NORTH AMERICAN ENERGY ALLIANCE, LLC

c/o William P. Short III
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February 2, 2011

Low Impact Hydropower Institute
c/o Mr. Fred Ayer
Executive Director
34 Providence Street
Portland, Maine 04103

Re: Application of Gardners Falls project for Certification by the Low Impact Hydropower Institute

Dear Mr. Ayer:

Attached please find an application for certification by the Low Impact Hydropower Institute ("LIHI") of the Gardners Falls project (the "Project" or the "Facility") of North America Energy Alliance, LLC ("NAEA"). In 2008, NAEA purchased the Project. NAEA is a Delaware limited liability company with its principal place of business at 99 Wood Avenue South, Suite 200, Iselin, New Jersey 08830. The company owns a portfolio of 1,755 megawatts of clean and efficient electricity producing power stations located in the Northeastern United States. NAEA is wholly-owned by Industry Funds Management Pty Ltd ("IFM"), an Australian company which has completed 47 transactions in that 16-year period with approximately $5.9 billion invested in the infrastructure sector. Additional information on NAEA and IFM may be found at www.naeallc.com and www.industryfundsmanagement.us, respectively.

For purposes of responding to inquiries regarding the application, persons should contact the following:

Primary Contact

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Secondary Contact

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Gardners Falls (FERC No. 2334) is a 3.58 MW licensed, limited pond-and-release project located on the Deerfield River in Franklin County, Massachusetts. This station has an estimated annual production of 14,400 MWh. The FERC license was issued April 4, 1997 and expires on March 31, 2037. The Project has been in compliance with its license requirements. The relicensing process is not expected to begin until around 2031.

The following text or computer files are attached to this application:

1. LIHI Questionnaire Form
2. Appendix 1-1, FERC order issuing new license, issued April 4, 1997
3. Appendix 1-2 FERC order approving and modifying minimum flow monitoring plan, issued May 4, 1998
4. Appendix 1-3, FERC order approving and modifying revised fish passage plan, issued May 4, 1998
5. Appendix 1-4, FERC order approving and modifying fish passage effectiveness monitoring plan, issued May 4, 1998
6. Appendix 1-5, FERC order approving recreational use, erosion and sediment control plan, issued August 3, 1998
7. Appendix 1-6, FERC order approving cultural resources management plan, issued November 17, 1998
8. Appendix 1-7, FERC order approving and modifying plunge pool plan, issued January 21, 1999
9. Appendix 1-8, FERC order approving recreation plan in part under article 406, issued April 18, 2001
10. Appendix 1-9, FERC order approving final downstream fish passage effectiveness report and recommended modifications, issued June 14, 2001
11. Appendix 1-10, FERC order approving revised recreation plan, issued October 18, 2001
12. Appendix 1-11, Memorandum of Agreement Between Consolidated Edison Energy Massachusetts, Inc. and MDEM
13. Appendix 1-12, FERC Environmental Inspection Report, dated October 26, 2004
14. Appendix 2, Agency Contacts
15. Appendix 3-1, Description of the Facility
16. Appendix 3-2, Mode of Operation
17. Appendix 3-3, Locations of Major Items of the Facility
18. Appendix 3-4, Site Plan of the Facility
19. Appendix A, Flows
20. Appendix A-1, Demonstration of Minimum Flows
21. Appendix B, Water Quality
22. Appendix B-1, MDEP Water Quality Certificate, issued December 14, 1994
23. Appendix C, Fish Passage and Protection
24. Appendix C-1, Fish Passage Effectiveness Study
25. Appendix D, Watershed Protection
26. Appendix D-1, Demonstration of Watershed Protection
27. Appendix E, Threatened and Endangered Species Protection

28. Appendix F, Cultural Resource Protection
29. Appendix F-1, Demonstration of Cultural Resource Protection Compliance
30. Appendix G, Recreation
31. Appendix G-1, Demonstration of Recreation Compliance
32. Appendix G-2, Existing Recreational Facilities
33. Appendix H, Facilities Recommended for Removal

The application is arranged such that the control document is the LIHI Questionnaire. Back-up documents are cited in the questionnaire and may be found in the appendices.

I request that you review this application and let me know if anything additional is needed in order to place this application in front of the agency contacts and eventually the board of directors of LIHI for consideration.

Sincerely yours,

William P. Short III

enclosures

APPENDIX 1-1

GARDNERS FALLS PROJECT

FERC ORDER
ISSUED APRIL 4, 1997

A copy of FERC Order Issued April 4, 1997 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-1 FERC Order 1997_04_04."

Gardners Falls Dam

APPENDIX 1-2

GARDNERS FALLS PROJECT

FERC ORDER APPROVING AND MODIFYING MINIMUM FLOW MONITORING PLAN ISSUED MAY 4, 1998

A copy of FERC Order Issued May 4, 1998 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-2 FERC Order 1998_05_04."

Minimum Flow Gate (left), Plunge Pool (bottom) and Dam (right)

APPENDIX 1-3

GARDNERS FALLS PROJECT

FERC ORDER APPROVING AND MODIFYING REVISED FISH PASSAGE PLAN ISSUED MAY 4, 1998

A copy of FERC Order Issued May 4, 1998 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-3 FERC Order 1998_05_04."

Minimum Flow Gate

APPENDIX 1-4

GARDNERS FALLS PROJECT

FERC ORDER APPROVING AND MODIFYING FISH PASSAGE EFFECTIVENESS MONITORING PLAN ISSUED MAY 4, 1998

A copy of FERC Order Issued May 4, 1998 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-4 FERC Order 1998_05_04."

Minimum Flow Gate

APPENDIX 1-5

GARDNERS FALLS PROJECT

FERC ORDER APPROVING RECREATIONAL USE EROSION AND SEDIMENT CONTROL PLAN ISSUED AUGUST 3, 1998

A copy of FERC Order issued August 3, 1998 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-5 FERC Order 1998_08_03."

Walkway at Dam (Fish Louvers Attached)

APPENDIX 1-6

GARDNERS FALLS PROJECT

FERC ORDER APPROVING CULTURAL RESOURCES MANAGEMENT PLAN ISSUED NOVEMBER 17, 1998

A copy of FERC Order Issued November 17, 1998 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-6 FERC Order 1998_11_17."

Power Canal Entrance

APPENDIX 1-7

GARDNERS FALLS PROJECT

FERC ORDER APPROVING AND MODIFYING PLUGE POOL PLAN ISSUED JANUARY 21, 1999

A copy of FERC Order issued January 21, 1999 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-7 FERC Order 1999_01_21."

Power Canal Gates

APPENDIX 1-8

GARDNERS FALLS PROJECT

FERC ORDER APPROVING RECREATION PLAN IN PART UNDER ARTICLE 406 ISSUED APRIL 18, 2001

A copy of FERC Order issued April 18, 2001 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-8 FERC Order 2001_04_18."

Power Canal

APPENDIX 1-9

GARDNERS FALLS PROJECT

FERC ORDER APPROVING FINAL DOWNSTREAM FISH PASSAGE EFFECTIVENESS REPORT AND RECOMMENDED MODIFICATIONS ISSUED JUNE 14, 2001

A copy of FERC Order issued June 14, 2001 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-9 FERC Order 2001_06_14."

Sluice Gate

APPENDIX 1-10

GARDNERS FALLS PROJECT

FERC ORDER APPROVING REVISED RECREATION PLAN ISSUED OCTOBER 18, 2001

A copy of FERC Order issued October 18, 2001 may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-10 FERC Order 2001_10_18."

Brook Crossing Scenic Trail

APPENDIX 1-11

GARDNERS FALLS PROJECT

MEMORANDUM OF AGREEMENT BETWEEN CONSOLIDATED EDISON ENERGY MASSACHUSETTS, INC. AND MDEM

A copy of Memorandum of Agreement may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-11 Memorandum of Agreement."

Wilcox Hollow

APPENDIX 1-12

GARDNERS FALLS PROJECT

FERC ENVIRONMENTAL INSPECTION REPORT DATED OCTOBER 26, 2004

A copy of FERC Environmental Inspection Report, dated October 26, 2004, may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix 1-12 FERC Environmental Inspection Report 2004_10_26."

Power House Trash Rake

APPENDIX 2

GARDNERS FALLS PROJECT

AGENCY CONTACTS

Army Corps of Engineers
Steve Andon; (978) 318-8007
steve.a.andon@usace.army.mil

Fish and Wildlife Service
John Warner; (603) 223-2541, x-15
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National Park Service, Rivers and Special Studies Branch
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Natural Resources Conservation Service
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Federal Energy Regulatory Commission
Kimberly D. Bose, Secretary; (202) 502-8400
kimberly.bose@ferc.gov

Federal Energy Regulatory Commission – New York Regional Office
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Massachusetts Division of Fisheries and Wildlife
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Massachusetts Historical Commission (SHPO)
Brona Simon; (617) 727-8470
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American Rivers
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American Whitewater
Mark Singleton: (828) 586-1930
mark@americanwhitewater.org

Appalachian Mountain Club
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kkimball@outdoors.org

Conservation Law Foundation
Cynthia Liebman; (617) 350-0990
cliebman@clf.org

Deerfield Rivers Watershed Association
Francoise Hatte; **(no telephone listing)**
drwa@deerfieldriver.org

Trout Unlimited
Charles Olchowski; (413) 773-5920
charlieolchowski@mtdata.com

Trout Unlimited
Jeff Readon; (207) 236-2427
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APPENDIX 3-1

Gardners Falls Project

Description of the Facility

The Gardners Falls project (the "Project"), licensed by the Federal Energy Regulatory Commission ("FERC") as Project No. 2234, is owned by North American Energy Alliance, LLC ("NAEA").[1] The project is located in the Towns of Buckland and Shelburne in Franklin County, Massachusetts, at approximate river mile 15.8 on the Deerfield River. The Project was originally constructed in 1904. The original project included two hydro-electric turbines. The powerhouse was expanded in 1914 with the installation of two more turbines, followed by a final expansion in 1924 with the addition of a fifth turbine. One of the original turbines ("Unit 1") was retired in 1971. The Unit 1 penstock was plugged and filled in when the unit was removed from service. Currently, the Project is semi-automated and contains four active units.

The major project works consist of a dam and impoundment, a power canal, an intake structure and a powerhouse. Specifically, the Project consists of: (1) a concrete gravity dam, 337 feet long with a maximum height of 30 feet at permanent crest elevation 332.79 feet mean sea level (msl) and flashboard elevation 334.79 feet msl, (2) an impoundment 3,200 feet long, with a surface area of 21 acres, 190 acre-feet gross storage and 37.2 acre-feet usable storage, (3) a brick and concrete powerhouse equipped with four turbine-generator units with total capacity 3.58 MW, (4) a 1,300-foot power canal 31 feet wide and 15 feet deep, and (5) a double circuit 13.8 KV transmission line connecting the Gardners Falls project to the Montague substation.

The Gardners Falls project is situated among nine other hydroelectric facilities located on the Deerfield River. All of the other nine facilities are owned and operated by an affiliate of TransCanada Corporation, and eight are licensed as one project ("Deerfield River Project," FERC No. 2323). The Deerfield River Project consists of one storage facility (Somerset Development) and seven hydroelectric facilities (Searsburg, Harriman, and Sherman Developments, and the Deerfield No. 5, No. 4, No. 3 and No. 2 Developments). A pumped-storage project (Bear Swamp

[1] At the time of re-licensing during the 1990s, the Project was owned by Western Massachusetts Electric Company. In the late 1990s, the Project was sold to an affiliate of Consolidated Edison Company of New York, Inc. In 2008, the project was sold to its current owner NAEA.

Project), owned by Bear Swamp Power Company, LLC and operated by Brookfield Renewable Power, is licensed by the FERC as Project No. 2669 and is located below the Deerfield No. 5 development. The Deerfield River Project (FERC No. 2323) also underwent FERC relicensing at the same time as the Gardners Falls project.

While the Project operates as a limited pond-and-release mode, several of the upstream hydroelectric facilities on the Deerfield River are operated primarily during the daily peak demand periods. Flows into the Gardners Falls project, which is located between Deerfield Developments 3 and 2, are dependent upon flow releases from TransCanada's upstream projects. The Gardners Falls project is operated in a limited pond-and-release mode, utilizing the small storage capacity (37.2 acre-feet) afforded by a maximum 1.8–foot drawdown to accommodate the flows caused by the upstream peaking operations.

The operating mode of the Gardners Falls project does not change during dry, mean or high water years. As flows vary at the Project, the number of turbines operating and the duration of operation changes, increasing and decreasing the amount of annual generation realized.

APPENDIX 3-2

Gardners Falls Project

Mode of Operation

The Gardners Falls project is situated among nine other hydroelectric facilities located on the Deerfield River. All of the other nine facilities are owned and operated by an affiliate of TransCanada Corporation, and eight are licensed as one project ("Deerfield River Project," FERC No. 2323). The Deerfield River Project consists of one storage facility (Somerset Development) and seven hydroelectric facilities (Searsburg, Harriman, and Sherman Developments, and the Deerfield No. 5, No. 4, No. 3 and No. 2 Developments). A pumped-storage project (Bear Swamp Project), owned by Bear Swamp Power Company, LLC and operated by Brookfield Renewable Power, is licensed by the FERC as Project No. 2669 and is located below the Deerfield No. 5 development.

While the Project operates as a limited pond-and-release mode, several of the upstream hydroelectric facilities on the Deerfield River are operated primarily during the daily peak demand periods. Flows into the Gardners Falls project, which is located between Deerfield Developments 3 and 2, are dependent upon flow releases from TransCanada's upstream projects. The Gardners Falls project is operated in a limited pond-and-release mode, utilizing the small storage capacity (37.2 acre-feet) afforded by a maximum 1.8–foot drawdown to accommodate the flows caused by the upstream peaking operations.

The operating mode of the Gardners Falls project does not change during dry, mean or high water years. As flows vary at the Project, the number of turbines operating and the duration of operation changes, increasing and decreasing the amount of annual generation realized.

With relicensing, the licensee installed the necessary monitoring equipment at the time of construction of the new minimum flow/fish passage gate during the summer/fall of 1998. Operation of the gate is controlled by a Programmable Logic Controller (PLC) located in the powerhouse. The PLC is remotely monitored and has been calibrated by the manufacturer so that flows can be verified as a function of the hydraulic head of the gate. The PLC records time, pond elevation, and gate crest elevation. From this data the hydraulic head on the gate can be used to compute the flow passed by the gate. The licensee reviews the flow data

periodically and takes actions necessary to ensure that the flow requirements are being met. If revisions to the monitoring plan are necessary, the licensee would then prepare a revised plan and consult with the U.S. Fish & Wildlife Service ("USFWS") and Massachusetts Division of Fisheries and Wildlife ("MDFW") prior to filing the plan with the Commission.

The licensee installed a new gate in response to USFWS's concerns for the continuous release through a fish passage/minimum flow gate in the crest of the dam of the 100 cubic feet per second ("cfs") guaranteed inflow during a power loss. This gate was designed to pass the required minimum flow of 150 cfs as the level of the reservoir rises or falls. In the event of a power loss, the gate is set to open to a depth of 3 feet which would allow the passage of 100 cfs during the salmon smolt passage season.[2] The depth of the gate is set to release 150 cfs or inflow which would always be at least 100 cfs. The 100 cfs inflow to the project impoundment is the guaranteed release from the upstream Deerfield No. 3 Development of Project No. 2323. To meet the minimum flow requirement of 150 cfs when inflow is less than 150 cfs but greater than 100 cfs, the licensee uses available storage up to 37 acre-feet. After this quantity of water is depleted to maintain the 150 cfs release, at least 100 cfs would continue to be released through the gate.

In regards to the monitoring plan, USFWS along with the MDFW are to be notified in the event of a minimum flow violation. Inflow to the project impoundment should always be 100 cfs and that upon a power loss the gate should be set to open 3 feet or to elevation 330 feet to pass 100 cfs.

The licensee's plan to monitor the minimum flows described above satisfies the requirements of article 402. The plan includes a description of how the required minimum flow release would be augmented from reservoir storage when needed.

In summary, the licensee's plan to monitor the minimum flows required in article 401 and to augment minimum flows from reservoir storage fulfills both the requirements of article 402 and contributes to the protection of fish and other aquatic resources in the Deerfield River.

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[2] The minimum flow gate is only designed to close hydraulically. It opens by gravity with help from the weight of the water passing over it. Actual operation has the gate constantly being opened by water flow and, when flow through the gate becomes greater than 150 cfs (as determined by the PLC), the gate is hydraulically closed until only 150 cfs are passing through it. Thus, in the event of power loss, the gate *fails* into a wide open position, allowing all inflow into the gate to pass.

APPENDIX 3-3

Gardners Falls Project

Locations of Major Items of the Facility

The major components of the Gardners Falls project may be viewed on Goggle Earth and may be found at the following latitudes and longitudes:

Facility	**Latitude**	**Longitude**
a concrete gravity dam	43^0 35’29.47” N	72^0 43’42.58” W
a brick and concrete powerhouse	43^0 35’21.56” N	72^0 43’35.66” W
a 3,200 feet long impoundment	43^0 35’31.81” N	72^0 43’50.31” W
a 1,300-foot power canal	43^0 35’24.70” N	72^0 43’44.66” W

Unit Intake House

APPENDIX 3-4

Gardners Falls Project

Site Plan of the Facility

The site plan of the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled “Appendix 3-4 Site Plan of the Facility.”

Tailrace

APPENIDX A

Gardners Falls Project

Flows

The facility is in compliance with resource agency recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches.

The licensee releases from Gardners Falls dam a minimum flow of 150 cfs, or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish resources in the bypassed reach of the Deerfield River. The minimum flow is comprised of the total flows over the dam and flows through the downstream fish passage facility.

The licensee installed a new gate in response to USFWS's concerns for the continuous release through a fish passage/minimum flow gate in the crest of the dam of the 100 cfs guaranteed inflow during a power loss. This gate was designed to pass the required minimum flow of 150 cfs as the level of the reservoir rises or falls. In the event of a power loss, the gate is set to open to a depth of 3 feet which would allow the passage of 100 cfs during the salmon smolt passage season. The depth of the gate is set to release 150 cfs or inflow which would always be at least 100 cfs. The 100 cfs inflow to the project impoundment is the guaranteed release from the upstream Deerfield No. 3 Development of Project No. 2323. To meet the minimum flow requirement of 150 cfs when inflow is less than 150 cfs but greater than 100 cfs, the licensee uses available storage up to 37 acre-feet. After this quantity of water is depleted to maintain the 150 cfs release, at least 100 cfs would continue to be released through the gate.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the Licensee and the MDFW. If the flow is so modified, the licensee notifies FERC as soon as possible, but no later than ten days after each such incident.

The Gardners Falls project consists of a dam site located on the Deerfield River. The 77-mile long Deerfield River originates in the Green Mountains of southern

Vermont and discharges into the Connecticut River, about 15.8 miles downstream of the project area at Greenfield, Massachusetts. The following flow parameters are extrapolated from 45 years of United States Geological Survey ("USGS") (1940-1985) records from hydrologic gaging station No. 01170000, located on the Deerfield River near West Deerfield, Massachusetts, located about 7.2 miles downstream of the Gardners Falls dam site. The drainage area at this gage is 557 square miles and the drainage area at the hydropower project site is 501 square miles. The mean annual discharge at the project is 1,286 cfs with a minimum and maximum historical discharge of 28 cfs, recorded in July 29, 1962, and 48,500 cfs, recorded in December 31, 1948, respectively. Additional flow parameters for the Deerfield River related to the project area are as follows:

- high flow: approximately 2,200 cfs; flow exceeded 10 percent of the time;
- low flow: approximately 225 cfs; flow exceeded 90 percent of the time;
- 7Q10 flow: 145 cfs (the 7Q10 flow refers to the minimum 7-day average flow rate expected to occur once every 10 years and is based on 0.29 cfs per square mile of drainage area).

The dam creates an average 9-foot deep, 21-acre impoundment that is 3,200 feet long, with a normal surface elevation of 334.8 feet USGS datum, normal tailwater elevation of 295.8 feet and average gross head of 38.1 feet.

In summary, the licensee operates the Gardners Falls Project in a limited pond-and-release mode for the protection of water quality, aquatic resources, and aesthetic values in the Deerfield River. This 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 Commission and MDFW.

APPENIDX A-1

Gardners Falls Project

Demonstration of Minimum Flows

A copy of the latest FERC compliance filing for the minimum flow requirements for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled “Appendix A-1 FERC Minimum Flow Compliance Filing.”

Power House Substation

APPENIDX B

Gardners Falls Project

Water Quality

The facility is in compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the facility after December 31, 1986.

Under Section 401(a)(1) of the Clean Water Act ("CWA"),[3] an applicant for a federal license or permit to conduct any activity that may result in any discharge into navigable waters must obtain from the state in which the discharge originates certification that any such discharge will comply with applicable water quality standards. The Commission may therefore not issue a license for a hydropower project unless the relevant state agency either has issued a water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year.[4]

The Massachusetts Department of Environmental Protection ("MDEP"), on December 14, 1994, issued a Section 401 certification for the Gardners Falls project.[5] The certification contains ten conditions, labeled A to J. All the certification conditions are included in the new license, except for those discussed next, which the Commission conclude are beyond the scope of CWA Section 401.

Condition H of the certification provides that any modification of project operation that would affect the state's certification conditions must be approved by Massachusetts, and Condition J reserves Massachusetts' right to review, and modify, if necessary, its certification conditions if the Vermont certification for the Vermont developments of Project No. 2323 results in non-compliance with the Massachusetts certification. These conditions in effect give Massachusetts the opportunity to revisit its certification. Section 401(a)(3) of the CWA sets out the exclusive manner in which state certifications may be modified and makes clear that the process is to be initiated by the federal licensing agency, not the state.[6]

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[3] 33 U.S.C. 1341(a)(1).

[4] Id.

[5] See Appendix A of Appendix 1-1 FERC Order 1997_04_04

[6] See, e.g., Great Northern Paper, Inc., 77 FERC 61,068 at pp. 61,271-73 (1996).

Thus, the Commission determines whether proposed license amendments require new water quality certification.[7] Conditions H and J are therefore beyond the scope of Massachusetts authority under Section 401 and were not be included in the license.

The existing water quality at the Gardners Falls project is classified by the MDEP as a Class B, warmwater fishery. In Massachusetts, general standards govern levels of oil and grease, radioactive substances, color, odor, form, turbidity, floating or suspended solids, nutrients, and aesthetics (314 CMR 4.03 (1988)) for all waters. In addition, the Class B warmwater fishery classification requires the water to have a minimum of 5.0 mg/l of dissolved oxygen (D.O.); temperature must be less than 83°F; pH must be between 6.5 and 8.0 standard units, and fecal coliform bacteria counts must not be more than 200 per 100 ml sample.

The facility area and the downstream reach are currently identified by the US EPA as meeting water quality standards pursuant to Section 303(d) of the CWA.[8] While the US EPA noted that several pollutants[9] are present in the Deerfield or its tributaries,[10] none appear to be found in the Deerfield River immediate above or before the Gardners Falls project (between Deerfield Number 3 and Deerfield Number 2 dams).

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[7] The Commission's regulations, 18 C.F.R. 4.38(7)(iii), provide that, if an applicant seeks to amend its application or license, it must make a new request for water quality certification if the amendment would have a material adverse impact on the discharge from the project.

[8] Information on this US EPA determination can be found at http://iaspub.epa.gov/tmdl_waters10/huc_rept.control?p_huc=01080203&p_huc_desc=DEERFIELD&p_cycle=2006.

[9] Mercury, pathogens, metals (other than mercury), PCBs, pollutants in urban stormwater and pH.

[10] Chickley River, Davis Mine Brook, Green River, Plainfield Pond, Sherman Reservoir and South River.

APPENDIX B-1

Gardners Falls Project

MDEP Water Quality Certificate
Dated December 14, 1994

A copy of the MDEP Water Quality Certificate, dated December 14, 1994, for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix B-1 MDEP Water Quality Certificate 1994_12_14."

Sluice Gate Discharge

APPENDIX C

Gardners Falls Project

Fish Passage and Protection

The facility is in compliance with mandatory fish passage prescriptions for upstream and downstream passage of anadromous and catadromous fish issued by resource agencies after December 31, 1986.

In summary, the Commission agreed to follow the recommendations of Western Massachusetts Electric Company's ("WMECO") EIS, and require, in article 403, that the licensee submit a plan to the Commission for the construction of downstream fish passage facilities at the Project. Following the issuance of the Project's license, WMECO installed a jetty extension and the downstream fish passage facilities. Subsequently, WMECO finalized the design of the plunge pool. Between 1999 and 2000, WEMCO and ConEdison Energy (the new licensee after July 1, 1999) conducted several tests of the effectiveness of the fish passage facility. By combining survivals through the various passage routes (bypass, spillage and turbines), the estimated project passage survival was determined to be approximately 94%. The Commission found that licensee's plan to monitor the effectiveness of the downstream fish passage facilities and associated operational flows, required by article 403, fulfilled the requirements of article 404 and should contribute to the restoration of Atlantic salmon in the Deerfield River basin.

A valid Section 18 prescription should mandate a specific physical structure, facility, or device for fish passage, or measures related to such structures. Interior's purported prescription included conditions that are beyond the scope of its authority under FPA Section 18. During the re-licensing of the Project (early-to-mid-1990's), Interior discussed the licensee's proposal to install a louver system with bypass at the project but did not adopt the proposal as its own. Interior did not specify the exact type of downstream fish passage facility to be installed at the project. Instead, Interior required WMECO to provide functional design drawings for Interior's approval four months from the issuance date of the license and final designs within two years after issuing the license. The Commission; however, retains final authority to approve all project structures, including fishways.[11] Interior required that the facility be constructed and operational within two years of

[11] Lynchburg Hydro Associates, 39 FERC 61,079 (1987).

the issuance of the license. Only the Commission, however, has the authority to control the timing of activities under a Commission-issued license. The Commission concluded that in these respects Interior's October 5, 1994 submission is not a valid Section 18 prescription. The Commission agreed, however, to follow the recommendations of WMECO's EIS, and require, in article 403, that the licensee submit a plan to the Commission for the construction of downstream fish passage facilities at the Project.

The Commission recognized that future fish passage needs cannot always be determined at the time of project licensing. The Commission's practice has been to include a license article that reserves the Secretary's authority to prescribe facilities for fish passage.[12] Therefore, article 405 of the license reserved the Commission's authority to require fishways that the Secretary of the Interior may prescribe in the future.

Following the issuance of the Project's license, WMECO initially installed a jetty extension and the downstream fish passage facilities.[13] However, the final design of the plunge pool was delayed until after the new minimum flow gate was operational. These changes in downstream fish passage plan were based upon the need for further site investigations in order to determine flow release patterns prior to finalizing the design of the plunge pool. This revised plan was discussed with the resource agencies and it incorporated the conditions of these agencies to protect fish resources during the construction activities.

Following the finalization of the design of the plunge pool, WMECO and ConEdison Energy (the new licensee after July 1, 1999) prepared a plan to monitor the effectiveness of the downstream fish passage facilities at the Project in an attempt to satisfy the requirements of article 404 of the license. The plan includes a program to monitor the downstream movement of radio-tagged Atlantic salmon smolts to determine the effectiveness of the fish passage facility. The licensee's plan includes a schedule for providing and filing the results of the monitoring to the resource agencies and with the Commission, respectively.

Between 1999 and 2000, initially WMECO and later ConEdison Energy conducted several tests of the effectiveness of the fish passage facility. A total of 199 radio-

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[12] The Commission has specifically sanctioned the reservation of fishway prescription authority at relicensing. See Wisconsin Public Service Corporation, 62 FERC 61,095, for the authority to require fishways that the Secretary of the Interior may prescribe in the future.

[13] For a discussion of the specifics of the fish passage/minimum flow gate in the crest of the dam, please see Appendix A Gardners Falls Project Flows.

tagged smolts were verified as passing the Project by either the bypass, spillage or turbine passage. Of the 199 fish, 109 (55%) used the bypass gate, 19 (9%) passed by the spillway, and 67 (34%) passed through the turbines and contact was lost with 4 (2%) of the fish. 59 out of the 67 fish (88%) that passed through the Gardners Falls turbines were detected at the next downstream project. By combining survivals through the various passage routes (bypass, spillage and turbines), the estimated project passage survival was approximately 94%.[14]

In conclusion, the Commission found that licensee's plan to monitor the effectiveness of the downstream fish passage facilities and associated operational flows, required by article 403, fulfilled the requirements of article 404 and should contribute to the restoration of Atlantic salmon in the Deerfield River basin.

Walkway and Min Flow Gate

[14] A copy of the Fish Passage Effectiveness Study for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix C-1 Fish Passage Effectiveness Study."

APPENDIX C-1

Gardners Falls Project

Fish Passage Effectiveness Study

A copy of the Fish Passage Effectiveness Study for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix C-1 Fish Passage Effectiveness Study."

Walkway at Dam (Fish Louver Attached)

APPENDIX D

Gardners Falls Project

Watershed Protection

The facility is in compliance with both state and federal resource agencies recommendations for a license-approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project.

On April 6, 1998, WMECO, the then licensee, filed a Recreational Use Erosion and Sediment Control Plan (the "Plan") for the Gardners Falls project, FERC No. 2334. The Plan was required by article 407 of the project license issued on April 4, 1997. Commission staff found that the Plan filed on April 6, 1998, consistent with article 407 and that all agency comments were incorporated. Accordingly, on August 3, 1998, the Director ordered the Plan filed for the Gardners Falls project approved and made part of the license.

Article 407 requires the licensee to file a plan to include provisions for: (1) designing and implementing appropriate erosion and sediment control measures and measures for revegetation of land-clearances and ground-disturbances associated with improvement and construction of any new recreational facilities not covered by the relicensing action; and (2) regularly-scheduled monitoring and maintenance for all recreational use areas at the project for the purpose of identifying and implementing appropriate and timely measures to control and remedy erosion, sediment, and reservoir and river bank problems which may develop over time as a result of recreational use. The article also requires that the plan be based on the recommendations of the United States National Park Service ("USNPS"), the USFWS, the Massachusetts Department of Environmental Management ("MDEM"),[15] and the United States Natural Resources Conservation Service ("USNRCS").

The licensee stated there is no specific future recreational development anticipated which was not identified during relicensing. The licensee agreed to consult with the resource agencies designated in article 407 when any new recreational development is proposed. If it is determined that control measures are required, the licensee agreed to consult with the agencies to ensure that ground disturbance

[15] Subsequently, MDEM was incorporated into and re-named the Massachusetts Department of Conservation and Recreation ("MDCR").

is minimized and that any necessary measures to prevent soil erosion and/or sediment transport are properly designed and implemented. All agency recommendations will be incorporated into the final design. No ground disturbance activities will take place until agency concurrence has been obtained.

The licensee agreed to inspect Project recreational facilities each year prior to the start of the recreation season (April 15). Periodic monitoring will take place monthly during the recreation season to determine whether soil erosion or sediment transport has occurred or is ongoing.[16] If soil erosion and sediment transport has occurred, the area will be restored to its original condition as soon as possible. If soil erosion and/or sediment transport are ongoing, the appropriate measures will be implemented to prevent any further erosion or sediment transport. The area will be restored to its original condition and appropriate measures will be implemented to prevent any future impacts.

The licensee consulted with the USNPS, USFWS, USNRCS, MDEM, and the MDFW. The USNRCS was the only agency which commented on the plan. The USNRCS noted the need to consult with the local conservation commissions, the MDEP and the U.S. Army Corps of Engineers. The NRCS also stated that a detailed erosion and sediment control plan should be included as part of the project design.

Commission staff found that the Plan filed on April 6, 1998, consistent with article 407 and that all agency comments were incorporated. In addition, Commission staff found that implementing the plan should minimize erosion related to recreation use at the project. Accordingly, the Director ordered the Plan filed on April 6, 1998, for the Gardners Falls project, approved and made part of the license.

[16] A copy of the latest FERC compliance filing for Watershed Protection for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix D-1 Demonstration of Watershed Protection."

APPENDIX D-1

Gardners Falls Project

Demonstration of Watershed Protection Compliance

A copy of the latest FERC compliance filing for Watershed Protection for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix D-1 Demonstration of Watershed Protection."

Back Wall of Powerhouse over #3 & #4 Tailrace

APPENDIX E

Gardners Falls Project

Threatened and Endangered Species Protection

There are no threatened or endangered species listed under state or federal Endangered Species Acts present in the facility area and/or the downstream reach. (A website link to a list of Massachusetts threatened, endangered or special concern species can be found in the footnote at the end of this Appendix).[17]

In conjunction with the EIS prepared by WMECO in connection with relicensing, both the MDFW and USFWS were consulted to determined whether any federally listed or proposed threatened and endangered species under the jurisdiction of MDFW or USFWS are known to occur in the project area, with the exception of occasional, transient, individuals including bald eagles.

The USFWS reported that no known federally listed populations of endangered, threatened or rare botanical species occur in the project area. Only the mountain alder (Alnus viridis ssp. crispa – special concern to MDFW) was found on the west side of the bypass reach in the unconsolidated shore vegetation.

The shortnose sturgeon is the only federally listed endangered fish species in Massachusetts. The habitat and distribution of this species does not include the project area. Massachusetts lists several fishes as rare; however, MDFW reported

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[17] The Massachusetts Division of Fisheries and Wildlife maintains a list of threatened, endangered and special concern species on its website at http://www.mass.gov/dfwele/dfw/nhesp/species_info/mesa_list/mesa_list.htm. The following fish species are listed as threatened, endangered or special concern. None appear to be found in the Deerfield River immediate above or before the Gardners Falls project (between Deerfield Number 2 and Deerfield Number 3 dams).

Federally Endangered Species	Shortnose Sturgeon (Acipenser brevirostrum)
Massachusetts Endangered Species	Atlantic Sturgeon (Acipenser oxyrinchus) Lake Chub (Couesius plumbeus) Northern Redbelly Dace (Phoxinus eos) Shortnose Sturgeon (Acipenser brevirostrum)
Massachusetts Threatened Species	American Brook Lamprey (Lampetra appendix) Threespine Stickleback (Gasterosteus aculeatus)
Massachusetts Special Concern Species	Eastern Silvery Minnow (Hybognathus regius) Bridle Shiner (Hybognathus regius) Longnose Sucker (Catostomus catostomus) Burbot (Lota lota)

that these species occur only in headwaters, tributaries or other upstream areas of the Deerfield drainage not affected by the Gardners Falls project.

Both the MDFW and USFWS reported that there were no threatened, rare or endangered wildlife species known to occur in the project area, and none were discovered during any field survey.

APPENDIX F

Gardners Falls Project

Cultural Resource Protection

The facility is in compliance with all requirements regarding cultural resource protection, mitigation or enhancement included in its FERC license. In view of the results of discovery efforts and the SHPO's determination, the FERC found that the project would have no effect on any structure, site, building, district, or object listed in or eligible for listing in the National Register of Historic Places.

Specifically, on April 3, 1998, WMECO, the then licensee, filed a Cultural Resources Management Plan ("CRMP") for the Gardners Falls project, FERC No. 2334. The CRMP is required by article 408 of the project license issued April 4, 1997. Subsequent to comments by the State Historic Preservation Office (SHPO), the licensee filed a final CRMP on June 2, 1998. Accordingly, on November 17, 1998, the Director ordered the CRMP for the Gardners Falls project approved and made part of the license.

Article 408 requires the licensee to implement the Programmatic Agreement (PA) executed on September 4, 1996,[18] and file a CRMP for mitigating the project's effects on historic properties. The licensee's CRMP states the Gardners Falls project dam, power canal, and powerhouse and its appurtenant buildings and structures are eligible for listing in the National Register of Historic Places. The CRMP also identified within the Area of Potential Effect a possible prehistoric rockshelter site and one historic stone foundation site.

The CRMP lists the types of activities that could have an impact on archaeological resources and require consultation with the SHPO. The CRMP also lists the activities which could not have an impact on cultural resources and would not require SHPO consultation. The CRMP also sets forth the guidelines for dealing with the discovery of new properties during routine project operation and maintenance.

The CRMP also contains procedures for public interpretation and shoreline monitoring. For properties discovered along the shoreline, the licensee will give

[18] Signatories to the PA include the Federal Energy Regulatory Commission, State Historic Preservation Officer and the Advisory Council On Historic Preservation. The licensee was a concurring party.

priority to in-place preservation through shoreline stabilization. If data recovery is found to be necessary, the licensee will develop a recovery plan which is consistent with the Advisory Council on Historic Preservation's ("ACHP") principles and procedures. The CRMP proposes to follow the ACHP's policy statement and relevant state laws and guidelines for the treatment and disposition of human remains. The CRMP was developed according to the requirements set forth in the Interior's Standards and Guidelines and addresses the professional qualification standards.

The licensee consulted with the SHPO during the development of the CRMP and adequately incorporated all of its comments into the final plan. Commission staff forwarded the proposed CRMP to ACHP for their comment pursuant to section II, B of the PA. In a letter dated November 2, 1998, the ACHP had no objection to the CRMP's implementation. The licensee is required, by section II, D of the PA that on every anniversary of the license issuing, to file annually a report with the Commission and the SHPO of activities conducted under the implemented CRMP.[19]

Commission staff found that the final CRMP sets the appropriate standards and guidelines to protect unknown sites if found in the future and is consistent with the requirement of article 408 and the approved PA. Accordingly, on November 17, 1998, the Director ordered the CRMP for the Gardners Falls project approved and made part of the license.

[19] A copy of the latest FERC compliance filing for Cultural Resource Protection for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix F-1 Cultural Resources Plan."

APPENDIX F-1

Gardners Falls Project

Demonstration of Cultural Resource Protection Compliance

A copy of the latest FERC compliance filing for Cultural Resource Protection for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix F-1 Cultural Resources Plan."

Power House

APPENDIX G

Gardners Falls Project

Recreation

The facility is in compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license. In addition, the facility allows access to the reservoirs and downstream reaches without fees or charges.

On December 31, 1962 WMECO submitted an application for license to the Federal Power Commission (FPC, predecessor agency to the FERC) for the Gardners Falls project. The license order required WMECO to file a proposed Recreational Use Plan by July 15, 1965. A plan was subsequently prepared and submitted for FPC approval on July 13, 1965. The plan received FPC approval on April 5, 1966. The facilities outlined in the plan were constructed in 1966 and 1967. The facilities have been maintained and improved over the years.

In the 1960's, as now, one of the primary concerns of recreationists of the area was convenient access to the Deerfield River. Massachusetts Route 2 provides the most direct access to the river, crossing the river above the Town of Shelburne Falls and following the river for about 12 miles. However, due to the steep river gorges and existing developments, convenient access is limited. WMECO identified this concern in its original recreational plan. To make additional access available, WMECO proposed to purchase a tract of land between Route 2 and WMECO's land downstream of the Gardners Falls powerhouse on the north bank of the river across from the powerhouse. The purchase was completed in the 1970's. The tract was then donated to the Commonwealth of Massachusetts for future recreational development. The Commonwealth has designated their parcel as the Wilcox Hollow State Forest.

WMECO also purchased a strip of land between the donated parcel and Route 2, to provide direct access to the Commonwealth land. The WMECO land along the Deerfield River adjacent to the Commonwealth property completed the access route. The gravel access road described above was constructed in the 1970's from Route 2 to the water's edge.

The recreational facilities constructed by WMECO and now maintained by NAEA at the Gardners Falls project were designed only for day use. The primary use of the area is for fishing, as the MDFW stocks the impoundment several times during the spring with adult trout as a put-and-take fishery. Other uses include picnicking, walking and jogging along the access road, which is infrequently used by vehicles and provides a scenic route.

In recent years, there has been an increasing public demand for improved access to the river, especially for day use activities, including canoeing and kayaking. Project waters are presently accessible to car-top boats. On the upstream side of the dam above the boat barrier is a concrete boat launch. This provides boat access to the impoundment up to the Deerfield No. 3 tailrace

In 2001 the MDEM and ConEd Energy agreed that universal angler across at the Wilcox Hollow site is not feasible or maintainable. In lieu of universal angler access at Wilcox Hollow, ConEd Energy made a gift of $45,100 to the MDEM, payable to the Department of Environmental Management Conservation Trust, to be used to provide an equivalent opportunity within 20 miles of the Gardners Falls Project. The MDEM will use these funds for construction or improvements of a universal angler access facility and/or programming at an alternate site, to be managed and maintained by MDEM at its sole cost and expense. If it is not feasible to provide such an opportunity within the 20-mile radius, funds may be used to provide such opportunities as near to the Project as is feasible.

At the same time, access to the Deerfield River at Wilcox Hollow was formalized. Access is to be by a gravel road that extends through property owned by the Massachusetts Highway Department, Northeast Utilities, MDEM and ConEd Edison (now NAEA). NAEA has no obligation or responsibilities for the construction or the maintenance of any access improvements or for portions of the gravel road not owned by NAEA. However, NAEA is responsible for the maintenance of the section of the gravel road that is currently owns.

The existing recreational facilities associated with the Gardners Falls project are shown in Appendix G-2 of this LIHI application and are described below:

Picnic Areas

A short distance down the access road (Old Conway Road) from the public highway (Conway Road) is a picnic area on a bluff overlooking the Gardners Falls impoundment. This area is operated and maintained by

NAEA. Parking has been provided for 15 to 20 cars. Adjacent to the parking area is a picnic area with picnic tables, raised charcoal grills and garbage barrels.

Parking is also available near the powerhouse for approximately five or six cars. Fisherman also park near the canal headgates in three flat graveled areas which can hold a total of about 10 vehicles.

Access Trails in the Impoundment, Canal and Trailrace Area

From the picnic area, a foot trail leads to the Gardners Falls impoundment. A set of timber stairs set into the side of the bluff allows descent to the river. At the base of the bluff, the trail passes over a brook via a timber foot bridge.

At the end of the foot trail, additional trails follow the impoundment, upstream and downstream, to provide additional areas to the impoundment and a scenic trail for nature walks or exercise.

Access to the impoundment can also be gained from a path immediately upstream of the canal intake structure at the dam. Parking is available at the dam for approximately 10 cars. A boat barrier was installed across the impoundment upstream of the dams in 1991. The barrier is installed in May 15 of each year and removed after November 15 of each year, in accordance with FERC requirements.

The Project canal consists of a straight channel, with natural banks; the western bank abuts a forested lowland at the toe of a steep, wooded slope. It provides an attractive setting for hiking. Access to the canal area is possible from the access road that parallels the canal. Access to the wooded shore of the canal is also provided by a foot trail along the canal on the opposite side from the access road. The trail starts at the dam and passes through a wooded area and a pine grove. Several rustic crossings over brooks and streams have been provided along the trail. The trail extends from the dam to the powerhouse tailrace area, and is marked by wooden signs.

The trail along the canal continues downstream from the powerhouse along the river's edge for several hundred feet. The trail provides fishing access to the tailrace area and to the river below the project. A second trail crosses structures of the powerhouse and leads back to the access road.

NAEA also owns a strip of land along the river on the opposite side of the river from the powerhouse. This area is referred to as Wilcox Hollow. Access to this land is obtained from Route 2. There is a gravel road from Route 2 that leads to the Wilcox Hollow area. That road passes through state property to the strip of land which NAEA owns along the river. The gravel road extends across NAEA land to the river's edge, approximately 300 feet downstream of the powerhouse. At the end of the gravel road is a turn-around. The Wilcox Hollow area provides an informal access to the river across from the powerhouse. It is used frequently by anglers and, occasionally, by kayakers and canoeists.

APPENDIX G-1

Gardners Falls Project

Demonstration of Recreation Compliance

A copy of the latest FERC compliance filing for recreation for the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Appendix G-1 Demonstration of Recreation."

Nature Trail Bridge over Tailrace

APPENDIX G-2

Gardners Falls Project

Existing Recreational Facilities

A map of the Existing Recreational Facilities at the Gardners Falls project may be found on the portion of the LIHI website devoted to the Gardners Falls application and is titled "Existing Recreational Facilities at the Gardners Falls Project."

Nature Trail Fence along Bridge

APPENDIX H

Gardners Falls Project

Facilities Recommended for Removal

There is no resource agency recommendation for removal of the dam associated with the facility.

Power House