LOW IMPACT HYDROPOWER INSTITUTE

P-2800 Lawrence Hydroelectric Project Application

APPENDIX B – QUESTIONNAIRE

April 2014 REVISION

Back**ground Information**	
1) Name of the Facility as used in the FERC license/exemption.	Lawrence Hydroelectric Project
2) Applicant's complete contact information (please use Appendix D, Project Contact Form)	Lawrence Hydroelectric Associates One Tech Drive, Suite 220 Andover, MA 01810 Attn: Randald Bartlett Regional Manager- MA/CT (978) 513-3401 Email: Randald.Bartlett@ENEL.com Lawrence Hydroelectric Associates (LHA), a subsidiary of ENEL Green Power North America, Inc., is the owner and operator of the Facility Refer to Appendix D for additional contact information
3) Location of Facility including (a) the state in which Facility is located; (b) the river on which Facility is located; (c) the river-mile location of the Facility dam; (d) the river's drainage area in square miles at the Facility intake; (e) the location of other dams on the same river upstream and downstream of the Facility; and (f) the exact latitude and longitude of the Facility dam.	The Lawrence Hydroelectric Project is located at Merrimack River Mile 31 in the city of Lawrence, Essex County, MA. The Project has a 4,460 square mile drainage area and is located approximately 10 miles downstream of the Lowell Hydroelectric Project (FERC No. 2790) and is the first dam on the river leading to the Atlantic Ocean. The project's

	coordinates are: Latitude: 42.7003 Longitude: -71.1660 Refer to Attachment 3 for a location basin map for the development and for information regarding other dams on the Merrimack River.
4) Installed capacity.	The Lawrence Hydroelectric Project has 16.8 MW of installed capacity at a twin unit powerhouse development.
5) Average annual generation.	64.6 GWH
6) Regulatory status.	The Lawrence Hydroelectric Project received an operating license from the FERC on December 4, 1978 as FERC Project No. 2800. The license expires on November 30, 2028. The license was amended on August 14, 1980 to remove the original Article 35 and add a new standard Article 43 providing the Licensee authority to grant permission for certain uses of project lands and waters and to convey certain interests in project lands without Commission approval. The license was again amended on June 19, 2007 to replace the wooden flashboard system with an inflatable flashboard system. The Project has completed all license order compliance requirements. Refer to Attachment #6 for complete license documentation.
7) Reservoir volume and surface area measured at the normal maximum operating level.	The Lawrence Hydroelectric Project impoundment is approximately 9.8 miles long and has a surface

	area of approximately 655 acres. Gross storage capacity at the normal pond level is 19,900 acre feet. The Project is operated as a run-of-river facility with no appreciable usable storage capacity.
8) Area occupied by non-reservoir facilities (e.g., dam, penstocks, powerhouse).	1.5 acres
9) Number of acres inundated by the Facility.	655 acres
10) Number of acres contained in a 200-foot zone extending around entire reservoir.	238 acres
11) Contacts for Resource Agencies and non-governmental organizations	See Attachment #11
12) Description of the Facility, its mode of operation (i.e., peaking/run of river) and photographs, maps and diagrams.	The Project is operated in a run-of-river mode and generally consists of: (1) a 33-foot high, 900-foot-long dam of rubble masonry construction with five-foot-high inflatable flashboard system; (2) the approximately 35 feet wide and 10 feet deep South Canal, which generally parallels the Merrimack River below the Essex Dam; (3) the approximately 95 feet wide and 15 feet deep North Canal paralleling the Merrimack River below the dam; (4) fish passage facilities including a fish elevator installed at the dam, a downstream fish bypass and an eel ladder; (5) a powerhouse containing two 8.4 MW hydroelectric generating units and a tailrace channel extending into the Merrimack River Channel; and (6) appurtenant facilities. Refer to

	Attachment #12 for additional information and project photographs.
Questions for "New" Facilities Only: If the Facility you are applying for is "new" (i.e., an existing dam that added or increased power generation capacity after August of 1998) please answer the following questions to determine eligibility for the program.	Not Applicable
13) When was the dam associated with the Facility completed?	
14) When did the added or increased generation first generate electricity? If the added or increased generation is not yet operational, please answer question 18 as well.	
15) Did the added or increased power generation capacity require or include any new dam or other diversion structure?	
16) Did the added or increased capacity include or require a change in water flow through the facility that worsened conditions for fish, wildlife, or water quality (for example, did operations change from run-of-river to peaking)?	
17 (a) Was the existing dam recommended for removal or decommissioning by resource agencies, or recommended for removal or decommissioning by a broad representation of interested persons and organizations in the local and/or regional community prior to the added or increased capacity? (b) If you answered "yes" to question 17(a), the Facility is not eligible for certification, unless you can show that the added or increased capacity resulted in specific measures to improve fish, wildlife, or water quality protection at the existing dam. If such measures were a result, please explain.	
18 (a) If the added or increased generation is not yet operational, has the increased or added generation received regulatory authorization (e.g., approval by the Federal Energy Regulatory Commission)? If not, the facility is not eligible for consideration; and	

(b) Are there any pending appeals or litigation regarding that authorization? If so, the facility is not eligible for consideration.		
A. Flows	PASS	FAIL
1) Is the Facility 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?	Not Applicable, conditions issued prior to December 31, 1986	
2) If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or "good" habitat flow standards calculated using the Montana-Tennant method?	Yes. The License and Water Quality Certificate, issued prior to January 1, 1987, each set the required minimum flow release for the Project that established the Aquatic Base Flow standard for the Project. The Project is operated in a run-of-river mode and has a limited bypass area. River flows are typically in excess of the required minimum project flow which resource agencies have verbally confirmed remain appropriate for the Project. Refer to Attachment A for documentation that required minimum flow releases have been supplied as required by the operating license	
3) If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource	Not Applicable	

Agency confirming that demonstration, that the flow conditions at the Facility are appropriately protective of fish, wildlife, and water quality?		
B. Water Quality	PASS	FAIL
1) Is the Facility either: a) 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? Or b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?	1 a) Not Applicable (Water Quality Certificate issued prior to December 31, 1986. 1 b) Yes - The Project waters are classified as Class B (refer to Attachment B for a copy of the designation and standards). Attachment B provides excerpts from the most recent water quality monitoring information confirming compliance with the standards. In addition, the State agencies have verbally confirmed the standards are being met. Refer to Attachment B for additional information.	
2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?	No. The 2009 Merrimack River Monitoring Program Annual Report (excerpts in Attachment B) reported dissolved oxygen levels of around 8.0 mg/l, exceeding the state standard of 5.0 mg/l, with only a slight decrease in D.O. downstream of the Project. The water quality also satisfies all other state	

	standards. Refer to Attachment B for excerpts from the 2009 report.	
3) If the answer to question B.2 is yes, has there been a determination that the Facility does not cause, or contribute to, the violation?		
C. Fish Passage and Protection	PASS	FAIL
1) Are anadromous and/or catadromous fish present in the Facility area or are they know to have been present historically?	Yes	
2) Is the Facility 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?	Yes: The project's original 1978 license included provisions for the design and installation of upstream and downstream fish passage facilities at the project, and for evaluating the effectiveness of the installed fish passage facilities for passing upstream and downstream migrating anadromous fish species. Subsequent and on-going consultation has effectively modified the Mandatory Fish Passage Prescriptions for the Project since the early 1990s. The fish passage facilities have been installed, tested and are operated though annual consultation with the Technical Committee for the Restoration of Anadromous Fish Species to the	

	Merrimack River Basin (Technical Committee). Modifications to the operation and system features continued to be implemented on an on-going basis. The facilities provide a critical part of the fish restoration program through operational of trap and truck components used to collect brood stock. Management of the fish passage facilities are conducted through a FERC approved Comprehensive Fish Passage Plan. The Project installed upstream eel passage at the site in 2012 and continues to work with the Technical Committee to enhance the system's effectiveness. Refer to Attachment C for documentation that the Project continues to support restoration efforts.	
3) Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish no longer have a migratory run)? a) If the fish are extinct or extirpated from the Facility area or downstream		

reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility? b) If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?		
4) If, since December 31, 1986: a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C.3.a above), and b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription, c) Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?		
5) If C4 was not applicable: a) Are upstream and downstream fish passage survival rates for		

anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology? Or b) If the Facility is unable to meet the fish passage standards in 5.a, has the Applicant either i) demonstrated, and obtained a letter from the U.S. Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and downstream fish passage measures (if any) at the Facility are appropriately protective of the fishery resource, or ii) committed to the provision of fish passage measures in the future and obtained a letter from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service indicating that passage measures are not currently warranted?		
6) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of Riverine fish?	Not Applicable - no Mandatory Fish Passage Prescriptions for Riverine Fish has been issued.	
7) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?	Yes - the downstream fish bypass facility was completed in 1992 and studies confirmed effective passage of the target species through the bypass and turbines. Additional information is supplied in Attachment C.	
D. Watershed Protection	PASS	FAIL
1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the average annual high water line for at least 50% of the shoreline, including all of the undeveloped shoreline?		NO - the Project is located within an

		industrial area established prior to Project construction.
2) Has the Facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1,and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?		NO
3) Has the Facility owner/operator established through a settlement agreement with appropriate stakeholders, with state and federal resource agencies agreement, an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)?		NO - the Project is located within an industrial area established prior to Project construction.
4) Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project?	Not Applicable - The Project is operated in a run-of-river mode with little water level changes, except during seasonal high flow events. The Project has been in operation for numerous years with established and stable shorelines that do not have evidence of erosion concerns. The development's urban industrial area location, land ownership, local ordinances and land/water rites prevent the ability to install docks and similar	

	systems along the impoundment. Article 35 of the license (copy in Attachment 6) requires the Licensee to ensure that authorized usage of Project lands are consistent with shoreline aesthetics, are maintained in good condition and comply with state and local regulations. The original license did not required the development of a shoreline management plan.	
E. Threatened and Endangered Species Protection	PASS	FAIL
1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?	No. There are no federally listed species located at the Project per the USFWS website and Natural Heritage Endangered Species Program. Refer to Attachment E for documentation that there are no threatened or endangered species at the Project.	
2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?	Not Applicable	
3) If the Facility has received authorization to incidentally Take a listed		

species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authorization pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authorization?	Not Applicable	
4) If a biological opinion applicable to the Facility for the threatened or endangered species has been issued, can the Applicant demonstrate that: a) The biological opinion was accompanied by a FERC license or exemption or a habitat conservation plan? Or b) The biological opinion was issued pursuant to or consistent with a recovery plan for the endangered or threatened species? Or c) There is no recovery plan for the threatened or endangered species under active development by the relevant Resource Agency? Or d) The recovery plan under active development will have no material effect on the Facility's operations?	Not Applicable	
5) If E.2 and E.3 are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?	Not Applicable	
F. Cultural Resource Protection	PASS	FAIL
1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in	Yes. The Essex Dam, also	

the FERC license or exemption?	referred to Great Stone Dam, and the North Canal are listed on the National Register of Historic Places and the South Canal with associated gatehouse structure are eligible for inclusion in the National Register. During licensing the Commission and Massachusetts State Historical Preservation Officer determined that the Project has no adverse impacts on historical structures. This designation was reaffirmed during the license amendment process required to install the Essex Dam crest gates (copy of letter in Attachment F). Article 29 of the license (copy in Attachment 6) requires the licensee to cooperate with the Massachusetts Historical Commission in order to avoid any adverse impact on identified historic structures at the project. The licensee maintains the project structures in the preservation and enhancement of their historic nature (refer to Attachment G for additional information).	
2) If not FERC-regulated, does the Facility owner/operator have in place		

(and is in Compliance with) a plan for the protection, mitigation or enhancement of impacts to Cultural Resources approved by the relevant state or federal agency or Native American Tribe, or a letter from a senior officer of the relevant agency or Tribe that no plan is needed because Cultural Resources are not negatively affected by the Facility?	Not Applicable	
G. Recreation	PASS	FAIL
1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?	Yes - refer to Attachment G	
2) If not FERC-regulated, does the Facility provide recreational access, accommodation (including recreational flow releases) and facilities, as Recommended by Resource Agencies or other agencies responsible for recreation?	Not Applicable	
3) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?	YES: Public access to the reservoir and downstream reaches are without fee or charges. Public access near the transformer yard and powerhouse area is restricted by fencing for public safety and security measures.	
H. Facilities Recommended for Removal	PASS	FAIL
1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?	No	