CONTOOCOOK HYDRO, LLC
c/o William P. Short III
44 West 62nd Street
P.O. Box 2371773
New York, New York 10023-7173
(917) 206-0001; (201) 970-3707
w.shortiii@verizon.net

September 23, 2012

Rhode Island Public Utilities Commission
Attn: Renewable Energy Resources Eligibility
89 Jefferson Boulevard
Warwick, Rhode Island 02888

Re: Application of Hopkinton Hydro Project for Certification as a 70.15% Rhode Island New Renewable Energy Resource and a 29.85% Rhode Island Existing Renewable Energy Resource

Dear Sir:

Attached please find an application for certification by the Rhode Island Public Utilities Commission (the "Commission") of the Hopkinton Hydro Project (the "Project" or the "Facility") of Contoocook Hydro, LLC ("Contoocook") as a 70.15% Rhode Island New Renewable Energy Resource and a 29.85% Rhode Island Existing Renewable Energy Resource (the "Application").

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

Primary Contact	**Secondary Contact**
William P. Short III	Lori Barg
Consultant	President
44 West 62nd Street	Contoocook Hydro, LLC
P.O. Box 237173	113 Bartlett Road
New York, New York 10023-7173	Plainfield, Vermont 05667
(917) 206-0001 Office	(802) 454-1874 Office
(201) 970-3707 Cell	(802) 454-8458 Cell
w.shortiii@verizon.net	lori@communityhydro.biz

The Hopkinton Hydro Project (FERC No. P-5735) is a 0.250 MW exempt from licensing, run-of-river hydro-electric project. A FERC exemption from licensing was issued March 14, 1984. The Project has been in continuous compliance with its requirements for exemption from licensing since 1984.

In late April 2008, Contoocook purchased the Project. Contoocook is a New Hampshire limited liability company with its principal place of business at 113 Bartlett Road, Plainfield, Vermont 05667.

The Project is located on the Contoocook River at 33 Pine Street in the Town of Contoocook in Merrimack County, New Hampshire with the powerhouse in Contoocook near the Rescue building. The facility is located at approximate river mile 12 on the Contoocook River from its confluence with the Merrimack River, approximately 6 river miles below the Army Corps of Engineers flood control dam; the station now has an estimated annual production of 1,200 MWh under normal streamflow.

Contoocook obtained third party generation and streamflow records for the Project and USGS gage at West Hopkinton, respectively.[1] Monthly generation records for the Project were obtained from PSNH for the period of 1995 through 1997, Algonquin Hydro for the period from 1998 through 2001 and the NEPOOL GIS for the period from 2002 through 2011. Monthly streamflow data of the Contoocook River at the USGS gage at West Hopkinton were obtained from the USGS for the period of 1991 through mid-year 2011, a twenty-one year period. The streamflow data was then increased by 1.6393% to account for the increase in the watershed between the West Hopkinton gage and the Project.

Contoocook is filing this application with the Commission after having completed a substantial number of improvements to upgrade the Project's electric production.[2] When Contoocook purchased the Project in April 2008, the Project has not been upgraded with modern controls or equipment since it was first placed in-service in late 1984. While these capital and efficiency improvements did not increase the nameplate of the Project, they did dramatically increase the annual production of the Facility, adjusting for changes in streamflow, from less than 700 MWh (January 1995 - April 2008) to approximately 1,200 MWh now (2009 through 2011).

Calculation of hydro-electric power plant efficiency (electric production in MWh divided by streamflow in cfs) of the Project for both the pre- and post-improvement periods were made. Any monthly flow above 284 cfs was discarded as were the results for those months when monthly flow was less than 100 cfs. On the former adjustment, the Project is significantly undersized for the average monthly streamflow, 872 cfs. On the latter adjustment, these results were discarded because low flows are not indicative of equipment performance. In addition, all

[1] West Hopkinton gage is located approximately 6 miles downstream of the Project. At the gage the West Hopkinton gage drains an area of 427 square miles while the Project drains an area of 434 square miles.

[2] Contoocook made 70 capital and efficiency improvements to the Facility since becoming the owner. Given just the sheer number, the magnitude of improvements and the overlapping times of the improvements, it is impossible to determine the exact impact of each improvement; accordingly, Contoocook believes that the Commission should examine the improvements as one collective set of improvements, made over time, instead of having Contoocook make estimates of the impact of each improvement.

monthly performance was discarded from May 2008 through year end 2008 as the first capital and efficiency improvements were just being made by the new owner and these months were not thought to be indicative of future performance.

The pre- and post-average monthly efficiencies produce an average monthly hydro-electric power plant efficiency of 0.211 and 0.359, respectively. This analysis indicates that 70.15% of the post 2009-electric production is attributed to the post-April 2008 capital and efficiency improvements. Accordingly, Contoocook requests that the Rhode Island Public Utilities Commission certify the Hopkinton Hydro Project as a 70.15% Rhode Island New Renewable Energy Resource and a 29.85% Rhode Island Existing Renewable Energy Resource.

Upon your review of our application, if you have any questions on comments, please do not hesitate to contact either Lori Barg or myself.

Sincerely yours,

William P. Short III

attachments

cc: Lori Barg

LISTS OF ATTACHMENTS

Application for Certification of the Hopkinton Hydro Project, dated September 23, 2012

Hopkinton Hydro Project FERC Order Granting Exemption from Licensing, issued March 14, 1984

Summary of Hopkinton Hydro Project Capital and Efficiency Improvements, May 2008 through September 2012

Analysis of Hopkinton Hydro Project Hydro-electric Dam Efficiency (1995-2011)

<u>RIPUC Use Only</u> Date Application Received: __ __/ __ __/ __ __ Date Review Completed: __ __/ __ __/ __ __ Date Commission Action: __ __/ __ __/ __ __ Date Commission Approved: __ __/ __ __/ __ __

GIS Certification #: **MSS #919**

RENEWABLE ENERGY RESOURCES ELIGIBILITY FORM

The Standard Application Form
Required of all Applicants for Certification of Eligibility of Renewable Energy Resource
(Version 7 – June 11, 2010)

STATE OF RHODEISLAND PUBLIC UTILITIES COMMISSION
Pursuant to the Renewable Energy Act
Section 39-26-1 et. seq. of the General Laws of Rhode Island

<u>NOTICE</u>:
When completing this Renewable Energy Resources Eligibility Form and any applicable Appendices, please refer to the State of Rhode Island and Providence Plantations Public Utilities Commission Rules and Regulations Governing the Implementation of a Renewable Energy Standard (RES Regulations, Effective Date: January 1, 2006), and the associated RES Certification Filing Methodology Guide. All applicable regulations, procedures and guidelines are available on the Commission's web site: www.ripuc.org/utilityinfo/res.html. Also, all filings must be in conformance with the Commission's Rules of Practice and Procedure, in particular, Rule 1.5, or its successor regulation, entitled "Formal Requirements as to Filings."

• Please complete the Renewable Energy Resources Eligibility Form and Appendices using a typewriter or black ink.

• Please submit one original and three copies of the completed Application Form, applicable Appendices and all supporting documentation to the Commission at the following address:

Rhode Island Public Utilities Commission
89 Jefferson Blvd
Warwick, RI02888
Attn: Renewable Energy Resources Eligibility

In addition to the paper copies, electronic/email submittals are required under Commission regulations. Such electronic submittals should be sent to: Luly E. Massaro, Commission Clerk at lmassaro@puc.state.ri.us

•In addition to filing with the Commission, Applicants are required to send, electronically or electronically and in paper format, a copy of the completed Application including all attachments and supporting documentation, to the Division of Public Utilities and Carriers and to all interested parties. A list of interested parties can be obtained from the Commission's website at www.ripuc.org/utilityinfo/res.html.

•Keep a copy of the completed Application for your records.

•The Commission will notify the Authorized Representative if the Application is incomplete.

• Pursuant to Section 6.0 of the RES Regulations, the Commission shall provide a thirty (30) day period for public comment following posting of any administratively complete Application.

• Please note that all information submitted on or attached to the Application is considered to be a public record unless the Commission agrees to deem some portion of the application confidential after consideration under section 1.2(g) of the Commission's Rules of Practice and Procedure.

•In accordance with Section 6.2 of the RES Regulations, the Commission will provide prospective reviews for Applicants seeking a preliminary determination as to whether a facility would be eligible prior to the formal certification process described in Section 6.1 of the RES Regulations. Please note that space is provided on the Form for applicant to designate the type of review being requested.

• Questions related to this Renewable Energy Resources Eligibility Form should be submitted in writing, preferably via email and directed to: Luly E. Massaro, Commission Clerk at lmassaro@puc.state.ri.us

SECTION I: Identification Information

1.1 Name of Generation Unit (sufficient for full and unique identification):

Hopkinton Hydro Project

1.2 Type of Certification being requested (check one):

X Standard Certification ❑ Prospective Certification (Declaratory Judgment)

1.3 This Application includes: (Check all that apply)[1]

- ❑ APPENDIX A: Authorized Representative Certification for Individual Owner or Operator
- X APPENDIX B: Authorized Representative Certification for Non-Corporate Entities Other Than Individuals
- X APPENDIX C: Existing Renewable Energy Resources
- ❑ APPENDIX D: Special Provisions for Aggregators of Customer-sited or Off-grid Generation Facilities
- ❑ APPENDIX E: Special Provisions for a Generation Unit Located in a Control Area Adjacent to NEPOOL
- ❑ APPENDIX F: Fuel Source Plan for Eligible Biomass Fuels

1.4 Primary Contact Person name and title:

William P. Short III, Consultant

1.5 Primary Contact Person address and contact information:
Address:
P.O. Box 237173
New York, New York 10023-7173
Phone: **(917) 206-0001** Fax: **(917) 206-0001**
Email: **w.shortiii@verizon.net**

1.6 Backup Contact Person name and title:

Lori Barg, President

1.7 Backup Contact Person address and contact information:
Address: **Contoocook Hydro, LLC**
113 Bartlett Road
Plainfield, Vermont 05667
Phone: **(802) 454-1874** Fax: **(802) 454-1874**
Email: **lori@communityhydro.biz**

[1] Please note that all Applicants are required to complete the Renewable Energy Resources Eligibility Standard Application Form and all of the Appendices that apply to the Generation Unit or Owner or Operator that is the subject of this Form. Please omit Appendices that do not apply.

1.8 Name and Title of Authorized Representative (*i.e.*, the individual responsible for certifying the accuracy of all information contained in this form and associated appendices, and whose signature will appear on the application):

William P. Short III, Consultant

Appendix A or B (as appropriate) completed and attached? **X** Yes ❑ No ❑ N/A

1.9 Authorized Representative address and contact information:
Address:
P.O. Box 237173
New York, New York 10023-7173
Phone: **(917) 206-0001** Fax: **(917) 206-0001**
Email: **w.shortiii@verizon.net**

1.10 Owner name and title:

Lori Barg, President

1.11 Owner address and contact information:
Address: **Contoocook Hydro, LLC**
113 Bartlett Road
Plainfield, Vermont 05667
Phone: **(802) 454-1874** Fax: **(802) 454-1874**
Email: **lori@communityhydro.biz**

1.12 Owner business organization type (check one):
❑ Individual
❑ Partnership
❑ Corporation
X Other: **New Hampshire Limited Liability Company**

1.13 Operator name and title: **Lori Barg, President**
Operator address and contact information:
Address: **Contoocook Hydro, LLC**________________________
113 Bartlett Road
Plainfield, Vermont 05667
Phone: **(802) 454-1874** Fax: **(802) 454-1874**
Email: **lori@communityhydro.biz**

1.15 Operator business organization type (check one):
❑ Individual
❑ Partnership
❑ Corporation
X Other: **New Hampshire Limited Liability Company**

SECTION II: Generation Unit Information, Fuels, Energy Resources and Technologies

2.1 ISO-NE Generation Unit Asset Identification Number or NEPOOL GIS Identification Number (either or both as applicable): **MSS #919**

2.2 Generation Unit Nameplate Capacity: **0.250 MW**

2.3 Maximum Demonstrated Capacity: **0.250 MW (source: 2010 ISO-NE CELT Report)**

2.4 Please indicate which of the following Eligible Renewable Energy Resources are used by the Generation Unit: (Check ALL that apply) – *per RES Regulations Section 5.0*

❑ Direct solar radiation
❑ The wind
❑ Movement of or the latent heat of the ocean
❑ The heat of the earth
X Small hydro facilities
❑ Biomass facilities using Eligible Biomass Fuels and maintaining compliance with all aspects of current air permits; Eligible Biomass Fuels may be co-fired with fossil fuels, provided that only the renewable energy fraction of production from multi-fuel facilities shall be considered eligible.
❑ Biomass facilities using unlisted biomass fuel
❑ Biomass facilities, multi-fueled or using fossil fuel co-firing
❑ Fuel cells using a renewable resource referenced in this section

2.5 If the box checked in Section 2.4 above is "Small hydro facilities", please certify that the facility's aggregate capacity does not exceed 30 MW. – *per RES Regulations Section 3.32*

X← check this box to certify that the above statement is true
❑ N/A or other (please explain) ____

____

2.6 If the box checked in Section 2.4 above is "Small hydro facilities", please certify that the facility does not involve any new impoundment or diversion of water with an average salinity of twenty (20) parts per thousand or less. – *per RES Regulations Section 3.32*

X← check this box to certify that the above statement is true
❑ N/A or other (please explain) ____

____

2.7 If you checked one of the Biomass facilities boxes in Section 2.4 above, please respond to the following:

A. Please specify the fuel or fuels used or to be used in the Unit: ________________

____

B. Please complete and attach Appendix F, Eligible Biomass Fuel Source Plan.
Appendix F completed and attached? ❑ Yes ❑ No ❑ N/A

2.8 Has the Generation Unit been certified as a Renewable Energy Resource for eligibility in another state's renewable portfolio standard?

X Yes ❑ No If yes, please attach a copy of that state's certifying order.

Copy of State's certifying order attached? ❑ Yes ❑ No X N/A

SECTION III: Commercial Operation Date

Please provide documentation to support all claims and responses to the following questions:

3.1 Date Generation Unit first entered Commercial Operation: **12 / 1 / 1984** at the site.

If the commercial operation date is after December 31, 1997, please provide independent verification, such as the utility log or metering data, showing that the meter first spun after December 31, 1997. This is needed in order to verify that the facility qualifies as a New Renewable Energy Resource.

Documentation attached? ❑ Yes ❑ No ❑ N/A

3.2 Is there an Existing Renewable Energy Resource located at the site of Generation Unit?

X Yes
❑ No

3.3 If the date entered in response to question 3.1 is earlier than December 31, 1997 or if you checked "Yes" in response to question 3.2 above, please complete Appendix C.

Appendix C completed and attached? X Yes ❑ No ❑ N/A

3.4 Was all or any part of the Generation Unit used on or before December 31, 1997 to generate electricity at any other site?

❑ Yes
X No

3.5 If you checked "Yes" to question 3.4 above, please specify the power production equipment used and the address where such power production equipment produced electricity (attach more detail if the space provided is not sufficient):

____

____

____

SECTION IV: Metering

4.1 Please indicate how the Generation Unit's electrical energy output is verified (check all that apply):

X ISO-NE Market Settlement System
❑ Self-reported to the NEPOOL GIS Administrator

❑ Other (please specify below and see Appendix D: Eligibility for Aggregations):

____

Appendix D completed and attached? ❑ Yes ❑ No **X** N/A

SECTION V: Location

5.1 Please check one of the following that apply to the Generation Unit:

X Grid Connected Generation
❑ Off-Grid Generation (not connected to a utility transmission or distribution system)
❑ Customer Sited Generation (interconnected on the end-use customer side of the retail electricity meter in such a manner that it displaces all or part of the metered consumption of the end-use customer)

5.2 Generation Unit address: **The Hopkinton Hydro Project is located at 33 Pine Street in the Town of Contoocook in Merrimack County, New Hampshire, The power-house is located in Contoocook (near the rescue building) at approximate river mile 12 on the Contoocook River from its confluence with the Merrimack River. The Project dam is located approximately 6 river miles below the Army Corps of Engineers flood control dam.**

5.3 Please provide the Generation Unit's geographic location information:

A. Universal Transverse Mercator Coordinates: ______________________

B. Longitude/Latitude: **43^{0} 13' 21.97"N** / **71^{0} 42' 56.52" W**

5.4 The Generation Unit located: (please check the appropriate box)

X In the NEPOOL control area
❑ In a control area adjacent to the NEPOOL control area
❑ In a control area other than NEPOOL which is not adjacent to the NEPOOL control area ←*If you checked this box, then the generator does not qualify for the RI RES – therefore, please do not complete/submit this form.*

5.5 If you checked "In a control area adjacent to the NEPOOL control area" in Section 5.4 above, please complete Appendix E.

Appendix E completed and attached? ❑ Yes ❑ No **X** N/A

SECTION VI: Certification

6.1 Please attach documentation, using one of the applicable forms below, demonstrating the authority of the Authorized Representative indicated in Section 1.8 to certify and submit this Application.

Corporations

If the Owner or Operator is a corporation, the Authorized Representative shall provide **either**:

(a) Evidence of a board of directors vote granting authority to the Authorized Representative to execute the Renewable Energy Resources Eligibility Form, **or**

(b) A certification from the Corporate Clerk or Secretary of the Corporation that the Authorized Representative is authorized to execute the Renewable Energy Resources Eligibility Form or is otherwise authorized to legally bind the corporation in like matters.

Evidence of Board Vote provided? ❑ Yes ❑ No X N/A

Corporate Certification provided? ❑ Yes ❑ No X N/A

Individuals

If the Owner or Operator is an individual, that individual shall complete and attach APPENDIX A, or a similar form of certification from the Owner or Operator, duly notarized, that certifies that the Authorized Representative has authority to execute the Renewable Energy Resources Eligibility Form.

Appendix A completed and attached? ❑ Yes ❑ No X N/A

Non-Corporate Entities

(Proprietorships, Partnerships, Cooperatives, etc.) If the Owner or Operator is not an individual or a corporation, it shall complete and attach APPENDIX B or execute a resolution indicating that the Authorized Representative named in Section 1.8 has authority to execute the Renewable Energy Resources Eligibility Form or to otherwise legally bind the non-corporate entity in like matters.

Appendix B completed and attached? X Yes ❑ No ❑ N/A

6.2 Authorized Representative Certification and Signature:

I hereby certify, under pains and penalties of perjury, that I have personally examined and am familiar with the information submitted herein and based upon my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties, both civil and criminal, for submitting false information, including possible fines and punishment. My signature below certifies all information submitted on this Renewable Energy Resources Eligibility Form. The Renewable Energy Resources Eligibility Form includes the Standard Application Form and all required Appendices and attachments. I acknowledge that the Generation Unit is obligated to and will notify the Commission promptly in the event of a change in a generator's eligibility status (including, without limitation, the status of the air permits) and that when and if, in the Commission's opinion, after due consideration, there is a material change in the characteristics of a Generation Unit or its fuel stream that could alter its eligibility, such Generation Unit must be re-certified in accordance with Section 9.0 of the RES Regulations. I further acknowledge that the Generation Unit is obligated to and will file such quarterly or other reports as required by the Regulations and the Commission in its certification order. I understand that the Generation Unit will be immediately de-certified if it fails to file such reports.

Signature of Authorized Representative:

SIGNATURE: William P. Short III DATE: 9/23/12

Consultant
(Title)

GIS Certification #:
MSS #919

APPENDIX B
(Required When Owner or Operator is a Non-Corporate Entity Other Than An Individual)

STATE OF RHODEISLAND
PUBLIC UTILITIES COMMISION

RENEWABLE ENERGY RESOURCES ELIGIBILITY FORM
Pursuant to the Renewable Energy Act
Section 39-26-1 et. seq. of the General Laws of Rhode Island

RESOLUTION OF AUTHORIZATION

Resolved: that **William P. Short III**, named in Section 1.8 of the Renewable Energy Resources Eligibility Form as Authorized Representative, is authorized to execute the Application on the behalf of **Contoocook Hydro, LLC**, the Owner or Operator of the Generation Unit named in section 1.1 of the Application.

SIGNATURE: Lori Barg　　　　DATE: 9/6/12

State: VT

County: WASHINGTON

(TO BE COMPLETED BY NOTARY) I, Denise M. Brown as a notary public, certify that I witnessed the signature of the above named LORI BARG, and that said person stated that he/she is authorized to execute this resolution, and the individual verified his/her identity to me, on this date: 9/6/12.

SIGNATURE: Denise M. Brown　　　　DATE: 9/6/12

My commission expires on:　　　　NOTARY SEAL:

OFFICIAL SEAL
DENISE M. BROWN
NOTARY PUBLIC - STATE OF VERMONT
My Comm. Expires Feb 10, 15

GIS Certification #:
MSS #919

APPENDIX C
(Revised 6/11/10)
(Required of all Applicants with Generation Units at the Site of Existing Renewable Energy Resources)

STATE OF RHODEISLAND
PUBLIC UTILITIES COMMISION

RENEWABLE ENERGY RESOURCES ELIGIBILITY FORM
Pursuant to the Renewable Energy Act
Section 39-26-1 et. seq. of the General Laws of Rhode Island

If the Generation Unit: (1) first entered into commercial operation before December 31, 1997; or (2) is located at the exact site of an Existing Renewable Energy Resource, please complete the following and attach documentation, as necessary to support all responses:

C.1 Is the Generating Unit seeking certification, either in whole or in part, as a New Renewable Energy Resource? X Yes ❑ No

C.2 If you answered "Yes" to question C.1, please complete the remainder of Appendix C. If you answered "No" and are seeking certification entirely as an Existing Renewable Energy Resource, you do NOT need to complete the remainder of Appendix C.

C.3 If an Existing Renewable Energy Resource is/was located at the site, has such Existing Renewable Energy Resource been retired and replaced with the new Generation Unit at the same site? ❑ Yes X No

C.4 Is the Generation Unit a Repowered Generation Unit (as defined in Section 3.29 of the RES Regulations) which uses Eligible Renewable Energy Resources and which first entered commercial operation after December 31, 1997 at the site of an existing Generation Unit? ❑ Yes X No

C.5 If you checked "Yes" to question C.4 above, please provide documentation to support that the entire output of the Repowered Generation Unit first entered commercial operation after December 31, 1997.

C.6 Is the Generation Unit a multi-fuel facility in which an Eligible Biomass Fuel is first co-fired with fossil fuels after December 31, 1997? ❑ Yes X No

C.7 If you checked "Yes" to question C.6 above, please provide documentation to support that the renewable energy fraction of the energy output first occurred after December 31, 1997.

C.8 Is the Generation Unit an Existing Renewable Energy Resource other than an Intermittent Resource (as defined in Sections 3.10 and 3.15 of the RES Regulations)? ❑ Yes X No

C.9 If you checked "Yes" to question C.8 above, please attach evidence of completed capital investments after December 31, 1997 attributable to efficiency improvements or additions of capacity that are sufficient to, were intended to, and can be demonstrated to increase annual electricity output in excess of ten percent (10%). As specified in Section 3.23.v of the RES Regulations, the determination of incremental production shall not be based on any operational changes at such facility **not directly** associated with the efficiency improvements or additions of capacity.

Please provide the single proposed percentage of production to be deemed incremental, attributable to the efficiency improvements or additions of capacity placed in service after December 31, 1997.Please make this calculation by comparing actual electrical output over the three calendar years 1995-1997 (the "Historical Generation Baseline") with the actual output following the improvements. The incremental production above the Historical Generation Baseline will be considered "New" generation for the purposes of RES. Please give the percentage of the facility's total output that qualifies as such to be considered "New" generation.

C.10 Is the Generating Unit an Existing Renewable Energy Resource that is an Intermittent Resource? X Yes ❑ No

C.11 If you checked "Yes" to question C.10 above, please attach evidence of completed capital investments after December 31, 1997 attributable to efficiency improvements or additions of capacity that are sufficient to, were intended to, and have demonstrated on a normalized basis to increase annual electricity output in excess of ten percent (10%). The determination of incremental production shall not be based on any operational changes at such facility **not directly** associated with the efficiency improvements or additions of capacity. In no event shall any production that would have existed during the Historical Generation Baseline period in the absence of the efficiency improvements or additions to capacity be considered incremental production. Please refer to Section 3.23.vi of the RES Regulations for further guidance.

C.12 If you checked "Yes" to C.10, provide the single proposed percentage of production to be deemed incremental, attributable to the efficiency improvements or additions of capacity placed in service after December 31, 1997. The incremental production above the Historical Generation Baseline will be considered "New" generation for the purposes of RES. Please make this calculation by comparing actual monthly electrical output over the three calendar years 1995-1997 (the "Historical Generation Baseline") with the actual output following the improvements on a normalized basis. Please provide back-up information sufficient for the Commission to make a determination of this incremental production percentage.

For example, for small hydro facilities, please use historical river flow data to create a monthly normalized comparison (e.g. average MWh produced per cubic foot/second of river flow for each month) between actual output values post-improvements with the Historical Generation Baseline. For solar and wind facilities, please use historical solar irradiation, wind flow, or other applicable data to normalize the facility's current production against the Historical Generation Baseline.

C.13 If you checked "no" to both C.3 and C.4 above, please complete the following:

a. Was the Existing Renewable Energy Resource located at the exact site at any time during calendar years 1995 through 1997? X Yes ❑ No

b. If you checked "yes" in Subsection (a) above, please provide the Generation Unit Asset Identification Number and the average annual electrical production (MWhs) for the three calendar years 1995 through 1997, or for the first 36 months after the Commercial Operation Date if that date is after December 31, 1994, for each such Generation Unit.

c. Please attach a copy of the derivation of the average provided in (b) above, along with documentation support (such as ISO reports) for the information provided in Subsection (b) above. Data must be consistent with quantities used for ISO Market Settlement System.

HOPKINTON HYDRO PROJECT

Average Monthly Streamflow at West Hopkinton Gage (cfs) (1991 --2011) (1)

Month	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	21-Ye
January	727.3	992.3	996.1	670.7	1322.2	1612.4	1133.7	1046.7	852.5	709.5	543.6	183.5	437.7	771.4	1,108.0	1,886.0	1,156.0	1,055.0	926.2	966.8	509.6	933.7
February	889.4	426.4	489.0	88.2	625.6	1563.5	920.9	937.2	902.6	673.4	483.8	306.9	307.6	274.6	860.7	1,593.0	364.9	1,846.0	573.8	838.4	483.1	735.7
March	1553.3	925.5	602.9	1554.6	1206.0	1162.8	1050.0	1961.8	1781.1	2040.8	722.4	596.0	1,147.0	726.7	853.9	705.0	989.4	1,919.0	1,487.0	2,878.0	2,590.0	1,354.9
April	1056.9	1026.9	3199.6	2427.9	603.6	2364.3	2577.9	1589.1	842.1	1808.9	3147.0	1,060.0	2,601.0	2,598.0	2,640.0	663.3	2,374.0	2,920.0	1,718.0	2,007.0	2,006.0	1,963.4
May	789.8	738.8	450.9	1130.1	533.9	1761.0	990.8	870.0	298.6	861.6	595.6	1,160.0	984.6	855.5	1,410.0	1,755.0	1,153.0	872.9	619.3	403.9	1,025.0	917.2
June	378.6	593.9	243.4	255.4	293.9	475.0	243.8	2012.0	105.4	745.6	715.6	896.5	682.8	391.3	726.4	2,242.0	522.8	213.1	917.6	295.5	801.3	654.9
July	154.6	324.0	76.1	286.6	222.9	761.5	256.7	613.3	146.5	412.5	211.5	150.2	107.6	223.0	608.7	683.9	341.5	523.4	1,474.0	82.1	277.7	378.0
August	728.0	403.5	143.5	342.8	317.9	183.6	170.8	192.8	76.4	646.1	74.0	46.6	351.3	278.4	184.8	304.8	88.1	640.8	1,084.0	58.6	598.5	329.3
September	703.1	212.4	123.7	328.2	86.1	177.6	192.5	111.6	993.3	325.6	81.4	57.1	204.9	611.3	93.4	227.4	85.4	653.9	467.4	41.4	1,422.0	342.8
October	1080.4	314.4	292.6	406.8	1073.9	1296.5	173.1	388.8	640.9	470.4	95.6	183.6	558.3	356.4	2,736.0	849.1	278.6	624.8	892.6	512.2	1,668.0	709.2
November	1308.3	758.5	484.7	446.4	1976.7	1108.8	776.0	348.5	623.2	616.1	124.9	632.2	931.4	546.4	1,775.0	1,782.0	468.9	988.6	1,117.0	926.8	1,451.7	913.9
December	1138.2	726.0	1171.2	1381.8	636.8	2253.3	525.7	333.8	732.6	991.0	205.1	656.4	1,736.0	1,335.0	1,309.0	985.9	490.2	1,842.0	1,085.0	943.2	1,929.2	1,067.0
Totals	10,507.9	7,442.4	8,273.7	9,319.6	8,899.5	14,720.2	9,012.0	10,405.6	7,995.3	10,301.4	7,000.5	5,929.0	10,050.2	8,968.0	14,305.9	13,677.4	8,312.8	14,099.5	12,361.9	9,953.9	14,762.1	10,299.9
Average	875.7	620.2	689.5	776.6	741.6	1,226.7	751.0	867.1	666.3	858.5	583.4	494.1	837.5	747.3	1,192.2	1,139.8	692.7	1,175.0	1,030.2	829.5	1,079.2	858.3

Total CFS (1991-2011)	216,299	Total CFS (1995-1997)	32,632	Total CFS (1998-Apr.2008)	104,686	Total CFS (May 2008-2011)	43,437
Average Monthly CFS (1991-2011)	858	Average Monthly CFS (1995-1997)	906	Average Monthly CFS (1998-Apr.2008)	844	Average Monthly CFS (May 2008-2011)	987

Adjusted Average Monthly Streamflow for Hopkinton Project (cfs) (1991 --2011) (1)

Month	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	21-Ye
January	739	1,009	1,012	682	1,344	1,639	1,152	1,064	867	721	552	187	445	784	1,126	1,917	1,175	1,072	941	983	518	949.0
February	904	433	497	90	636	1,589	936	953	917	684	492	312	313	279	875	1,619	371	1,876	583	852	491	747.7
March	1,579	941	613	1,580	1,226	1,182	1,067	1,994	1,810	2,074	734	606	1,166	739	868	717	1,006	1,950	1,511	2,925	2,632	1,377.1
April	1,074	1,044	3,252	2,468	613	2,403	2,620	1,615	856	1,839	3,199	1,077	2,644	2,641	2,683	674	2,413	2,968	1,746	2,040	2,039	1,995.6
May	803	751	458	1,149	543	1,790	1,007	884	304	876	605	1,179	1,001	870	1,433	1,784	1,172	887	629	411	1,042	932.2
June	385	604	247	260	299	483	248	2,045	107	758	727	911	694	398	738	2,279	531	217	933	300	814	665.6
July	157	329	77	291	227	774	261	623	149	419	215	153	109	227	619	695	347	532	1,498	83	282	384.2
August	740	410	146	348	323	187	174	196	78	657	75	47	357	283	188	310	90	651	1,102	60	608	334.7
September	715	216	126	334	88	180	196	113	1,010	331	83	58	208	621	95	231	87	665	475	42	1,445	348.5
October	1,098	320	297	413	1,091	1,318	176	395	651	478	97.2	187	567	362	2,781	863	283	635	907	521	1,695	720.8
November	1,330	771	493	454	2,009	1,127	789	354	633	626	126.9	643	947	555	1,804	1,811	477	1,005	1,135	942	1,475	928.9
December	1,157	738	1,190	1,404	647	2,290	534	339	745	1,007	208.5	667	1,764	1,357	1,330	1,002	498	1,872	1,103	959	1,961	1,084.5
Totals	10,680	7,564	8,409	9,472	9,045	14,961	9,160	10,576	8,126	10,470	7,115	6,026	10,215	9,115	14,540	13,902	8,449	14,331	12,565	10,117	15,004	10,468.8
Average	890	630	701	789	754	1,247	763	881	677	873	593	502	851	760	1,212	1,158	704	1,194	1,047	843	1,250	872.4

Total CFS (1991-2011)	219,845	Total CFS (1995-1997)	33,167	Total CFS (1998-Apr.2008)	106,402	Total CFS (May 2008-2011)	44,149
Average Monthly CFS (1991-2011)	872	Average Monthly CFS (1995-1997)	921	Average Monthly CFS (1998-Apr.2008)	858	Average Monthly CFS (May 2008-2011)	1,003

HOPKINTON HYDRO PROJECT

Month	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Monthly Generation for Hopkinton Hydro (MWh) (1998 -- 2011) (2)																						
January					58.20	119.50	73.40	162.70	40.20	19.70	74.30	35.00	77.00	23.00	96.00	73.00	106.00	102.00	**125.00**	**137.00**	**94.00**	86.8
February					87.70	50.70	130.70	88.30	87.40	68.80	75.50	47.00	60.00	29.00	128.00	61.00	65.00	69.00	**111.00**	**99.00**	**82.00**	75.1
March					109.20	55.80	100.50	75.00	66.60	69.30	72.50	76.00	50.00	0.00	133.00	113.00	110.00	92.00	**140.00**	**71.00**	**68.00**	85.3
April					123.80	133.30	87.00	133.10	54.10	61.70	26.80	95.00	74.00	0.00	61.00	117.00	70.00	46.00	**112.00**	**112.00**	**113.00**	80.0
May					119.40	59.00	66.50	89.50	13.30	82.00	71.00	100.00	97.00	0.00	118.00	65.00	124.00	**95.00**	**139.00**	**112.00**	**142.00**	99.2
June					107.80	110.30	100.10	56.00	0.00	72.00	60.90	98.00	71.00	39.00	121.00	86.00	98.00	**25.00**	**127.00**	**53.00**	**107.00**	82.5
July					7.00	69.90	18.50	23.30	0.00	68.90	7.00	12.00	1.00	32.00	90.00	115.00	63.00	**60.00**	**131.00**	**0.00**	**60.00**	56.4
August					33.80	53.80	8.90	13.10	6.30	47.60	0.00	0.00	49.00	25.00	14.00	65.00	11.00	**96.00**	**95.00**	**0.00**	**46.00**	40.1
September					5.70	5.10	2.20	5.30	16.90	54.70	2.50	2.00	18.00	3.00	5.00	30.00	7.00	**75.00**	**85.00**	**1.00**	**102.00**	32.8
October					0.10	1.80	0.00	18.20	11.60	51.70	1.20	9.00	27.00	52.00	2.00	46.00	19.00	**42.00**	**102.00**	**76.00**	**110.00**	48.5
November					7.90	12.10	0.00	42.60	63.10	90.70	34.00	35.00	52.00	67.00	24.00	47.00	54.00	**86.00**	**105.00**	**127.00**	**87.00**	68.4
December					88.60	42.90	50.40	35.20	58.20	71.40	34.00	64.00	46.00	103.00	86.00	121.00	85.00	**72.00**	**116.00**	**111.00**	**113.00**	91.7
Totals					749.20	714.20	638.20	742.30	417.70	758.50	459.70	573.00	622.00	373.00	878.00	939.00	812.00	860.00	1,388.00	899.00	1,124.00	846.8
Average					62.43	59.52	53.18	61.86	34.81	63.21	38.31	47.75	51.83	31.08	73.17	78.25	67.67	71.67	115.67	83.43	95.14	70.6

Total MWh (1998-2011)	10,846	Total MWh (1998-Apr. 2008)	6,884	Total MWh (May 2008-2011)	3,962
Average Monthly MWh (1998-2011)	64.56	Average Monthly MWh (1998-Apr 2008)	55.52	Average Monthly MWh (2008-2010)	90.05

HOPKINTON HYDRO PROJECT

Month	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Monthly Generation (MWh) (1995 -- 2010)/Average Monthly Streamflow (cfs) (1995 -- 2010)																		
January	0.0433	0.0729	0.0637	0.1529	0.0464	0.0273	0.1345	0.1877	0.1731	0.0293	0.0852	0.0381	0.0902	0.0951	**0.1328**	**0.1394**	**0.1815**	0.1081
February	0.1379	0.0319	0.1396	0.0927	0.0953	0.1005	0.1535	0.1507	0.1919	0.1039	0.1463	0.0377	0.1753	0.0368	**0.1903**	**0.1162**	**0.1670**	0.1256
March	0.0891	0.0472	0.0942	0.0376	0.0368	0.0334	0.0987	0.1255	0.0429	0.0000	0.1532	0.1577	0.1094	0.0472	**0.0926**	**0.0243**	**0.0258**	0.0704
April	0.2018	0.0555	0.0332	0.0824	0.0632	0.0336	0.0084	0.0882	0.0280	0.0000	0.0227	0.1735	0.0290	0.0155	**0.0641**	**0.0549**	**0.0554**	0.0514
May	0.2200	0.0330	0.0660	0.1012	0.0438	0.0936	0.1173	0.0848	0.0969	0.0000	0.0823	0.0364	0.1058	**0.1071**	**0.2208**	**0.2728**	**0.1363**	0.1071
June	0.3608	0.2285	0.4040	0.0274	0.0000	0.0950	0.0837	0.1076	0.1023	0.0981	0.1639	0.0377	0.1844	**0.1154**	**0.1362**	**0.1765**	**0.1314**	0.1043
July	0.0309	0.0903	0.0709	0.0374	0.0000	0.1644	0.0326	0.0786	0.0091	0.1412	0.1455	0.1654	0.1815	**0.1128**	**0.0874**	**0.0000**	**0.2126**	0.0977
August	0.1046	0.2883	0.0513	0.0668	0.0812	0.0725	0.0000	0.0000	0.1372	0.0884	0.0745	0.2098	0.1228	**0.1474**	**0.0862**	**0.0000**	**0.0756**	0.0830
September	0.0651	0.0283	0.0112	0.0467	0.0167	0.1653	0.0302	0.0345	0.0864	0.0048	0.0527	0.1298	0.0806	**0.1128**	**0.1789**	**0.0238**	**0.0706**	0.0739
October	0.0001	0.0014	0.0000	0.0461	0.0178	0.1081	0.0123	0.0482	0.0476	0.1436	0.0007	0.0533	0.0671	**0.0661**	**0.1124**	**0.1460**	**0.0649**	0.0667
November	0.0039	0.0107	0.0000	0.1203	0.0996	0.1448	0.2678	0.0545	0.0549	0.1206	0.0133	0.0259	0.1133	**0.0856**	**0.0925**	**0.1348**	**0.0590**	0.0991
December	0.1369	0.0187	0.0943	0.1038	0.0782	0.0709	0.1631	0.0959	0.0261	0.0759	0.0646	0.1208	0.1706	**0.0385**	**0.1052**	**0.1158**	**0.0576**	0.0919
Totals	1.3945	0.9067	1.0284	0.9153	0.5790	1.1095	1.1022	1.0560	0.9965	0.8058	1.0051	1.1862	1.4301	0.9803	1.4996	1.2044	1.2377	1.0791
Average	0.1162	0.0756	0.0857	0.0763	0.0482	0.0925	0.0918	0.0880	0.0830	0.0671	0.0838	0.0989	0.1192	0.0817	0.1250	0.1004	0.1031	0.0899

Total Efficiency (1995-Apr. 2008)	13.710	Total Efficiency (May 2008-2011)	4.727
Average Efficiency (1995-Apr. 2008)	0.0857	Average Monthly Efficiency (May 2008-2011)	0.1074
Total Monthly Efficiency (1995-1997)	3.330		
Average Monthly Efficiency (1995-1997)	0.0925	Percent "New"	13.91%

(1) Source: USGS gage at West Hopkinton, New Hampshire
(2) Source: PSNH, Algonquin or NEPOOL GIS
Missing data points

HOPKINTON HYDRO PROJECT

21-years flow data, 1991-2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Flow (cfs)	948.98	747.73	1,377.13	1,995.59	932.20	665.59	384.20	334.70	348.46	720.82	928.89	1,084.51	872.40

***Based on data from Hopkinton Gage multiplied by 434 sq. mile/427 sq. mile to account for increase in drainage area**

HOPKINTON HYDRO PROJECT

Avg. kW = (Avg. Operating Head x Avg. Flow (CFS) x Efficiency) / 11.8

Avg Operating Head:	13		
Assumed Efficiency:	80%		
Nameplate kW	250		
cfs that produces 0.250 MW		**283.6538**	**<-- Post-improvement cap**

Avg Operating Head:	13		
Assumed Efficiency:	80%		
Nameplate kW	250		
cfs that produces 0.250 MW		**283.6538**	**<--- pre-improvement cap**

Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
31	28.25	31	30	31	30	31	31	30	31	30	31

Pre Improvement

Avg Operating Head:	13		
Assumed Efficiency:	80%		
cfs that produces 0.250 MW			
Nameplate MW	0.25		
		730	hrs/month
		182.5	mwh/mo

Post Improvement

Avg Operating Head:	13		
Assumed Efficiency:	80%		
cfs that produces 0.250 MW			
Nameplate MW	0.25		
		730	hrs/month
		182.5	mwh/mo

HOPKINTON PROJECT
NO OUTLIERS REMOVED

(Historical Baseline Period (based on 437/424% of flow at USGS West Hopkinton Gauging Station Data)

Pre-Upgrade

		January	February	March	April	May	June	July	August	September	October	November	December	
1995	Flow (cfs)	1,344	636	1,226	613	543	299	227	323	88	1,091	2,009	647	9,045
	Generation (MWH)	58	88	109	124	119	108	7	34	6	0	8	89	749
283.7	**MWH/cfs**	**0.043**	**0.138**	**0.089**	**0.202**	**0.220**	**0.361**	**0.031**	**0.105**	**0.065**	**0.000**	**0.004**	**0.137**	**1.395**
	Capped Flow (cfs)	284	284	284	284	284	284	227	284	88	284	284	284	3,151
	MWH/Capped cfs	**0.205**	**0.309**	**0.385**	**0.436**	**0.421**	**0.380**	**0.031**	**0.119**	**0.065**	**0.000**	**0.028**	**0.312**	**2.692**
1996	Flow (cfs)	1,639	1,589	1,182	2,403	1,790	483	774	187	180	1,318	1,127	2,290	14,961
	Generation (MWH)	120	51	56	133	59	110	70	54	5	2	12	43	714
	MWH/cfs	**0.073**	**0.032**	**0.047**	**0.055**	**0.033**	**0.228**	**0.090**	**0.288**	**0.028**	**0.001**	**0.011**	**0.019**	**0.907**
	Capped Flow (cfs)	284	284	284	284	284	284	284	187	180	284	284	284	3,204
	MWH/Capped cfs	**0.421**	**0.179**	**0.197**	**0.470**	**0.208**	**0.389**	**0.246**	**0.288**	**0.028**	**0.006**	**0.043**	**0.151**	**2.627**
1997	Flow (cfs)	1,152	936	1,067	2,620	1,007	248	261	174	196	176	789	534	9,160
	Generation (MWH)	73	131	101	87	67	100	19	9	2	0	0	50	638
	MWH/cfs	**0.064**	**0.140**	**0.094**	**0.033**	**0.066**	**0.404**	**0.071**	**0.051**	**0.011**	**0.000**	**0.000**	**0.094**	**1.028**
	Capped Flow (cfs)	284	284	284	284	284	248	261	174	196	176	284	284	3,040
	MWH/Capped cfs	**0.259**	**0.461**	**0.354**	**0.307**	**0.234**	**0.404**	**0.071**	**0.051**	**0.011**	**0.000**	**0.000**	**0.178**	**2.330**
	Average MWH/Non-Capped Flow	**0.060**	**0.103**	**0.077**	**0.097**	**0.106**	**0.331**	**0.064**	**0.148**	**0.035**	**0.000**	**0.005**	**0.083**	**1.110**
	Average MWH/Capped Flow	**0.295**	**0.316**	**0.312**	**0.404**	**0.288**	**0.391**	**0.116**	**0.153**	**0.035**	**0.002**	**0.024**	**0.214**	**2.550**

Extended Pre-Upgrade Period

		January	February	March	April	May	June	July	August	September	October	November	December	
1998	Flow (cfs)	1,064	953	1,994	1,615	884	2,045	623	196	113	395	354	339	10,576
	Generation (MWH)	163	88	75	133	90	56	23	13	5	18	43	35	742
	MWH/cfs	**0.153**	**0.093**	**0.038**	**0.082**	**0.101**	**0.027**	**0.037**	**0.067**	**0.047**	**0.046**	**0.120**	**0.104**	**0.915**
	Capped Flow (cfs)	284	284	284	284	284	284	284	196	113	284	284	284	3,146
	MWH/Capped cfs	**0.574**	**0.311**	**0.264**	**0.469**	**0.316**	**0.197**	**0.082**	**0.067**	**0.047**	**0.064**	**0.150**	**0.124**	**2.666**
1999	Flow (cfs)	867	917	1,810	856	304	107	149	78	1,010	651	633	745	8,126
	Generation (MWH)	40	87	67	54	13	0	0	6	17	12	63	58	418
	MWH/cfs	**0.046**	**0.095**	**0.037**	**0.063**	**0.044**	**0.000**	**0.000**	**0.081**	**0.017**	**0.018**	**0.100**	**0.078**	**0.579**
	Capped Flow (cfs)	284	284	284	284	284	107	149	78	284	284	284	284	2,886
	MWH/Capped cfs	**0.142**	**0.308**	**0.235**	**0.191**	**0.047**	**0.000**	**0.000**	**0.081**	**0.060**	**0.041**	**0.222**	**0.205**	**1.532**
2000	Flow (cfs)	721	684	2,074	1,839	876	758	419	657	331	478	626	1,007	10,470
	Generation (MWH)	20	69	69	62	82	72	69	48	55	52	91	71	759
	MWH/cfs	**0.027**	**0.101**	**0.033**	**0.034**	**0.094**	**0.095**	**0.164**	**0.072**	**0.165**	**0.108**	**0.145**	**0.071**	**1.109**
	Capped Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	3,404
	MWH/Capped cfs	**0.069**	**0.243**	**0.244**	**0.218**	**0.289**	**0.254**	**0.243**	**0.168**	**0.193**	**0.182**	**0.320**	**0.252**	**2.674**
2001	Flow (cfs)	552	492	734	3,199	605	727	215	75	83	97	127	208	7,115
	Generation (MWH)	74	76	73	27	71	61	7	0	3	1	34	34	460
	MWH/cfs	**0.134**	**0.154**	**0.099**	**0.008**	**0.117**	**0.084**	**0.033**	**0.000**	**0.030**	**0.012**	**0.268**	**0.163**	**1.102**
283.7	Capped Flow (cfs)	284	284	284	284	284	284	215	75	83	97	127	208	2,507
	MWH/Capped cfs	**0.262**	**0.266**	**0.256**	**0.094**	**0.250**	**0.215**	**0.033**	**0.000**	**0.030**	**0.012**	**0.268**	**0.163**	**1.849**

HOPKINTON PROJECT
NO OUTLIERS REMOVED

2002	Flow (cfs)	187	312	606	1,077	1,179	911	153	47	58	187	643	667	6,026
	Generation (MWH)	35	47	76	95	100	98	12	0	2	9	35	64	573
	MWH/cfs	**0.188**	**0.151**	**0.125**	**0.088**	**0.085**	**0.108**	**0.079**	**0.000**	**0.034**	**0.048**	**0.054**	**0.096**	**1.056**
	Capped Flow (cfs)	187	284	284	284	284	284	153	47	58	187	284	284	2,617
	MWH/Capped cfs	**0.188**	**0.166**	**0.268**	**0.335**	**0.353**	**0.345**	**0.079**	**0.000**	**0.034**	**0.048**	**0.123**	**0.226**	**2.165**
2003	Flow (cfs)	445	313	1,166	2,644	1,001	694	109	357	208	567	947	1,764	10,215
	Generation (MWH)	77	60	50	74	97	71	1	49	18	27	52	46	622
	MWH/cfs	**0.173**	**0.192**	**0.043**	**0.028**	**0.097**	**0.102**	**0.009**	**0.137**	**0.086**	**0.048**	**0.055**	**0.026**	**0.996**
	Capped Flow (cfs)	284	284	284	284	284	284	109	284	208	284	284	284	3,154
	MWH/Capped cfs	**0.271**	**0.212**	**0.176**	**0.261**	**0.342**	**0.250**	**0.009**	**0.173**	**0.086**	**0.095**	**0.183**	**0.162**	**2.221**
2004	Flow (cfs)	784	279	739	2,641	870	398	227	283	621	362	555	1,357	9,115
	Generation (MWH)	23	29	0	0	0	39	32	25	3	52	67	103	373
	MWH/cfs	**0.029**	**0.104**	**0.000**	**0.000**	**0.000**	**0.098**	**0.141**	**0.088**	**0.005**	**0.144**	**0.121**	**0.076**	**0.806**
	Capped Flow (cfs)	284	279	284	284	284	284	227	283	284	284	284	284	3,342
	MWH/Capped cfs	**0.081**	**0.104**	**0.000**	**0.000**	**0.000**	**0.137**	**0.141**	**0.088**	**0.011**	**0.183**	**0.236**	**0.363**	**1.345**
2005	Flow (cfs)	1,126	875	868	2,683	1,433	738	619	188	95	2,781	1,804	1,330	14,540
	Generation (MWH)	96	128	133	61	118	121	90	14	5	2	24	86	878
	MWH/cfs	**0.085**	**0.146**	**0.153**	**0.023**	**0.082**	**0.164**	**0.145**	**0.075**	**0.053**	**0.001**	**0.013**	**0.065**	**1.005**
	Capped Flow (cfs)	284	284	284	284	284	284	284	188	95	284	284	284	3,119
	MWH/Capped cfs	**0.338**	**0.451**	**0.469**	**0.215**	**0.416**	**0.427**	**0.317**	**0.075**	**0.053**	**0.007**	**0.085**	**0.303**	**3.156**
2006	Flow (cfs)	1,917	1,619	717	674	1,784	2,279	695	310	231	863	1,811	1,002	13,902
	Generation (MWH)	73	61	113	117	65	86	115	65	30	46	47	121	939
	MWH/cfs	**0.038**	**0.038**	**0.158**	**0.174**	**0.036**	**0.038**	**0.165**	**0.210**	**0.130**	**0.053**	**0.026**	**0.121**	**1.186**
	Capped Flow (cfs)	284	284	284	284	284	284	284	284	231	284	284	284	3,351
	MWH/Capped cfs	**0.257**	**0.215**	**0.398**	**0.412**	**0.229**	**0.303**	**0.405**	**0.229**	**0.130**	**0.162**	**0.166**	**0.427**	**3.334**
2007	Flow (cfs)	1,175	371	1,006	2,413	1,172	531	347	90	87	283	477	498	8,449
	Generation (MWH)	106	65	110	70	124	98	63	11	7	19	54	85	812
	MWH/cfs	**0.090**	**0.175**	**0.109**	**0.029**	**0.106**	**0.184**	**0.182**	**0.123**	**0.081**	**0.067**	**0.113**	**0.171**	**1.430**
	Capped Flow (cfs)	284	284	284	284	284	284	284	90	87	283	284	284	3,012
	MWH/Capped cfs	**0.374**	**0.229**	**0.388**	**0.247**	**0.437**	**0.345**	**0.222**	**0.123**	**0.081**	**0.067**	**0.190**	**0.300**	**3.003**
2008	Flow (cfs)	1,072	1,876	1,950	2,968	887	217	532	651	665	635	1,005	1,872	14,331
	Generation (MWH)	102	69	92	46	95	25	60	96	75	42	86	72	860
	MWH/cfs	**0.095**	**0.037**	**0.047**	**0.015**									**0.195**
	Capped Flow (cfs)	284	284	284	284	284	217	284	284	284	284	284	284	3,337
	MWH/Capped cfs	**0.360**	**0.243**	**0.324**	**0.162**									**1.089**
	Average MWH/Non-Capped Flow	**0.096**	**0.117**	**0.077**	**0.050**	**0.076**	**0.090**	**0.096**	**0.085**	**0.065**	**0.054**	**0.102**	**0.097**	**1.004**
	Average MWH/Capped Flow	**0.265**	**0.250**	**0.275**	**0.237**	**0.268**	**0.247**	**0.153**	**0.100**	**0.072**	**0.086**	**0.194**	**0.252**	**2.401**

HOPKINTON PROJECT
NO OUTLIERS REMOVED

Post Upgrade

		January	February	March	April	May	June	July	August	September	October	November	December	
2008	Flow (cfs)	1,072	1,876	1,950	2,968	887	217	532	651	665	635	1,005	1,872	14,331
	Generation (MWH)	102	69	92	46	95	25	60	96	75	42	86	72	860
	MWH/cfs					**0.107**	**0.115**	**0.113**	**0.147**	**0.113**	**0.066**	**0.086**	**0.038**	**0.786**
	Capped Flow (cfs)	284	284	284	284	284	217	284	284	284	284	284	284	3,337
	MWH/Capped cfs					**0.335**	**0.115**	**0.212**	**0.338**	**0.264**	**0.148**	**0.303**	**0.254**	**1.970**
2009	Flow (cfs)	941	583	1,511	1,746	629	933	1,498	1,102	475	907	1,135	1,103	12,565
	Generation (MWH)	125	111	140	112	139	127	131	95	85	102	105	116	1,388
	MWH/cfs	**0.133**	**0.190**	**0.093**	**0.064**	**0.221**	**0.136**	**0.087**	**0.086**	**0.179**	**0.112**	**0.092**	**0.105**	**1.500**
	Capped Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	3,404
	MWH/Capped cfs	**0.441**	**0.391**	**0.494**	**0.395**	**0.490**	**0.448**	**0.462**	**0.335**	**0.300**	**0.360**	**0.370**	**0.409**	**4.893**
2010	Flow (cfs)	983	852	2,925	2,040	411	300	83	60	42	521	942	959	10,117
	Generation (MWH)	137	99	71	112	112	53	0	0	1	76	127	111	899
	MWH/cfs	**0.139**	**0.116**	**0.024**	**0.055**	**0.273**	**0.176**	**0.000**	**0.000**	**0.024**	**0.146**	**0.135**	**0.116**	**1.204**
	Capped Flow (cfs)	284	284	284	284	284	284	83	60	42	284	284	284	2,738
	MWH/Capped cfs	**0.483**	**0.349**	**0.250**	**0.395**	**0.395**	**0.187**	**0.000**	**0.000**	**0.024**	**0.268**	**0.448**	**0.391**	**3.190**
2011	Flow (cfs)	518	491	2,632	2,039	1,042	814	282	608	1,445	1,695	1,475	1,961	15,004
	Generation (MWH)	94	82	68	113	142	107	60	46	102	110	87	113	1,124
	MWH/cfs	**0.181**	**0.167**	**0.026**	**0.055**	**0.136**	**0.131**	**0.213**	**0.076**	**0.071**	**0.065**	**0.059**	**0.058**	**1.238**
	Capped Flow (cfs)	284	284	284	284	284	284	282	284	284	284	284	284	3,402
	MWH/Capped cfs	**0.331**	**0.289**	**0.240**	**0.398**	**0.501**	**0.377**	**0.213**	**0.162**	**0.360**	**0.388**	**0.307**	**0.398**	**3.964**
	Average MWH/Capped Flow	**0.418**	**0.343**	**0.328**	**0.396**	**0.430**	**0.282**	**0.221**	**0.209**	**0.237**	**0.291**	**0.357**	**0.363**	**3.875**

Baseline Period	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Long Term Flow at Dam (per USGS 1991-2011 data)	949.0	747.7	1,377.1	1,995.6	932.2	665.6	384.2	334.7	348.5	720.8	928.9	1,084.5	872.4
Capped Long Term Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	284
Average MWH/Capped Flow (cfs) - Hist Base	0.295	0.316	0.312	0.404	0.288	0.391	0.116	0.153	0.035	0.002	0.024	0.214	1.204
MWH, Long-Term Avg. - Capped Hist Base	**84**	**90**	**89**	**115**	**82**	**111**	**33**	**43**	**10**	**1**	**7**	**61**	**723**
Average MWH/Capped Flow (cfs) - Ex Base	0.265	0.250	0.275	0.237	0.268	0.247	0.153	0.100	0.072	0.086	0.194	0.252	3.190
MWH, Long-Term Avg. - Capped - Ex Base	**75**	**71**	**78**	**67**	**76**	**70**	**43**	**28**	**21**	**24**	**55**	**72**	**681**
Post Improvement Period	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Long Term Flow at Dam (per USGS 1991-2011 data)	949	748	1,377	1,996	932	666	384	335	348	721	929	1,085	872
Capped Long Term Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	284
Average MWH/Capped Flow (cfs)	0.418	0.343	0.328	0.396	0.430	0.282	0.221	0.209	0.237	0.291	0.357	0.363	3.875
MWH, Long-Term Avg. - Capped	**119**	**97**	**93**	**112**	**122**	**80**	**63**	**59**	**67**	**83**	**101**	**103**	**1,099**
% Change, Base to New - Capped - Ex Base	**58%**	**37%**	**19%**	**67%**	**61%**	**14%**	**45%**	**108%**	**227%**	**237%**	**84%**	**44%**	**61.43%**
% Change, Base to New - Capped - Hist Base	**42%**	**9%**	**5%**	**-2%**	**49%**	**-28%**	**91%**	**37%**	**579%**	**12926%**	**1419%**	**70%**	**51.99%**

HOPKINTON HYDRO PROJECT
OUTLIERS REMOVED

(Historical Baseline Period (based on 437/424% of flow at USGS West Hopkinton Gauging Station Data)

Pre-Upgrade

		January	February	March	April	May	June	July	August	September	October	November	December	
1995	Flow (cfs)	1,344	636	1,226	613	543	299	227	323	88	1,091	2,009	647	9,045
	Generation (MWH)	58	88	109	124	119	108	7	34	6	0	8	89	749
283.7	**MWH/cfs**	**0.043**	**0.138**	**0.089**	**0.202**	**0.220**	**0.361**	**0.031**	**0.105**	**0.065**	**0.000**	**0.004**	**0.137**	**1.395**
	Capped Flow (cfs)	284	284	284	284	284	284	227	284	88	284	284	284	3,151
	MWH/Capped cfs	**0.205**	**0.309**	**0.385**	**0.436**	**0.421**	**0.380**	**0.031**	**0.119**	**0.065**	**0.000**	**0.028**	**0.312**	**2.692**
1996	Flow (cfs)	1,639	1,589	1,182	2,403	1,790	483	774	187	180	1,318	1,127	2,290	14,961
	Generation (MWH)	120	51	56	133	59	110	70	54	5	2	12	43	714
	MWH/cfs	**0.073**	**0.032**	**0.047**	**0.055**	**0.033**	**0.228**	**0.090**	**0.288**	**0.028**	**0.001**	**0.011**	**0.019**	**0.907**
	Capped Flow (cfs)	284	284	284	284	284	284	284	187	180	284	284	284	3,204
	MWH/Capped cfs	**0.421**	**0.179**	**0.197**	**0.470**	**0.208**	**0.389**	**0.246**	**0.288**	**0.028**	**0.006**	**0.043**	**0.151**	**2.627**
1997	Flow (cfs)	1,152	936	1,067	2,620	1,007	248	261	174	196	176	789	534	9,160
	Generation (MWH)	73	131	101	87	67	100	19	9	2	0	0	50	638
	MWH/cfs	**0.064**	**0.140**	**0.094**	**0.033**	**0.066**	**0.404**	**0.071**	**0.051**	**0.011**	**0.000**	**0.000**	**0.094**	**1.028**
	Capped Flow (cfs)	284	284	284	284	284	248	261	174	196	176	284	284	3,040
	MWH/Capped cfs	**0.259**	**0.461**	**0.354**	**0.307**	**0.234**	**0.404**	**0.071**	**0.051**	**0.011**	**0.000**	**0.000**	**0.178**	**2.330**
	Average MWH/Non-Capped Flow	**0.060**	**0.103**	**0.077**	**0.097**	**0.106**	**0.331**	**0.064**	**0.148**	**0.020**	**0.000**	**0.005**	**0.083**	**1.095**
	Average MWH/Capped Flow	**0.295**	**0.316**	**0.312**	**0.404**	**0.288**	**0.391**	**0.116**	**0.153**	**0.020**	**0.002**	**0.024**	**0.214**	**2.535**

Extended Pre-Upgrade Period

		January	February	March	April	May	June	July	August	September	October	November	December	
1998	Flow (cfs)	1,064	953	1,994	1,615	884	2,045	623	196	113	395	354	339	10,576
	Generation (MWH)	163	88	75	133	90	56	23	13	5	18	43	35	742
	MWH/cfs	**0.153**	**0.093**	**0.038**	**0.082**	**0.101**	**0.027**	**0.037**	**0.067**	**0.047**	**0.046**	**0.120**	**0.104**	**0.915**
	Capped Flow (cfs)	284	284	284	284	284	284	284	196	113	284	284	284	3,146
	MWH/Capped cfs	**0.574**	**0.311**	**0.264**	**0.469**	**0.316**	**0.197**	**0.082**	**0.067**	**0.047**	**0.064**	**0.150**	**0.124**	**2.666**
1999	Flow (cfs)	867	917	1,810	856	304	107	149	78	1,010	651	633	745	8,126
	Generation (MWH)	40	87	67	54	13	0	0	6	17	12	63	58	418
	MWH/cfs	**0.046**	**0.095**	**0.037**	**0.063**	**0.044**	**0.000**	**0.000**	**0.081**	**0.017**	**0.018**	**0.100**	**0.078**	**0.579**
	Capped Flow (cfs)	284	284	284	284	284	107	149	78	284	284	284	284	2,886
	MWH/Capped cfs	**0.142**	**0.308**	**0.235**	**0.191**	**0.047**	**0.000**	**0.000**	**0.081**	**0.060**	**0.041**	**0.222**	**0.205**	**1.532**
2000	Flow (cfs)	721	684	2,074	1,839	876	758	419	657	331	478	626	1,007	10,470
	Generation (MWH)	20	69	69	62	82	72	69	48	55	52	91	71	759
	MWH/cfs	**0.027**	**0.101**	**0.033**	**0.034**	**0.094**	**0.095**	**0.164**	**0.072**	**0.165**	**0.108**	**0.145**	**0.071**	**1.109**
	Capped Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	3,404
	MWH/Capped cfs	**0.069**	**0.243**	**0.244**	**0.218**	**0.289**	**0.254**	**0.243**	**0.168**	**0.193**	**0.182**	**0.320**	**0.252**	**2.674**
2001	Flow (cfs)	552	492	734	3,199	605	727	215	75	83	97	127	208	7,115
	Generation (MWH)	74	76	73	27	71	61	7	0	3	1	34	34	460
	MWH/cfs	**0.134**	**0.154**	**0.099**	**0.008**	**0.117**	**0.084**	**0.033**	**0.000**	**0.030**	**0.012**	**0.268**	**0.163**	**1.102**
283.7	Capped Flow (cfs)	284	284	284	284	284	284	215	75	83	97	127	208	2,507
	MWH/Capped cfs	**0.262**	**0.266**	**0.256**	**0.094**	**0.250**	**0.215**	**0.033**	**0.000**	**0.030**	**0.012**	**0.268**	**0.163**	**1.849**

HOPKINTON HYDRO PROJECT
OUTLIERS REMOVED

2002	Flow (cfs)	187	312	606	1,077	1,179	911	153	47	58	187	643	667	6,026
	Generation (MWH)	35	47	76	95	100	98	12	0	2	9	35	64	573
	MWH/cfs	**0.188**	**0.151**	**0.125**	**0.088**	**0.085**	**0.108**	**0.079**	**0.000**	**0.034**	**0.048**	**0.054**	**0.096**	**1.056**
	Capped Flow (cfs)	187	284	284	284	284	284	153	47	58	187	284	284	2,617
	MWH/Capped cfs	**0.188**	**0.166**	**0.268**	**0.335**	**0.353**	**0.345**	**0.079**	**0.000**	**0.034**	**0.048**	**0.123**	**0.226**	**2.165**
2003	Flow (cfs)	445	313	1,166	2,644	1,001	694	109	357	208	567	947	1,764	10,215
	Generation (MWH)	77	60	50	74	97	71	1	49	18	27	52	46	622
	MWH/cfs	**0.173**	**0.192**	**0.043**	**0.028**	**0.097**	**0.102**	**0.009**	**0.137**	**0.086**	**0.048**	**0.055**	**0.026**	**0.996**
	Capped Flow (cfs)	284	284	284	284	284	284	109	284	208	284	284	284	3,154
	MWH/Capped cfs	**0.271**	**0.212**	**0.176**	**0.261**	**0.342**	**0.250**	**0.009**	**0.173**	**0.086**	**0.095**	**0.183**	**0.162**	**2.221**
2004	Flow (cfs)	784	279	739	2,641	870	398	227	283	621	362	555	1,357	9,115
	Generation (MWH)	23	29	0	0	0	39	32	25	3	52	67	103	373
	MWH/cfs	**0.029**	**0.104**	**0.000**	**0.000**	**0.000**	**0.098**	**0.141**	**0.088**	**0.005**	**0.144**	**0.121**	**0.076**	**0.806**
	Capped Flow (cfs)	284	279	284	284	284	284	227	283	284	284	284	284	3,342
	MWH/Capped cfs	**0.081**	**0.104**	**0.000**	**0.000**	**0.000**	**0.137**	**0.141**	**0.088**	**0.011**	**0.183**	**0.236**	**0.363**	**1.345**
2005	Flow (cfs)	1,126	875	868	2,683	1,433	738	619	188	95	2,781	1,804	1,330	14,540
	Generation (MWH)	96	128	133	61	118	121	90	14	5	2	24	86	878
	MWH/cfs	**0.085**	**0.146**	**0.153**	**0.023**	**0.082**	**0.164**	**0.145**	**0.075**	**0.053**	**0.001**	**0.013**	**0.065**	**1.005**
	Capped Flow (cfs)	284	284	284	284	284	284	284	188	95	284	284	284	3,119
	MWH/Capped cfs	**0.338**	**0.451**	**0.469**	**0.215**	**0.416**	**0.427**	**0.317**	**0.075**	**0.053**	**0.007**	**0.085**	**0.303**	**3.156**
2006	Flow (cfs)	1,917	1,619	717	674	1,784	2,279	695	310	231	863	1,811	1,002	13,902
	Generation (MWH)	73	61	113	117	65	86	115	65	30	46	47	121	939
	MWH/cfs	**0.038**	**0.038**	**0.158**	**0.174**	**0.036**	**0.038**	**0.165**	**0.210**	**0.130**	**0.053**	**0.026**	**0.121**	**1.186**
	Capped Flow (cfs)	284	284	284	284	284	284	284	284	231	284	284	284	3,351
	MWH/Capped cfs	**0.257**	**0.215**	**0.398**	**0.412**	**0.229**	**0.303**	**0.405**	**0.229**	**0.130**	**0.162**	**0.166**	**0.427**	**3.334**
2007	Flow (cfs)	1,175	371	1,006	2,413	1,172	531	347	90	87	283	477	498	8,449
	Generation (MWH)	106	65	110	70	124	98	63	11	7	19	54	85	812
	MWH/cfs	**0.090**	**0.175**	**0.109**	**0.029**	**0.106**	**0.184**	**0.182**	**0.123**	**0.081**	**0.067**	**0.113**	**0.171**	**1.430**
	Capped Flow (cfs)	284	284	284	284	284	284	284	90	87	283	284	284	3,012
	MWH/Capped cfs	**0.374**	**0.229**	**0.388**	**0.247**	**0.437**	**0.345**	**0.222**	**0.123**	**0.081**	**0.067**	**0.190**	**0.300**	**3.003**
2008	Flow (cfs)	1,072	1,876	1,950	2,968	887	217	532	651	665	635	1,005	1,872	14,331
	Generation (MWH)	102	69	92	46	95	25	60	96	75	42	86	72	860
	MWH/cfs	**0.095**	**0.037**	**0.047**	**0.015**									**0.195**
	Capped Flow (cfs)	284	284	284	284	284	217	284	284	284	284	284	284	3,337
	MWH/Capped cfs	**0.360**	**0.243**	**0.324**	**0.162**									**1.089**
	Average MWH/Non-Capped Flow	**0.096**	**0.117**	**0.077**	**0.050**	**0.076**	**0.090**	**0.096**	**0.108**	**0.075**	**0.059**	**0.102**	**0.097**	**1.042**
	Average MWH/Capped Flow	**0.265**	**0.250**	**0.275**	**0.237**	**0.268**	**0.247**	**0.153**	**0.133**	**0.088**	**0.094**	**0.194**	**0.252**	**2.457**

HOPKINTON HYDRO PROJECT
OUTLIERS REMOVED

Post Upgrade

Year		January	February	March	April	May	June	July	August	September	October	November	December	
2008	Flow (cfs)	1,072	1,876	1,950	2,968	887	217	532	651	665	635	1,005	1,872	14,331
	Generation (MWH)	102	69	92	46	95	25	60	96	75	42	86	72	860
	MWH/cfs					**0.107**	**0.115**	**0.113**	**0.147**	**0.113**	**0.066**	**0.086**	**0.038**	**0.786**
	Capped Flow (cfs)	284	284	284	284	284	217	284	284	284	284	284	284	3,337
	MWH/Capped cfs					**0.335**	**0.115**	**0.212**	**0.338**	**0.264**	**0.148**	**0.303**	**0.254**	**1.970**
2009	Flow (cfs)	941	583	1,511	1,746	629	933	1,498	1,102	475	907	1,135	1,103	12,565
	Generation (MWH)	125	111	140	112	139	127	131	95	85	102	105	116	1,388
	MWH/cfs	**0.133**	**0.190**	**0.093**	**0.064**	**0.221**	**0.136**	**0.087**	**0.086**	**0.179**	**0.112**	**0.092**	**0.105**	**1.500**
	Capped Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	3,404
	MWH/Capped cfs	**0.441**	**0.391**	**0.494**	**0.395**	**0.490**	**0.448**	**0.462**	**0.335**	**0.300**	**0.360**	**0.370**	**0.409**	**4.893**
2010	Flow (cfs)	983	852	2,925	2,040	411	300	83	60	42	521	942	959	10,117
	Generation (MWH)	137	99	71	112	112	53	0	0	1	76	127	111	899
	MWH/cfs	**0.139**	**0.116**	**0.024**	**0.055**	**0.273**	**0.176**	**0.000**	**0.000**	**0.024**	**0.146**	**0.135**	**0.116**	**1.204**
	Capped Flow (cfs)	284	284	284	284	284	284	83	60	42	284	284	284	2,738
	MWH/Capped cfs	**0.483**	**0.349**	**0.250**	**0.395**	**0.395**	**0.187**	**0.000**	**0.000**	**0.024**	**0.268**	**0.448**	**0.391**	**3.190**
2011	Flow (cfs)	518	491	2,632	2,039	1,042	814	282	608	1,445	1,695	1,475	1,961	15,004
	Generation (MWH)	94	82	68	113	142	107	60	46	102	110	87	113	1,124
	MWH/cfs	**0.181**	**0.167**	**0.026**	**0.055**	**0.136**	**0.131**	**0.213**	**0.076**	**0.071**	**0.065**	**0.059**	**0.058**	**1.238**
	Capped Flow (cfs)	284	284	284	284	284	284	282	284	284	284	284	284	3,402
	MWH/Capped cfs	**0.331**	**0.289**	**0.240**	**0.398**	**0.501**	**0.377**	**0.213**	**0.162**	**0.360**	**0.388**	**0.307**	**0.398**	**3.964**
	Average MWH/Capped Flow	**0.418**	**0.343**	**0.328**	**0.396**	**0.462**	**0.337**	**0.337**	**0.249**	**0.330**	**0.338**	**0.375**	**0.400**	**4.313**

Baseline Period	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Long Term Flow at Dam (per USGS 1991-2011 data)	949.0	747.7	1,377.1	1,995.6	932.2	665.6	384.2	334.7	348.5	720.8	928.9	1,084.5	872
Capped Long Term Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	284
Average MWH/Capped Flow (cfs) - Hist Base	0.295	0.316	0.312	0.404	0.288	0.391	0.116	0.153	0.020	0.002	0.024	0.214	2.535
MWH, Long-Term Avg. - Capped Hist Base	**84**	**90**	**89**	**115**	**82**	**111**	**33**	**43**	**6**	**1**	**7**	**61**	**719**
Average MWH/Capped Flow (cfs) - Ex Base	0.265	0.250	0.275	0.237	0.268	0.247	0.153	0.133	0.088	0.094	0.194	0.252	2.457
MWH, Long-Term Avg. - Capped - Ex Base	**75**	**71**	**78**	**67**	**76**	**70**	**43**	**38**	**25**	**27**	**55**	**72**	**697**
Post Improvement Period	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Long Term Flow at Dam (per USGS 1991-2011 data)	949	748	1,377	1,996	932	666	384	335	348	721	929	1,085	872
Capped Long Term Flow (cfs)	284	284	284	284	284	284	284	284	284	284	284	284	284
Average MWH/Capped Flow (cfs)	0.418	0.343	0.328	0.396	0.462	0.337	0.337	0.249	0.330	0.338	0.375	0.400	4.313
MWH, Long-Term Avg. - Capped	**119**	**97**	**93**	**112**	**131**	**96**	**96**	**71**	**94**	**96**	**106**	**113**	**1,223**
% Change, Base to New - Capped - Ex Base	**58%**	**37%**	**19%**	**67%**	**72%**	**36%**	**120%**	**87%**	**276%**	**258%**	**93%**	**58%**	**75.52%**
% Change, Base to New - Capped - Hist Base	**42%**	**9%**	**5%**	**-2%**	**60%**	**-14%**	**191%**	**63%**	**1569%**	**15058%**	**1495%**	**87%**	**70.15%**

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

The Town of Hopkinton) Project No. 5735-001

ORDER GRANTING EXEMPTION FROM LICENSING OF A SMALL HYDROELECTRIC PROJECT OF 5 MEGAWATTS OR LESS

(Issued March 14, 1984)

The Applicant 1/ filed an application for exemption from all or part of Part I of the Federal Power Act (Act) pursuant to 18 C.F.R. Part 4 Subpart K (1980) implementing in part Section 408 of the Energy Security Act (ESA) of 1980 for a project as described in the attached public notice. 2/ 3/

Notice of the application was published in accordance with Section 408 of the ESA and the Commission's regulations and comments were requested from interested Federal and State agencies including the U.S. Fish and Wildlife Service and the State Fish and Wildlife Agency. All comments, protests and petitions to intervene that were filed have been considered. No agency has any objection relevant to issuance of this exemption.

Standard Article 2, included in this exemption, requires compliance with any terms and conditions that Federal or State fish and wildlife agencies have determined appropriate to prevent loss of, or damage to, fish and wildlife resources. The terms and conditions referred to in Article 2 are contained in any letters of comment by these agencies which have been forwarded to the Applicant in conjunction with this exemption.

1/ The Town of Hopkinton, Project No. 5735-001, filed on November 29, 1983.

2/ Pub. Law 96-294, 94 Stat. 611. Section 408 of the ESA amends inter alia, Sections 405 and 408 of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. §§2705 and 2708).

3/ Authority to act on this matter is delegated to the Deputy Director, Office of Electric Power Regulation, under §375.308 of the Commission's regulations, 18 C.F.R. §375.308 (1983). This order may be appealed to the Commission by any party within 30 days of its issuance pursuant to Rule 1902, 18 C.F.R. 385.1902, (1983). Filing an appeal and final Commission action on that appeal are prerequisites for filing an application for rehearing as provided in Section 313(a) of the Act. Filing an appeal does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically directed by the Commission.

Should the Applicant contest any terms or conditions that were proposed by Federal or State agencies in their letters of comment as being outside the scope of Article 2, the Commission shall determine whether the disputed terms or conditions are outside the scope of Article 2.

Based on the terms and conditions required by Federal and State fish and wildlife agencies, the environmental information in the application for exemption, other public comments, and staff's independent analysis, issuance of this order is not a major Federal action significantly affecting the quality of the human environment.

It is ordered that:

(A) The Hopkinton Project No. 5735 as described and designated in the Town of Hopkinton's application filed on November 29, 1983, is exempted from all of the requirements of Part I of the Federal Power Act, including licensing, subject to the standard articles in §4.106, of the Commission's regulations attached hereto as Form E-2, 18 C.F.R. §4.106 45 Fed. Reg. 76115 (November 18, 1980), and the following Special Article.

Article 6. Any exempted small hydroelectric power project that utilizes a dam which is more than 33 feet in height above streambed, as defined in 18 CFR 12.31(c) of this chapter, impounds more than 2,000 acre-feet of water, or has a significant or high hazard potential, as defined in 33 CFR Part 222, is subject to the following provisions of 18 CFR Part 12:

(i) Section 12.4(b)(1)(i) and (ii), (2)(i), (iii)(A) and (B), (iv), and (v);

(ii) Section 12.4(c);

(iii) Section 12.5;

(iv) Subpart C; and

(v) Subpart D.

For the purposes of applying these provisions of 18 CFR Part 12, the exempted project is deemed to be a licensed project development and the owner of the exempted project is deemed to be a licensee.

Robert E. Cackowski
Robert E. Cackowski
Deputy Director, Office of
Electric Power Regulation

P-5735-001

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

Notice of Application Filed with the Commission

(December 30, 1983)

Take notice that the following hydroelectric application has been filed with the Federal Energy Regulatory Commission and is available for public inspection:

a. Type of Application: 5 MW Exemption

b. Project No: 5735-001

c. Date Filed: November 29, 1983

d. Applicant: The Town of Hopkinton

e. Name of Project: Hopkinton Project

f. Location: On the Contoocook River in Hillsborough County, New Hampshire.

g. Filed Pursuant to: Federal Power Act, 16 U.S.C. §§791(a) - 825(r).

h. Contact Person: John R. Spencer, Dufresne-Henry, Inc., Precision Park, North Spring Field, Vermont 05150.

i. Comment Date: FEB 1 ? 1984

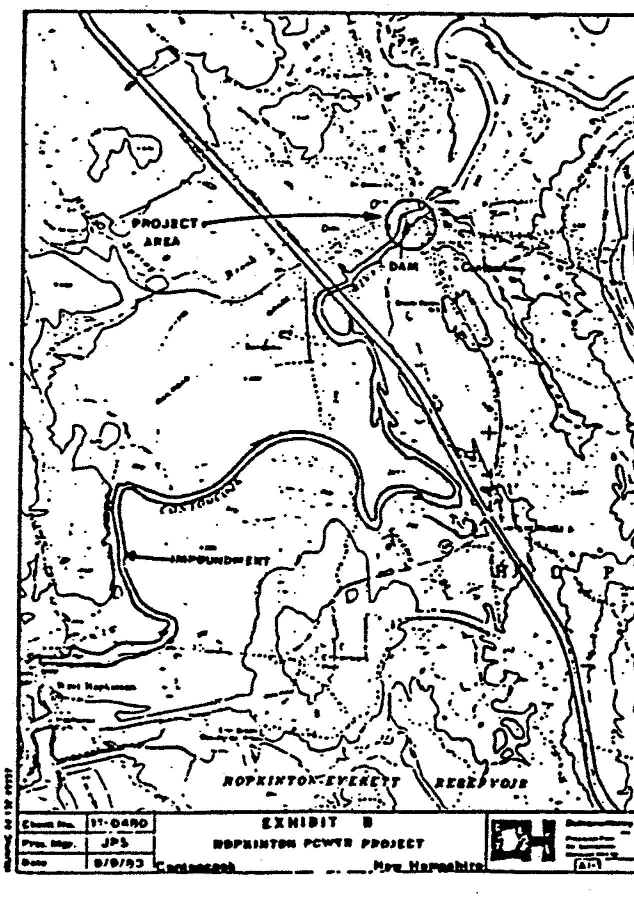
j. Description of Project: The proposed project would consist of: (1) an existing 325-foot-long and 11-foot-high dam; (2) a reservoir with negligible storage capacity; (3) new intake structures at the northern side of the dam; (4) a new powerhouse with an installed capacity of 249 kW; (5) a new tailrace; (6) a new 100-foot-long transmission line; and (7) other appurtenances. Applicant owns all existing facilities. It estimates an average annual generation of 1,303,000 kWh.

k. Purpose of Project: Project energy would be sold to the Public Service Company of New Hampshire.

l. This notice also consists of the following standard paragraphs: A1, A9, B, C, and D1a.

m. Purpose of Exemption: An exemption, if issued, gives the Exemptee priority of control, development, and operation of the project under the terms of the exemption from licensing, and protects the Exemptee from permit or license Applicant that would seek to take or develop the project.

DC-A-30



§ 4.106 Standard terms and conditions of exemption from licensing.

Any exemption from licensing granted under this subpart for a small hydroelectric power project is subject to the following standard terms and conditions:

(a) Article 1. The Commission reserves the right to conduct investigations under sections 4(g), 306, 307, and 311 of the Federal Power Act with respect to any acts, complaints, facts, conditions, practices, or other matters related to the construction, operation, or maintenance of the exempt project. If any term or condition of the exemption is violated, the Commission may revoke the exemption, issue a suitable order under section 4(g) of the Federal Power Act, or take appropriate action for enforcement, forfeiture, or penalties under Part III of the Federal Power Act.

(b) Article 2. The construction, operation, and maintenance of the exempt project must comply with any terms and conditions that any Federal or state fish and wildlife agencies have determined are appropriate to prevent loss of, or damage to, fish or wildlife resources or otherwise to carry out the purposes of the Fish and Wildlife Coordination Act, as specified in Exhibit E of the application for exemption from licensing or in the comments submitted in response to the notice of the exemption application.

(c) Article 3. The Commission may accept a license application by any qualified license applicant and revoke this exemption if actual construction or development of any proposed generating facilities has not begun within 18 months, or been completed within four years, from the date on which this exemption was granted. If an exemption is revoked, the Commission will not accept a subsequent application for exemption within two years of the revocation.

(d) Article 4. This exemption is subject to the navigation servitude of the United States if the project is located on navigable waters of the United States.

(e) Article 5. This exemption does not confer any right to use or occupy any Federal lands that may be necessary for the development or operation of the project. Any right to use or or occupy any Federal lands for these purposes must be obtained from the administering Federal land agencies. The Commission may accept a license application by any qualified license applicant and revoke this exemption, if any necessary right to use or occupy Federal lands for those purposes has not been obtained within one year from the date on which this exemption was granted.

Hopkinton Hydro Project 2008 Capital and Efficiency Improvements				
No.	**Description of Improvements**	**When Started**	**When Completed**	**Description of Improvement Benefit**
2008-1	Installed new 24-inch exhaust fan with thermostat and floor fans.	2008	May 2008	Keeps generators cool to prevent plant from shutting down due to overheating of powerhouse. Installed floor fans with thermostatic control. Turbine/generator units used to shut down when powerhouse temperature exceeded 130^{o}F
2008-2	Installed new leaf boom.	2008	May 2008	Minimized debris on rack, increase production and reduce need for maintenance. Racks would clog and plant would shut down. Major improvement in production.
2008-3	Replaced valve gaskets on G1 and G2 safety air valves.	2008	Jul. 2008	Rebuilt safety air valves that are used to reduce torque on turbine. Valves were leaking causing substantial loss on production. Required piece of equipment to maintain safety of plant to reduce torque on turbine during shutdown and emergency shutdown. Now included on normal shutdown to protect equipment.
2008-4	Rewound burned out coil on G2 air valve.	2008	Jul. 2008	Safety air valve was not functional but is required equipment for plant operations. Rebuilt safety air valves are used to reduce torque on turbine. Required piece of equipment to maintain safety of plant to reduce torque on turbine during normal and emergency shutdown. Now included on normal shutdown to protect equipment.
2008-5	Replaced couplings on G1 and G2 speed tachometer.	2008	Sep. 2008	Continual failure of tachometer would shut plant down and reduce production. Replaced couplings and motor to keep plant on line and running. Dramatic increase in production, as this was a common failure.
2008-6	Installed new tachometer-Servotek.	2008	Sep. 2008	Continual failure of tachometer would shut plant down and reduce production. Replaced motor to keep plant on line and running. Dramatic increase in production, as this was a common failure. Plant used to stock broken spare parts on shelf. Production is increased by keeping stock of working critical spare parts on hand.

2008-7	Installed new vacuum contactor bottles g1 and g2.	2009	2010	Thermal imager enabled us to locate main vacuum contactor bottle overheating. Replaced before imminent failure. Stocked spare vacuum contactor, with spare bottles.
2008-8	Purchased thermal imager,	Sept. 2009	2012	Purchase thermal imaging device for continual inspection and monitoring of plant. Thermal imager has enabled problems to be discovered before they become critical. Has prevented shutdowns and increased production. Gives us time to locate and purchase replacement products for repair, while still being on line and operating. Major increases in production.
2008-9	Installed new 100 cfm Ingersoll Rand gas powered compressor.	2008	Aug. 2008	Made trash rack cleaning safer and more efficient for operators, reduced head loss, increased production, cut down time for operators
2008-10	Refurbished dam.	2008	Sep. 2008	Reduce leakage, improved structural stability of dam, enable project to keep operating. Required and necessary to ensure longevity of dam structure.
2008-11	Refurbished trash racks.	2008	Oct. 2008	Original trashracks were corroded and had reduced spacing due to thick rust and corrosion, thus reducing production and increasing headloss. Headloss was often over 1 foot through the racks, even when racks were cleaned. Major increase in production.
2008-12	Installed motion sensor light and handrail.	2008	Oct. 2008	Improved safety for operators and safety of other personnel, reducing risk of fall injury.
2008-13	Built and installed new 12V dc backup power supply.	2008	Nov. 2008	Enabled plant to be safely shut down when grid power was down. This is a required emergency backup system; there was no system in place before installation. Without DC UPS 12V system facility cannot experience a controlled shutdown of the turbines during a loss of power.
2008-14	Installed new Basler 3-P digital relay.	2008	Sept. 2008	Required upgrade by PSNH to maintain plant on line. Old relay deemed obsolete by utility, extended life of facility by protecting plant during grid instability.
2008-15	Ordered new digital tachometer and proximity sensor for G2 I	2008	Dec. 2008	Plant was blowing 250 amp fuses due to inaccurate signal from speed tachometer, causing instability in generation, and throwing plant off line. Old tachometer system was functionally obsolete. There was no feedback on cause of outage. New tachometer brought plant to industry standard using digital controls.

2008-16	Installed 1/3 hp 3-p fan motor with seized bearings on G2 with new motor.	2008	Nov. 2008	Critical component for cooling of gearbox, increased useful life span of gearbox. Existing motor was industry standard, but not functioning. Cleaned cooling mechanism-which was clogged due to lack of maintenance. Increase overall efficiency of cooling of gearbox oil. Prevent overheating which can result in significant turbine efficiency loss
2008-17	Replaced level sensor pressure transducer, installed dessicant with low wattage light bulb.	2008	Nov. 2008	Replaced level sensor which is main control component of plant for reliable operation. Upgraded cabinet with dessicant and heating device to keep moisture out of new transducer, increasing useful life span of transducer.
2008-18	Installed new Watt-hour meters on G1 and G2.	2008	Nov. 2008	Watt-hour meters had reached end of useful life and needed replacement with industry standard.
2008-19	Replaced saturated meter per PSNH requirements.	2008	Sep. 2008	Plant had increased production due to upgrades so that existing meter was not able to accurately read production. Utility required meter to be changed to accurately read production.
2008-20	Replaced transducer in G1 with new Crompton Paladin transducer-Spectrum Industries.	2008	Dec. 2008	Transducer drives watt meter and is used to record production. Transducer had reached end of useful life span. Required replacement, New transducer meets industry standard and is part of shutdown mechanism to protect from overpower and underpower of generators.
2008-21	Installed new spooler on gate 3	2008	Dec. 2008	Replaced hydraulic spooler, part of gate control system, required to keep plant safely operational.

Hopkinton Hydro Project
2009 Capital and Efficiency Improvements

No.	Description of Improvements	When Started	When Completed	Description of Improvement Benefit
2009-1	Ordered new TR5000 from electro-sensors for G2. Installed in April 2009.	2009	April 2009	Brought second unit up to industry standard with replacement of mechanical tachometer with digital tachometer with higher accuracy and safety settings to protect from underspeed and overspeed, required to put induction unit on line at right time. Longevity advantage for synching unit with grid.
2009-2	Installed new digital KW meter on G1.	2009	Jan. 2009	Provides more accurate reading of output, and more reliable trip setting and shut down relay to determine when plant shut down during power production. Protects equipment from cavitation due to low flows. Bring up to industry standards with use of digital device.
2009-3	Installed new air compressor starter solenoid (new starter motor in 11/09; new solenoid in 12/09).	2009	Dec. 2009	Keeps air compressor running which is integral part of keeping trash racks clean and maintaining production.
2009-4	Ordered new fan motors for G1 and G2 after G2 replacement motor burned out.	2009	Dec. 2009	Critical component for cooling of gearbox, increased useful life span of gearbox. Existing motor was industry standard, but not functioning. Cleaned cooling mechanism, which was clogged due to lack of maintenance. Increased overall efficiency of cooling of gearbox oil. Prevents overheating which can result in significant loss of turbine efficiency.
2009-5	Installed new gate limit switches (ordered 2 spare switches).	2009	Nov. 2009	Critical component for operation of plant,. Without limit switch working, gates would not function and plant could not operate. Had reached end of previous useful life and was replaced with industry standard.
2009-6	Ordered new separator filter for IR compressor.	2009	Jan. 2009	Keeps air compressor running which is integral part of keeping trash racks clean and maintaining production.
2009-7	Ordered spare time delay 250 amp fuses.	2009	Mar. 2009	Keeps spare parts on shelf for immediate repair to enable plant to be on line quickly when fault occurs.

2009-8	Modified gates for single gate operation.	2009	Jan. 2009	Reconfigured gate operation to enable generation and increase production at low flows
2009-9	Posted dam danger signs.	2009	May 2009	Brought facility into minimum compliance with FERC dam safety requirements.
2009-10	Installed new small center fan and set up thermostat for floor fans.	2009	Apr. 2009	Keep generators cool to prevented plant from shutting down due to overheating of powerhouse. Install floor fans with thermostatic control. T/G units used to shut down for overheating when powerhouse temperature exceeded 130^{o}F
2009-11	Installed fuses on transducers in cabinets.	2009	Dec. 2009	Fuses protect transducers during faults; thus, reducing catastrophic damage to control panel and reducing risk of system failure
2009-12	Refurbished G2 gearbox, redipped G2 generator windings and brake coil, installed new bearings and on generator shaft.	Jul. 2009	Sep. 2009	Major overhaul of gearbox and generator winding required to extend previous useful life and reliability of unit. Anticipated to last for additional decade or more.
2009-13	Installed new smoke detector and hooked up to unit 3 (?) of sensaphone.	2009	Sep. 2009	Installation of new smoke detection system for early warning of any conditions that produce smoke in powerhouse. Attached to powerhouse alarm system that notifies operator of problem.
2009-14	Installed frazil timer.	2009	Dec. 2009	Frazil timer relay circuitry installed to accommodate delayed start in winter when frazil ice is present to increase production when normally plant would shut down.
2009-15	Repacked gate cylinders and new bushings on two cylinders, straightened one bent cylinder and replaced badly pitted cylinder with new chrome plated stainless steel cylinder.	Oct. 2009	Dec. 2009	Major overhaul of hydraulic gate cylinders required to extend useful life and reliability of gates. Anticipated to last for additional decade or more..
2009-16	Replaced rotten beams in forebay in front of G1 gates.	2009	2009	Improved safety for operators and safety of other personnel, reducing risk of injury to personnel and equipment
2009-17	Installed new floating bobble line for boat barrier at dam.	2009	2009	Upgrade existing system to replace inefficient system, reducing labor costs and increasing safety. Upgraded to minimum conditions of FERC license.

2009-18	Replaced turbine bearing bolts on G2.	Jul. 2009	Jul. 2009	Replacing broken bolts prevented major failure of bearing which would have caused catastrophic failure and taken plant off line for indeterminate period of time.
2009-19	Replaced burned terminals on primary powerhouse panel.	Jan. 2009	Dec. 2009	Drastically improved reliability of control system, facilitating increased production due to reduction of nuisance tripping of control equipment for both units.

Hopkinton Hydro Project
2010 Capital and Efficiency Improvements

No.	Description of Improvements	When Started	When Completed	Description of Improvement Benefit
2010-1	Installed new vacuum contactor bottles G1 and G2.	2009	2010	Thermal imager enabled locating main vacuum contactor bottle before overheating and replacement before failure. Stocked spare vacuum contactor with spare bottles.
2010-2	Installed new overspeed protection.	2010	Nov-10	Installed overspeed protection. Previously, there was no overspeed protection on generators. Lack of overspeed protection could have caused a major failure that will cause a loss of production.
2010-3	Installed new starter on HPU motor.	2010	Jan-10	Installed to prevent failure. Maintains operations of gates that are critical component to safe and productive operation of plant. Without replacement of main hydraulic unit failure could have limited future operation.
2010-4	Installed new Electrosensor 5000 on G1.	2010	Apr-10	Brought first unit up to industry standard with replacement of digital tachometer with higher accuracy and safety settings to protect from underspeed and overspeed conditions, required to put induction unit on line at right time. Longevity advantage for synching unit with grid. Intermittent problem-resolved with replacement with same unit
2010-5	Replaced oil flow sensors.	2010	May-10	Replaced with current industry standard solid state oil flow detection device. Senor monitors critical flow of oil through the gearbox, preventing overheating and seizure of the gears. Senor extends anticipated life of gearbox.
2010-6	Installed new thermostat on gearbox.	2010	May-10	Upgraded old analog temperature sensing devices with new digital programmable thermostat relay. Thermostat gives more accurate and reliable feedback to the controls and provides critical protection of units.
2010-7	Installed lightning arrestors on GI and G.	2010	May-10	Installation of lightning surge arrestors on main switchgear,. Adds protection to the main power source of the plant

2010-8	Installed fuses in control cabinets.	2010	May-10	Fuses protect potential transformers during faults, reducing risk of both catastrophic damage to control panel and system failure
2010-9	Installed G2 safety air valve system operating on compressed air.	2010	Aug-2010	Coil had failed, been replaced and then failed again. New system designed to operate on compressed air. Increase longevity of valve assembly and operation. Critical component for reducing torque on turbine. Upgraded to industry standard using readily available components.
2010-10	Installed new flexible grease lines to G2 runner bearing.	2010	Jul-10	Grease lines maintain grease to bearing. Without replacement, catastrophic failure could have occurred due to lack of grease to turbine, shortening operating life of bearing. Failure to do so would result in complete facility shutdown.
2010-11	Replaced G1glass flow meter.	2010	May-10	Replacement of glass required to ensure proper reading and prevent damage to gearbox.
2010-12	Rebuilt grease pump.	2010	May-10	Grease flow to main bearing was insufficient; refurbishment of grease pump enabled proper operation and increased operating life of lower bearing.
2010-13	Rebuilt dipsticks.	2010	Dec-10	With upgraded dipsticks, improved maintenance and operating life of gearboxes
2010-14	Replaced hydraulic lines to gates.	2010	Aug-10	Enables gates to operate at higher head and colder temperatures

Hopkinton Hydro Project
2011 Capital and Efficiency Improvements

No.	Description of Improvements	When Started	When Completed	Description of Improvement Benefit
2011-1	Refurbished gates with UHMW adhesive on downstream side of gates.	2011	Mar. 2011	Required refurbishment. The lifespan and functionality of gates had decreased almost to point of limited usability. Refurbishment averted over $50,000 for new gates, thus avoiding down time and increasing production and reliability.
2011-2	Installed new oil pump on G1 gearbox.	2011	May 2011	Replaced with new oil pump which moves oil through the gearbox, preventing overheating and seizure of the gears and extending anticipated life of gearbox.
2011-3	Tested gearbox oil through Signum for synthetic oil.	2011	Mar. 2011	Adopted new oil test program to reduce overhead costs and pre-mature oil replacement and to monitor the condition of gearbox and HPU.
2011-4	Installed new metal roof.	2011	Aug. 2011	Old roof had reached end of previous useful life.
2011-5	Replaced seal on G2 at base of generator.	2011	Mar. 2011	Replaced oil seal with industry standard. Replaced original factory seals with higher temperature seals to increase longevity and life expectancy of seals which are critical to containment of oil in the gearbox.
2011-6	Replaced G1 bearings with SKF 6320-ZC3S1 bearings.	2011	Nov. 2011	Due to thermal imaging scanning of plant, early failure of bearings was detected. Bearings were replaced before imminent failure, thus allowing increased production and reduced downtime. . Investment extended facilities useful life span by reducing the risk of system failure.
2011-7	Modified transformer on high side with tygon tubing, to test oil levels. Replaced blown high voltage bushing and binary transformer	2011	Nov. 2011	Installation of new visual oil level sensor allows for additional monitoring of oil in transformer. Facility was shut down due to blown high voltage bushing in transformer, bushing was replaced and oil was renovated to enable plant operation. Refurbishment increased useful lifespan and avoided expensive replacement of transformer.
2011-8	Replaced batteries and maintainer in DC HPU, spare inverter to keep backup of critical component available	2011	Dec. 2011	Enabled plant to be safely shut down when grid power was down. This is a required emergency backup system. Without replacement of batteries and maintenance DC UPS 12V system facility cannot experience a controlled shutdown of the turbines during a loss of power.

2011-9	Installed new check valves for HPU	2011	Dec. 2011	Required refurbishment, original component had reached end of useful life expectancy.
2011-10	Bought two-stage compressor.	2011	Dec. 2011	Installed more reliable compressor to drive safety air valve for more reliable operation of critical system.

Hopkinton Hydro Project **2012 Capital and Efficiency Improvements**				
No.	**Description of Improvements**	**When Started**	**When Completed**	**Description of Improvement Benefit**
2012-1	Refurbished G2 capacitors to avoid shorting.	2012	Apr. 2012	Complete overhaul of G2 capacitor bank to facilitate more robust connections. Previous capacitors continued to fail. Required for reliability of safety system. Replaced capacitors to maintain system stability and protection of generator from surges caused by instability in grid. Previous system was obsolete and damaged.
2012-2	Replaced G2 bearing cover.	2012	Jun. 2012	During annual inspection G2 bearing cover was found to be loose and wearing shaft. Cover was rebuilt repaired and reinforced to avoid future failures. Fixed G1 bearing cover to avoid same.
2012-3	Installed dry transformer.	2012	Jun. 2012	Upgraded and reconfigured powerhouse electrical system.
2012-4	Replaced relay-G1 safety air valve.	2012	Jun. 2012	Replaced relay and circuit control of critical component. Safety air valve was not functional but is required for safe plant operations. Required piece of equipment to maintain safety of plant by reducing torque on turbine during normal and emergency shutdown. Now included on normal shutdown to protect equipment.
2012-5	Refurbished shaft.	2012	Sept 2012	Shaft on G2 turbine was weakened by loose bearing cover. Refurbished shaft.
2012-6	Refurbished dam.	2012	July 2012	Refurbished undermined foundation of dam and by placing. 28 yards of gunnite in dam.