirer, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, Concord, New Hampshire, June 8, 1990).

3. Section 401 certification (Clean water Act).

Not required.
X Required; applicant requested certification in accordance with applicable state laws governing filing requirements on 11/11/89.
Status : X Granted by the certifying agency on 03/29/90.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer: X Yes. No.
b. National Park Service: X Yes. No.
c. National Register status: X None. Eligible or listed.
d. Council: X Not required. Completed: / / .
e. Further consultation: X Not required. Required.

Sugar River 2 FERC License

4

5. Recreational consultation (Federal Power Act).

- a. U.S. Owners: Yes. X No.
- b. National Park Service: X Yes. No.
- c. State(s): X Yes. No.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: X None. Listed. Determination completed: / /

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: X None. Designated.

E. COMMENTS

1. The following agencies and entities provided comments on the application in response to the public notice dated 08/02/90.

Commenting agencies and other entities	Date of letter
Department of the Interior	10/16/90
Department of the Army, New England Division, Corps of Engineers	10/22/90
New Hampshire Fish and Game Department	11/13/90

2. X The applicant did not respond to the comments.

F. AFFECTED ENVIRONMENT

1. General description of the locale.

a. Description of the Connecticut River Basin.

At 11,265 square miles, the Connecticut River Basin (CRB) is the largest river basin in New England. The CRB spans four states: New Hampshire, Vermont, Massachusetts, and Connecticut (Federal Energy Regulatory Commission, 1986). Major tributaries to the CRB include the Passumpsic, White, West, Ottauquechee, and Black Rivers in Vermont; the Ammonoosuc, Mascoma, Sugar, and Ashuelot Rivers in New Hampshire; the Millers, Deerfield, Chicopee, and Westfield Rivers in Massachusetts; and the Farmington River in Connecticut (Federal Energy Regulatory Commission, 1983).

Land use in the CRB is 79 percent forest lands, 9 percent cropland, 4 percent pasture, 4 percent urban with the balance in other land uses. Industry accounts for the highest source of income in the CRB. Textiles, machinery, paper, metal products, and tools are important outputs. Agriculture, in the form of forage crops, dairy, fruits, poultry, and vegetables is also an

□

Sugar River 2 FERC License

5

important contributor to the basin's economy. The CRB is an important source of recreational opportunities, offering both coldwater and warmwater areas. Recreation available in the basin includes picnicking, swimming, boating, camping, hiking, fishing, hunting, and nature study (Federal Energy Regulatory Commission, 1989).

b. Number of major and minor licensed, and exempted projects in the Connecticut River Basin as of March 28, 1991, (Federal Energy Regulatory Commission, 1990).

Major licensed - 37; Minor licensed - 47; Exempted - 45

c. Number of pending applications for major or minor licenses, and for exemptions in the Connecticut River Basin as of March 28, 1991, (Federal Energy Regulatory Commission, 1990).

Major license - 2; Minor license - 2; Exemption - 2

d. At present, there are 29 hydropower sites in the Sugar River area, which consists of 3,250 kilowatts of existing capacity, 3,380 kilowatts of capacity under construction, and 19,685 kilowatts of potential capacity.

e. Cumulative impacts to target resources.

A target resource is an important resource that may be cumulatively affected by multiple development within the basin. We base our selection of target resources on the regional significance and geographic distribution of the resource within the river basin.

The proposed Sugar River II Project is located on the Sugar River, one of 34 major tributaries of the Connecticut River and part of the Connecticut River Basin (CRB). In a cumulative impact study for the CRB, we identified Atlantic salmon as a target resource which could be adversely affected in a cumulative manner by proposed hydropower projects in the CRB (FERC 1986, 1987). This target resource is further described in section F(2)(d). Potential impacts to Atlantic salmon related to the construction and operation of the Sugar River II Project are discussed in sections G and H.

2. Descriptions of the resources in the project impact area (Source: Sugar River Hydro, Sugar River II Project, Project No. 10934, application, exhibit E, unless otherwise indicated).

a. Geology and soils: The topography of the project area includes nearly flat and gently sloping land in the parking lot at the upper end of the new canal construction area, a section of very steep river bank adjacent to a depressed, swampy area where

□

Sugar River 2 FERC License

the new canal embankment would be constructed, and gently to moderately sloping land along the lower half of the canal alignment to the powerhouse. The project area is classified as urban land within a developed area, and now has some areas of fill as well as the original glacial soils. The unconsolidated deposits that would comprise the proposed new dam foundation are characterized as silty gravel.

b. Streamflow: The Sugar River experiences "regulated" river flows because of the management and operation of reservoirs in the upper basin. The managed discharge generally results in a minimum flow of not less than 10 cfs at the project site which is similar to the 7Q10 flow (the lowest consecutive 7-day flow expected to occur within a 10-year period) of 9.6 cfs identified for this site by the New Hampshire Department of Environmental Services (NHDES) (letter dated September 2, 1988, NHDES, Water Resources Division). The proposed dam would create a shallow impoundment approximately 0.4 acres in surface area.

Using the flows measured at U.S. Geological Survey (USGS) stream flow gage No. 01152500 located downstream, and prorating based on a 4:1 ratio of drainage areas, we computed flows at the project site to be; mean flow 110 cfs, minimum flow 3.8 cfs, and maximum flow 3,831 cfs.

c. Water quality: New Hampshire designates the Sugar River as Class B water in the area of the proposed project. New Hampshire defines dissolved oxygen (DO) standards for Class B waters as not less than 75 percent saturation nor less than 6 milligrams per liter (mg/l), unless naturally occurring. Waters are acceptable for swimming and other recreation, fish habitat, and after adequate treatment, for use as water supplies.

Data collected in the Sugar River upstream of the proposed project site indicates that the state water quality standard for DO concentrations has generally been met in the Sugar River. Water quality data collected upstream of the proposed project site by the State at Newport, New Hampshire indicated a DO concentration of 8.3 mg/l (92 percent saturation) on August 27, 1974 and 9.4 mg/l (106 percent saturation) on July 19, 1976. The New Hampshire Water Supply and Pollution Control Division (NHWSPCD) has not identified any significant water quality problems for the project area and water quality certification has been granted for the proposed Sugar River II Project (letter dated March 29, 1990 from Robert Baczynski, NHWSPCD, Biologist, Water Quality Section, Concord, New Hampshire).

d. Fisheries:

Anadromous: x Absent. Present.

□

The Sugar River historically, was an important producer of Atlantic salmon for the basin. By the early 1900's this species and other anadromous species were nearly eliminated from the CRB. The construction of dams, overfishing, loss of habitat, and

Sugar River 2 FERC License

degradation of water quality on the Connecticut River and its tributaries, such as the Sugar River, have all acted together over the years to prevent the reoccurrence of naturally producing populations of Atlantic salmon.

Since 1967, state and federal resource agencies, forming the Connecticut River Atlantic Salmon Commission (CRASC), and the Technical Committee for Fisheries Management of the Connecticut River, have developed and implemented programs to restore and manage the existing anadromous fishery resources, including Atlantic salmon, within the CRB. At present, the state's strategic plan for restoring Atlantic salmon to the CRB has placed the Sugar River in a deferred category, which means that no restoration efforts for anadromous species are proposed for the river at this time and upstream fish passage facilities will not be required for at least the next 10 to 15 years. This plan, however, identifies the potential for the river to be used as a salmon smolt rearing area in combination with a fry-release program sometime within the next 5 to 10 years, depending on the success of the continuing restoration efforts occurring throughout other parts of the basin.

No American shad have been observed at the proposed project site and no specific program has targeted the Sugar River for shad restoration. There are no proposals to stock American shad upstream of the Sugar River II Project site or in any tributaries of the Connecticut River.

At present, no anadromous fish are known to use the Sugar River near the proposed project site (letter dated September 17, 1990 from Delbert Downing, Director, New Hampshire Department of Environmental Services, Water Resources Division, Concord, New Hampshire). Anadromous fish currently have access to the mouth of the Sugar River through fish passage at dams on the Connecticut River (i.e. Enfield, Holyoke, Turners Falls, Vernon, and Bellows Falls). However, the proposed Sweetwater Project (FERC No. 10898), located at the confluence of the Connecticut River and Sugar River, does not currently have fish passage facilities, and thus restricts movement of anadromous species in the Sugar River basin. Runs of American shad, alewife, and blueback herring could eventually be established in the Sugar River in the proposed project area when fish passage is established at dams downstream of the project.

Resident: Absent. x Present.

The Sugar River supports a wide diversity of warmwater fish species. However, resident species found near the project site

□

may, at times be limited due to poor water quality along the lower reach of the river. The NHFGD stocks the Sugar River with catchable size (7 to 9-inch) brook trout, rainbow trout, and brown trout on an annual basis (personal communication, Bill Ingham, Ecologist, NHFGD, Concord, New Hampshire, January 4, 1991). In the upper Sugar River basin, trout are

Sugar River 2 FERC License
stocked between Sunapee Lake and Route 103. In the lower basin,
trout are stocked between the towns of Newport and Claremont.

A recreational fishery exists in the town of Newport and a
diverse resident fish community is present in the project area.
Resident species expected to be found in the Sugar River
smallmouth bass, fallfish, yellow perch, white sucker, longnose
sucker, brown bullhead, common shiners, tessellated darters,
american eel, and a variety of minnow species. In addition, the
headpond of a dam located immediately upstream of the proposed
project site is a popular site for collecting shiners and minnows
to be used as baitfish.

e. Vegetation: Within the project area, the vegetative
community is dominated by red oak, black oak, red maple, sugar
maple, and white birch, interspersed with Northern white pine and
Eastern hemlock. The understory consists primarily of maple and
oak saplings, dogwood, and mountain laurel. Ground cover
consists of bracken fern, ground pine, false Solomon's seal, and
grass.

Project-related construction would cause a long-term loss of
approximately 1.9 acres of vegetation, of which 0.6 acre consists
of trees, 1.0 acre consists of grass, and 0.3 acre is a wetland.
The vegetative cover is primarily sedges and sumac. The FWS does
not have any concerns with project-related disturbance to the 0.3
acre wetland area (personal communication, Bob Scheirer, Fish and
wildlife Biologist, U.S. Fish and wildlife Service, Concord, New
Hampshire, June 8, 1990).

The proposed 75-foot-long transmission line, extending from
the powerhouse to an interconnection with Public Service Company
of New Hampshire, would cross over the project's proposed
tailrace. There would be no need for vegetative control beneath
the transmission line (Fay Engineering Services, 1990).

f. Wildlife: The variety of wildlife that inhabit the
project area includes white-tailed deer, opossum, Eastern
cottontail, striped skunk, red fox, Eastern gray squirrel, and
red squirrel. Beaver, muskrat, raccoon, and mink are associated
with the riparian habitat along the Sugar River. Mallard, black
duck, wood duck, great blue heron, and belted kingfisher frequent
the Sugar River.

Raptors, such as osprey, red-tailed hawk, red-shouldered
hawk, and several species of owls, are known to occur in the

□

project area. Various nongame birds, mammals, reptiles, and
amphibians also occur in the project area.

g. Cultural:

X National Register (listed and eligible) properties
have not been recorded.

Sugar River 2 FERC License

h. Visual quality: The proposed project is located in a semi-industrial setting with residential areas nearby. The dominant visual features at the site are the Sturm-Ruger mill factory, mill parking area, and ruins of a former Sturm-Ruger mill. There is a small, 0.3 acre wetland on the north bank of the river. The south bank is primarily wooded. The project is visible from the Cross Street bridge, neighboring streets, and nearby residences. The New Hampshire Department of Environmental Services, Water Resources Division (DES), in a September 2, 1988, letter states that there would be no adverse effects on scenic and recreational values, and that the project would potentially enhance these values.

i. Recreation: Recreational use of the Sugar River at the project site is limited by the industrial nature of the surroundings. The primary activity is bank fishing which has been estimated at 1-3 anglers per day (Fay Engineering Services, 1990, application, C-1). The NHFGD stocks fish both upstream and downstream of the project site. There are several outdoor recreation facilities and areas within a 5-mile radius of the proposed project including campgrounds, parks, a trail, wildlife management areas, and athletic fields (letter from Joseph F. Quinn, Director, Office of Recreation Services, New Hampshire Division of Parks and Recreation, Concord, New Hampshire, June 6, 1989).

j. Land use: Land use in the immediate area is residential along the south bank of the river and industrial at the proposed project site.

k. Socioeconomics: The economy of Sullivan County is based on manufacturing and service-industry operations.

G. ENVIRONMENTAL ISSUES AND PROPOSED RESOLUTIONS

There are 8 issues addressed below.

1. Erosion, sedimentation, and slope stability: The major ground-disturbing construction activities would be the dredging/excavations in the river and river banks necessary for construction of the dam, cleaning out of the original power canal, construction of the new canal and inlet works, and cleaning out of the tailrace. According to the proposed erosion and sediment control plan, about 5,576 cubic yards (c.y.) of

material would be excavated or dredged from the river and river banks during construction of the dam and power canal, including 4,006 c.y. of sands and gravels, 1,452 c.y. of organic silts, and 118 c.y. of organic silts and sands (Fay Engineering Services, 1990). The major potential erosion site during project construction would be where the toe of the earthen canal embankment would coincide with the outside bend of the river.

Ruger filed an erosion control plan which contains measures for controlling erosion and sediment at the project. Although

Sugar River 2 FERC License

the control measures are not finalized, we believe that the proposed measures would reduce to moderate levels most of the potential erosion and sedimentation problems that could result from project construction.

The major site protection for construction-related erosion would be provided by the proposed construction sequence which would be to construct the tailrace and all of the power canal except the head of the canal and intake channel first, and then install a temporary cofferdam across the river upstream of the dam and canal intake site to divert river flows through a temporary diversion canal and through the completed power canal, powerhouse, and tailrace and to completely bypass and dewater the dam and intake channel site during construction. Substantial protection would also be provided by the proposal to isolate the tailrace construction site from the river during excavation by using haybales and silt fencing.

Further reduction of erosion and sediment runoff from construction sites would result from Ruger's proposals to: (a) identify work limits before beginning clearing and excavation activities; (b) use sediment basins in conjunction with site dewatering; (c) install silt fencing around the spoil disposal site before using the area; (d) periodically inspect and maintain control features during construction; and (e) use riprap or apply stockpiled topsoil, seed, and mulch on all work areas after final grading.

Although the proposed erosion and sediment control plan would reduce erosion and sedimentation during project construction, the plan would be more effective if modified by the following additions and changes:

(i) Silt fences or temporary diversion dikes, with appropriate outlets or sediment traps, should be installed along the river, at the base of all slopes to be disturbed, and at temporary topsoil stockpile sites before commencing any other land-clearing or land-disturbing activities at the sites.

(ii) Control measures should be inspected at the end of each working day and daily during holidays, weekends, and other breaks in construction, and should be immediately maintained or

11

repaired, as necessary, as a priority before continuing other construction activities.

(iii) Stabilized construction entrances (SCE's) should be installed at all vehicle ingress and egress points to eliminate tracking sediments onto public streets. The SCE's should be at least 50 feet long and a minimum of 10 feet wide, and consist of a minimum of 6-inch thickness of 2-inch diameter crushed stone aggregate or recycled concrete placed on filter cloth that covers the entire area to be covered with stone. The SCE's should also include a mountable berm at the lower end if the grade slopes down to a public street.

Sugar River 2 FERC License

(iv) Specifications should be provided for applying mulch, and for the design, installation, and removal of silt fence and haybale structures and for replacing haybales at least every 3 months.

(v) A schedule should be included that shows the timing for implementation, maintenance, and removal of control measures, including permanent and temporary stabilization, in relation to the various stages of land-disturbance and construction.

We conclude that erosion and sedimentation would be reduced to minor levels and be of short-term duration, by modifying the control plan as described above, preparing final drawings and specifications for controlling erosion and sediment in consultation with the appropriate resource agencies, and implementing the potential modified plan and final drawings. Therefore, we recommend that the proposed erosion and sediment control plan filed on May 4, 1990, with the modifications listed above, be approved and made a part of any license issued for the project. Ruger, after consulting with the agencies, should file final drawings, specifications, and an implementation schedule for controlling erosion, sediment, and slope stability at the project.

2. Run-of-river operation: The applicant proposes to operate the project in a run-of-river mode such that instantaneous flows measured downstream of the project powerhouse in the Sugar River equal instantaneous flows into the project reservoir. Flows above and below the hydraulic capacity of the project would be released at the project dam. According to stream flow data provided by the applicant, the Sugar River II Project would operate at its maximum hydraulic capacity (178 cfs) about 18 percent of the time, spilling excess flows at the dam. At river flows below the turbine minimum hydraulic capacity, the project would not operate and all flows would be released at the dam. The average river flow has generally exceeded the proposed project capacity of 178 cfs only in the month of April, with average river flows less than project capacity occurring the remaining 11 months.

□

12

To protect aquatic resources, federal and state agencies recommend that the project be operated in a run-of-river mode, where inflow to the project reservoir equals outflow from the project powerhouse on an instantaneous basis.

Operating the project in a run-of-river mode would protect aquatic habitat and fisheries resources by minimizing fluctuations of water surface levels both upstream and downstream of the project in the Sugar River. Fluctuating water surface levels have been found, for example, to reduce fish spawning success and to cause stranding of fish and invertebrates, subjecting them to desiccation and predation from terrestrial predators (Cushman, 1985).

Sugar River 2 FERC License

We conclude that the licensee should be required to operate the project in a run-of-river mode for the protection of aquatic resources in the Sugar River. Therefore, if a license is issued for the Sugar River II Project, we recommend that the licensee be required to operate the project in a run-of-river mode.

3. Minimum flow in the bypassed reach: The proposed project could dewater or significantly reduce flows in a 1,200-foot segment of the Sugar River between the proposed new dam and the powerhouse tailrace. Reduction of flows in this segment would reduce fisheries habitat in this reach and could adversely affect fisheries in the project area. Reduced flows could also diminish water quality in the bypassed reach.

For the protection of water quality, the New Hampshire Department of Environmental Services, recommends that at least 10 cfs be discharged at the spillway. This approximates the 7Q10 flow for this reach.

The NHFGD recommends that a flow of 15 cfs be provided in the bypassed reach for the protection of aquatic resources (letter dated April 20, 1989). NHFGD's 15 cfs flow recommendation is consistent with flows which have been provided for other hydropower projects in the area; the Sugar River I Project located just upstream of the proposed project site currently maintains a 15-cfs continuous flow release.

The applicant conducted an instream flow study of the bypassed reach and the NHFGD conducted a site visit to evaluate the need for a flow in the bypassed reach. Based on the results of this study and on field observations, the applicant has proposed to release a continuous flow in the bypassed reach of 15 cfs or project inflow, whichever is less. The discharge would be provided at the dam through a v-notch weir cut into stop logs at the dam. The FWS and the NHFGD both concur with the 15 cfs flow proposed by the applicant.

13

We agree that providing a minimum flow of 15 cfs to the bypassed reach is adequate to protect aquatic habitat and fishery resources in the project area. This flow will also serve to maintain water quality in the project area. Ruger's proposed flow and the agency's recommended bypass flow of 15 cfs is consistent with flows which would be based on a watershed runoff value of 0.2 cfs per square mile (cfs/m) of drainage area. This method, which bases flow recommendations on the hydraulic and geologic characteristics of the drainage basin, has been used in establishing adequate flows to protect aquatic resources at other hydropower projects in the New England Region. 4/ Therefore, if a license is issued for the Sugar River II Project, we recommend that the licensee be required to maintain a continuous flow of at least 15 cfs, or inflow to the project, whichever is less, to the 1,200-foot-long bypassed reach of the Sugar River between the project dam and powerhouse.

4. Streamflow gaging plan. To verify run-of-river

Sugar River 2 FERC License

operation and flows which would be required in the bypassed reach, the NHFGD recommends that stream flow gages or other devices be installed at the project site (letter dated April 20, 1989). Ruger filed a draft gaging plan with the Commission on December 6, 1990, proposes to install stream flow gages. This draft plan consists of determining the outflow of the Sugar River I project, located just upstream of the proposed project site, and setting the turbine of the proposed project at 15 cfs less than this flow. In addition, a v-notch weir, designed to release 15 cfs, will be cut into the stoplog grooves of the project dam to release flows to the bypassed reach. The NHFGD (letter dated August 24, 1990 from Donald A. Normandeau, Executive Director, NHFGD, Concord, New Hampshire) and Interior (letter dated October 9, 1990 from William Patterson, Regional Director, U. S. Department of the Interior, Boston, Mass.) have concurred with the proposed gaging plan.

Gaging is necessary to monitor compliance with our recommendation for run-of-river operation and the 15 cfs flow provision for the bypassed reach of the Sugar River. Therefore, before project operation begins, the licensee should develop and file with the Commission a final plan for the installation, operation, and maintenance of streamflow monitoring equipment in the Sugar River. This final plan should be developed in consultation with the FWS, NHFGD, and USGS, and should include

- 4/ The watershed discharge value of 0.2 cfsm was recommended by the resource agencies and included as requirements, in licenses the Commission issued for the Windsor Locks Hydroelectric Project (FERC No. 8404-001) and for the Pachaug River Hydroelectric Project (FERC No. 9230-002), located on the Connecticut River and the Pachaug River, respectively, in Connecticut.

14

provisions for providing operation and flow data to these agencies within 30 days of the agencies' request.

5. Downstream fish passage and fish protection: Studies of entrainment mortality of warmwater fishes indicate that substantial numbers of warmwater fish can be entrained, injured, and killed by passing through hydropower turbines and that mortality rates can range from 5 to 23 percent for fish that are entrained (Energy and Environmental Management, 1986 and 1987). Estimates of turbine mortality of warmwater fishes, once entrained, are generally about 15 percent (Plosky and Aggus, 1984). Operation of the proposed project could have a similar effect on the fishery of the Sugar River, resulting in a moderate impact on the local fishery.

The FWS (letter dated February 16, 1990) requires downstream passage facilities to be installed when juvenile Atlantic salmon are stocked above the project. Atlantic salmon are not now stocked above the project site, and downstream fish passage is not immediately needed, however, Ruger proposes to install an

Sugar River 2 FERC License

angled trashrack and fish bypass sluiceway when the project is constructed. Installing the trashrack during the initial project construction period would offset the cost of providing such a structure in the future. An angled trashrack would also facilitate removal of debris from the project intake canal.

Ruger's proposed trashrack and fish bypass facility has been designed according to the recommendations of the NHFGD and the FWS. Ruger provided functional design drawings to the agencies and to us for the proposed fish bypass facility on December 6, 1990. Both the FWS (letter dated February 16, 1990) and the NHFGD (letter dated August 24, 1990) have reviewed the functional design drawings of the proposed trashrack and downstream passage facility and the flows required to operate the facility and have found them to be satisfactory.

We recommend, therefore, that the licensee install the proposed angled trashrack and downstream bypass facility, as described in Ruger's filing with the Commission on December 6, 1990, as part of any license issued for the Sugar River II Project. In addition, as-built design drawings of these facilities should be filed with the Commission after construction of the trashrack and downstream fish bypass structure.

6. Upstream Fish Passage: Anadromous fish are not present in the vicinity of the proposed project at this time. Interior states that upstream fishway facilities are not needed at this time, however, such facilities may be needed in the future (letter dated October 9, 1990). The NHFGD requires that both upstream fishways and downstream fish passage, and operational flows required to operate such facilities, be provided when deemed necessary by the FWS and the NHFGD (letter dated April 20,

1988). In addition, the FWS (letter dated February 16, 1990 from Gordon E. Beckett, Supervisor, FWS, Concord, New Hampshire) also identifies that the project tailrace will require a barrier screen during the upstream migrating period. Ruger concurs with this recommendation and has agreed to work with the fishery agencies to provide such facilities as needed in the future.

Ruger provided conceptual design drawings for upstream fishways at the project site. This design consists of a single concrete denil-type fish ladder placed at the project dam with an entrance at the base of the dam. The FWS estimates that a 40-cfs flow would be required to operate the upstream facilities when fish are migrating upstream. The FWS (letter dated September 6, 1990) and the NHFGD (letter dated August 24, 1990) have reviewed and approved the conceptual design plans for upstream fishways.

Interior requests that Section 18 reservation of authority be placed in any license issued for the Sugar River II Project (letter dated October 9, 1990). Section 18 of the Federal Power Act provides the Secretary of Interior the authority to prescribe fishways. 5/ Although fishways are not recommended by Interior at this time for the Sugar River II Project, the Commission

Sugar River 2 FERC License should include license articles which reserve Interior's prescription authority. 6/ Under these circumstances, and upon receiving a specific request from Interior, it is appropriate for the Commission to reserve both Interior's authority to prescribe fishways, and its authority to require construction and operation of such facilities.

6(a). Cumulative Impacts on Anadromous Fish

There are over 700 dams on the mainstem and tributaries to the Connecticut River, which present barriers to adult Atlantic salmon and other anadromous species migrating from the ocean to spawning areas upstream. To facilitate upstream migration, fish passage facilities have been constructed at many of the Connecticut River mainstem dams, and passage facilities have been recommended at other dam sites as needed in the future.

Management of Atlantic salmon in the Sugar River is currently deferred. Until the Sugar River is removed from deferred status, no management plan will be implemented and no Atlantic salmon fry would be planted in the river. Hence, no

5/ Section 18 of the Federal Power Act provides: "The Commission shall require construction, maintenance, and operation by a licensee at its own expense ... such fishways as may be prescribed by the Secretary of Commerce or the Secretary of Interior as appropriate."

6/ Lynchburg Hydro Associates, 39 FERC r 61,079 (1987).

Atlantic salmon would presently be adversely affected by construction and operation of the proposed Sugar River II Project. Project related cumulative impacts would be minimized by providing both upstream and downstream fish passage facilities at the project site when anadromous fish occupy the project area.

7. Cultural resources: Based on the results of efforts to search for listed and eligible National Register properties in the project area, and the SHPO's recommendation of no effect (Letter from R. Stuart Wallace, State Historic Preservation Officer, Division of Historical Resources, Concord, New Hampshire, October 18, 1988), we find that the project would have no effect on any structure, site, building, district, or object listed on or eligible for listing on the National Register.

Despite this, National Register and eligible properties could be affected by the possibility that there could be significant undiscovered properties in the project area and by the possibility that project design changes could occur. If such properties are found during project development or operation, or if project design deviates from that approved in the license, Ruger should: (a) consult with the SHPO; (b) based on consultations with the SHPO, prepare a plan describing the appropriate course of action and a schedule for carrying it out;

	Sugar River	2	FERC License			
°a. Geology-Soils	°2AS ³ 1AS ³	°	°f. Wildlife	°1AS ³	°	°
°	°	°	°g. Cultural:	°	°	°
°b. Streamflow	° 0 ³ 3 ³	°	° Archeological	° 0 ³ 3 ³	°	°
°c. Water quality:	°	°	°	°	°	°
° Temperature	° 0 ³ 3 ³	°	° Historical	° 0 ³ 3 ³	°	°
° Dissolved	°	°	°	°	°	°
° oxygen	° 0 ³ 3 ³	°	°h. Visual quality	°1AS ³ 1AS ³	°	°
° Turbidity and	°	°	°i. Recreation	°1BL ³ 1BL ³	°	°
° sedimentation	°2AS ³ 1AS ³	°	°	°	°	°
°d. Fisheries:	°	°	°j. Land use	° 0 ³ 3 ³	°	°
° Anadromous	°1AL ³ 3 ³	°	°k. Socioeconomics	° 0 ³ 3 ³	°	°
° Resident	°1AL ³ 3 ³	°	°	°	°	°
°e. Vegetation	°1AL ³ 3 ³	°	°	°	°	°
°	°	°	°	°	°	°

Remarks:

a. Geology soils: Moderate, short-term erosion, sediment, and turbidity impacts would result from project construction activities. Our recommendations for modifying the soil erosion control plan and for preparing the final drawings and specifications for controlling erosion and sediment in consultation with the appropriate resource agencies would, if

implemented, reduce the potential for those impacts to minor levels.

b. Anadromous fisheries. The proposed project will require construction of a new dam. Future participation by the licensee in upstream/downstream fish passage plans will benefit Atlantic salmon in the CRB. Should anadromous fish be restored to the project area modification of the intake trashracks would reduce turbine-related mortality, however, some project-related anadromous fish mortality could still occur.

c. Resident Fisheries. Resident fish species would be protected by a trashrack designed with a downstream fish bypass structure; However, some project-related resident fish mortality would still occur.

d. and e. Vegetation and wildlife. Project-related construction would cause a long-term loss of approximately 1.9 acres of vegetation. During project-related construction, Ruger's proposal to implement its erosion control and sedimentation plan would restore the vegetative cover of the area, where applicable, and thereby, minimize long term impact to wildlife.

f. Visual quality. The adverse aesthetic impacts of reduced flows in the streambed and construction-related disturbances are offset by the beneficial impacts that would result from cleaning-up the project site of existing debris and

Sugar River 2 FERC License

mill ruins.

g. Recreation. Continued public access to the project impoundment and the bypass reach would provide for the recreational needs in the project area.

2. Impacts of the no-action alternative.

Under the no action alternative, denial of the FERC license, the proposed project, and the opportunity to produce an additional 200 kw of energy at this site would be foreclosed. Denial of the license would deny the nation of the established benefits of a source of renewable, primary energy and result in the increased consumption of non-renewable fossil fuel resources that contribute to atmospheric pollution and acid rain.

I. RECOMMENDED ALTERNATIVE (including proposed, required, and recommended mitigative measures).

X Proposed project	Action alternative	No action
--------------------	--------------------	-----------

1. Reason(s) for selecting the preferred alternative

Sections 4(e) and 10(a)(1) of the Federal Power Act (Act) require the Commission to give equal consideration to all uses of the waterway on which a project is located. In determining whether, and under what conditions, a hydropower license should be issued, we must weigh the various economic and environmental tradeoffs involved in the decision.

Based on our independent review and evaluation of the proposed project and the no-action alternative documented in this environmental assessment (EA) and the Safety and Design Assessment (S&DA), we recommend the proposed project as the preferred option. We recommend this option because: (1) with mitigation, the environmental effects of project construction and operation would be beneficial; and (2) the 650 Mwh of electricity that would be generated from a renewable resource would be beneficial because it would reduce the use of fossil-fueled, electric generating plants, thereby conserving nonrenewable primary energy resources and reducing atmospheric pollution. In making this decision, we considered the relative importance of the environmental resources at the project and in the Sugar River, mitigative measures needed to protect these environmental resources, benefits of the project versus the no-action alternative, and consistency of the proposed project with applicable comprehensive plans.

The mitigative and enhancement measures we believe protect the environmental resources include: (1) run-of-river project operation to minimize upstream and downstream water-level fluctuations to protect and enhance aquatic resources and to reduce erosion; (2) measures to provide minimum flows for the maintenance of water quality and aquatic resources in the bypass reach; (3) measures to monitor flows that would be provided to

Sugar River 2 FERC License

protect and maintain aquatic resources and water quality in the bypass reach at the discharge points at the dam to include the installation of a new gage section; and (4) measures to provide and downstream fish passage and upstream fishways should they be required in the future.

The project would generate an estimated 650 Mwh annually. The levelized cost of power from the hydro project, including the above mitigative measures, would be about 88.9 mills per kilowatthour (mills/kwh) or about \$57,788. We calculated the levelized value of the project power to be about 111 mills/kwh. The project would have a levelized net benefit of about 22.1 mills/kwh or about \$14,365 annually. The project would be economically beneficial.

Based on our review of the agency and public comments filed on this project, and on our independent analysis of the project pursuant to sections 4(e), 10(a)(1), and 10(a)(2) of the Act, we find that the proposed Sugar River II Project is best adapted to a comprehensive plan for the proper use, conservation, and

20

development of the Sugar River and other project related resources.

2. Unavoidable adverse impacts of the recommended alternative.

Project-related construction would cause a long-term loss of approximately 1.9 acres of vegetation comprised of woodlands, grass, and hedges.

Minor, short-term disturbance and displacement of wildlife populations in the project area would occur until disturbed land surfaces are revegetated.

J. CONCLUSION

1. X Finding of No Significant Impact. Approval of the recommended alternative [H(3)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.
2. X Pursuant to section 10(j) of the Act, this EA addresses the concerns of the Federal and state fish and wildlife agencies and makes recommendations consistent with those of the agencies.

K. LITERATURE CITED

- Bailey, Robert G. 1976. Ecoregions of the United States. U.S. Forest Service, Ogden, Utah (map only: scale: 1:7,500,000).
- Bell, M.C. 1986. Fisheries handbook of engineering requirements and biological criteria. Department of the Army, Corps of

Sugar River 2 FERC License
Engineers, North Pacific Division, Portland Oregon.

- Boreman, John. 1977. Topics briefs: fish and wildlife resources and electric generation, no. 1. - impacts of power plant intake velocities on fish. U.S. Fish and wildlife Service, Office of Biological Services, Washington D.C., FWS/OBS-76/20.1, March 1977.
- Cada, G. T. 1990. Assessing fish mortality rates. Hydro Review. February 1990. pp. 52-60.
- Cushman, R.M. 1985. Review of ecological effects of rapidly varying flows downstream from hydroelectric facilities. North American Journal of Fisheries Management. 5:330-339. Bethesda, MD.
- Energy and Environmental Management, Inc. 1987. Millville hydro station, FERC Project No. 2343, fish entrainment studies.

21

Prepared for Potomac Edison Co. and the Allegheny Power Service Corporation.

- Energy and Environmental Management, Inc. 1986. Dam no. 4 hydro station, installation of unit no 3, 1985 and 1986 field studies summary report. Prepared for Potomac Edison Co. and the Allegheny Power Service Corporation.
- Fay Engineering Services. 1990. Application for license for the Sugar River II Hydroelectric Project, FERC No. 10934, New Hampshire. May 4, 1990.
- Federal Energy Regulatory Commission. 1986. Environmental assessment for the Connecticut River Basin: Environmental Assessment Report. Washington D.C., August, 1986. 33 p.
- Federal Energy Regulatory Commission. 1987. Environmental assessment of cumulative impacts associated with hydropower development at five proposed project sites in the Connecticut River Basin in Connecticut, New Hampshire, and Vermont Washington D.C., August, 1987, 22 p.
- Hansen, Charles H., James R. White, and Hiram W. Li. 1977. Entrapment and impingement of fishes by power plant cooling water intakes: an overview. MFR Paper 1266. Marine Fisheries Review, Vol. 39, No. 10, October 1977.
- Knapp, W.E., B. Kynard, and S.P. Gloss (editors). 1982. Potential effects of Kaplan, Osseberger, and bulb turbines on anadromous fishes of the northeast United States. FWS/OBS-82/62. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. September 1982. 132 pp.
- Nettles, D.C. and S.P. Gloss. 1987. Migration of landlocked salmon smolts and effectiveness of a fish bypass structure on a small scale hydroelectric facility. North American

Sugar River 2 FERC License
Journal of Fisheries Management. 7:562-568, American
Fisheries Society, Bethesda, Maryland.

- Plosky, G.R. and L.R. Aggus. 1984. Potential impacts of
hydropower development on the fishery resources of the Red
River Waterway. U.S. Army Corps of Engineer, Vicksburg
District.
- Schmulbach, J. C., D. M. Tunink, and A. E. Zittel. 1977.
Swimming performance of fishes endemic to the Missouri River
in South Dakota. Department of Biology, University of South
Dakota, Vermillion, South Dakota.
- Stolte, L.W. 1982. A strategic plan for the restoration of
Atlantic salmon to the Connecticut River Basin, revised.
U.S. Fish and Wildlife Service, Department of the Interior,

22

Laconia, New Hampshire. September 1982.

L. LIST OF PREPARERS

Name	Position title
Robert Bell	Project Manager (Environmental Coordinator)
M. Golato	Public Utilities Specialist
J. T. Griffin	Archaeologist
Peter A. Leitzke	Geology and Soils
Patti Leppert-Slack	Ecologist
C. Frank Miller	Electrical Engineer
M. Charlene Scott	Civil Engineer
Monte J. TerHaar	Aquatic Biologist/Environmental Engineer
Vince Yearick	Environmental Protection Specialist

SAFETY AND DESIGN ASSESSMENT
SUGAR RIVER II PROJECT NO. 10934
March 27, 1991

On May 4, 1990, William B. Ruger, Jr. (Ruger) submitted a
license application for the Sugar River II Project. The project
would be located in the town of Newport, New Hampshire on the
Sugar River about 16 miles from its confluence with the
Connecticut River.

Project Description

The proposed project would consist of: (1) a proposed 42-
Page 33

Sugar River 2 FERC License

foot-long, 6-foot-high reinforced concrete dam; (2) an impoundment having a surface area of 0.37 acre, with negligible storage, and a water surface elevation of 822 feet msl; (3) a proposed 22-foot-wide and 112-foot-long rectangular intake; (4) a proposed trapezoidal unlined earth canal 400 feet long with a bottom width of 5 feet and a top width of 25 feet; (5) an existing 9-foot-deep, 20-foot-wide and 400-foot-long canal; (6) an existing 250-foot-long, 7-foot-diameter concrete penstock; (7) an existing 27-foot-wide and 35-foot-long powerhouse, containing 1 generating unit with an installed capacity of 200 kw and a hydraulic capacity of 178 cubic-feet-per-second (cfs) at a net head of 18 feet; (8) an existing 75-foot-long, 4.16-kv transmission line; and (9) appurtenant electrical facilities. The project would also include a fishway. The applicant owns the existing facilities.

The 200-kw hydropower plant would operate in a run-of-river mode at a gross head of 18 feet. It would generate about 650,000 kilowatthours (kwh) of energy per year as estimated by the applicant.

DAM SAFETY

On September 18, 1990, the New York Regional Office (NYRO) inspected the Sugar River II Project site. There were no water retaining structures at the site. The NYRO staff classified the project as being low hazard based on the low height of the dam and improbable property damage in the downstream area in the event of a hypothetical dam failure. We conclude the project would be safe and adequate if constructed and operated in conformance with the license.

WATER RESOURCES PLANNING

The Sugar River II Hydroelectric Project has a drainage area of 74 square miles. We calculated the annual generation for the project site based on 60 years of data from the U.S.G.S. gage no. 01152500, located in Claremont, New Hampshire. The stream has a drainage area of 269 square miles and an average flow of 402 cfs. We verified the applicant's energy estimate. The average annual flow at the project site is about 110 cfs.

□

The project would be operated in a run-of-river mode. Two of the bays formed by the piers in the dam would discharge excess water to the Sugar River. Three of the bays would admit water to an intake works. The flow would be diverted through a 900-foot-long canal into the existing powerhouse.

Section 10(1)(2) of the Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We identified 6 comprehensive plans that meet the requirements of section 10(a)(2); however, none address various resources in New Hampshire in relation to developmental considerations of

Sugar River 2 FERC License
hydroelectric development of the site.

ECONOMIC ANALYSIS

The proposed Sugar River II Project would be economically beneficial, so long as the projected levelized cost is less than the levelized cost of alternative energy and capacity in the region.

Ruger plans on selling the project power to a local utility or business. The levelized cost of power from the hydro project would be about 79.8 mills per kilowatthour (mills/kwh) or about \$57,788 annually. We calculated the levelized value of the project power to be about 111 mills/kwh. The project would have a levelized net benefit of about 31.2 mills/kwh or about \$20,030 annually. The project would be economically beneficial.

Our analysis further shows that the project would provide a 12.6 percent internal rate of return based on 100-percent-equity financing. At this level, the project would be fairly secure and attractive for investors, and could be financed. Any further determination of the financial feasibility must be governed by the applicant's efforts to secure project financing and favorable construction bids.

We conclude that the proposed project would be economically beneficial and potentially financially feasible.

EXHIBITS

The following portions of Exhibit A and the Exhibit F drawings filed November 16, 1988, conform to the Commission's rules and regulations and should be included in the license.

3

Exhibit A. (i) through (viii) on pages 1 and 2.

Exhibit F	FERC No.	
Drawing No.	10934-	Title
F-1	001	Dam and Canal Plan View
F-2	002	Section Drawings of Dam
F-3	003	Section and Profile View of Turbine and Powerhouse
F-4	004	Plan View of Powerhouse

PREPARERS

M. Charlene Scott, Civil Engineer
C. Frank Miller, Electrical Engineer
Page 35

M. Golato, Editor Sugar River 2 FERC License

0

1

0

Attachment B-2

**Sugar River 2 Hydroelectric Project
(MSS17223)**

**Construction Completion Report Filed with the FERC (FERC No. 10934)
dtd April 1, 2010**

Sugar River Hydroelectric Power Company
P.O. Box 293
Newport, NH 03773
Phone: (603) 863-6332
Fax: (603) 863-9391
Email: billruger@comcast.net

April 1, 2010

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St., NE, Room 1 A
Washington, DC 20426

Re: FERC #10934-NH, Sugar River II Hydro Project

Dear Secretary Bose:

We hereby notify the FERC that the above captioned project has been completed in all planned respects and was put on line on March 30, 2010.

The project additionally complied with all the interconnection requirements of the Public Service Company of New Hampshire, and they have so certified by notice dated 3/30/10 at 1:30 PM, their letter stating, in pertinent part, "this unit (SESD #187, Sugar River II) has completed all items required to commence commercial operations."

We e-filed a request for an extension of time to complete this project on Jan. 13, 2010, with respect to which we have not received a reply. Perhaps the fact that this project has now been complete renders this request moot.

Yours truly,

Sugar River Hydroelectric Power Company
William B. Ruger, Jr., Proprietor

Attachment C

**Sugar River 2 Hydroelectric Project
(MSS17223)**

**Operating and Interconnection Agreements (FERC No. 10934)
dtd January 30, 2006 and September 30, 2005 respectively**



**Public Service
of New Hampshire**

SPS/CNV/SE # 187

bcc: P. A. Magoun
T. J. Brown
R. E. Evans
L. G. Lajoie
M. A. Sandler

~~SESD File #187~~

February 8, 2006

Mr. William B. Ruger, Jr.
Sugar River Hydroelectric Power Company
P. O. Box 293
Newport, NH 03773

Subject: Sugar River 2 Hydro (#187)
Operating Agreement for Purposes of Wheeling and Power Sales

Dear Mr. Ruger:

Enclosed is your executed original of the subject Agreement. By copy of this letter, we are asking our Law Department to file our original and are notifying the New Hampshire Public Utilities Commission that this Agreement has been executed.

Prior to the project commencing operation, we will need the FERC QF registration number, the completed report on the calibration and testing of all protective devices, and a certificate of insurance with PSNH as named insured. Following receipt of this information and after confirming all interconnection work has been completed, we will issue a letter notifying the project that it may start operating connected to the PSNH grid.

Sincerely,

Carl W. Vogel for
S. B. Wicker, Jr.
Manager
Supplemental Energy Sources

CNV/dem

Enclosure

cc: D. A. Howland (NHPUC)
G. M. Eaton (w/original)
S. R. Hall

OPERATING AGREEMENT
FOR
PURPOSES OF WHEELING AND POWER SALES

AGREEMENT, dated *January 30*, 2006 by and between William B. Ruger, Jr./dba/Sugar River Hydroelectric Power Company (hereinafter referred to as the "Interconnector"), and Public Service Company of New Hampshire, a New Hampshire corporation having its principal place of business in Manchester, New Hampshire (hereinafter referred to as "PSNH").

WHEREAS, Interconnector desires to interconnect their Sugar River #2 225 KVA hydroelectric generating facility (the "Facility"), (SESD #187) located on the Sugar River in Newport, New Hampshire, with the electric system of PSNH in accordance with applicable New Hampshire Public Utilities Commission ("NHPUC") Orders and federal law; and

WHEREAS, Interconnector intends to certify its generator as a Qualifying Facility ("QF") as defined by the Public Utilities Regulatory Policies Act ("PURPA") as it may be amended from time to time; and

WHEREAS, Interconnector desires to, and PSNH agrees to, provide for the interconnection of the Facility with the electric system of PSNH, its successors and permitted assigns, and Interconnector may have the right to sell the electric output of the Facility to PSNH and/or to such other third party purchasers with which Interconnector may make sales arrangements; and

WHEREAS, it is necessary that certain agreements be made prior to the interconnection of the Facility to ensure the safety, reliability and integrity of PSNH's electric system and the operation of the Facility; and

WHEREAS, Interconnector and PSNH wish to provide for certain other matters pertaining to discretionary power sales from the Facility;

NOW, THEREFORE, the parties hereby agree as follows:

Article 1. Interconnection and Voltage Characteristics.

The delivery point shall be that point at which the Facility interconnects with the 4.16 KV electric system of PSNH. Under this Agreement, the Interconnector shall receive and pay for the services necessary for the purpose of connecting the Facility with the PSNH electrical system, including Pool Transmission Facilities ("PTF") as defined by the New England Power Pool ("NEPOOL"), and non-PTF.

Unless PSNH converts its interconnection circuit, all electric energy delivered to PSNH's system from the Facility shall be 4.16 KV, three-phase, sixty hertz.

Article 2. Metering.

The metering shall be configured so as to represent the electric power output delivered to the PSNH electric system as specified in the Interconnection Report ("Report") dated September 30, 2005, attached as Attachment A. The metering may be installed on the generation side of the transformer provided that transformer losses are subtracted from the measured generation by a suitable method. Interconnector shall be responsible for all costs associated with the metering required for sales to PSNH and/or other third parties from the Facility.

Interconnector shall install and will own, and maintain all metering equipment as referenced in Article 5, to measure the physical flow of electrical energy from the Facility into the PSNH electric system. If at any time the meter is found to be in error by more than two percent fast or slow (+ or - 2%), Interconnector shall cause such meter to be corrected and the meter readings for the period of inaccuracy shall be adjusted to correct such inaccuracy so far as the same can be reasonably ascertained, but no adjustment prior to the beginning of the preceding month shall be made except by agreement of the parties. All tests and calibrations shall be made in accordance with New Hampshire Code of Administrative Rules, Chapter PUC 300 Rules and Regulations for Electric Service, as amended, and any applicable Rules and Regulations of ISO-New England ("ISO"). Interconnector is responsible for assuring that meter tests are performed as required at Interconnector's expense. The PSNH Meter Laboratory should be contacted in advance to arrange for said meter testing.

Interconnector shall cause the meter to be tested at any time upon request of either party and, at PSNH's option, in the presence of a representative of PSNH. If such equipment proves accurate within two percent fast or slow (+ or - 2%), the expense of the test shall be borne by the requesting party.

PSNH reserves the right to secure or seal the metering installation, but upon the written request of Interconnector will provide such information regarding, and access to, the metering installation as Interconnector requests. Interconnector is required to record electrical energy physically delivered to the PSNH electric system on an hour-by-hour basis, and to electronically make available to PSNH, Interconnector's generation in kilowatt-hours for each hour during the prior 24 hours.

To the extent necessary for Interconnector to receive credit and compensation for power sales to entities other than PSNH of electric energy and/or other power products generated at the Facility, PSNH shall cooperate with and assist Interconnector to ensure that the metering installations applicable to the Facility meet the required specifications and operational characteristics as necessary to accomplish such sales.

Article 3. Wheeling Arrangements.

If requested by Interconnector in connection with any sales of energy or other electric products to entities other than PSNH, PSNH (or other Northeast Utilities system companies) shall transmit the electric output of the Facility, or such portion(s) thereof as are identified by Interconnector, to an appropriate PTF point or to such purchasers (as applicable to the transaction) under the terms and conditions and rates set forth in the NORTHEAST UTILITIES SYSTEM COMPANIES Open Access Transmission Service Tariff No. 9 (the "NU OATT") filed with the Federal Energy Regulatory Commission ("FERC"), or its successor tariff, as those tariffs may be amended or supplemented from time to time hereafter. The wheeling of generation shall also be subject to any regulatory approved and applicable local transmission and distribution wheeling tariffs.

Article 4. Power Sales, Billing and Payment.

(a) PURPA Sales

This Agreement is contingent upon the Facility' s continuing eligibility for status as a QF as defined by PURPA. As a QF, Interconnector may make sales to PSNH and PSNH shall purchase all or a portion of the electric energy and other electrical products generated at the Facility pursuant to the requirements of the PURPA, the New Hampshire Limited Electrical Energy Producers Act (" LEEPA"), and ISO.

Pursuant to PURPA, and as approved by the NHPUC in Docket No. DE 99-099, in accordance with the Settlement Agreement between PSNH and the State of New Hampshire, the rates paid to Interconnector for short-term, as available power sales to PSNH shall be the applicable market clearing price for such energy and/or other electrical product(s) or such replacement pricing methods as determined by the ISO or any successor entity for each period during which Interconnector has delivered such energy and/or other electrical power products for sale to PSNH. The above short-term prices shall be adjusted for line losses, wheeling costs, and administrative costs as they may be determined by PSNH or the NHPUC and as modified from time to time. The parties agree to abide by the ISO rules for recognition and determination of energy and capacity credit.

Facilities delivering all of their output to the PSNH grid will be assigned a Line Loss Adjustment Factor (the " LLAFF"). The initial LLAFF for the Facility is 1.0. If a recalculation of the LLAFF is required, PSNH shall calculate a new LLAFF to represent the change in PSNH' s electrical system losses attributable to the generator characteristics and physical location of the Facility. The LLAFF shall be applied to that portion of the generation output from the Facility which is sold to PSNH during a billing month by multiplying the LLAFF times the kilowatt output. PSNH shall not have the right to use a new or materially different methodology for conducting any such LLAFF study except as ordered by the NHPUC. The LLAFF may be less than one or greater than one.

Should PSNH no longer be the load holding entity for the entire retail load connected to its System, the LLAFF shall be proportionally reduced to reflect the percentage of retail load supplied by PSNH. This adjustment shall become effective with the billing months of February

and August based upon the percentage of retail load supplied by PSNH over the previous six (6) month period ending in December and June, respectively. The LLAF may be recalculated at the request of either party. The requesting party shall pay for the cost of performing the line loss study. Upon the completion of the updated LLAF study, the new LLAF shall be used at the start of the next billing month.

In addition, Interconnector shall have the right and option at any time to engage a third party consultant to validate and verify the methodology and results of any LLAF study performed by PSNH under this Agreement, at Interconnector's expense. If the review performed by such consultant concludes that the results of any study performed by PSNH are incorrect, then PSNH shall perform a new study, at its expense, to determine the correct LLAF. Any dispute between the parties related to such studies shall be resolved by the NHPUC.

PSNH shall read the meter, installed in accordance with Article 2, once each month and shall promptly send Interconnector an invoice showing the billing month's net generation and amount owed for energy and other electrical products generated for any sales to PSNH hereunder. Interconnector shall then return to PSNH the approved invoice for payment. PSNH shall make payments to Interconnector electronically for the total amount due within 23 days of the meter reading date, provided that PSNH receives a timely return of the approved invoice.

(b) Bilateral and Power Exchange Sales

At all times during the term of this Agreement, Interconnector shall have the right to sell any or all of the Facility's electric power output, including electric energy, installed capacity, spinning reserves, other operating reserves and/or automatic generation control and other products, to entities other than PSNH, either through bilateral transactions or through the markets administered by the ISO. With respect to any such bilateral or market sales by Interconnector, Interconnector may request that PSNH function as "Lead Participant", and/or "Designated Entity" (as those terms are defined and amended or replaced from time to time by the ISO) and/or other similar role (or function necessary to process and implement such sales) on Interconnector's behalf and, subject to Interconnector's instructions, perform any and all functions in such roles as are necessary to implement and consummate such sales, and shall

submit to ISO and/or other appropriate entities (on Interconnector' s behalf) all information, including, without limitation, standard or non-standard contracts, self-schedules, unit characteristics, bid submissions and metering data, required to effect such transactions, provided that Interconnector provides PSNH with all information and direction reasonably required for the submission of such information by PSNH but no later than 9:30 am on the last business day prior to the commencement of such transaction or bid, unless PSNH can accommodate the transaction in less time.

As PSNH' s full compensation when it acts as the " Lead Participant" for performing the administrative services described in this subsection, Interconnector shall pay to PSNH for each such month an amount equal to the greater of \$500 or 0.0126¢/kwhr of Interconnector' s sales of generation for which PSNH is " Lead Participant" during such month made pursuant to this Article 4 (b). The foregoing shall only be due to PSNH when PSNH actually acts as " Lead Participant" in such sale.

Any contractual arrangements for the sale of electricity with others shall be in accordance with the requirements of the Federal Power Act, the rules of FERC and the rules of ISO New England as they all may be amended from time to time. The price and products associated with such sale shall be identified in the contractual arrangements.

Article 5. Interconnection and Protection Requirements.

Interconnector shall install or provide for the installation of all interconnection, protection, metering, and control equipment as specified in the Report to ensure the safe and reliable operation of the Facility in parallel with the PSNH system. The Interconnector will be responsible for all study costs associated with the development of the Report, and those costs associated with the equipment and its installation, required by the Report.

Up to the delivery point, all equipment shall be the sole property of Interconnector. Interconnector shall have sole responsibility for the operation, maintenance, replacement, and repair of the Facility, including the interconnection equipment owned by the Interconnector.

Prior to the interconnection to PSNH' s system under this agreement, Interconnector shall have tested, and every twelve months thereafter, Interconnector shall test, or cause to be

tested, all protection devices including verification of calibration and tripping functions; and Interconnector shall provide PSNH with a copy of the tests and results.

If either party reasonably determines that the operation or use of any portion of the protection system will or may not perform its protective function, Interconnector shall immediately open the interconnection between PSNH' s system and the Facility. Interconnector shall promptly notify PSNH of this action and the reason for this action. The interconnection shall remain open until Interconnector has satisfactorily cured the defect. Any repair or replacement of Interconnector' s equipment shall be at no cost to PSNH, except PSNH shall be responsible for any loss or damage requiring repair or replacement of all or a portion of the Interconnector' s equipment as a result of the negligence or misconduct of PSNH, its agents or employees.

Article 6. Right of Access.

Upon prior written or oral notice to Interconnector, PSNH shall have the right to enter the property of Interconnector at mutually agreed upon reasonable times and shall be provided reasonable access to Interconnector's metering, protection, control, and interconnection equipment to review for compliance with this Agreement. PSNH shall provide Interconnector with a copy of any notes, reports or other documents made relating to any such inspection or review.

Article 7. Modification of Facility.

If Interconnector plans any modifications to its Facility as described in Attachment A, which modifications would reasonably be expected to affect its interconnection with the PSNH System, Interconnector shall give PSNH prior written notice of its intentions.

Article 8. Term of Agreement.

This Agreement shall become effective between the parties on the date of execution of this agreement but no earlier than the date PSNH receives notification from Interconnector that its status as a QF has been filed with FERC. This Agreement shall remain in full force and effect

subject to the suspension and termination rights contained in this Article 8.

Interconnector may terminate this Agreement by giving PSNH not less than sixty (60) days prior written notice of its intention to terminate. PSNH may terminate the interconnection under this Agreement by giving not less than sixty (60) days prior written notice should Interconnector fail to substantially perform with the interconnection, metering and other safety provisions of this Agreement, and such failure continues for more than sixty (60) days from date of notice without cure. The PSNH notice shall state with specificity the facts constituting the alleged failure to perform by Interconnector. If the parties are unable to reach agreement within 60 days on a cure for the failure to perform, either party may elect to submit the dispute to the NHPUC for resolution.

If changes in applicable federal or state statutes, regulations or orders; or changes in applicable ISO or NEPOOL requirements occur which materially affect this Agreement, the parties shall negotiate in good faith to modify this Agreement to accommodate such changes. If the parties are unable to reach agreement within 60 days, either party may elect to submit the dispute to the NHPUC for resolution.

PSNH may also terminate its obligation contained in this Agreement if all laws, regulations and orders mandating interconnections or purchases from qualifying facilities are repealed, or declared invalid by a Court or Regulatory Agency, and no revised law is enacted providing for such interconnection or sales on a similar basis.

After termination of this Agreement, both parties shall be discharged from all further obligation under the terms of this Agreement, excepting any liability (including without limitation the obligation to pay for power delivered prior to any such termination which obligation shall survive the termination of this Agreement) which may have been incurred before the date of such termination. Any reasonable costs incurred by PSNH to physically disconnect the Facility as a result of the termination of this Agreement shall be paid by the Interconnector. Termination of this Agreement shall not effect the parties' obligation to pay for power delivered prior to termination of that purchase obligation.

Article 9. Indemnification and Insurance.

Each party will be responsible for its equipment and the operation thereof and will indemnify and save the other harmless from any and all loss by reason of property damage, bodily injury, including death resulting therefrom suffered by any person or persons including the parties hereto, employees thereof or members of the public, (and all expenses in connection therewith, including attorney's fees) whether arising in contract, warranty, tort (including negligence), strict liability or otherwise, caused by or sustained on, or alleged to be caused by or sustained on, equipment or property, or the operation or use thereof, owned or controlled by such party, except that each party shall be solely responsible for and shall bear all costs of its negligence, and willful misconduct, and claims by its own employees or contractors growing out of any workers' compensation law. The foregoing paragraph shall survive the termination of this Agreement and such termination will not extinguish any liabilities or obligations in respect of reimbursements under this paragraph, incurred up to the time of termination.

The Interconnector shall, at its own expense, continue to maintain throughout the term of this Agreement Comprehensive General Liability Insurance with a combined single limit of not less than \$1,000,000 for each occurrence.

The insurance policy specified above shall name PSNH, Northeast Utilities and its subsidiaries, officers, directors and employees, as additional insured with respect to any and all third party bodily injury and/or property damage claims arising from Interconnector's performance of this Agreement. It is further agreed that PSNH shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium for such insurance. The policy shall not be canceled, terminated, altered, reduced or materially changed without at least thirty (30) days prior written notice to PSNH.

Evidence of the required insurance shall be provided to PSNH in the form of a Certificate of Insurance prior to the actual physical interconnection of the Facility, and annually thereafter. During the term of this Agreement, the Interconnector, upon PSNH's reasonable request, shall furnish PSNH with certified copies of the actual insurance policies described in this Article.

The insurance coverage shall be primary and is not in excess to or contributing with any insurance or self-insurance maintained by PSNH or its affiliates and shall not be deemed to limit

Interconnector' s liability under this Agreement.

PSNH shall have the right to modify the limits of liability specified herein, at any time in the future, to remain consistent with those limits generally required by the NHPUC. PSNH must notify Interconnector in writing, at least ninety (90) days prior to any required change and these new liability limits will become effective upon renewal of the Insurance Policy.

In no event shall either party be liable, whether in contract, tort (including negligence), strict liability, warranty, or otherwise, for any special, indirect, incidental, punitive or consequential losses or damages, suffered by the other party or any person or entity and arising out of or related to this Agreement including but not limited to, cost of capital, cost of replacement power, loss of profits or revenues or the loss of the use thereof. This paragraph of Article 9 shall apply notwithstanding any other statement to the contrary, if any, in this Agreement and shall survive the termination of this Agreement.

Article 10. Force Majeure.

Neither party shall be considered to be in default hereunder and shall be excused from performance hereunder if and to the extent that it shall be prevented from doing so by storm, flood, lightning, earthquake, explosion, equipment failure, civil disturbance, labor dispute, act of God or the public enemy, action of a court or public authority, withdrawal of equipment from operation for necessary maintenance and repair, or any other cause beyond the reasonable control of either party and not due to the fault or negligence of the party claiming force majeure, provided that the party claiming excuse from performance uses its best efforts to remedy its inability to perform.

Article 11. Dispute Resolution and Voluntary Arbitration.

In the event of any dispute, disagreement, or claim (except for disputes referred to the NHPUC under Article 8 of this Agreement) arising out of or concerning this Agreement, the Party that believes there is such a dispute, disagreement, or claim will give written notice to the other Party of such dispute, disagreement, or claim. The affected Parties shall negotiate in good faith to resolve such dispute, disagreement, or claim. If such negotiations have not resulted in

resolution of such dispute to the satisfaction of the affected Parties within ten (10) working days after notice of the dispute has been given, then, an affected Party may, upon mutual agreement of all of the affected Parties, submit such dispute, disagreement, or claim arising out of or concerning this Agreement, including whether such dispute, disagreement, or claim is arbitrable, to binding arbitration.

The arbitration proceeding shall be conducted by a single arbitrator, appointed by mutual agreement of the affected Parties, in Manchester, New Hampshire, under the Commercial Arbitration Rules of the American Arbitration Association in effect at the time a demand for arbitration under such rules was made. In the event that the affected Parties fail to agree upon a single arbitrator, each shall select one arbitrator, and the arbitrators so selected shall, within twenty (20) days of being selected, mutually select a single arbitrator to govern the arbitration. A decision and award of the arbitrator made under the Rules and within the scope of his or her jurisdiction shall be exclusive, final, and binding on all Parties, their successors, and assigns. The costs and expenses of the arbitration shall be allocated equitably amongst the affected Parties, as determined by the arbitrator(s). Judgment upon the award rendered by the arbitrator(s) may be entered in any court having jurisdiction. Each Party hereby consents and submits to the jurisdiction of the federal and state courts in the State of New Hampshire for the purpose of confirming any such award and entering judgment thereon.

Article 12. Modification of Agreement.

In order for any modification to this Agreement to be binding upon the parties, said modification must be in writing and signed by both parties.

Article 13. Prior Agreements Superseded.

Once effective, this Agreement with Attachment A represents the entire agreement between the parties with respect to the interconnection of the Facility with the PSNH electric system and, as between Interconnector and PSNH, all previous agreements including previous discussion, communications and correspondence related thereto are superseded by the execution of this Agreement.

Article 14. Waiver of Terms or Conditions.

The failure of either party to enforce or insist upon compliance with any of the terms or conditions of this Agreement shall not constitute a general waiver or relinquishment of any such terms or conditions, but the same shall remain at all times in full force and effect. Any waiver is only effective if given to the other party in writing.

Article 15. Binding Effect; Assignment

This Agreement shall be binding upon, and shall inure to the benefit of, the respective successors and permitted assigns of the parties hereto. PSNH shall not assign this Agreement or any of its rights or obligations hereunder without the prior written consent of Interconnector except to a successor-in-interest. PSNH shall provide written notice to Interconnector of any such assignment to a successor-in-interest within fifteen (15) days following the effective date of the assignment. Interconnector shall have the right to assign this Agreement to any person or entity that is a successor-in-interest to the Facility without the consent of PSNH. In the event of any such assignment, Interconnector shall notify PSNH in writing within fifteen (15) days following the effective date of the assignment. Interconnector may make such other assignment of this Agreement as it determines, subject to the prior written consent of PSNH, which consent shall not be unreasonably withheld or delayed. Any assignment in violation of this Article shall be void at the option of the non-assigning party.

Article 16. Applicable Law.

This Agreement is made under the laws of the State of New Hampshire and, to the extent applicable, the Federal Power Act, and the interpretation and performance hereof shall be in accordance with and controlled by such laws, excluding any conflicts of law provisions of the State of New Hampshire that could require application of the laws of any other jurisdiction.

Article 17. Qualifying Facility Status

Interconnector has stated its intent to seek FERC certification of its generator as a QF and

this Agreement and the related Interconnection Report shall be null and void should Interconnector fail to file for or should FERC deny the certification of QF status for the generator or later revoke the Project' s QF status.

Article 18. Headings.

Captions and headings in the Agreement are for ease of reference and shall not be used to and do not affect the meaning of this Agreement.

Article 19. Notices and Service.

All notices, including communications and statements which are required or permitted under the terms of this Agreement, shall be in writing, except as otherwise provided or as reasonable under the circumstances. Service of a notice may be accomplished and will be deemed to have been received by the recipient party on the day of delivery if delivered by personal service, on the day of confirmed receipt if delivered by telegram, registered or certified commercial overnight courier, or registered or certified mail or on the day of transmission if sent by telecopy with evidence of receipt obtained, and in each case addressed as follows:

Interconnector: Sugar River Hydroelectric Power Company
P. O. Box 293
Newport, NH 03773
Attn.: William B. Ruger, Jr.
Telephone No. (603) 863-3300
Fax No. (603) 863-0535

PSNH: Public Service Company of New Hampshire
780 North Commercial Street
P. O. Box 330
Manchester, NH 03105-0330
Attn.: Manager, Supplemental Energy Sources Department
Telephone No. (603) 634-2312
Fax No. (603) 634-2449
email: psnhesd@psnh.com

IN WITNESS WHEREOF, the parties, each by its duly authorized representative, have hereunto caused their names to be subscribed, as of the day and year first above written.

Sugar River Hydroelectric Power Company

By:

Title:

Walter G. Rogers, Jr.

Proprietor
Duly Authorized

Public Service Company of New Hampshire

By:

Title:

Paul E. Ramsey 1/3/06

Paul E. Ramsey
Vice President, Customer Services
Duly Authorized

**PSNH INTERCONNECTION REPORT
FOR
CUSTOMER GENERATION**

SUGAR RIVER 2 HYDRO

FINAL REPORT

SESD SITE NO. 187

L. J. Croteau
September 30, 2005

CONTENTS

- I. INTRODUCTION
- II. DESCRIPTION OF MAJOR COMPONENTS
 - A. DESCRIPTION OF FACILITIES
 - B. ELECTRICAL COMPONENTS
 - C. MECHANICAL COMPONENTS
- III. PSNH REQUIREMENTS - GENERAL
 - A. SAFETY CONSIDERATIONS
 - B. SERVICE QUALITY CONSIDERATIONS
 - C. METERING CONSIDERATIONS
- IV. PSNH REQUIREMENTS - SPECIFIC
 - A. SYSTEM CONFIGURATION AND PROTECTION
 - B. SYSTEM METERING
 - C. PRIMARY INTERCONNECTION
- V. PSNH PRICE ESTIMATES
 - A. SYSTEM PROTECTION
 - B. METERING
 - C. PRIMARY INTERCONNECTION
- VI. INTERCONNECTION EQUIPMENT OWNERSHIP, OPERATION, AND MAINTENANCE
 - A. DELIVERY POINT
 - B. DESCRIPTION OF RESPONSIBILITIES
- VII. DRAWINGS
 - A. PARTIAL ONE-LINE DIAGRAM (SK-LJC-187-1)

I. INTRODUCTION

A study has been performed to determine the impact of this facility on the PSNH system. All technical analysis was based on the equipment listed under Section II, and the facility arrangement illustrated on partial one-line diagram SK-LJC-187-1. Where actual site-specific data was not readily available, estimated or "typical" values were utilized in any required calculations. Any deviation from the listed equipment and/or the illustrated configuration may have significant safety and/or technical ramifications. Consequently, if changes are anticipated now or in the future, PSNH should be informed immediately so that the requirements and recommendations contained within the report may be revised where necessary. This procedure will ensure that the Developer is informed of PSNH requirements in a timely fashion and should eliminate the delays and expense which could otherwise be experienced by the Developer.

II. DESCRIPTION OF MAJOR COMPONENTS

A. Description Of Facilities

The Sugar River 2 hydroelectric facility is situated in Newport, NH and receives water from the Sugar River impounded behind FERC dam no. 10394-NH. All electrical output will be delivered to PSNH 4.16kV circuit 42H2. Station service for this site is taken from the existing site off pole 33/5 on Canal St.

The salient electrical features of this facility are illustrated on the partial One-line diagram SK-LJC-187-1 in section VII.A of this report.

B. Electrical Components

1. Generator – Westinghouse S/N 2453188, Synchronous, 3 Phase, 200 KW, 225 KVA, 600V, 217A, 164 RPM
2. Exciter – Owner anticipates using a Basler SSE 125-13 static exciter, 125V DC
3. Generator Step Up Transformer – Owner anticipates using 300 KVA pad mounted transformer, 600V delta secondary, 4160V wye ungrounded primary.
4. Circuit Breaker – GE Power Break 11, 800A rated, 600V, 50kA interrupting capability

C. Mechanical Components

1. Turbine – S. Morgan Smith, 250 HP, 164 RPM, 17 ft. head

III. PSNH REQUIREMENTS - GENERAL

A. Safety Considerations

1. The connection of the facility to the PSNH system must not compromise the safety of PSNH's customers, personnel, or the owner's personnel.
2. The generating facility must not have the capability of energizing a de-energized PSNH circuit.
3. An emergency shutdown switch with facility status indicator lights, and a disconnecting device with a visible open shall be made available for unrestricted use by PSNH personnel. The operation of the switch shall cause all of the facility's generation to be isolated from the PSNH grid and shall block all automatic reconnection of generation to the PSNH grid until the switch is reset. The status lights, mounted with the shutdown switch, shall be located outdoors at a position acceptable to PSNH Operating Division personnel. A red light shall indicate that the facility may have generation connected to the PSNH system. A green light shall indicate that all generation is disconnected from the PSNH system. The lights shall be driven directly from auxiliary switches located on the facility's breaker(s). The disconnecting device with visible open shall be located between the PSNH system and the facility's generation.
4. The Developer is responsible for determining and applying the complete settings for all non PSNH required protective relays. PSNH will determine, at the Developer's expense, voltage, frequency and current set points for PSNH required protective functions (once more, the Developer is responsible for determining and applying the complete settings of these relays).
5. A PSNH approved testing company will be required to verify the proper functioning of those protective systems required by PSNH. This work will be performed at the Developer's expense.
6. The generating facility has full responsibility for ensuring that the protective system and the associated devices are maintained in reliable operating condition. PSNH reserves the right to inspect and test all protective equipment at the generator site whenever it is considered necessary. This inspection may include tripping of the breakers.
7. The short circuit interrupting device(s) must have sufficient interrupting capacity for all faults that might exist. The PSNH system impedance at the facility will be supplied on request.
8. All shunt-tripped short circuit interrupting devices applied to generators must be equipped with reliable power sources. A D.C. battery with associated charging facilities is considered a reliable source.
9. All synchronous generator facilities must be equipped with battery-tripped circuit breakers.

10. Any protection scheme utilizing AC control power must be designed in a fail-safe mode. That is, all protective components must utilize contacts which are closed during normal operating conditions, but which open during abnormal conditions or when control power is lost to de-energize the generator contactor coil. These schemes may be utilized only with non-latching contactors and may not be used with synchronous generators.
11. A complete set of AC and DC elementary diagrams showing the implementation of all systems required by PSNH must be supplied for PSNH review. These drawings should be supplied as soon as possible so that any non-conforming items may be corrected by the Developer without impacting the scheduled completion date of the facility.
12. All voltage transformers driving PSNH-required protection systems must be rated by the manufacturer as to accuracy class, and must be capable of driving their connected burdens with an error not exceeding 1.2 percent.
13. All current transformers driving PSNH-required protection systems must be rated by the manufacturer as to accuracy class and must be capable of driving their connected burdens with an error not exceeding 10 percent at maximum fault requirements.
14. All PSNH-required protective relays, and any other relays which PSNH might be requested to test, must be equipped with test facilities which allow secondary quantity injection and output contact isolation.
15. It is not the policy of PSNH to maintain a stock of protective relays for resale to facility Developers. Since many protective devices have delivery times of several months, Developers are strongly advised to order them as soon as possible after PSNH type-approval is received.
16. Protection of the generating facility equipment for problems and/or disturbances which might occur internal or external to the facility is the responsibility of the Developer.
17. No operation of the facility's generation is allowed until all requirements in Sections III and IV of this report have been met, and all systems required therein, are in place, calibrated, and, if applicable, proven functional. This requirement may be waived by PSNH for a given system if generation is required to demonstrate the proper functioning of that system.

B. Service Quality Considerations

1. The connection of the facility to the PSNH system must not reduce the quality of service currently existing on the PSNH system. Voltage fluctuations, flicker, and excessive voltage and current harmonic content are among the service quality considerations. Harmonic limitations should conform to the latest IEEE guidelines and/or ANSI standards.

2. In general, induction generators must be accelerated to “synchronous” speed prior to connection to the PSNH system to reduce the magnitude and duration of accelerating current and resulting voltage drop to PSNH customers to acceptable levels.
3. In general, synchronous generators may not use the “pull-in” method of synchronizing due to excessive voltage drops to PSNH customers.
4. Power factor correction capacitors may be required for some facilities either at the time of initial installation, or, at some later date. The installation will normally be done by the Developer at his expense.
5. Certain facilities, having installed capacity similar in magnitude to connected circuit load, may require that control modifications be made to tap changers in the electrical vicinity. Should they be necessary, the modifications will be made at the Developer’s expense.
6. Automatic reclosing of the PSNH circuit after a tripping operation may occur after an appropriate time delay. If voltage blocking of automatic reclosing is required, it will be added at the Developers’ expense.

C. Metering Considerations

1. Except for metering and protection/control voltage sensing and generator and/or capacitor contactor supply voltage, no unmetered AC power shall be taken from the PSNH system.

IV. PSNH REQUIREMENTS - SPECIFIC

A. System Configuration and Protection

1. The facility must be arranged and equipped as per partial one-line diagram SK-LJC-187-1.
2. The following protective functions must be supplied and connected to automatically trip at least the breakers as shown. These devices must be utility grade as approved by PSNH.
 - a) 59N - Ground Overvoltage, Trip 52G
 - b) 81 O/U - Over/Underfrequency, Trip 52G
 - c) 27/59 - Under/Overvoltage, Trip 52G
 - d) 51V - Voltage Controlled Overcurrent, Trip 52G
3. The facility generator step-up transformer (GSU) must have an ungrounded wye (HV) – delta (LV) winding configuration.
4. Three (3) 4160-120V voltage transformers must be applied at the high voltage side of the generator step-up transformer. These VTs must be connected grounded wye (HV) – broken delta (LV) and shall supply operating voltage to item 2.a. above. Note that secondary windings must not be permanently

grounded in the transformer.

B. System Metering

1. The facility will be equipped with the metering shown on partial one line diagram SK-LJC-187-1.

2. The metering must consist of the following components provided by the Developer:

1. Two (2) metering accuracy current transformers (CT's), 200:5, 0.6kV insulation class, 0.3 accuracy class at burden ratings of 0.1 through 0.5.
2. Two (2) metering accuracy voltage transformers (VT's), 600:120, 0.6kV insulation class, and 0.3 accuracy class at burden ratings of W, X, M, and Y. The Developer may purchase the CT's and VT's directly from PSNH.

PSNH will provide the following and bill the Developer:

1. Multi-function form 9S meter with load profile memory, telephone modem and reactive measurement capability.
2. Thirteen (13) terminal meter socket with a pre-wired ten (10) pole test switch, equivalent to a Milbank SC2420-RL-21 or Durham 1008432.
3. Seven (7) conductor, 12 AWG, type TC control cable from the CT's to the test switch.

The CT's and VT's will be mounted and the control cable installed by the Developer. Secondary connections will be made either by PSNH or under the supervision of PSNH. The physical location of the meters must be approved by PSNH and reasonable access must be assured. The meter will be installed, tested and analyzed by PSNH.

The multi-function meter must remain energized by connecting an uninterrupted power source to the meter's auxiliary power input.

The meter must be continuously compensated by means of transformer loss compensation programmed into the multi-function meter so as to register and record generation delivered to PSNH at the delivery point.

The developer shall install and maintain an analog telephone line that will be connected to the multi-function meter modem. The phone line may be a dedicated line or connected to a line sharing device such that PSNH has unfettered access to the metering data through remote interrogation on a daily basis.

Three phase station service in excess of generation is to be metered by reverse registration through the multi-function generation meter and billed under our standard three phase G rate.

C. Primary Interconnection

Sugar River Hydro 2 will deliver power to the PSNH system on the 42H2 circuit at

pole 33/5Y on Canal Street in Newport, NH. The following distribution work is required to connect this facility:

1. Extend three phase primary from PSNH pole 33/5 to new pole 33/5Y and install guy stub pole and anchor for pole 33/5Y.
2. Install customer owned pole PP1 located approximately 20 feet from PSNH pole 33/5Y. Install customer supplied and owned three phase, gang operated disconnect switch on this pole.
3. Install customer owned pole PP2 located approximately 20 feet from customer owned pole PP1. This pole will be the riser pole for the primary cable to the customer owned 300 KVA pad mounted transformer serving as generator step-up transformer.

V. PSNH PRICE ESTIMATES

The following estimates for labor, materials, and overheads are supplied as an aid to the Developer for financial planning purposes. Should the Developer elect to have PSNH perform any of the work described in the estimates, he will ultimately be billed for the full actual cost of any work performed, including overheads.

Authorization for PSNH to perform any of the work or supply any of the equipment described below must be forwarded to the Supplemental Energy Sources Department along with a minimum payment covering 50% of the estimated labor and 50% of materials cost. PSNH will neither perform work nor order materials until this requirement has been met.

A. System Protection

1. All protective relays at the generator plant, including equipment at the outdoor switchgear, will be purchased by the Developer. PSNH must be notified as to exact relay model numbers proposed before ordering to assure that proper setting capability exists for interfacing with the PSNH system.

SUBTOTAL	\$	<u>0.00</u>
----------	----	-------------

2. Engineering - PSNH review of control circuits, material specifications and development of PSNH required relay settings at the site. In addition, assistance with specifications and settings for related primary distribution equipment.

SUBTOTAL	\$	<u>1,500.00</u>
----------	----	-----------------

SECTION A TOTAL	\$	<u>1,500.00</u>
-----------------	----	-----------------

B. Metering

1. Labor and material for installation and site analysis of new metering.

SECTION B TOTAL \$ 2,500.00

C. Primary Interconnection

1. Materials, Labor, Overhead, Misc.

SECTION C TOTAL \$ 11,000.00

GRAND TOTAL (A + B + C) \$ 15,000.00

VI. INTERCONNECTION EQUIPMENT OWNERSHIP, OPERATION AND MAINTENANCE

A. Delivery Point

For the purpose of establishing ownership, operation and maintenance responsibilities, the location of facility energy delivery to PSNH (the "Delivery Point") must be defined. At this facility, the delivery point is located at the primary line taps on the PSNH line pole 33/5Y on Canal St.

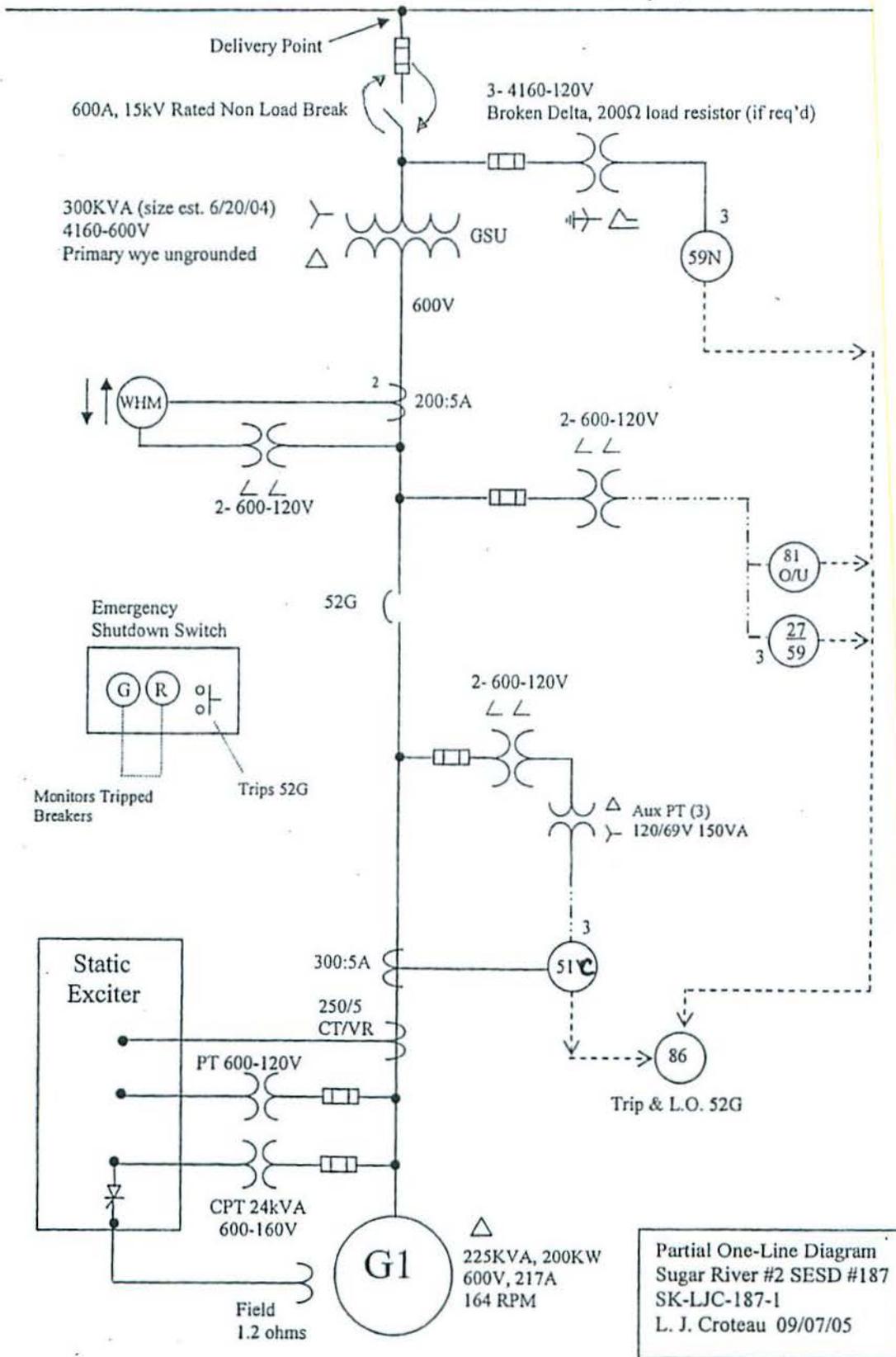
B. Description of Responsibilities

1. PSNH will own and maintain all equipment up to the delivery point. The Developer will own and maintain all equipment from the delivery point into and throughout the plant.
2. The Developer is normally responsible for operating all equipment on the facility side of the delivery point. The only exception to this rule would be if special circumstances required PSNH personnel to operate the emergency shutdown switch and/or disconnect switch.

VII. DRAWINGS

- A. Sketch SK-LJC-187-1 is attached.

4.16kV circuit 42H2 Newport, NH



Partial One-Line Diagram
 Sugar River #2 SESD #187
 SK-LJC-187-1
 L. J. Croteau 09/07/05